DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

50 CFR Part 218

[Docket No. 210701–0141]

RIN 0648–BK07

Taking and Importing Marine Mammals; Taking Marine Mammals Incidental to the U.S. Navy Training and Testing Activities in the Point Mugu Sea Range Study Area

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

ACTION: Proposed rule; request for comments and information.

SUMMARY: NMFS has received a request from the U.S. Navy (Navy) to take marine mammals incidental to training and testing activities conducted in the Point Mugu Sea Range (PMSR) Study Area. Pursuant to the Marine Mammal Protection Act (MMPA), NMFS is requesting comments on its proposal to issue regulations and subsequent Letter of Authorization (LOA) to the Navy to incidentally take marine mammals during the specified activities. NMFS will consider public comments prior to issuing any final rule and making final decisions on the issuance of the requested LOA. Agency responses to public comments will be summarized in the notice of the final decision in the final rule. The Navy's activities qualify as military readiness activities pursuant to the MMPA, as amended by the National Defense Authorization Act for Fiscal Year 2004 (2004 NDAA).

DATES: Comments and information must be received no later than August 30, 2021.

ADDRESSES: Submit all electronic public comments via the Federal e-Rulemaking Portal. Go to *https://www.regulations.gov* and enter NOAA–NMFS–2021–0064 in the Search box. Click on the ''Comment'' icon, complete the required fields, and enter or attach your comments.

Instructions: Comments sent by any other method, to any other address or individual, or received after the end of the comment period, may not be considered by NMFS. All comments received are a part of the public record and will generally be posted for public viewing on *www.regulations.gov* without change. All personal identifying information (*e.g.,* name, address), confidential business information, or otherwise sensitive information submitted voluntarily by the sender will be publicly accessible. NMFS will accept anonymous comments (enter ''N/A'' in the required fields if you wish to remain anonymous). Attachments to electronic comments will be accepted in Microsoft Word, Excel, or Adobe PDF file formats only.

FOR FURTHER INFORMATION CONTACT: Stephanie Egger, Office of Protected Resources, NMFS, (301) 427–8401. Electronic copies of the application and supporting documents, as well as a list of the references cited in this document, may be obtained online at: *https://www.fisheries.noaa.gov/permit/incidental-take-authorizations-under-marine-mammal-protection-act.* In case of problems accessing these documents, or for anyone who is unable to comment via electronic submission, please call the contact listed above.

SUPPLEMENTARY INFORMATION:

Purpose of Regulatory Action

These proposed regulations, issued under the authority of the MMPA (16 U.S.C. 1361 *et seq.*), would provide the framework for authorizing the take of marine mammals incidental to the Navy's training and testing activities (which qualify as military readiness activities) from the use of at-surface and near-surface explosive detonations throughout the PMSR Study Area, as well as launch events from San Nicolas Island (SNI). The Study Area includes 36,000 square miles and is located adjacent to Los Angeles, Ventura, Santa Barbara, and San Luis Obispo Counties along the Pacific Coast of Southern California (see Figure 1.1 of the application). The two primary components of the PMSR are the Special Use Airspace (SUA) and the ocean Operating Areas (PMSR-controlled sea space). The PMSR-controlled sea space parallels the California coast for approximately 225 nautical miles (nmi) and extends approximately 180 nmi seaward (see Figure 1–1 of the application).

NMFS received an application from the Navy requesting seven-year regulations and an authorization to incidentally take individuals of multiple species of marine mammals (''Navy's rulemaking/LOA application'' or ''Navy's application''). Take is anticipated to occur by Level A and Level B harassment incidental to the Navy's training and testing activities, with no serious injury or mortality expected or proposed for authorization.

Background

The MMPA prohibits the take of marine mammals, with certain exceptions. Sections 101(a)(5)(A) and (D) of the MMPA direct the Secretary of Commerce (as delegated to NMFS) 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 and the opportunity to submit comments.

An authorization for incidental takings shall be granted if NMFS finds that the taking will have a negligible impact on the species or stocks and will not have an unmitigable adverse impact on the availability of the species or stocks for taking for subsistence uses (where relevant). Further, NMFS must prescribe the permissible methods of taking and other means of effecting the least practicable adverse impact on the affected species or stocks and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of such species or stocks for taking for certain subsistence uses (referred to in this rule as ''mitigation measures''). NMFS also must prescribe the requirements pertaining to the monitoring and reporting of such takings. The MMPA defines ''take'' to mean to harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any marine mammal. The Preliminary Analysis and Negligible Impact Determination section below discusses the definition of ''negligible impact.''

The NDAA for Fiscal Year 2004 (2004 NDAA) (Pub. L. 108–136) amended section 101(a)(5) of the MMPA to remove the ''small numbers'' and ''specified geographical region'' provisions indicated above and amended the definition of ''harassment'' as applied to a ''military readiness activity.'' The definition of harassment for military readiness activities (section 3(18)(B) of the MMPA) is: (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). In addition, the 2004 NDAA amended the MMPA as it relates to military readiness activities

such that the least practicable adverse impact analysis shall include consideration of personnel safety, practicality of implementation, and impact on the effectiveness of the military readiness activity.

More recently, section 316 of the NDAA for Fiscal Year 2019 (2019 NDAA) (Pub. L. 115–232), signed on August 13, 2018, amended the MMPA to allow incidental take rules for military readiness activities under section 101(a)(5)(A) to be issued for up to seven years. Prior to this amendment, all incidental take rules under section 101(a)(5)(A) were limited to five years.

Summary and Background of Request

On March 9, 2020, NMFS received an application from the Navy for authorization to take marine mammals by Level A and Level B harassment incidental to training and testing activities (categorized as military readiness activities) from (1) the use of at-surface or near-surface explosive detonations in the PMSR Study Area, as well as (2) launch events from SNI, over a seven-year period beginning October 2021 through October 2028. We received a revised application on August 28, 2020, which provided minor revisions to the mitigation and monitoring sections, and upon which the Navy's rulemaking/LOA application was found to be adequate and complete. On September 4, 2020, we published a notice of receipt (NOR) of application in the **Federal Register** (85 FR 55257), requesting comments and information related to the Navy's request for 30 days. We reviewed and considered all comments and information received on the NOR in development of this proposed rule.

The following types of training and testing, which are classified as military readiness activities pursuant to the MMPA, as amended by the 2004 NDAA, will be covered under the regulations and LOA: Air warfare (air-to-air, surface-to-air), electronic warfare (directed energy—lasers and high-powered microwave systems), and surface warfare (surface-to-surface, air-to-surface, and subsurface-to surface). The proposed activities will not include any sonar, pile driving/removal, or use of air guns.

The Navy's mission is to organize, train, equip, and maintain combat-ready naval forces capable of winning wars, deterring aggression, and maintaining freedom of the seas. This mission is mandated by Federal law (10 U.S.C. 8062), which requires the readiness of the naval forces of the United States. The Navy executes this responsibility by training and testing at sea, often in designated operating areas (OPAREA) and testing and training ranges. The Navy must be able to access and utilize these areas and associated sea space and air space in order to develop and maintain skills for conducting naval operations. The Navy's testing activities ensure naval forces are equipped with well-maintained systems that take advantage of the latest technological advances. The Navy's research and acquisition community conducts military readiness activities that involve testing. The Navy tests ships, aircraft, weapons, combat systems, sensors, and related equipment, and conducts scientific research activities to achieve and maintain military readiness.

The Navy has been conducting testing and training activities in the PMSR Study Area since the PMSR was established in 1946. The tempo and types of training and testing activities fluctuate because of the introduction of new technologies, the evolving nature of international events, advances in warfighting doctrine and procedures, and changes in force structure (*e.g.,* organization of ships, submarines, aircraft, weapons, and personnel). Such developments influence the frequency, duration, intensity, and location of required training and testing activities. The proposed activities include current activities, previously analyzed in the 2002 PMSR Environment Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS), and increases in the testing and training activities as described in the 2020 PMSR DEIS/OEIS. NMFS promulgated MMPA incidental take regulations relating to missile launches from SNI from June 3, 2014, through June 3, 2019 (79 FR 32678; June 6, 2014). Since then, the Navy has been operating under IHAs (84 FR 28462, June 19, 2019; 85 FR 38863, June 29, 2020) for those similar activities on SNI. For this rulemaking, the Navy is requesting authorization for marine mammal take incidental to activities on SNI similar to those they have conducted under these and previous authorizations, as well as the use of at-surface and near-surface explosive detonations throughout the PMSR Study Area. The proposed testing and training activities are deemed necessary to accomplish Naval Air System Command's mission of providing for the safe and secure collection of decision-quality data; and developing, operating, managing and sustaining the interoperability of the Major Range Test Facility Base at the PMSR into the foreseeable future.

The Navy's rulemaking/LOA application reflects the most up-to-date compilation of training and testing activities deemed necessary to accomplish military readiness requirements. The types and numbers of activities included in the rule account for fluctuations in training and testing in order to meet evolving or emergent military readiness requirements. These proposed regulations would cover training and testing activities that would occur for a seven-year period beginning October 2021.

Description of the Specified Activity

The Navy requests authorization to take marine mammals incidental to conducting training and testing activities. The Navy has determined that explosive stressors and missile launch activities are most likely to result in impacts on marine mammals that could rise to the level of harassment, and NMFS concurs with this determination. Descriptions of these activities are provided in section 2 of the 2020 PMSR Draft EIS/OEIS (DEIS/OEIS) (U.S. Department of the Navy, 2020) and in the Navy's rulemaking/LOA application (*https://www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-military-readiness-activities*), and are summarized here.

Dates and Duration

The specified activities would occur at any time during the seven-year period of validity of the regulations, with the exception of the activity types and time periods for which limitations have explicitly been identified (to the maximum extent practicable; see Proposed Mitigation Measures section). The proposed amount of training and testing activities are described in the Detailed Description of the Specified Activities section (Table 3).

Geographical Region

The PMSR Study Area is located adjacent to Los Angeles, Ventura, Santa Barbara, and San Luis Obispo Counties along the Pacific Coast of Southern California and includes a 36,000-square-mile sea range (Figure 1). It is a designated Major Range Test Facility Base and is considered a national asset that exists primarily to provide test and evaluation information for DoD decision makers and to support the needs of weapon system development programs and DoD research needs. The two primary components of the PMSR Study Area are Special Use Airspace (SUA) and the ocean Operating Areas. Additionally, the Navy is proposing launch activities on San Nicolas Island (SNI), California, for testing and training activities associated with operations within the PMSR Study Area. SNI is one

of the Channel Islands in the PMSR Study Area.

Special Use Airspace

The SUA is airspace designated wherein activities must be confined because of their nature, or wherein limitations are imposed upon aircraft operations that are not a part of those activities, or both. SUA consists of both controlled and uncontrolled airspace and has defined dimensions. Flight and other activities for non-participating aircraft are restricted or prohibited for safety or security reasons. The majority of SUA is established for military flight activities and, with the exception of prohibited areas, may be used for commercial or general aviation when not reserved for military activities. Two area components of the PMSR SUA:

- Warning Areas—A Warning Area is airspace of defined dimensions, extending from 3 nmi outward from the coast that contains activity that may be hazardous to non-participating aircraft. Warning areas are established to contain a variety of hazardous aircraft and non-aircraft activities, such as aerial gunnery, air and surface missile firings, bombing, aircraft carrier operations, surface and subsurface operations, and naval gunfire. The 11 Warning Areas within the PMSR include W–532N, W–532E, W–532S; W–537; W–289N, W–289 S, W–289W, W–289E; W–292W, W–292E; and W–412 (see Figure 1).
- Restricted Areas—restricted areas are a type of SUA within which the flight of aircraft, while not wholly prohibited, is subject to restriction.

Ocean Operating Areas

The PMSR-controlled sea space (Ocean Operating Areas) parallels the California coast for approximately 225 nmi and extends approximately 180 nmi seaward, aligning with the PMSR Warning Area airspace (Figure 1). The controlled sea space areas consist of the following:

- Surface Danger Zones—A danger zone is a defined water area used for target practice, bombing, rocket firing, or other especially hazardous military activities.
- Restricted Area—A restricted area is a defined water area for the purpose of prohibiting or limiting public access to the area.

Additional detail can be found in Chapter 2 of the Navy's rulemaking/LOA application.

BILLING CODE 3510–22–P

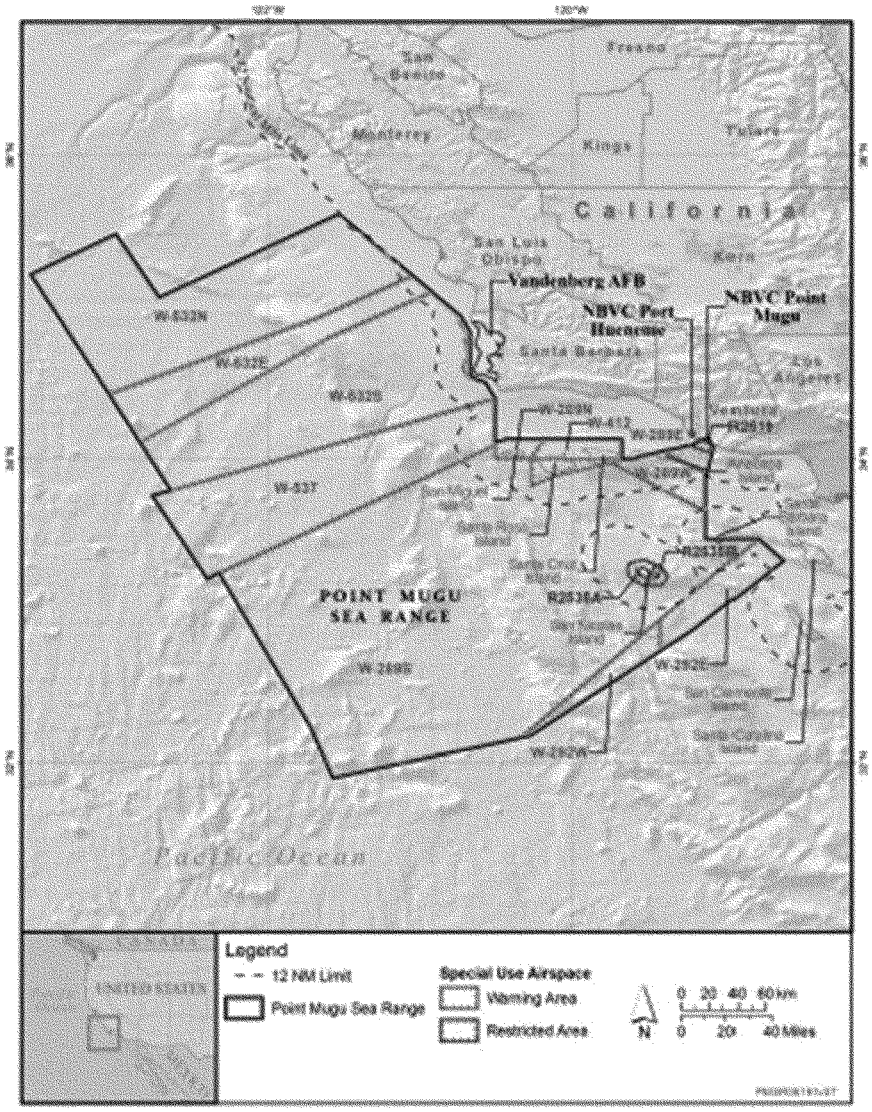

Figure 1--Map of the PMSR Study Area

BILLING CODE 3510–22–C

Overview of Training and Testing Within the PMSR Study Area

The Navy describes and analyzes the effects of its activities within the 2020 PMSR DEIS/OEIS. In its assessment, the Navy concluded that at-surface and near-surface explosive detonations were the stressors that would result in impacts on marine mammals that could rise to the level of harassment as defined under the MMPA. Therefore, the Navy's rulemaking/LOA application provides the Navy's assessment of potential effects from these stressors in terms of various warfare mission areas in which they will be conducted.

Primary Mission Areas

The Navy categorizes its at-sea activities into functional warfare areas called primary mission areas. Each warfare community may train in some or all of these primary mission areas. The Navy also categorizes most, but not all, of its testing activities under these primary mission areas. Activities addressed for the PMSR Study Area are categorized under three primary mission areas. Within those three primary mission areas, there are more specific categories or activity scenarios that reflect testing and training activities, as listed below: Air warfare (air-to-air, surface-to-air); Electronic warfare (directed energy—lasers and high-powered microwave systems); and Surface warfare (surface-to-surface, air-to-surface, and subsurface-to-surface). A description of the munitions, targets, systems, and other material used during training and testing activities within these primary mission areas is provided in Appendix A (*Training and Testing Activities Descriptions*) of the 2020 PMSR DEIS/OEIS and summarized here.

Air warfare—The mission of air warfare is to destroy or reduce enemy air and missile threats (including unmanned airborne threats) and serves two purposes: To protect U.S. forces from attacks from the air and to gain air superiority. Air warfare provides U.S. forces with adequate attack warnings, while denying hostile forces the ability to gather intelligence about U.S. forces.

Aircraft conduct air warfare through radar search, detection, identification,

and engagement of airborne threats. Surface ships conduct air warfare through an array of modern anti-aircraft weapon systems such as aircraft-detecting radar, naval guns linked to radar-directed fire-control systems, surface-to-air missile systems, and radar-controlled guns for close-in point defense.

Testing of air warfare systems is required to ensure the equipment is fully functional under the conditions in which it will be used. Tests may be conducted on radar and other early-warning detection and tracking systems, new guns or gun rounds, and missiles. Testing of these systems may be conducted on new ships and aircraft, and on existing ships and aircraft following maintenance, repair, or modification. For some systems, tests are conducted periodically to assess operability. Additionally, tests may be conducted in support of scientific research to assess new and emerging technologies. Air-to-air scenarios involve the employment of an airborne weapon system against airborne targets. Missiles are fired from a fighter aircraft for both testing and training events. Surface-to-air scenarios evaluate the overall weapon system performance, warhead effectiveness, and software/hardware modifications or upgrades of ground-based and ship-based weapons systems. Missiles are fired from a ship or a land-based launcher against a variety of supersonic and subsonic airborne targets.

Electronic Warfare—The mission of electronic warfare is to degrade the enemy's ability to use electronic systems, such as communication systems and radar, and to confuse or deny them the ability to defend their forces and assets. Electronic warfare is also used to detect enemy threats and counter their attempts to degrade the electronic capabilities of the Navy. Typical electronic warfare activities include threat avoidance training, signals analysis for intelligence purposes, and use of airborne and surface electronic jamming devices (that block or interfere with other devices) to defeat tracking, navigation, and communications systems. Testing of electronic warfare systems is conducted to improve the capabilities of systems and ensure compatibility with new systems. Testing involves the use of aircraft, surface ships, and submarine crews to evaluate the effectiveness of electronic systems. Similar to training activities, typical electronic warfare testing activities include the use of airborne and surface electronic jamming devices (including testing chaff and flares; see Appendix A (*PMSR Scenario Descriptions*) of the 2020 PMSR DEIS/OEIS for a description of these devices) to defeat tracking and communications systems.

Surface Warfare—The mission of surface warfare is to obtain control of sea space from which naval forces may operate, and entails offensive action against other surface, subsurface, and air targets while also defending against enemy forces. In surface warfare, aircraft use guns, air-launched cruise missiles, or other precision-guided munitions; ships employ naval guns, and surface-to-surface missiles; and submarines attack surface ships using submarine-launched, anti-ship cruise missiles. Surface warfare training includes surface-to-surface gunnery and missile exercises, air-to-surface gunnery and missile exercises, and submarine missile launch activities, and other munitions against surface targets. Testing of weapons used in surface warfare is conducted to develop new technologies and to assess weapon performance and operability with new systems, such as unmanned systems. Tests include various air-to-surface guns and missiles, surface-to-surface guns and missiles, and bombing tests. Testing activities may be integrated into training activities to test aircraft or aircraft systems in the delivery of munitions on a surface target. In most cases the tested systems are used in the same manner in which they are used for Fleet training activities. Air-to-surface tests evaluate the integration of a missile or other weapons system into Department of Defense aircraft, or the performance of the missile/system itself. Missiles are fired from an aircraft against a variety of mobile seaborne targets and fixed aim points.

Summary Testing—Research, Development, Acquisition, Testing, and Evaluation of new technologies by the U.S. Department of Defense occurs continually to ensure that the U.S. military can counter new and anticipated threats. All new Navy systems and related equipment must be tested to ensure proper functioning before delivery to the Fleets for use. The PMSR Study Area is the Navy's primary ocean testing area for guided missiles and related ordnance. Test operations on the PMSR Study Area are conducted under highly controlled conditions, allowing for the collection of empirical data to evaluate the performance of a weapon system or subsystem. Testing conducted in the PMSR Study Area is important for maintaining readiness. Two of the U.S. Navy's Systems Commands, Naval Sea Systems Command (NAVSEA) and Naval Air Systems Command (NAVAIR), sponsor the majority of the testing within the PMSR Study Area. NAVSEA's five affiliated Program Executive Offices (PEOs) oversee over a dozen Program Manager, Sea offices that sponsor testing activities within the PMSR Study Area. NAVAIR's four affiliated PEOs, along with NAVAIR Headquarters-managed programs, oversee approximately 20 Program Managers and Air offices that also sponsor testing activities at PMSR.

Target and Missile Launches on SNI—The Navy plans to continue a target and missile launch program from two launch sites on SNI for testing and training activities associated with operations within the PMSR Study Area. Missiles vary from tactical and developmental weapons to target missiles used to test defensive strategies and other weapons systems. Some launch events involve a single missile or target, while others involve the launch of multiple missiles or targets in quick succession. The missiles or targets are launched from one of several fixed locations on the western end of SNI. Missiles or targets launched from SNI fly generally west, southwest, and northwest through the PMSR Study Area. The primary launch locations are the Alpha Launch Complex, located 190 meters (m) above sea level on the west-central part of SNI and the Building 807 Launch Complex, which accommodates several fixed and mobile launchers, at the western end of SNI at approximately 11 m above sea level. The Point Mugu airfield on the mainland, the airfield on SNI, and the target sites in the PMSR will be a routine part of launch operations.

Description of Stressors

The Navy uses a variety of platforms, weapons, and other devices, including ones used to ensure the safety of Sailors and Marines, to meet its mission. Training and testing with these systems may introduce acoustic (sound) energy or shock waves from explosives into the environment. The following subsections describe explosives detonated at or near the surface of the water and launch noise associated with missiles launched from SNI for marine mammals and their habitat (including prey species) within the PMSR Study Area. Because of the complexity of analyzing sound propagation in the ocean environment, the Navy relied on acoustic models in its environmental analyses and rulemaking/LOA application that considered sound source characteristics and varying ocean conditions across the PMSR Study Area. Stressor/resource interactions that were determined to have de minimis or no impacts (*i.e.,* vessel, aircraft, or weapons noise) were

not carried forward for analysis in the Navy's rulemaking/LOA application. NMFS reviewed the Navy's analysis and conclusions on de minimis sources and finds them complete and supportable.

Acoustic stressors include incidental sources of broadband sound produced as a byproduct of vessel movement and use of weapons or other deployed objects. Explosives also produce broadband sound but are characterized separately from other acoustic sources due to their unique hazardous characteristics. There are no sonar activities proposed in the PMSR Study Area. Characteristics of explosives are described below.

In order to better organize and facilitate the analysis of various explosives used for training and testing by the Navy, including sonar and other transducers and explosives, a series of source classifications, or source bins, was developed by the Navy. The source classification bins do not include the broadband sounds produced incidental to vessel or aircraft transits, weapons firing, and bow shocks.

The use of source classification bins provides the following benefits:

- Provides the ability for new sensors or munitions to be covered under existing authorizations, as long as those sources fall within the parameters of a bin;
- Improves efficiency of source utilization data collection and reporting requirements anticipated under the MMPA authorizations;
- Ensures a conservative approach to all impact estimates, as all sources within a given class are modeled as the most impactful source (having the largest net explosive weight) within that bin;
- Allows analyses to be conducted in a more efficient manner, without any compromise of analytical results; and
- Provides a framework to support the reallocation of source usage (number of explosives) between different source bins, as long as the total numbers of 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.

Explosives

This section describes the characteristics of explosions during naval training and testing. The activities analyzed in the Navy's rulemaking/LOA application that use explosives are described in Appendix A (*PMSR Scenario Descriptions*) of the 2020 PMSR DEIS/OEIS.

To more completely analyze the results predicted by the Navy's acoustic effects model from detonations occurring in-air above the ocean surface, it is necessary to consider the transfer of energy across the air-water interface.

Detonation of an explosive in air creates a supersonic high pressure shock wave that expands outward from the point of detonation (Kinney & Graham, 1985; Swisdak, 1975). The near-instantaneous rise from ambient pressure to an extremely high peak pressure is what makes the explosive shock wave potentially injurious to an animal experiencing the rapid pressure change (U.S. Department of the Navy, 2017e). Farther from an explosive, the peak pressures decay and the explosive waves propagate as an impulsive, broadband sound. As the shock wave-front travels away from the point of detonation, it slows and begins to behave as an acoustic wave-front travelling at the speed of sound. Whereas a shock wave from a detonation in-air has an abrupt peak pressure, that same pressure disturbance when transmitted through the water surface results in an underwater pressure wave that begins and ends more gradually compared with the in-air shock wave, and diminishes with increasing depth and distance from the source (Bolghasi *et al.,* 2017; Chapman and Godin, 2004; Cheng and Edwards, 2003; Moody, 2006; Richardson *et al.,* 1995; Sawyers, 1968; Sohn *et al.,* 2000; Swisdak, 1975; Waters and Glass, 1970; Woods *et al.,* 2015). The propagation of the shock wave in air and then transitioning underwater, is very different from a detonation occurring deep underwater where there is little interaction with the surface. In the case of an underwater detonation occurring just below the surface, a portion of the energy from the detonation would be released into the air (referred to as surface blow off), and at greater depths a pulsating, air-filled cavitation bubble would form, collapse, and reform around the detonation point (Urick, 1983). The Navy's acoustic effects model for analyzing underwater impacts on marine species does not account for the loss of energy due to surface blow-off or cavitation at depth. Both of these phenomena would diminish the magnitude of the acoustic energy received by an animal under real-world conditions (U.S. Department of the Navy, 2018c).

Propagation of explosive pressure waves in water is highly dependent on environmental characteristics such as bathymetry, bottom type, water depth, temperature, and salinity, which affect how the pressure waves are reflected, refracted, or scattered; the potential for reverberation; and interference due to multi-path propagation. In addition, absorption greatly affects the distance over which higher-frequency components of explosive broadband noise can propagate. Because of the complexity of analyzing sound propagation in the ocean environment, the Navy relies on acoustic models in its environmental analyses that consider sound source characteristics and varying ocean conditions across the PMSR Study Area (U.S. Department of the Navy, 2019a).

Missiles, rockets, bombs, and medium and large-caliber projectiles may be explosive or nonexplosive, depending on the objective of the testing or training activity in which they are used. The proposed activities do not include explosive munitions used underwater. Missiles, bombs, and projectiles that detonate at or near (within 10 m of) the water's surface are considered for the potential impact they may have on marine mammals. All explosives used during testing and training activities within the PMSR Study Area would detonate at or near the surface or in-air. Several parameters influence the acoustic effect of an explosive: The weight of the explosive warhead, the type of explosive material, the boundaries and characteristics of the propagation medium(s); and the detonation depth underwater and the depth of the receiver (*i.e.,* marine mammal). The net explosive weight (NEW), which is the explosive power of a charge expressed as the equivalent weight of trinitrotoluene (TNT), accounts for the first two parameters.

Land-Based Launch Noise on San Nicolas Island

Noise from target and missile launches on SNI can also occur. These ongoing activities affecting pinnipeds hauled out in the vicinity of launch sites have been analyzed previously (NMFS 2014, 2019, 2020) and are summarized below as part of the Navy's rulemaking/LOA application. As part of previous authorizations, the Navy could conduct up to 40 launch events annually from SNI, but the total may be less than 40 depending on operational requirements. Launch timing will be determined by operational, meteorological, and logistical factors. Up to 10 of the 40 launches may occur at night, but this is also dependent on operational requirements, and night-time launches are only conducted when required by test objectives.

Vessel Strike

Vessel strikes have the potential to result in incidental take from serious injury and/or mortality. Vessel strikes are not specific to any particular training or testing activity, but rather are a limited, sporadic, and incidental result of Navy vessel movement within a study area. Vessel strikes from commercial, recreational, and military vessels are known to seriously injure and occasionally kill cetaceans (Abramson *et al.,* 2011; Berman-Kowalewski *et al.,* 2010; Calambokidis, 2012; Douglas *et al.,* 2008; Laggner, 2009; Lammers *et al.,* 2003; Van der Hoop *et al.,* 2012; Van der Hoop *et al.,* 2013), although reviews of the literature on ship strikes mainly involve collisions between commercial vessels and whales (Jensen and Silber, 2003; Laist *et al.,* 2001). Vessel speed, size, and mass are all important factors in determining both the potential likelihood and impacts of a vessel strike to marine mammals (Conn and Silber, 2013; Gende *et al.,* 2011; Silber *et al.,* 2010; Vanderlaan and Taggart, 2007; Wiley *et al.,* 2016). For large vessels, speed and angle of approach can influence the severity of a strike.

The number of Navy vessels in the PMSR Study Area at any given time varies and is dependent on scheduled testing and training requirements. Most activities include either one or two vessels and may last from a few hours to two weeks. Vessel movement as part of the proposed activities would be widely dispersed throughout the PMSR Study Area. Vessels used include ships (*e.g.,* aircraft carriers, surface combatants), support craft, and submarines. Vessel size ranges from 15 ft to over 1,000 ft, and vessels transit at speeds that are optimal for fuel conservation or to meet operational requirements. In comparison, commercial ship size can range from very large oil tankers that are over 1,000 ft in length to the smaller general cargo ships with lengths that can be under 300 ft. Large Navy ships (greater than 18 m in length) generally operate at average speeds of 10–15 knots, and submarines generally operate at speeds in the range of 8–13 knots. Small Navy craft (for purposes of this discussion, less than 18 m in length), which are all support craft, have much more variable speeds (0–50+ knots, dependent on the mission). While these speeds are averages that are representative of most events, some vessels need to operate outside of these parameters. For example, to produce the required relative wind speed over the flight deck, an aircraft carrier engaged in flight operations must adjust its speed through the water accordingly. Also, there are other instances, such as launch and recovery of a small rigid-hull inflatable boat, or retrieval of a target when vessels would be dead in the water, or moving slowly ahead to maintain steerage. There are a few specific testing and training events that include high-speed requirements for certain systems for which vessels would operate at higher speeds.

Refer to Chapter 3, *Affected Environment and Environmental Consequences* of the 2020 PMSR DEIS/OEIS for additional details on vessel use and movement in the PMSR Study Area.

Detailed Description of the Specified Activities

Proposed Training and Testing Activities

Training and testing activities would be conducted at sea, in designated airspace, and on SNI, within the PMSR Study Area.

The proposed training and testing activities are deemed necessary to accomplish Naval Air Systems Command's mission of providing for the safe and secure collection of decision-quality data; and developing, operating, managing and sustaining the interoperability of the Major Range Test Facility Base at the PMSR into the foreseeable future. Collectively, the proposed training and testing activities support current and projected military readiness requirements into the foreseeable future, as shown in Table 1.

TABLE 1—MAXIMUM NUMBER OF ANNUAL PROPOSED ACTIVITIES IN THE PMSR STUDY AREA

[Inclusive of SNI launches]

Activity	Activity sub category	Proposed activities
Aerial Targets (# of targets)		176
Surface Targets (# of targets)		522
Ordnance (# of ordnance)	Bombs	30
	Gun Ammunition	281,230
	Missiles	584
	Rockets	40

Most of the factors influencing frequency and types of activities are fluid in nature (*i.e.,* continually evolving and changing), and the annual activity level in the PMSR Study Area will continue to fluctuate. The number of events may not be the same year to year, but the maximum number of events were predicted annually. Total annual events would not exceed what is proposed in Table 1 above. Proposed training and testing duration and frequency varies depending on Fleet requirements, and funding and does not occur on a predictable annual cycle.

Fleet training activities occur over scheduled continuous and uninterrupted blocks of time, focusing on the development of core capabilities/skills. Training events in the PMSR Study Area are conducted to ensure Navy forces can sustain their training cycle requirements. Primarily, changes occur with increases or decreases in annual operational tempo of activities, in addition to changes in the types of aircraft, vessels, targets, ordnance, and tasks that are actions or processes performed as part of Navy operations.

Future testing depends on scientific and technological developments that are not easy to predict, and experimental designs may evolve with emerging science and technology. Even with these challenges, the Navy makes every effort to forecast all future testing requirements. As a result, testing requirements are driven by the need to support Fleet readiness based on emerging national security interests, and alternatives must have sufficient annual capacity to conduct the research, development, and testing of new systems and technologies, with upgrades, repairs, and maintenance of existing systems.

Fleet Training

Fleet training within the PMSR Study Area includes the same types of warfare of the primary mission areas. Training conducted in conjunction with testing activities provide Fleet operators unique opportunities to train with ship and

aircraft combat weapon systems and personnel in scripted warfare environments, including live-fire events. For example, Fleet training would occur while testing a weapon system, in which Sailors would experience (be trained in) the use of the system being tested. Combat ship crews train in conjunction with scheduled ship testing and qualification trials, to take advantage of the opportunity to provide concurrent training and familiarization for ship personnel in maintaining and operating installed equipment, identifying design problems, and determining deficiencies in support elements (*e.g.,* documentation, logistics, test equipment, or training). Live and inert weapons, along with chaff, flares, jammers, and lasers may be used.

Typically concurrent with testing, surface training available within the PMSR Study Area includes tracking events, missile-firing events, gun-firing events, high-speed anti-radiation missile events, and shipboard self-defense system training, (*e.g.,* Phalanx (Close-in Weapons System), Rolling Airframe Missile, and Evolved Sea Sparrow Missile). These events are limited in scope and generally focus on one or two tasks. Missiles may be fired against subsonic, supersonic, and hypersonic targets. Certain training events designed for single ships are conducted to utilize unique targets only available for training in the PMSR Study Area.

Aviation warfare training conducted in the PMSR Study Area, categorized as unit-level training, is designed for a small number of aircraft up to a squadron of aircraft. These training events occur within the PMSR Study Area, as it is the only West Coast Navy venue to provide powered air-to-air targets. They are limited in scope and generally focus on one or two tasks. These scenarios require planning and coordination to ensure safe and effective training.

Combat Systems Testing

The System Command Program Executive Offices are tasked with conducting extensive combat systems tests and trials on each new platform prior to releasing the platform to the Fleet, to include ships that have been in an extended upgrade or overhaul status. The PMSR Study Area is the preferred site to conduct these tests, as it offers a venue for a thorough evaluation of combat and weapons system performance through the actual employment of weapon systems. The comprehensive tests are conducted by the responsible Program Manager, with close cooperation from the Fleet Type Commanders (Surface Force, Air Force, or Submarine Force). Frequent tests conducted in the PMSR Study Area are Combat Systems Ship Qualification Trials (CSSQTs). This is a series of comprehensive tests and trials designed to show that the equipment and systems included in the CSSQT program meet combat system requirements. Live and inert weapons, along with chaff, flares, jammers, and lasers may be used. Naval Sea Systems Command has recently developed two new reporting programs to test and evaluate combat and weapons system performance on new classes of ships, resulting in an increased tempo in the PMSR Study Area.

Explosives At-Surface or Near the Surface

Missiles, bombs, and projectiles that detonate at or near (within 10 m of) the water's surface are considered for the potential that they could result in an acoustic impact to marine mammals that may be underwater and nearby. The maximum number of explosives and the appropriate events modeling bin for the proposed activities are provided in Table 2 for the proposed activities in the PMSR Study Area. Table 2 describes the maximum number of explosives that could be used in any year under the proposed training and testing activities. Under the proposed activities, bin use could vary annually (but would not exceed the maximum), and the seven-year totals for the proposed training and testing activities take into account that annual variability.

TABLE 2—EXPLOSIVES DETONATING AT OR NEAR THE SURFACE BY BINS ANNUALLY AND FOR A SEVEN-YEAR PERIOD FOR TRAINING AND TESTING ACTIVITIES WITHIN THE PMSR STUDY AREA

[Inclusive of SNI Launches]

Primary mission area activity scenarios	Explosive bin	Munition type	Maximum number of high explosive munitions used annually	Maximum number of high explosives used over a 7-year period proposed activity
Surface-Surface	E1	Gunnery	22,110	154,770
	E3	Gunnery	4,909	34,363
	E5	Gunnery	1,666	11,662
Air-Surface	E5	Rockets	24	168
Air-Surface; Surface-Air	E6	Missiles	72	504
Air-Surface	E7	Missiles, Bombs	45	315
Air-Surface; Surface-Air	E8	Missiles	45	315
Air-Surface; Surface-Surface	E9	Missiles, Bombs, Rockets	58	406
Surface-Surface; Subsurface-Surface	E10	Missiles	13	91

Note: Bins E1–E5 are gunnery events that involve guns with high rates of firing ''clusters'' of munitions (*e.g.,* >80–200 rounds per minute for Bin E1, 500–650 rounds per minute for Bin E3, and 16–20 rounds per minutes for Bin E5), hence the high number of HE munitions used during these activities. The numbers above do not reflect the actual number of events, which can vary and typically last 1–3 hrs. The increase in tempo under the Proposed Action is a result of a proposed increase in Combat Systems Ship Qualification Trials as discussed in Section 2.2.1 (Current and Proposed Activities) of the 2020 PMSR DSEIS/OEIS.

The explosive energy released by detonations in air has been well studied, and basic methods are available to estimate the explosive energy exposure with distance from the detonation (*e.g.,* U.S. Department of the Navy, 1975). In air, the propagation of impulsive noise from an explosion is highly influenced by atmospheric conditions, including temperature and wind. While basic estimation methods do not consider the unique environmental conditions that

may be present on a given day, they allow for approximation of explosive energy propagation under neutral atmospheric conditions. Explosions that occur during air warfare would typically be at a sufficient altitude that a large portion of the sound refracts upward due to cooling temperatures with increased altitude. Based on an understanding of the explosive energy released by detonations in air, detonations occurring in air at altitudes greater than 10 m are not likely to result in acoustic impacts to marine mammals and thus are not carried forward in the analysis.

Missile Launch Activities on SNI

Missiles can be propelled by either liquid-fueled or solid-fueled rocket engines; however, solid fuel is preferred for military uses. Such engines commonly propel tactical guided missiles (*i.e.,* missiles intended for use within the immediate area) toward their targets at twice the speed of sound. Cruise or ballistic missiles are designed to strike targets far beyond the immediate area, and are therefore also known as strategic missiles. Cruise missiles are jet-propelled at subsonic speeds throughout their flights, while ballistic missiles are rocket-powered only in the initial (boost) phase of flight, after which they follow an arcing trajectory to the target. As gravity pulls the ballistic warhead back to Earth, speeds of several times the speed of sound are reached. Ballistic missiles are most often categorized as short-range, medium-range, intermediate-range, and intercontinental ballistic missiles. Missile weights range between 54–2,900 kilograms (kg), but total weight is dependent on fuel or boosters.

Table 3 shows the number of launches that have occurred at SNI since 2001 and the number of launch events that have occurred during the associated comprehensive reporting timeframes. There have not been more than 25 launch events conducted in any given year since 2001. However, as part of the proposed activities, 40 launch events per year from SNI involving various missiles and aerial targets are requested for take authorization.

TABLE 3—THE TOTAL NUMBER OF LAUNCHES THAT HAVE OCCURRED SINCE 2001 AT SNI

Time period	Number of launches
August 2001 to March 2008	77
June 2009 to June 2014	36
June 2014 to June 2019	27

A combination of missiles and targets are launched from SNI, including aerial targets, surface-to-surface missiles, and surface-to-air missiles, with aerial targets representing the majority of the launches from SNI.

The following descriptions are representative of some of the types of targets and missiles typically launched from SNI. While this list is not inclusive of all potential missiles and targets that could be launched annually, the descriptions and the sound profiles are representative of the diversity of the types of missiles and targets typically launched. For information on the sound levels these missiles produce please refer to Section 1.2 of the application.

GQM–163A ''Coyote''—The Coyote, designated GQM–163A, is an expendable Supersonic Sea-Skimming Target (SSST) powered by a ducted-rocket ramjet. This missile is designed to provide a ground-launched, aerial target system to simulate a supersonic, sea-skimming Anti-Ship Cruise missile threat. Coyote launches are expected to be the primary large missile launched from SNI over the next several years. Coyotes are launched from previously installed launchers at the inland location (Alpha Launch Complex) on SNI.

Standard Missile (SM–2, SM–3, SM–6)—The Standard family of missiles consists of a range of air defense missiles including supersonic, medium, and extended range surface-to-air and surface-to-surface missiles. The Standard Missile 3 Block IIA (SM–3) is a ship-based missile system used to intercept short- to intermediate-range ballistic missiles as a part of the Aegis Ballistic Missile Defense System. Although primarily designed as an antiballistic missile defensive weapon, the SM–3 has also been employed in an anti-satellite capacity against a satellite at the lower end of low Earth orbit. Similarly, the SM–6 is a vertically launched, extended range missile compatible with the Aegis Weapon System to be used against extended range threats. The SM–6 Block I/IA combines the tested legacy of the SM–2 propulsion system and warhead with an active radio frequency seeker modified from the AIM–120 Advanced Medium Range Air-to-Air Missile. The new features allow for over-the-horizon engagements, enhanced capability at extended ranges and increased firepower. To date, only the SM–3 has been launched from SNI.

Other Missiles That May Be Used During Launch Events—The Navy may also launch other missiles to simulate various types of threat missiles and aircraft and to test other systems. For example, Tactical Tomahawks were launched from Building 807 Launch Complex in 2018 and 2019. Under this proposed rule, missiles launched from SNI would have sound source levels the same or lower than missiles described above or previously launched from the island.

Vessel Movement

The number and type of scheduled Navy vessels or Navy support vessels operating within the PMSR Study Area depends on the requirements for mission-essential activities, such as the test and evaluation of new weapon systems or qualification trials for upgraded existing ships. The types of Navy vessels or Navy support vessels operating within the PMSR are highly variable and range from small work boats used for nearshore work to major Navy combatants, up to and including aircraft carriers. Navy activities are conducted in large subdivisions of the total PMSR Study Area, and blocks of range times are allocated based on activity requirements. Most activities include either one or two vessels and may last from a few hours to two weeks. Vessel movement as part of the proposed activities would be widely dispersed throughout the PMSR Study Area.

The PMSR Study Area military vessel activity can be divided into two categories: Project ships and support boats. Project ships are larger Navy combatant vessels, such as destroyers, cruisers, or any other commissioned Navy or foreign military ship directly involved in events. They may operate anywhere within the PMSR Study Area depending on activity needs, although most ship operations occur within 60 nautical miles (nmi) of SNI. Most project ships and scheduled training ships operating in the PMSR Study Area transit there from off-range *(e.g.,* San Diego). Support boats are smaller vessels directly involved in test activities and operate from the Port Hueneme Harbor. While they may also operate throughout the PMSR Study Area, support boat operations occur mainly within the range areas receiving the most use. Smaller support boats have limited range and usually operate close to shore near Point Mugu and SNI. The activity level of ships or boats is characterized by a ship or boat event.

The Navy tabulated annual at-sea vessel steaming days for training and testing activities projected for the PMSR Study Area. Approximately 333 annual events of Navy at-sea vessel usage will occur over 2,085 hours (approximately 87 at-sea days) in the PMSR Study Area (Table 4). In comparison to the Southern

California portion (SOCAL) of the Hawaii-Southern California Training and Testing (HSTT) Study Area, the estimated number of annual at-sea days in the PMSR Study Area is less than 3 percent of what occurs in SOCAL annually.

TABLE 4—ANNUAL AT-SEA VESSEL STEAMING DAYS FOR TRAINING AND TESTING ACTIVITIES PROJECTED FOR THE PMSR STUDY AREA

Vessel	Ship type	Proposed activity	
		Events	Hours
CG	Guided Missile Cruiser	41	275
DDG–51	Guided Missile Destroyer	36	132
LHA	Amphibious Assault Ship	40	200
SDTS	Self-Defense Test Ship	50	190
WMSL–751/OPC	Coast Guard Cutter	6	28
LCS Variant (LCS 1)	Littoral Combat Ship	40	360
LCS Variant (LCS 2)		40	360
FF	Future Frigate	40	360
DDG 1000 Zumwalt Class	Guided Missile Destroyer	3	30
LHD	Amphibious Assault Ship	4	13
LPD	Amphibious Transport Deck	4	13
LSD	Dock Landing Ship	4	13
CVN	Nuclear-Powered Aircraft Carrier	6	16
SSBN	Ballistic Missile Submarine	19	95
Total		333	2,085

Additional details on Navy at-sea vessel movement are provided in the 2020 PMSR DEIS/OEIS.

Standard Operating Procedures

For training and testing to be effective, personnel must be able to safely use their sensors and weapon systems as they are intended to be used in military missions and combat operations and to their optimum capabilities. Navy publishes or broadcasts standard operating procedures via numerous naval instructions and manuals, including but not limited to the following:

- Ship, submarine, and aircraft safety manuals;
- Ship, submarine, and aircraft standard operating manuals;
- Fleet Area Control and Surveillance Facility range operating instructions;
- Fleet exercise publications and instruction;
- Naval Air Warfare Center Weapons Division (NAWCWD) and Naval Sea Systems Command test range safety and standard operating instructions;
- Navy instrumented range operating procedures;
- Naval shipyard sea trial agendas;
- Research, development, test, and evaluation plans;
- Naval gunfire safety instructions;
- Navy planned maintenance system instructions and requirements;
- Federal Aviation Administration regulations;
- International Regulations for Preventing Collisions at Sea;
- Range safety standard operating procedures and instructions for explosive munitions; and
- Ammunition and Explosive Operations standard operating procedures.

Because standard operating procedures are essential to safety and mission success, the Navy considers them to be part of the proposed Specified Activities, and has included them in the environmental analysis (see Chapter 3, *Affected Environment and Environmental Consequences,* of the 2020 PMSR DSEIS/OEIS for further details).

Description of Marine Mammals and Their Habitat in the Area of the Specified Activities

Marine mammal species that have the potential to occur in the PMSR Study Area are presented in Table 5 along with an abundance estimate, an associated coefficient of variation value, and best and minimum abundance estimates. The Navy requests authorization to take individuals of marine mammal species by Level A and Level B harassment incidental to training and testing activities from detonations of explosives occurring at or near the surface and launch activities on SNI (Table 5).

Information on the status, distribution, abundance, population trends, habitat, and ecology of marine mammals in the PSMR Study Area also may be found in Section 4 of the Navy's rulemaking/LOA application. NMFS reviewed this information and found it to be accurate and complete. Additional information on the general biology and ecology of marine mammals is included in the 2020 PMSR DEIS/OEIS. Table 5 incorporates data from the U.S. Pacific and the Alaska Marine Mammal Stock Assessment Reports (SARs; Carretta *et al.,* 2019; Muto *et al.,* 2019) and the most recent revised data in the draft SARs (see *https://www.fisheries.noaa.gov/national/marine-mammal-protection/draft-marine-mammal-stock-assessment-reports*). Table 5 also incorporates the best available science, including monitoring data from the Navy's marine mammal research efforts.

Species Not Included in the Analysis

The species carried forward for analysis (and described in Table 5 below) are those likely to be found in the PMSR Study Area based on the most recent data available, and do not include species that may have once inhabited or transited the area but have not been sighted in recent years (*e.g.,* species which were extirpated from factors such as 19th and 20th century commercial exploitation). Several species that may be present in the northwest Pacific Ocean have a low probability of presence in the PMSR Study Area. These species are considered extralimital (not anticipated to occur in the Study Area) or rare (occur in the Study Area sporadically, but sightings are rare). Species unlikely to be present in the PMSR Study Area or that are rare include the North Pacific right whale (*Eubalaena japonica*), rough-toothed dolphin (*Steno bredanensis*), and Steller sea lion

(*Eumetopias jubatus*), and these species have all been excluded from subsequent analysis for the reasons described below. There have been only four sightings, each of a single Northern Pacific right whale, in Southern California waters over approximately the last 30 years (in 1988, 1990, 1992, and 2017) (Brownell *et al.,* 2001; Carretta *et al.,* 1994; National Marine Fisheries Service, 2017b; WorldNow, 2017). Sightings off California are rare, and historically, even during the period of U.S. West Coast whaling through the 1800s, right whales were considered uncommon to rare off California (Reeves and Smith, 2010; Scammon, 1874). The range of the rough-toothed dolphin is known to occasionally include the Southern California coast during periods of warmer ocean temperatures, but there is no recognized stock for the U.S. West Coast (Carretta *et al.,* 2019c). Several strandings were documented for this species in central and Southern California between 1977 and 2002 (Zagzebski *et al.,* 2006), but this species has not been observed during seven systematic ship surveys from 1991 to 2014 off the U.S. West Coast (Barlow, 2016). During 16 quarterly ship surveys off Southern California from 2004 to 2008, there was one encounter with a group of nine rough-toothed dolphins, which was considered an extralimital occurrence (Douglas *et al.,* 2014). Steller sea lions range along the north Pacific from northern Japan to California (Perrin *et al.,* 2009b), with centers of abundance and distribution in the Gulf of Alaska and Aleutian Islands (Muto et al., 2019). San Miguel Island and Santa Rosa Island were, in the past, the southernmost rookeries and haulouts for the Steller sea lions, but their range contracted northward in the 20th century, and now Año Nuevo Island off central California is currently the southernmost rookery (Muto *et al.,* 2019; National Marine Fisheries Service, 2008; Pitcher *et al.,* 2007). Steller sea lions pups were known to be born at San Miguel Island up until 1981 (National Marine Fisheries Service, 2008; Pitcher *et al.,* 2007), and so, as the population continues to increase, it is anticipated that the Steller sea lions may re-establish a breeding colony on San Miguel Island in the future. In the Channel Islands and vicinity, despite the species' general absence from the area, a consistent but small number of Steller sea lions (one to two individuals at a time) have been sighted in recent years. Aerial surveys for pinnipeds in the Channel Islands from 2011 to 2015 encountered a single Steller sea lion at SNI in 2013 (Lowry *et al.,* 2017). NMFS agrees with the Navy's assessment that these species are unlikely to occur in the PMSR Study Area and they are not discussed further.

Southern sea otter (*Enhydra lutris neris*) occurs nearshore off the coast of central California, ranging from Half Moon Bay in the north to Point Conception and at SNI (Tinker *et al.,* 2006; Tinker and Hatfield, 2016; U.S. Geological Survey, 2014). Southern sea otters are managed by the U.S. Fish and Wildlife Service and therefore are not discussed further.

TABLE 5—MARINE MAMMAL OCCURRENCE WITHIN THE PMSR STUDY AREA

Common name	Scientific name [1]	Stock	Status		Stock abundance (CV)/N_{min}; most recent abundance survey [2]	PBR [3]	Annual M/SI [4]
			MMPA	ESA			
Blue whale	*Balaenoptera musculus*	Eastern North Pacific	Depleted	Endangered	1,496 (0.44)/1,051; 2014.	1.2	≥19.4
Bryde's whale	*Balaenoptera brydei/edeni.*	Eastern Tropical Pacific			unk; na	unk	unk
Fin whale	*Balaenoptera physalus*	California, Oregon, and Washington.	Depleted	Endangered	9,029 (0.12)/8,127; 2014.	81	≥43.7
Gray whale	*Eschrichtius robustus*	Eastern North Pacific			26,960 (0.05)/25,849; 2016.	801	131
		Western North Pacific	Depleted	Endangered	290 (na)/271; 2016.	0.12	unk
Humpback whale	*Megaptera novaeangliae.*	California, Oregon, Washington.	Depleted	Threatened/Endangered [1].	2,900 (0.05)/2,784; 2019.	16.7	≥42.1
Minke whale	*Balaenoptera acutorostrata.*	California, Oregon, and Washington.			636 (0.72)/369; 2014.	3.5	≥1.3
Sei whale	*Balaenoptera borealis*	Eastern North Pacific	Depleted	Endangered	519 (0.4)/374; 2014.	0.75	≥0.2
Baird's beaked whale	*Berardius bairdii*	California, Oregon, and Washington.			2,697 (0.6)/1,633; 2014.	16	0
Common Bottlenose dolphin.	*Tursiops truncatus*	California Coastal			453 (0.06)/346; 2011.	2.7	≥2.0
		California, Oregon, and Washington Offshore.			1,924 (0.54)/1,255; 2014.	11	≥1.6
Cuvier's beaked whale	*Ziphius cavirostris*	California, Oregon, and Washington.			3,274 (0.67)/2,059; 2014.	21	<0.1
Dall's porpoise	*Phocoenoides dalli*	California, Oregon, and Washington.			25,750 (0.45)/17,954; 2014.	172	0.3
Dwarf sperm whale	*Kogia sima*	California, Oregon, and Washington.			unk; 2014	und	0
Harbor Porpoise	*Phocoena phocoena*	Morro Bay			2,917 [5] (0.41)/1,384; 2012.	[5] 66	[5] ≥0.4
Killer whale	*Orcinus orca*	Eastern North Pacific Offshore.			300 (0.10)/276; 2012.	2.8	0
		Eastern North Pacific Transient/West Coast Transient [6].			349 na/349; 2018	3.5	0.4
Long-beaked common dolphin.	*Delphinus capensis*	California			101,305 (0.49)/68,432; 2014.	657	≥35.4
Mesoplodont beaked whales [7].	*Mesoplodon spp*	California, Oregon, and Washington.			3,044 (0.54)/1,967; 2014.	20	0.1
Northern right whale dolphin.	*Lissodelphis borealis*	California, Oregon, and Washington.			26,556 (0.44)/18,608; 2014.	179	3.8
Pacific white-sided dolphin.	*Lagenorhynchus obliquidens.*	California, Oregon, and Washington.			26,814 (0.28)/21,195; 2014.	191	7.5

TABLE 5—MARINE MAMMAL OCCURRENCE WITHIN THE PMSR STUDY AREA—Continued

Common name	Scientific name [1]	Stock	Status		Stock abundance (CV)/N_{min}; most recent abundance survey [2]	PBR [3]	Annual M/SI [4]
			MMPA	ESA			
Pygmy sperm whale	*Kogia breviceps*	California, Oregon, and Washington.			4,111 (1.12)/1,924; 2014.	19	0
Risso's dolphins	*Grampus griseus*	California, Oregon, and Washington.			6,336 (0.32)/4,817; 2014.	46	≥3.7
Short-beaked common dolphin.	*Delphinus delphis*	California, Oregon, and Washington.			969,861 (0.17)/ 839,325; 2014.	8,393	≥40
Short-finned pilot whale	*Globicephala macrorhynchus.*	California, Oregon, and Washington.			836 (0.79)/466; 2014.	4.5	1.2
Sperm whale	*Physeter macrocephalus.*	California, Oregon, and Washington.	Depleted	Endangered	1,997 (0.57)/1,270; 2014.	2.5	0.6
Striped dolphin	*Stenella coeruleoalba*	California, Oregon, and Washington.			29,211 (0.20)/ 24,782; 2014.	238	≥0.8
Harbor seal	*Phoca vitulina*	California			30,968 na/27,348; 2012.	1,641	43
Northern elephant seal	*Mirounga angustirostris*	California			179,000 na/ 81,368; 2010.	4,882	8.8
California sea lion	*Zalophus californianus*	U.S. Stock			257,606 na/ 233,515; 2014.	14,011	≥321
Northern fur seal	*Callorhinus ursinus*	California			14,050 na/7,524; 2013.	451	1.8
Guadalupe fur seal	*Arctocephalus townsendi.*	Mexico to California	Depleted	Threatened	34,187 unk/ 31,109; 2013.	1,602	≥3.8

[1] Taxonomy follows Committee on Taxonomy (2018).
[2] CV is coefficient of variation; N_{min} is the minimum estimate of stock abundance. The most recent abundance survey that is reflected in the abundance estimate is presented; there may be more recent surveys that have not yet been incorporated into the estimate.
[3] PBR is the Potential biological removal, defined by the MMPA as the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population size (OSP).
[4] These values, found in NMFS's SARs, represent annual levels of human-caused mortality plus serious injury from all sources combined (*e.g.,* commercial fisheries, subsistence hunting, ship strike). Annual M/SI often cannot be determined precisely and is in some cases presented as a range.
[5] The abundance number as presented is from the ''fine-scale transects'' as documented in Forney *et al.* (2014). PBR and M/SI are from draft 2020 SAR for the Pacific (Carretta *et al.,* 2020).
[6] This stock is mentioned briefly in the Pacific Stock Assessment Report and referred to as the ''Eastern North Pacific Transient'' stock, however, the Alaska Stock Assessment Report contains assessments of all transient killer whale stocks in the Pacific, and the Alaska Stock Assessment Report refers to this same stock as the ''West Coast Transient'' stock (Muto *et al.,* 2019).
[7] The six *Mesoplodont* beaked whale species off California are *M. densirostris, M. carlhubbsi, M. ginkgodens, M. perrini, M. peruvianus, M. stejnegeri.*
Notes: na = not available; unk = unknown ; und = undetermined or not provided in the draft 2020 SAR for the Pacific (Carretta *et al.,* 2020) (Carretta *et al.,* 2019b).

Further, after Navy completed their modeling analysis, the following species/stocks had zero calculated estimated takes: Bryde's whale (Eastern Tropical Pacific), Gray whale (Western North Pacific), Sei whale (Eastern North Pacific), Baird's beaked whale (California, Oregon, and Washington), Bottlenose dolphin (California Coastal), Cuvier's beaked whale (California, Oregon, and Washington), Harbor Porpoise (Morro Bay), Killer whale (Eastern North Pacific Offshore, Eastern North Pacific Transient or West Coast Transient), Mesoplodont spp. (California, Oregon, and Washington), Short-finned pilot whale (California, Oregon, and Washington), and Northern fur seal (California). NMFS agrees with the Navy's analysis; therefore, these species are excluded from further analysis.

Below, we include additional information about the marine mammals in the area of the Specified Activities that informs our analysis, such as identifying known areas of important habitat or behaviors, or where Unusual Mortality Events (UME) have been designated.

Critical Habitat

The statutory definition of occupied critical habitat refers to ''physical or biological features essential to the conservation of the species,'' but the ESA does not specifically define or further describe these features. ESA-implementing regulations at 50 CFR 424.02 (as amended, 84 FR 45020; August 27, 2019), however, define such features as follows: The features that occur in specific areas and that are essential to support the life-history needs of the species, including but not limited to, water characteristics, soil type, geological features, sites, prey, vegetation, symbiotic species, or other features. A feature may be a single habitat characteristic, or a more complex combination of habitat characteristics. Features may include habitat characteristics that support ephemeral or dynamic habitat conditions. Features may also be expressed in terms relating to principles of conservation biology, such as patch size, distribution distances, and connectivity.

On April 21, 2021, NMFS issued a final rule to designate critical habitat in nearshore waters of the North Pacific Ocean for the endangered Central America DPS and the threatened Mexico DPS of humpback whales (86 FR 21082). Critical habitat for the Central America DPS and Mexico DPS was established within the California Current Ecosystem (CCE) off the coasts of California, Oregon, and Washington, representing areas of key foraging habitat. Prey of sufficient quality, abundance, and accessibility within humpback whale feeding areas to support feeding and population growth is identified an essential feature to the conservation of these whales. Because humpback whales only rarely feed on breeding grounds and during migrations, humpback whales must have access to adequate prey resources within their feeding areas to build up their fat stores and meet the nutritional and energy demands associated with individual survival, growth, reproduction, lactation, seasonal migrations, and other normal life functions. Given that each of three humpback whale DPSs very clearly rely on the feeding areas while within U.S. waters, prey has been identified as a biological feature that is essential to the conservation of the whales. The prey essential feature was specifically defined as follows: Prey species, primarily euphausiids and small pelagic schooling fishes of

sufficient quality, abundance, and accessibility within humpback whale feeding areas to support feeding and population growth.

NMFS considered 19 units of habitat as critical habitat for the listed humpback whale DPSs. There is overlap between the PMSR Study Area and portions of the habitat designated Units 17 and 18 (see Figure 3.7–5 of the 2020 PMSR DEIS/OEIS) in the final critical habitat rule (86 FR 21082), which are described below.

Unit 17, referred to as the ''Central California Coast Area,'' extends from 36°00′ N to a southern boundary at 34°30′ N. The nearshore boundary is defined by the 30-m isobath, and the seaward boundary is drawn along the 3,700-m isobath. This unit includes waters off of southern Monterey County, and San Luis Obispo and Santa Barbara Counties. Unit 17 covers 6,697 nmi² of marine habitat. This unit encompasses Morro Bay to Point Sal Biologically Important Area (BIA; see next section) and typically supports high density feeding aggregations of humpback whales from April to November (Calambokidis *et al.* 2015). Based on acoustic survey data collected during 2004–2009, large krill hotspots, ranging from 700 km² to 2,100 km², occur off Big Sur, San Luis Obispo, and Point Sal (Santora *et al.* 2011). Hotspots with persistent, heightened abundance of krill were also reported in this unit in association with bathymetric submarine canyons (Santora *et al.* 2018). This is the northernmost portion of humpback whale critical habitat that overlaps with the PMSR Study Area.

Unit 18, referred to as the ''Channel Islands Area,'' extends from a northern boundary at 34°30′ N to a boundary line that extends from Oxnard, CA seaward to the 3,700-m isobath, along which the offshore boundary is drawn. The 50-m isobath forms the shoreward boundary. This unit includes waters off of Santa Barbara and Ventura counties. This unit covers 9,799 nmi² of marine habitat. This unit encompasses the Santa Barbara Channel-San Miguel BIA, which supports high density feeding aggregations of humpback whales during March through September (Calambokidis *et al.* 2015). Based on acoustic survey data collected during 2004–2009, a krill hotspot of about 780 km² has been documented off Point Conception (Santora *et al.* 2011). Some additional krill hotspots have also been observed in this unit in association with bathymetric submarine canyons (Santora *et al.* 2018). Coastal waters managed by the Navy, as addressed within the Point Mugu Integrated Natural Resources Management Plan (INRMP) and SNI INRMP, are not included in the proposed designation as these areas were determined by NMFS to be ineligible for designation as critical habitat under section 4(a)(3)(B)(i) of the ESA (84 FR 54354; October 9, 2019).The Navy does not anticipate national security impacts resulting from critical habitat designation in the portion of Region/Unit 18 that overlaps with the PMSR Study Area.

Biologically Important Areas

Biologically Important Areas (BIAs) include areas of known importance for reproduction, feeding, or migration, or areas where small and resident populations are known to occur (Van Parijs, 2015). Unlike ESA critical habitat, these areas are not formally designated pursuant to any statute or law, but are a compilation of the best available science intended to inform impact and mitigation analyses. An interactive map of the BIAs may be found here: *https://cetsound.noaa.gov/biologically-important-area-map.*

BIAs off the West Coast of the continental United States with the potential to overlap portions of the PMSR Study Area include the following feeding and migration areas for blue whales, gray whales, and humpback whales and are described in further detail below (Calambokidis *et al.,* 2015).

Blue Whale Feeding BIAs

Three blue whale feeding BIAs overlap with the PMSR Study Area (see Figure 3.7–2 of the 2020 PMSR DEIS/OEIS). The Point Conception/Arguello to Point Sal Feeding Area and Santa Barbara Channel and San Miguel Feeding Area have large portions within the PMSR Study Area, 87 and 61 percent respectively. The San Nicolas Island Feeding Area is entirely within the PMSR Study Area (Calambokidis *et al.,* 2015a). Feeding by blue whales occurs from June through October in these BIAs (Calambokidis *et al.,* 2015a).

Gray Whale Migration BIAs

Four gray whale migration BIAs overlap with the PMSR Study Area (see Figure 3.7–3 of the 2020 PMSR DEIS/OEIS). The northward migration of the Eastern North Pacific stock of gray whales to the feeding grounds in Arctic waters, Alaska, the Pacific Northwest, and Northern California occurs in two phases: Northbound Phase A and Northbound Phase B (Calambokidis *et al.,* 2015). Northbound Phase A migration BIA consists mainly of adults and juveniles that lead the beginning of the north-bound migration from late January through July, peaking in April through July. Newly pregnant females go first to maximize feeding time, followed by adult females and males, and then juveniles (Jones and Swartz, 2009). The Northbound Phase B migration BIA consists primarily of cow-calf pairs that begin their northward migration later (March through July), as they remain on the reproductive grounds longer to allow calves to strengthen and rapidly increase in size before the northward migration (Jones and Swartz, 2009; Urban-Ramirez *et al.,* 2003). The Potential presence migration BIA (January through July; October through December) and the Southbound—All migration BIA (October through March) routes pass through the waters of the PMSR Study Area.

Humpback Whale Feeding BIAs

Two humpback whale feeding areas overlap with the PMSR Study Area (Calambokidis *et al.,* 2015) (see Figure 3.7–4 of the 2020 PMSR DEIS/OEIS). These BIAs include the Morro Bay to Point Sal feeding area (April through November) and the Santa Barbara Channel–San Miguel feeding area (March through September) (Calambokidis *et al.,* 2015). The majority of these BIAs overlap with the PMSR Study Area (approximately 75 percent).

National Marine Sanctuaries

Under Title III of the Marine Protection, Research, and Sanctuaries Act of 1972 (also known as the National Marine Sanctuaries Act (NMSA)), NOAA can establish as national marine sanctuaries (NMS), areas of the marine environment with special conservation, recreational, ecological, historical, cultural, archaeological, scientific, educational, or aesthetic qualities. Sanctuary regulations prohibit or regulate activities that could destroy, cause the loss of, or injure sanctuary resources pursuant to the regulations for that sanctuary and other applicable law (15 CFR part 922). NMSs are managed on a site-specific basis, and each sanctuary has site-specific regulations. Most, but not all, sanctuaries have site-specific regulatory exemptions from the prohibitions for certain military activities. Separately, section 304(d) of the NMSA requires Federal agencies to consult with the Office of National Marine Sanctuaries whenever their activities are likely to destroy, cause the loss of, or injure a sanctuary resource.

There are two NMSs managed by the Office of National Marine Sanctuaries within the PMSR Study Area: The Channel Islands NMS and a small portion of the Monterey Bay NMS. The

Channel Islands NMS is an ecosystem-based managed sanctuary consisting of an area of 1,109 nmi² around Anacapa Island, Santa Cruz Island, Santa Rosa Island, San Miguel Island, and Santa Barbara Island to the south. It encompasses sensitive habitats (*e.g.,* kelp forest habitat, deep benthic habitat) and includes various shipwrecks and maritime heritage artifacts. The Channel Islands NMS waters and its remote, isolated position at the confluence of two major ocean currents support significant biodiversity of marine mammals, fish, and invertebrates. At least 33 species of cetaceans have been reported in the Channel Islands NMFS region with common species, including: Long-beaked common dolphin, short-beaked common dolphin, Bottlenose dolphin, Pacific white-sided dolphin, Northern right whale dolphin, Risso's dolphin, California gray whale, Blue whale, and Humpback whale. The three species of pinnipeds that are commonly found throughout or in part of the Channel Islands NMS include: California sea lion, Northern elephant seal, and Pacific harbor seal. About 877 nmi², or 79 percent of the Channel Island NMS, occurs within the PMSR Study Area (see Chapter 6 of the 2020 PMSR DEIS/OEIS and Figure 6.1–1). The Monterey Bay NMS is an ecosystem-based managed sanctuary consisting of an area of 4,601 nmi² stretching from Marin to Cambria and extending an average of 30 miles from shore. The Monterey Bay NMS contains extensive kelp forests and one of North America's largest underwater canyons and closest-to-shore deep ocean environments. Its diverse marine ecosystem also includes rugged rocky shores, wave-swept sandy beaches and tranquil estuaries. These habitats support a variety of marine life, including 36 species of marine mammals, more than 180 species of seabirds and shorebirds, at least 525 species of fishes, and an abundance of invertebrates and algae. Of the 36 species of marine mammals, six are pinnipeds with California sea lions being the most common, and the remainder are twenty-six species of cetaceans. Only 19 nmi², or less than 1 percent of the Monterey Bay NMS, occurs within the PMSR Study Area (see Chapter 6 of the 2020 PMSR DEIS/OEIS and Figure 6.1–1).

Unusual Mortality Events (UMEs)

An UME is defined under Section 410(6) of the MMPA as a stranding that is unexpected; it involves a significant die-off of any marine mammal population, and demands immediate response. From 1991 to the present, there have been 14 formally recognized UMEs affecting marine mammals in California and involving species under NMFS' jurisdiction. Three UMEs with ongoing or recently closed investigations in the PMSR Study Area that inform our analysis are discussed below. The California sea lion UME in California was closed on May 6, 2020. The Guadalupe fur seal UME in California and the gray whale UME along the west coast of North America are active and involve ongoing investigations.

California Sea Lion UME

From January 2013 through September 2016, a greater than expected number of young malnourished California sea lions (*Zalophus californianus*) stranded along the coast of California. Sea lions stranding from an early age (6–8 months old) through two years of age (hereafter referred to as juveniles) were consistently underweight without other disease processes detected. Of the 8,122 stranded juveniles attributed to the UME, 93 percent stranded alive (n = 7,587, with 3,418 of these released after rehabilitation) and 7 percent (n = 531) stranded dead. Several factors are hypothesized to have impacted the ability of nursing females and young sea lions to acquire adequate nutrition for successful pup rearing and juvenile growth. In late 2012, decreased anchovy and sardine recruitment (CalCOFI data, July 2013) may have led to nutritionally stressed adult females. Biotoxins were present at various times throughout the UME, and while they were not detected in the stranded juvenile sea lions (whose stomachs were empty at the time of stranding), biotoxins may have impacted the adult females' ability to support their dependent pups by affecting their cognitive function (*e.g.,* navigation, behavior towards their offspring). Therefore, the role of biotoxins in this UME, via its possible impact on adult females' ability to support their pups, is unclear. The proposed primary cause of the UME was malnutrition of sea lion pups and yearlings due to ecological factors. These factors included shifts in distribution, abundance and/or quality of sea lion prey items around the Channel Island rookeries during critical sea lion life history events (nursing by adult females, and transitioning from milk to prey by young sea lions). These prey shifts were most likely driven by unusual oceanographic conditions at the time due to the event known as the ''Warm Water Blob'' and El Niño. This investigation closed on May 6, 2020. Please refer to: *https://www.fisheries.noaa.gov/national/marine-life-distress/2013-2016-california-sea-lion-unusual-mortality-event-california* for more information on this UME.

Guadalupe Fur Seal UME

Increased strandings of Guadalupe fur seals began along the entire coast of California in January 2015 and were eight times higher than the historical average (approximately 10 seals/yr). Strandings have continued since 2015 and remained well above average through 2020. Numbers by year are as follows: 2015 (98), 2016 (76), 2017 (62), 2018 (45), 2019 (116), 2020 (95 as of December 17, 2020). The total number of Guadalupe fur seals stranding in California from January 1, 2015, through December 17, 2020, in the UME is 492. Strandings of Guadalupe fur seals became elevated in the spring of 2019 in Washington and Oregon, and strandings for seals in these two states subsequently (starting from January 1, 2019) have been added to the UME. The current total number of strandings in Washington and Oregon is 133 seals, including 91 in 2019 and 42 in 2020 as of December 17, 2020. Strandings are seasonal and generally peak in April through June of each year. The Guadalupe fur seal strandings involved the stranding of mostly weaned pups and juveniles (1–2 years old), with both live and dead strandings occurring. Current studies of this UME find that the majority of stranded animals experienced primary malnutrition with secondary bacterial and parasitic infections. The California portion of this UME was occurring in the same area where the 2013–2016 California sea lion UME occurred. This investigation is ongoing. Please refer to: *https://www.fisheries.noaa.gov/national/marine-life-distress/2015-2020-guadalupe-fur-seal-unusual-mortality-event-california* for more information on this UME.

Gray Whale UME

Since January 1, 2019, elevated levels of gray whale strandings have occurred along the west coast of North America, from Mexico to Canada. As of December 17, 2020, there have been a total of 385 strandings along the coasts of the United States, Canada, and Mexico, with 201 of those strandings occurring along the U.S. coast. Of the strandings on the U.S. coast, 93 have occurred in Alaska, 47 in Washington, 9 in Oregon, and 52 in California. Partial necropsy examinations conducted on a subset of stranded whales have shown evidence of poor to thin body condition, killer whale predation, and human

interactions. As part of the UME investigation process, NOAA is assembling an independent team of scientists to coordinate with the Working Group on Marine Mammal UMEs to review the data collected, sample stranded whales, and determine the next steps for the investigation. Please refer to: *https://www.fisheries.noaa.gov/national/marine-life-distress/2019-2020-gray-whale-unusual-mortality-event-along-west-coast.*

Potential Effects of Specified Activities on Marine Mammals and Their Habitat

This section includes a summary of the ways that components of the specified activity may impact marine mammals and their habitat. The Estimated Take of Marine Mammals section later in this rule includes a quantitative analysis of the number of instances of take that could occur from these activities. The Preliminary Analysis and Negligible Impact Determination section considers the content of this section, the Estimated Take of Marine Mammals section, and the Proposed Mitigation Measures section to draw conclusions regarding the likely impacts of these activities on the reproductive success or survivorship of individuals and whether those impacts on individuals are likely to adversely affect the species through effects on annual rates of recruitment or survival.

The Navy has requested authorization for the take of marine mammals that may occur incidental to training and testing activities in the PMSR Study Area. The Navy analyzed potential impacts to marine mammals from explosive sources, target and missile launches from SNI, and from vessel use in its rulemaking/LOA application. NMFS carefully reviewed the information provided by the Navy along with independently reviewing applicable scientific research and literature and other information to evaluate the potential effects of the Navy's activities on marine mammals.

Other potential impacts to marine mammals from training and testing activities in the PMSR Study Area were analyzed in the 2020 PMSR DEIS/OEIS, in consultation with NMFS as a cooperating agency. In particular, the Navy determined that these activities were unlikely to result in any incidental take from vessel strike or in any serious injury or mortality from explosive detonations (discussed in this section below), and the Navy has not requested authorizations of any such incidental take. NMFS agrees with these determinations by the Navy. Accordingly, in this proposed rule NMFS' analysis focuses on the potential effects on marine mammals from the activity components that may cause the take of marine mammals: Exposure to explosive stressors and launches.

For the purpose of MMPA incidental take authorizations, NMFS' effects assessments serve four primary purposes: (1) To determine whether the specified activities would have a negligible impact on the affected species or stocks of marine mammals (based on whether it is likely that the activities would adversely affect the species or stocks through effects on annual rates of recruitment or survival); (2) to determine whether the specified activities would have an unmitigable adverse impact on the availability of the species or stocks for subsistence uses; (3) to prescribe the permissible methods of taking (*i.e.,* Level B harassment (behavioral disturbance, incurred directly or as a result of temporary threshold shift (TTS)), and Level A harassment (permanent threshold shift (PTS) and non-auditory injury)), including identification of the number and types of take that could occur by harassment, serious injury, or mortality, and to prescribe other means of effecting the least practicable adverse impact on the species or stocks and their habitat (*i.e.,* mitigation measures); and (4) to prescribe requirements pertaining to monitoring and reporting.

Marine mammals may be affected by Navy activities by sensory impairment (permanent and temporary threshold shifts and acoustic masking), physiological responses (particular stress responses), direct behavioral disturbance, or habitat effects. The Estimated Take of Marine Mammals section discusses how the potential effects on marine mammals from the impulsive acoustic sources considered in this rule relate to the MMPA definitions of Level A harassment and Level B harassment, and quantifies those effects that rise to the level of a take. The Preliminary Analysis and Negligible Impact Determination section assesses whether the proposed authorized take would have a negligible impact on the affected species and stocks.

Sections 6, 7, and 9 of the Navy's application include summaries of the ways that components of the specified activity may impact marine mammals and their habitat, including specific discussion of potential effects to marine mammals from noise and other stressors produced through the use explosives detonating at or near the surface and noise from launch events on SNI. We have reviewed the Navy's discussion of potential effects for accuracy and completeness in its application and refer to that information rather than repeating it in full here. Below we include a summary of the potential effects to marine mammals.

Additionally, NMFS has included a comprehensive discussion of the potential effects of similar activities on marine mammals, including specifically from Navy testing and training exercises that use explosives, in other **Federal Register** notices. For additional detail, we refer the reader to these notices; please see, 85 FR 72312 (November 9, 2020) (Navy testing and training, including explosives); 84 FR 28462 (June 12, 2019) (Navy IHA on target and missile launches from SNI); and 79 FR 32678 (June 6, 2014) (Navy previous rule on target and missile launches from SNI), or view documents available online at *www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-military-readiness-activities.*

Below we provide a brief technical background on sound, on the characteristics of certain sound types, and on metrics used in this proposal, as well as a brief overview of the potential effects to marine mammals associated with the Navy's proposed activities. The proposed training and testing exercises have the potential to cause take of marine mammals by exposing them to impulsive noise and pressure waves generated by explosive detonation at or near the surface of the water as well as by impulsive noise target and missile launches from SNI. Exposure to noise or pressure resulting from these detonations and launches could result in non-lethal injury (Level A harassment) or disturbance (Level B harassment). The potential effects of impulsive sound and pressure from the proposed training and testing activities may include one or more of the following: Tolerance, masking, disturbance, hearing threshold shift, and stress responses. In addition, NMFS also considered the potential for harassment from vessels and serious injury and mortality from explosive detonations.

Description of Sound Sources

This section contains a brief technical background on sound, on the characteristics of certain sound types, and on metrics used in this proposal inasmuch as the information is relevant to the specified activity and to a discussion of the potential effects of the specified activity on marine mammals found later in this document. For general information on sound and its interaction with the marine environment, please see, *e.g.,* Au and

Hastings (2008); Richardson *et al.* (1995); Urick (1983).

Sound travels in waves, the basic components of which are frequency, wavelength, velocity, and amplitude. Frequency is the number of pressure waves that pass by a reference point per unit of time and is measured in hertz or cycles per second. Wavelength is the distance between two peaks or corresponding points of a sound wave (length of one cycle). Higher frequency sounds have shorter wavelengths than lower frequency sounds, and typically attenuate (decrease) more rapidly, except in certain cases in shallower water. Amplitude is the height of the sound pressure wave or the ''loudness'' of a sound and is typically described using the relative unit of the decibel (dB). A sound pressure level (SPL) in dB is described as the ratio between a measured pressure and a reference pressure (for underwater sound, this is 1 microPascal (μPa)), and is a logarithmic unit that accounts for large variations in amplitude. Therefore, a relatively small change in dB corresponds to large changes in sound pressure. The source level (SL) represents the SPL referenced at a distance of 1 m from the source (referenced to 1 μPa), while the received level is the SPL at the listener's position (referenced to 1 μPa).

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

Sound exposure level (SEL; represented as dB re 1 μPa^2-s) represents the total energy in a stated frequency band over a stated time interval or event and considers both intensity and duration of exposure. The per-pulse SEL is calculated over the time window containing the entire pulse (*i.e.,* 100 percent of the acoustic energy). SEL is a cumulative metric; it can be accumulated over a single pulse, or calculated over periods containing multiple pulses. Cumulative SEL represents the total energy accumulated by a receiver over a defined time window or during an event. Peak sound pressure (also referred to as zero-to-peak sound pressure or 0-pk) is the maximum instantaneous sound pressure measurable in the water at a specified distance from the source and is represented in the same units as the rms sound pressure. When underwater objects vibrate or activity occurs, sound-pressure waves are created. These waves alternately compress and decompress the water as the sound wave travels. Underwater sound waves radiate in a manner similar to ripples on the surface of a pond and may be either directed in a beam or beams or may radiate in all directions (omnidirectional sources), as is the case for sound produced by the pile driving activity considered here. The compressions and decompressions associated with sound waves are detected as changes in pressure by aquatic life and man-made sound receptors such as hydrophones.

Even in the absence of sound from the specified activity, the underwater environment is typically loud due to ambient sound, which is defined as environmental background sound levels lacking a single source or point (Richardson *et al.,* 1995). The sound level of a region is defined by the total acoustical energy being generated by known and unknown sources. These sources may include physical (*e.g.,* wind and waves, earthquakes, ice, atmospheric sound), biological (*e.g.,* sounds produced by marine mammals, fish, and invertebrates), and anthropogenic (*e.g.,* vessels, dredging, construction) sound. A number of sources contribute to ambient sound, including wind and waves, which are a main source of naturally occurring ambient sound for frequencies between 200 Hz and 50 kHz (Mitson, 1995). In general, ambient sound levels tend to increase with increasing wind speed and wave height. Precipitation can become an important component of total sound at frequencies above 500 Hz, and possibly down to 100 Hz during quiet times. Marine mammals can contribute significantly to ambient sound levels, as can some fish and snapping shrimp. The frequency band for biological contributions is from approximately 12 Hz to over 100 kHz. Sources of ambient sound related to human activity include transportation (surface vessels), dredging and construction, oil and gas drilling and production, geophysical surveys, sonar, and explosions. Vessel noise typically dominates the total ambient sound for frequencies between 20 and 300 Hz. In general, the frequencies of anthropogenic sounds are below 1 kHz and, if higher frequency sound levels are created, they attenuate rapidly. The sum of the various natural and anthropogenic sound sources that comprise ambient sound at any given location and time depends not only on the source levels (as determined by current weather conditions and levels of biological and human activity) but also on the ability of sound to propagate through the environment. In turn, sound propagation is dependent on the spatially and temporally varying properties of the water column and sea floor, and is frequency-dependent. As a result of the dependence on a large number of varying factors, ambient sound levels can be expected to vary widely over both coarse and fine spatial and temporal scales. Sound levels at a given frequency and location can vary by 10–20 decibels (dB) from day to day (Richardson *et al.,* 1995). The result is that, depending on the source type and its intensity, sound from the specified activity may be a negligible addition to the local environment or could form a distinctive signal that may affect marine mammals. Details of source types are described in the following text.

Sounds are often considered to fall into one of two general types: Pulsed and non-pulsed (defined in the following). The distinction between these two sound types is important because they have differing potential to cause physical effects, particularly with regard to hearing (*e.g.,* Ward, 1997 in Southall *et al.,* 2007). Please see Southall *et al.* (2007) and NMFS' *Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (Version 2.0) Underwater Thresholds for Onset of Permanent and Temporary Threshold Shift* (Acoustic Technical Guidance) (NMFS, 2018) for an in-depth discussion of these concepts. The distinction between these two sound types is not always obvious, as certain signals share properties of both pulsed and non-pulsed sounds. A signal near a source could be categorized as a pulse, but due to propagation effects as it moves farther from the source, the signal duration becomes longer (*e.g.,* Greene and Richardson, 1988).

Pulsed sound sources (*e.g.,* airguns, explosions, gunshots, sonic booms, impact pile driving) produce signals that are brief (typically considered to be less than one second), broadband, atonal transients (ANSI, 1986, 2005; Harris, 1998; NIOSH, 1998; ISO, 2003) and occur either as isolated events or repeated in some succession. Pulsed sounds are all characterized by a relatively rapid rise from ambient pressure to a maximal pressure value followed by a rapid decay period that may include a period of diminishing,

oscillating maximal and minimal pressures, and generally have an increased capacity to induce physical injury as compared with sounds that lack these features.

Non-pulsed sounds can be tonal, narrowband, or broadband, brief or prolonged, and may be either continuous or intermittent (ANSI, 1995; NIOSH, 1998). Some of these non-pulsed sounds can be transient signals of short duration but without the essential properties of pulses (*e.g.,* rapid rise time). Examples of non-pulsed sounds include those produced by vessels, aircraft, machinery operations such as drilling or dredging, vibratory pile driving, and active sonar systems. The duration of such sounds, as received at a distance, can be greatly extended in a highly reverberant environment.

Serious Injury or Mortality From Explosive Detonations

Serious injury or mortality to marine mammals from explosive detonations would consist of primary blast injury, which refers to those injuries that result from the compression of a body exposed to a blast wave and is usually observed as barotrauma of gas-containing structures (*e.g.,* lung and gut) and structural damage to the auditory system (Greaves *et al.,* 1943; Office of the Surgeon General, 1991; Richmond *et al.,* 1973). The near instantaneous high magnitude pressure change near an explosion can injure an animal where tissue material properties significantly differ from the surrounding environment, such as around air-filled cavities in the lungs or gastrointestinal (GI) tract. The gas-containing organs (lungs and GI tract) are most vulnerable to primary blast injury. Severe injuries to these organs are presumed to result in mortality (*e.g.,* severe lung damage may introduce air into the cardiopulmonary vascular system, resulting in lethal air emboli). Large pressure changes at tissue-air interfaces in the lungs and GI tract may cause tissue rupture, resulting in a range of injuries depending on degree of exposure. Recoverable injuries would include slight lung injury, such as capillary interstitial bleeding, and contusions to the GI tract. More severe injuries, such as tissue lacerations, major hemorrhage, organ rupture, or air in the chest cavity (pneumothorax), would significantly reduce fitness and likely cause death in the wild. Rupture of the lung may also introduce air into the vascular system, producing air emboli that can cause a stroke or heart attack by restricting oxygen delivery to critical organs. Susceptibility would increase with depth, until normal lung collapse (due to increasing hydrostatic pressure) and increasing ambient pressures again reduce susceptibility.

The Navy performed a quantitative analysis (refer to the Navy's Acoustic Effects Model section) to estimate the probability that marine mammals could be exposed to the sound and energy from explosions during Navy testing and training activities and the effects of those exposures. The effects of underwater explosions on marine mammals depend on a variety of factors including animal size and depth; charge size and depth; depth of the water column; and distance between the animal and the charge. In general, an animal would be less susceptible to injury near the water surface because the pressure wave reflected from the water surface would interfere with the direct path pressure wave, reducing positive pressure exposure. There are no explosives detonated underwater for the proposed activities, and those that detonate at or near the surface of the water are unlikely to transfer energy underwater sufficient to result in non-auditory injury (GI injury or lung injury) or mortality. NMFS agrees with the Navy's analysis that no mortality or serious injury from tissue damage in the form of GI injury or lung injury is anticipated to result from the proposed activities. The Navy did not request and NMFS does not propose it for authorization or discuss further. For additional details on the criteria for estimating non-auditory physiological impacts on marine mammals due to naval underwater explosions, we refer the reader to the report, *Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis (Phase III)* (U.S. Department of the Navy, 2017e).

Hearing Loss—Threshold Shift

Marine mammals exposed to high-intensity sound, or to lower-intensity sound for prolonged periods, can experience hearing threshold shift, which is the loss of hearing sensitivity at certain frequency ranges after cessation of sound (Finneran, 2015). Threshold shift can be permanent (PTS), in which case the loss of hearing sensitivity is not fully recoverable, or temporary (TTS), in which case the animal's hearing threshold would recover over time (Southall *et al.,* 2007). Irreparable damage to the inner or outer cochlear hair cells may cause PTS; however, other mechanisms are also involved, such as exceeding the elastic limits of certain tissues and membranes in the middle and inner ears and resultant changes in the chemical composition of the inner ear fluids (Southall *et al.,* 2007). PTS is considered an injury and Level A harassment while TTS is considered to be Level B harassment and *not* considered an injury.

Hearing loss, or threshold shift (TS), is typically quantified in terms of the amount (in decibels [dB]) that hearing thresholds at one or more specified frequencies are elevated, compared to their pre-exposure values, at some specific time after the noise exposure. The amount of TS measured usually decreases with increasing recovery time—the amount of time that has elapsed since a noise exposure. If the TS eventually returns to zero (*i.e.,* the hearing threshold returns to the pre-exposure value), the threshold shift is called a TTS. If the TS does not completely recover (the threshold remains elevated compared to the pre-exposure value), the remaining TS is a PTS.

Hearing loss has only been studied in a few species of marine mammals, although hearing studies with terrestrial mammals are also informative. There are no direct measurements of hearing loss in marine mammals due to exposure to explosive sources. The sound resulting from an explosive detonation is considered an impulsive sound and shares important qualities (*i.e.,* short duration and fast rise time) with other impulsive sounds such as those produced by air guns. General research findings regarding TTS and PTS in marine mammals, as well as findings specific to exposure to other impulsive sound sources, are discussed in Section 6.4.1.2, (Loss of Hearing Sensitivity and Auditory Injury) of the Navy's application.

Marine mammal TTS data from impulsive sources are limited to two studies with measured TTS of 6 dB or more: Finneran *et al.* (2002) reported behaviorally measured TTSs of 6 and 7 dB in a beluga exposed to single impulses from a seismic water gun, and Lucke *et al.* (2009) reported Audio-evoked Potential measured TTS of 7–20 dB in a harbor porpoise exposed to single impulses from a seismic air gun.

In addition to these data, Kastelein *et al.* (2015a) reported behaviorally measured mean TTS of 4 dB at 8 kHz and 2 dB at 4 kHz after a harbor porpoise was exposed to a series of impulsive sounds produced by broadcasting underwater recordings of impact pile driving strikes through underwater sound projectors. The cumulative SEL was approximately 180 decibels referenced to 1 micropascal squared seconds (dB re 1 μPa^2s). The pressure waveforms for the simulated pile strikes exhibited significant

''ringing'' not present in the original recordings, and most of the energy in the broadcasts was between 500 and 800 Hz. As a result, some questions exist regarding whether the fatiguing signals were representative of underwater pressure signatures from impact pile driving.

Several impulsive noise exposure studies have also been conducted without behaviorally measurable TTS. Specifically, Finneran *et al.* (2000) exposed dolphins and belugas to single impulses from an ''explosion simulator,'' and Finneran *et al.* (2015) exposed three dolphins to sequences of 10 impulses from a seismic air gun (maximum cumulative SEL = 193–195 dB re 1 μPa²s, peak SPL = 196–210 dB re 1 μPa) without measurable TTS. Finneran *et al.* (2003) exposed two sea lions to single impulses from an arc-gap transducer with no measurable TTS (maximum unweighted SEL = 163 dB re 1 μPa²s, peak SPL = 183 dB re 1 μPa).

Numerous studies have directly examined noise-induced hearing loss in marine mammals from non-impulsive sources (see Finneran, 2015). In these studies, hearing thresholds were measured in marine mammals before and after exposure to intense sounds. The difference between the pre-exposure and post-exposure thresholds was then used to determine the amount of TTS at various post-exposure times. The major findings from these studies, which include the following, highlight general concepts that are thought to be applicable across all types of sounds:

- The amount of TTS varies with the hearing test frequency. As the exposure SPL increases, the frequency at which the maximum TTS occurs also increases (Kastelein et al., 2014b). For high-level exposures, the maximum TTS typically occurs one-half to one octave above the exposure frequency (Finneran *et al.,* 2007; Mooney *et al.,* 2009a; Nachtigall *et al.,* 2004; Popov *et al.,* 2011; Popov *et al.,* 2013; Schlundt *et al.,* 2000). The overall spread of TTS from tonal exposures can therefore extend over a large frequency range (*i.e.,* narrowband exposures can produce broadband [greater than one octave] TTS).
- The amount of TTS increases with exposure SPL and duration and is correlated with sound exposure level (SEL), especially if the range of exposure durations is relatively small (Kastak *et al.,* 2007; Kastelein *et al.,* 2014b; Popov *et al.,* 2014). As the exposure duration increases, however, the relationship between TTS and SEL begins to break down. Specifically, duration has a more significant effect on TTS than would be predicted on the basis of SEL alone (Finneran *et al.,* 2010a, 2010b; Kastak *et al.,* 2005; Mooney *et al.,* 2009a). This means if two exposures have the same SEL but different durations, the exposure with the longer duration (thus lower SPL) will tend to produce more TTS than the exposure with the higher SPL and shorter duration. In most acoustic impact assessments, the scenarios of interest involve shorter duration exposures than the marine mammal experimental data from which impact thresholds are derived; therefore, use of SEL tends to overestimate the amount of TTS. Despite this, SEL continues to be used in many situations because it is relatively simple, more accurate than SPL alone, and lends itself easily to scenarios involving multiple exposures with different SPL.
- The amount of TTS depends on the exposure frequency. Sounds at low frequencies, well below the region of best sensitivity, are less hazardous than those at higher frequencies, near the region of best sensitivity (Finneran and Schlundt, 2013). The onset of TTS—defined as the exposure level necessary to produce 6 dB of TTS (*i.e.,* clearly above the typical variation in threshold measurements)—also varies with exposure frequency. At low frequencies onset-TTS exposure levels are higher compared to those in the region of best sensitivity.
- TTS can accumulate across multiple exposures, but the resulting TTS will be less than the TTS from a single, continuous exposure with the same SEL (Finneran *et al.,* 2010a; Kastelein *et al.,* 2014a; Kastelein *et al.,* 2015b; Mooney *et al.,* 2009b). This means that TTS predictions based on the total, cumulative SEL will overestimate the amount of TTS from intermittent exposures such as sonars and impulsive sources.
- The amount of observed TTS tends to decrease with increasing time following the exposure; however, the relationship is not monotonic (*i.e.,* increasing exposure does not always increase TTS). The time required for complete recovery of hearing depends on the magnitude of the initial shift; for relatively small shifts recovery may be complete in a few minutes, while large shifts (*e.g.,* ~40 dB) may require several days for recovery. Under many circumstances TTS recovers linearly with the logarithm of time (Finneran *et al.,* 2010a, 2010b; Finneran and Schlundt, 2013; Kastelein *et al.,* 2012a; Kastelein *et al.,* 2012b; Kastelein *et al.,* 2013a; Kastelein *et al.,* 2014a, 2014b; Kastelein *et al.,* 2014c; Popov *et al.,* 2011; Popov *et al.,* 2013; Popov *et al.,* 2014). This means that for each doubling of recovery time, the amount of TTS will decrease by the same amount (*e.g.,* 6 dB recovery per doubling of time).

The proposed activities include both TTS and a limited amount of PTS on some marine mammals.

Hearing Loss from SNI Target and Missile Launches—Missile launches are characterized by sudden onset of sound, moderate to high peak sound levels (depending on the type of missile and distance), and short sound duration. Although it is possible that some pinnipeds may incur TTS during launches from SNI, hearing impairment has not been measured for pinniped species exposed to launch sounds. Auditory brainstem response *(i.e.,* hearing assessment using measurements of electrical responses of the brain) was used to demonstrate that harbor seals did not exhibit loss in hearing sensitivity following launches of large rockets at Vandenberg Air Force Base (VAFB) (Thorson *et al.,* 1999; Thorson *et al.,* 1998). However, the hearing tests did not begin until at least 45 minutes after the launch; therefore, harbor seals may have incurred TTS which was undetectable by the time testing was begun. There was no sign of PTS in any of the harbor seals tested (Thorson *et al.,* 1999; Thorson *et al.,* 1998). Since 2001, no launch events at SNI have exposed pinnipeds to noise levels at or exceeding those where PTS could be incurred.

Based on measurements of received sound levels during previous launches at SNI (Burke 2017; Holst *et al.,* 2010; Holst *et al.,* 2005a; Holst *et al.,* 2008; Holst *et al.,* 2011; Ugoretz 2016; Ugoretz and Greene Jr. 2012), the Navy expects that there is a very limited potential of TTS for a few of the pinnipeds present, particularly for phocids. Available evidence from launch monitoring at SNI in 2001–2017 suggests that only a small number of launch events produced sound levels that could elicit TTS for some pinnipeds (Burke 2017; Holst *et al.,* 2008; Holst *et al.,* 2011; Ugoretz 2016; Ugoretz and Greene Jr. 2012). In general, if any TTS were to occur to pinnipeds, it is expected to be mild and reversible. It is possible that some launch sounds as measured close to the launchers may exceed the permanent threshold shift (PTS) criteria, but it is not expected that any pinnipeds would be close enough to the launchers to be exposed to sounds strong enough to cause PTS. Due to the expected sound levels of the activities proposed and the distance of the activity from marine mammal habitat, the effects of sounds from the proposed activities are unlikely to result in PTS.

Physiological Stress

There is growing interest in monitoring and assessing the impacts of stress responses to sound in marine animals. Classic stress responses begin when an animal's central nervous system perceives a potential threat to its homeostasis. That perception triggers stress responses regardless of whether a stimulus actually threatens the animal; the mere perception of a threat is sufficient to trigger a stress response (Moberg, 2000; Sapolsky *et al.,* 2005; Seyle, 1950). Once an animal's central nervous system perceives a threat, it mounts a biological response or defense that consists of a combination of the four general biological defense responses: behavioral responses, autonomic nervous system responses, neuroendocrine responses, or immune responses.

According to Moberg (2000), in the case of many stressors, an animal's first and sometimes most economical (in terms of biotic costs) response is behavioral avoidance of the potential stressor or avoidance of continued exposure to a stressor. An animal's second line of defense to stressors involves the sympathetic part of the autonomic nervous system and the classical ''fight or flight'' response which includes the cardiovascular system, the gastrointestinal system, the exocrine glands, and the adrenal medulla to produce changes in heart rate, blood pressure, and gastrointestinal activity that humans commonly associate with ''stress.'' These responses have a relatively short duration and may or may not have significant long-term effect on an animal's welfare.

An animal's third line of defense to stressors involves its neuroendocrine systems or sympathetic nervous systems; the system that has received the most study has been the hypothalmus-pituitary-adrenal system (also known as the HPA axis in mammals or the hypothalamus-pituitary-interrenal axis in fish and some reptiles). Unlike stress responses associated with the autonomic nervous system, virtually all neuro-endocrine functions that are affected by stress—including immune competence, reproduction, metabolism, and behavior—are regulated by pituitary hormones. Stress-induced changes in the secretion of pituitary hormones have been implicated in failed reproduction (Moberg, 1987; Rivier and Rivest, 1991), altered metabolism (Elasser *et al.,* 2000), reduced immune competence (Blecha, 2000), and behavioral disturbance (Moberg, 1987; Blecha, 2000). Increases in the circulation of glucocorticosteroids (cortisol, corticosterone, and aldosterone in marine mammals; see Romano *et al.,* 2004) have been equated with stress for many years.

Because there are many unknowns regarding the occurrence of acoustically induced stress responses in marine mammals, it is assumed that any physiological response (*e.g.,* hearing loss or injury) or significant behavioral response is also associated with a stress response.

Auditory Masking

Sound can disrupt behavior through masking, or interfering with, an animal's ability to detect, recognize, or discriminate between acoustic signals of interest (*e.g.,* those used for intraspecific communication and social interactions, prey detection, predator avoidance, or navigation) (Richardson *et al.,* 1995; Erbe and Farmer, 2000; Tyack, 2000; Erbe *et al.,* 2016). Masking occurs when the receipt of a sound is interfered with by another coincident sound at similar frequencies and at similar or higher intensity, and may occur whether the sound is natural (*e.g.,* snapping shrimp, wind, waves, precipitation) or anthropogenic (*e.g.,* shipping, sonar, seismic exploration) in origin. As described in detail in the 2020 PMSR DSEIS/OEIS, the ability of a noise source to mask biologically important sounds depends on the characteristics of both the noise source and the signal of interest (*e.g.,* signal-to-noise ratio, temporal variability, direction), in relation to each other and to an animal's hearing abilities (*e.g.,* sensitivity, frequency range, critical ratios, frequency discrimination, directional discrimination, age, or TTS hearing loss), and existing ambient noise and propagation conditions. Masking these acoustic signals can disturb the behavior of individual animals, groups of animals, or entire populations. Masking can lead to behavioral changes including vocal changes (*e.g.,* Lombard effect, increasing amplitude, or changing frequency), cessation of foraging, and leaving an area, to both signalers and receivers, in an attempt to compensate for noise levels (Erbe *et al.,* 2016). Masking only occurs in the presence of the masking noise and does not persist after the cessation of the noise. Masking may lead to a change in vocalizations or a change in behavior (*e.g.,* cessation of foraging, leaving an area). There are no direct observations of masking in marine mammals due to exposure to sound from explosive detonations or launches and nor would they be predicted given the shorter duration of these sounds.

Behavioral Disturbance

Behavioral responses to sound are highly variable and context-specific. Many different variables can influence an animal's perception of and response to (nature and magnitude) an acoustic event. An animal's prior experience with a sound or sound source affects whether it is less likely (habituation) or more likely (sensitization) to respond to certain sounds in the future (animals can also be innately predisposed to respond to certain sounds in certain ways) (Southall *et al.,* 2007). Related to the sound itself, the perceived nearness of the sound, bearing of the sound (approaching vs. retreating), the similarity of a sound to biologically relevant sounds in the animal's environment (*i.e.,* calls of predators, prey, or conspecifics), and familiarity of the sound may affect the way an animal responds to the sound (Southall *et al.,* 2007, DeRuiter *et al.,* 2013). Individuals (of different age, gender, reproductive status, *etc.*) among most populations will have variable hearing capabilities, and differing behavioral sensitivities to sounds that will be affected by prior conditioning, experience, and current activities of those individuals. Often, specific acoustic features of the sound and contextual variables (*i.e.,* proximity, duration, or recurrence of the sound or the current behavior that the marine mammal is engaged in or its prior experience), as well as entirely separate factors such as the physical presence of a nearby vessel, may be more relevant to the animal's response than the received level alone.

Controlled experiments with captive marine mammals have shown pronounced behavioral reactions, including avoidance of loud underwater sound sources (Ridgway *et al.,* 1997; Finneran *et al.,* 2003). These may be of limited relevance to the proposed activities given that airborne sound, and not underwater sound, may result in harassment of marine mammals as a result of the proposed activities; however we present this information as background on the potential impacts of sound on marine mammals. Observed responses of wild marine mammals to loud pulsed sound sources (typically seismic guns or acoustic harassment devices) have been varied but often consist of avoidance behavior or other behavioral changes suggesting discomfort (Morton and Symonds, 2002; Thorson and Reyff, 2006; see also Gordon *et al.,* 2004; Wartzok *et al.,* 2003; Nowacek *et al.,* 2007).

The onset of noise can result in temporary, short-term changes in an animal's typical behavior and/or

avoidance of the affected area. These behavioral changes may include: reduced/increased vocal activities; changing/cessation of certain behavioral activities (such as socializing or feeding); visible startle response or aggressive behavior; avoidance of areas where sound sources are located; and/or flight responses (Richardson *et al.,* 1995).

The biological significance of many of these behavioral disturbances is difficult to predict, especially if the detected disturbances appear minor. However, the consequences of behavioral modification could potentially be biologically significant if the change affects growth, survival, or reproduction. The onset of behavioral disturbance from anthropogenic sound depends on both external factors (characteristics of sound sources and their paths) and the specific characteristics of the receiving animals (hearing, motivation, experience, demography) and is difficult to predict (Southall *et al.,* 2007).

Ellison *et al.* (2012) outlined an approach to assessing the effects of sound on marine mammals that incorporates contextual-based factors. The authors recommend considering not just the received level of sound, but also the activity the animal is engaged in at the time the sound is received, the nature and novelty of the sound (*i.e.,* is this a new sound from the animal's perspective), and the distance between the sound source and the animal. They submit that this ''exposure context,'' as described, greatly influences the type of behavioral response exhibited by the animal. Forney *et al.* (2017) also point out that an apparent lack of response (*e.g.,* no displacement or avoidance of a sound source) may not necessarily mean there is no cost to the individual or population, as some resources or habitats may be of such high value that animals may choose to stay, even when experiencing stress or hearing loss. Forney *et al.* (2017) recommend considering both the costs of remaining in an area of noise exposure such as TTS, PTS, or masking, which could lead to an increased risk of predation or other threats or a decreased capability to forage, and the costs of displacement, including potential increased risk of vessel strike, increased risks of predation or competition for resources, or decreased habitat suitable for foraging, resting, or socializing. This sort of contextual information is challenging to predict with accuracy for ongoing activities that occur over large spatial and temporal expanses. However, distance is one contextual factor for which data exist to quantitatively inform a take estimate, and the method for predicting Level B harassment in this proposed rule does consider distance to the source. Other factors are often considered qualitatively in the analysis of the likely consequences of sound exposure, where supporting information is available.

Exposure of marine mammals to sound sources can result in, but is not limited to, no response or any of the following observable responses: Increased alertness; orientation or attraction to a sound source; vocal modifications; cessation of feeding; cessation of social interaction; alteration of movement or diving behavior; habitat abandonment (temporary or permanent); and, in severe cases, panic, flight, stampede, or stranding, potentially resulting in death (Southall *et al.,* 2007). A review of marine mammal responses to anthropogenic sound was first conducted by Richardson (1995). More recent reviews (Nowacek *et al.,* 2007; DeRuiter *et al.,* 2012 and 2013; Ellison *et al.,* 2012; Gomez *et al.,* 2016) address studies conducted since 1995 and focused on observations where the received sound level of the exposed marine mammal(s) was known or could be estimated. Gomez *et al.* (2016) conducted a review of the literature considering the contextual information of exposure in addition to received level and found that higher received levels were not always associated with more severe behavioral responses and vice versa. Southall *et al.* (2016) states that results demonstrate that some individuals of different species display clear yet varied responses, some of which have negative implications, while others appear to tolerate high levels, and that responses may not be fully predictable with simple acoustic exposure metrics (*e.g.,* received sound level). Rather, the authors state that differences among species and individuals along with contextual aspects of exposure (*e.g.,* behavioral state) appear to affect response probability.

During an activity with a series of explosions (not concurrent multiple explosions shown in a burst), an animal is expected to exhibit a startle reaction to the sound of the first detonation followed by another behavioral response after multiple detonations. At close ranges and high sound levels, avoidance of the area around the explosions is the assumed behavioral response in most cases. In certain circumstances, exposure to loud sounds can interrupt feeding behaviors and potentially decrease foraging success, interfere with communication or migration, or disrupt important reproductive or young-rearing behaviors, among other effects.

Behavioral Disturbance from SNI Target and Missile Launches—Pinnipeds may be exposed to airborne sounds that have the potential to result in behavioral harassment, depending on an animal's distance from the sound and the type of missile being launched. Sound could cause hauled out pinnipeds to exhibit changes in their normal behavior, such as temporarily abandoning their habitat.

Responses of pinnipeds on beaches exposed to acoustic disturbance arising from launches are highly variable. Harbor seals can be more reactive when hauled out compared to other species, such as northern elephant seals. Northern elephant seals generally exhibit no reaction at all, except perhaps a heads-up response or some stirring. If northern elephant seals do react, it may occur if California sea lions are in the same area mingled with the northern elephant seals and the sea lions react strongly. Responsiveness also varies with time of year and age class, with juvenile pinnipeds being more likely to react by leaving the haulout site. The probability and type of behavioral response will also depend on the season, the group composition of the pinnipeds, and the type of activity in which they are engaged. For example, in some cases, harbor seals at SNI appear to be more responsive during the pupping/breeding season (Holst *et al.* 2005a; Holst *et al.* 2008), while in others, mothers and pups seem to react less to launches than lone individuals (Ugoretz and Greene Jr. 2012), and California sea lions seem to be consistently less responsive during the pupping season (Holst *et al.* 2010; Holst *et al.* 2005a; Holst *et al.* 2008; Holst *et al.* 2011; Holst *et al.* 2005b; Ugoretz and Greene Jr. 2012). Though pup abandonment could theoretically result from these reactions, site-specific monitoring data indicate that pup abandonment is not likely to occur as a result of the specified activity because it has not been previously observed. While the reactions are variable, and can involve abrupt movements by some individuals, biological impacts of these responses appear to be limited. The responses are not expected to result in significant injury or mortality, or long-term negative consequences to individuals or pinniped populations on SNI.

Habituation can occur when an animal's response to a stimulus wanes with repeated exposure, usually in the absence of unpleasant associated events (Wartzok *et al.,* 2003). Animals are most likely to habituate to sounds that are

predictable and unvarying. The opposite process is sensitization, when an unpleasant experience leads to subsequent responses, often in the form of avoidance, at a lower level of exposure. Behavioral state may affect the type of response as well. For example, animals that are resting may show greater behavioral change in response to disturbing sound levels than animals that are highly motivated to remain in an area for feeding (Richardson *et al.,* 1995; NRC, 2003; Wartzok *et al.,* 2003).

It is possible that launch-induced flushing or stampedes could have adverse impacts on individual pinnipeds on the west end of SNI. Bowles and Stewart (1980) reported that harbor seals on San Miguel Island reacted to low-altitude jet overflights with alert postures and often with rapid movement across the haulout sites, especially when aircraft were visible. However, on SNI during missile launches in 2001–2017, there was no evidence of launch noise-related injuries or deaths (Burke 2017; Holst *et al.* 2010; Holst *et al.* 2005a; Holst *et al.* 2008; Holst *et al.* 2011; Ugoretz 2016; Ugoretz and Greene Jr. 2012). On several occasions, harbor seals and California sea lion adults moved near and sometimes over older pups (*i.e.,* greater than four months old) as the animals moved in response to the launch noises, but the pups were not injured (Holst *et al.,* 2010; Holst *et al.,* 2005a; Holst *et al.,* 2008; Holst *et al.,* 2011; Ugoretz and Greene Jr. 2012).

Vessel Strike

Vessel strikes from commercial, recreational, and military vessels are known to affect large whales and have resulted in serious injury and occasional fatalities to cetaceans (Berman-Kowalewski *et al.,* 2010; Calambokidis, 2012; Douglas *et al.,* 2008; Laggner 2009; Lammers *et al.,* 2003). Records of collisions date back to the early 17th century, and the worldwide number of collisions appears to have increased steadily during recent decades (Laist *et al.,* 2001; Ritter 2012).

Numerous studies of interactions between surface vessels and marine mammals have demonstrated that free-ranging marine mammals often, but not always (*e.g.,* McKenna *et al.,* 2015), engage in avoidance behavior when surface vessels move toward them. It is not clear whether these responses are caused by the physical presence of a surface vessel, the underwater noise generated by the vessel, or an interaction between the two (Amaral and Carlson, 2005; Au and Green, 2000; Bain *et al.,* 2006; Bauer 1986; Bejder *et al.,* 1999; Bejder and Lusseau, 2008; Bejder *et al.,* 2009; Bryant *et al.,* 1984; Corkeron, 1995; Erbe, 2002; Félix, 2001; Goodwin and Cotton, 2004; Lemon *et al.,* 2006; Lusseau, 2003; Lusseau, 2006; Magalhaes *et al.,* 2002; Nowacek *et al.,* 2001; Richter *et al.,* 2003; Scheidat *et al.,* 2004; Simmonds, 2005; Watkins, 1986; Williams *et al.,* 2002; Wursig *et al.,* 1998). Several authors suggest that the noise generated during motion is probably an important factor (Blane and Jaakson, 1994; Evans *et al.,* 1992; Evans *et al.,* 1994). Water disturbance may also be a factor. These studies suggest that the behavioral responses of marine mammals to surface vessels are similar to their behavioral responses to predators. Avoidance behavior is expected to be even stronger in the subset of instances during which the Navy is conducting training or testing activities using explosives.

The marine mammals most vulnerable to vessel strikes are those that spend extended periods of time at the surface in order to restore oxygen levels within their tissues after deep dives (*e.g.,* sperm whales). In addition, some baleen whales seem generally unresponsive to vessel sound, making them more susceptible to vessel collisions (Nowacek *et al.,* 2004). These species are primarily large, slow moving whales.

Some researchers have suggested the relative risk of a vessel strike can be assessed as a function of animal density and the magnitude of vessel traffic (*e.g.,* Fonnesbeck *et al.,* 2008; Vanderlaan *et al.,* 2008). Differences among vessel types also influence the probability of a vessel strike. The ability of any ship to detect a marine mammal and avoid a collision depends on a variety of factors, including environmental conditions, ship design, size, speed, and ability and number of personnel observing, as well as the behavior of the animal. Vessel speed, size, and mass are all important factors in determining if injury or death of a marine mammal is likely due to a vessel strike. For large vessels, speed and angle of approach can influence the severity of a strike. For example, Vanderlaan and Taggart (2007) found that, between vessel speeds of 8.6 and 15 knots, the probability that a vessel strike is lethal increases from 0.21 to 0.79. Large whales also do not have to be at the water's surface to be struck. Silber *et al.* (2010) found when a whale is below the surface (about one to two times the vessel draft), under certain circumstances (vessel speed and location of the whale relative to the ship's centerline), there is likely to be a pronounced propeller suction effect. This suction effect may draw the whale into the hull of the ship, increasing the probability of propeller strikes.

There are some key differences between the operation of military and non-military vessels, which make the likelihood of a military vessel striking a whale lower than some other vessels (*e.g.,* commercial merchant vessels). Key differences include:

- Many military ships have their bridges positioned closer to the bow, offering better visibility ahead of the ship (compared to a commercial merchant vessel);
- There are often aircraft associated with the training or testing activity (which can serve as Lookouts), which can more readily detect cetaceans in the vicinity of a vessel or ahead of a vessel's present course before crew on the vessel would be able to detect them;
- Military ships are generally more maneuverable than commercial merchant vessels, and if cetaceans are spotted in the path of the ship, could be capable of changing course more quickly;
- The crew size on military vessels is generally larger than merchant ships, allowing for stationing more trained Lookouts on the bridge. At all times when Navy vessels are underway, trained Lookouts and bridge navigation teams are used to detect objects on the surface of the water ahead of the ship, including cetaceans. Additional Lookouts, beyond those already stationed on the bridge and on navigation teams, are positioned as Lookouts during some training events; and
- When submerged, submarines are generally slow moving (to avoid detection) and therefore marine mammals at depth with a submarine are likely able to avoid collision with the submarine. When a submarine is transiting on the surface, there are Lookouts serving the same function as they do on surface ships.

While there have been vessel strikes documented with commercial vessels, NMFS has no documented vessel strikes of marine mammals by the Navy in the PMSR Study Area since the Navy started keeping records of ship strike in 1995. The only large Navy vessels homebased in the PMSR local area (Port Hueneme) are the Self Defense Test Ship and the Mobile Ship Target, which are both greater than 200 ft in length. There are smaller vessels used either as targets or for target recovery as well. The majority of Navy vessels (*e.g.,* LCS, destroyers) used during testing and training on the PMSR Study Area transit from San Diego Navy bases and typically transit further offshore and enter/exit the PMSR Study Area from

the southwestern boundaries to avoid commercial vessel traffic in and out of the Ports or Los Angeles/Long Beach via the Santa Barbara Channel.

The Navy transits at safer speeds and has other protective measures in place during transits, such as using Lookouts and maintaining safe distances from marine mammals (*e.g.,* 500 yd (457.2 m) for whales and 200 yd (182.88 m) around other marine mammals except bow-riding dolphins and pinnipeds hauled out on man-made navigational structures, port structures, and vessels). A DoD funded study (Mintz, 2016) on commercial and military vessel traffic in Southern California found that median vessel speed for Navy vessels in the Santa Barbara Channel and nearshore areas of the PMSR Study Area and SOCAL (part of the HSTT Study Area) was between 3 to 8 knots. Speed increased as vessels transited further offshore, between 10–16 knots, with the higher value on the furthest offshore areas of the PMSR Study Area. Commercial tankers and cargo median vessel speeds were between 8–14 knots for the same nearshore areas. Mintz (2016) indicated that Navy vessels make up only 4 percent of the overall vessel traffic off Southern California (PMSR/SOCAL). The data collected for Mintz (2016) was collected via AIS for commercial vessel data and SeaLink for military vessels (a classified Navy/Coast Guard database maintained by the Office of Naval Intelligence). The median surface speed of two of the classes of vessels used on the PMSR Study Area from 2011 through 2015 was below 12 knots. This median speed includes those training and testing operations that require elevated speeds, and being slightly above 10 knots, indicates that Naval vessels typically operate at speeds that would be expected to reduce the potential of vessel strike of a marine mammal.

The Navy has several standard operating procedures for vessel safety that could result in a secondary benefit to marine mammals through a reduction in the potential for vessel strike. For example, ships operated by or for the Navy have personnel assigned to stand watch at all times, day and night, when moving through the water (*i.e.,* when the vessel is underway). Watch personnel undertake extensive training in accordance with the U.S. Navy Lookout Training Handbook or civilian equivalent. A primary duty of watch personnel is to ensure safety of the ship, which includes the requirement to detect and report all objects and disturbances sighted in the water that may be indicative of a threat to the ship and its crew, such as debris, a periscope, surfaced submarine, or surface disturbance. Per safety requirements, watch personnel also report any marine mammals sighted that have the potential to be in the direct path of the ship, as a standard collision avoidance procedure. Navy vessels are required to operate in accordance with applicable navigation rules. These rules require that vessels proceed at a safer speed so proper and effective action can be taken to avoid collision and so vessels can be stopped within a distance appropriate to the prevailing circumstances and conditions. In addition to complying with navigation requirements, Navy ships transit at speeds that are optimal for fuel conservation, to maintain ship schedules, and to meet mission requirements. Vessel captains use the totality of the circumstances to ensure the vessel is traveling at appropriate speeds in accordance with navigation. This Navy message is also consistent with a message issued by the U.S. Coast Guard for vessels operating in the 11th district (covering the waters in and around the PMSR) as a Notice to Mariners that also informs operators about the presence of populations of blue, humpback, and fin whales in the area (see U.S. Coast Guard (2019) for further details).

For more information, please see section 3.7.1.1.1 *Vessels as a Strike Stressor* in the 2020 PMSR DEIS/OEIS. Additionally, the Navy has fewer vessel transits than commercial entities in the PMSR Study Area. To put the PMSR Navy vessel operations level in perspective, Table 6 includes an estimate of annual commercial shipping activity compared with vessel use in the PMSR Study Area. These annual estimates are representable of any given year as proposed for this rule. Navy vessels account for only about nine percent of the vessel traffic within the PMSR Study Area.

Table 6--Navy and Commercial Vessel Events on the PMSR Study Area

Vessel Type	Number of Events[1]
Project Ships	300
Support Boats	198
Small Support Boats	Up to 387[2]
Total PMSR Navy	836
Commercial Shipping Estimate	>7,000[3]

[1] "Event" is defined as one trip into the Sea Range for an assigned mission.

[2] Total number of HSMSTs and QST35s used as support boats

[3] Data collected is for FY15.

In addition, large Navy vessels (greater than 18 m in length) within the offshore areas of range complexes and testing ranges operate differently from commercial vessels in ways that may reduce potential for whale collisions. Surface ships operated by or for the Navy have multiple personnel assigned to stand watch at all times, when a ship or surfaced submarine is moving through the water (underway). A primary duty of personnel standing watch on surface ships is to detect and report all objects and disturbances sighted in the water that may indicate a threat to the vessel and its crew, such as debris, a periscope, surfaced submarine, or surface disturbance. Per vessel safety requirements, personnel standing watch also report any marine mammals sighted in the path of the vessel as a standard collision avoidance procedure. All vessels proceed at a safer speed so they can take proper and effective action to avoid a collision with any sighted object or disturbance, and can be stopped within a distance appropriate to the prevailing circumstances and conditions.

Between 2007 and 2009, the Navy developed and distributed additional training, mitigation, and reporting tools to Navy operators to improve marine

mammal protection and to ensure compliance with LOA requirements. In 2009, the Navy implemented Marine Species Awareness Training designed to improve effectiveness of visual observation for marine resources, including marine mammals. For over a decade, the Navy has implemented the Protective Measures Assessment Protocol software tool, which provides operators with notification of the required mitigation and a visual display of the planned training or testing activity location overlaid with relevant environmental data.

The Navy does not anticipate vessel strikes and has not requested authorization to take marine mammals by serious injury or mortality within the PMSR Study Area during training and testing activities. NMFS agrees with the Navy's conclusions based on this qualitative analysis; therefore, NMFS has preliminarily determined that the Navy's decision not to request take authorization for vessel strike of large whales is supported by multiple factors, including no previous instances of strikes by Navy vessels in the PMSR Study Area, relatively low at-sea days compared to other Navy training and testing study areas, fewer vessels used compared to other Navy training and testing study areas, ways in which the larger vessels operate in the PMSR Study Area, and the mitigation measures that would be in place to further minimize potential vessel strike.

In addition to the reasons listed above that make it unlikely that the Navy will hit a large whale (more maneuverable ships, larger crew, etc.), the following are additional reasons that vessel strike of dolphins and small whales is very unlikely. Dating back more than 20 years and for as long as it has kept records, the Navy has no records of individuals of these groups being struck by a vessel as a result of Navy activities and, further, their smaller size and maneuverability make a strike unlikely. Also, NMFS has never received any reports from other authorized activities indicating that these species have been struck by vessels. Worldwide ship strike records show little evidence of strikes of these groups from the shipping sector and larger vessels, and the majority of the Navy's activities involving faster-moving vessels (that could be considered more likely to hit a marine mammal) are located in offshore areas where smaller delphinid densities are lower. Based on this information, NMFS concurs with the Navy's assessment that vessel strike is not likely to occur for either large whales or smaller marine mammals.

Marine Mammal Habitat

Impacts on marine mammal habitat are part of the consideration in making a finding of negligible impact on the species and stocks of marine mammals. Habitat includes, but is not necessarily limited to, rookeries, mating grounds, feeding areas, and areas of similar significance. We do not anticipate that the Navy's proposed activities would result in permanent effects on the habitats used by the marine mammals in the PMSR Study Area, including the availability of prey (*i.e.,* fish and invertebrates). While it is anticipated that the proposed activity may result in marine mammals avoiding certain areas due to temporary ensonification, this impact to habitat is temporary and reversible and was considered in further detail earlier in this document, as behavioral modification. The main impact associated with the proposed activity will be temporarily elevated noise levels and the associated direct effects on marine mammals, previously discussed in this notice.

Effects to Prey—Sound may affect marine mammals through impacts on the abundance, behavior, or distribution of prey species (*e.g.,* crustaceans, cephalopods, fish, zooplankton). Marine mammal prey varies by species, season, and location and, for some species, is not well documented. Here, we describe studies regarding the effects of noise on known marine mammal prey.

Fish utilize the soundscape and components of sound in their environment to perform important functions such as foraging, predator avoidance, mating, and spawning (*e.g.,* Zelick *et al.,* 1999; Fay, 2009). The most likely effects on fishes exposed to loud, intermittent, low-frequency sounds are behavioral responses (*i.e.,* flight or avoidance). Short duration, sharp sounds (such as pile driving or air guns) can cause overt or subtle changes in fish behavior and local distribution. The reaction of fish to acoustic sources depends on the physiological state of the fish, past exposures, motivation (*e.g.,* feeding, spawning, migration), and other environmental factors. Key impacts to fishes may include behavioral responses, hearing damage, barotrauma (pressure-related injuries), and mortality.

Fishes, like other vertebrates, have a variety of different sensory systems to glean information from ocean around them (Astrup and Mohl, 1993; Astrup, 1999; Braun and Grande, 2008; Carroll *et al.,* 2017; Hawkins and Johnstone, 1978; Ladich and Popper, 2004; Ladich and Schulz-Mirbach, 2016; Mann, 2016; Nedwell *et al.,* 2004; Popper *et al.,* 2003; Popper *et al.,* 2005). Depending on their hearing anatomy and peripheral sensory structures, which vary among species, fishes hear sounds using pressure and particle motion sensitivity capabilities and detect the motion of surrounding water (Fay *et al.,* 2008) (terrestrial vertebrates generally only detect pressure). Most marine fishes primarily detect particle motion using the inner ear and lateral line system, while some fishes possess additional morphological adaptations or specializations that can enhance their sensitivity to sound pressure, such as a gas-filled swim bladder (Braun and Grande, 2008; Popper and Fay, 2011).

Hearing capabilities vary considerably between different fish species with data only available for just over 100 species out of the 34,000 marine and freshwater fish species (Eschmeyer and Fong, 2016). In order to better understand acoustic impacts on fishes, fish hearing groups are defined by species that possess a similar continuum of anatomical features which result in varying degrees of hearing sensitivity (Popper and Hastings, 2009a). There are four hearing groups defined for all fish species (modified from Popper *et al.,* 2014) within this analysis and they include: Fishes without a swim bladder (*e.g.,* flatfish, sharks, rays, *etc.*); fishes with a swim bladder not involved in hearing (*e.g.,* salmon, cod, pollock, *etc.*); fishes with a swim bladder involved in hearing (*e.g.,* sardines, anchovy, herring, *etc.*); and fishes with a swim bladder involved in hearing and high-frequency hearing (*e.g.,* shad and menhaden). Currently, less data are available to estimate the range of best sensitivity for fishes without a swim bladder.

In terms of behavioral responses of fish, Juanes *et al.* (2017) discuss the potential for negative impacts from anthropogenic soundscapes on fish, but the author's focus was on broader based sounds such as ship and boat noise sources. Occasional behavioral reactions to intermittent explosions occurring at or near the surface are unlikely to cause long-term consequences for individual fish or populations; there are no detonations of explosives occurring underwater from the proposed activities. Fish that experience hearing loss as a result of exposure to explosions may have a reduced ability to detect relevant sounds such as predators, prey, or social vocalizations. However, PTS has not been known to occur in fishes and any hearing loss in fish may be as temporary as the timeframe required to repair or replace the sensory cells that were damaged or destroyed (Popper *et al.,* 2005; Popper *et al.,* 2014; Smith *et al.,* 2006). It is not known if damage to

auditory nerve fibers could occur, and if so, whether fibers would recover during this process. It is also possible for fish to be injured or killed by an explosion in the immediate vicinity of the surface from dropped or fired ordnance. Physical effects from pressure waves generated by detonations at or near the surface could potentially affect fish within proximity of training or testing activities. The shock wave from occurring at or near the surface may be lethal to fish at close range, causing massive organ and tissue damage and internal bleeding (Keevin and Hempen, 1997). At greater distance from the detonation point, the extent of mortality or injury depends on a number of factors including fish size, body shape, orientation, and species (Keevin and Hempen, 1997; Wright, 1982). At the same distance from the source, larger fish are generally less susceptible to death or injury, elongated forms that are round in cross-section are less at risk than deep-bodied forms, and fish oriented sideways to the blast suffer the greatest impact (Edds-Walton and Finneran, 2006; O'Keeffe, 1984; O'Keeffe and Young, 1984; Wiley *et al.,* 1981; Yelverton *et al.,* 1975). Species with gas-filled organs are more susceptible to injury and mortality than those without them (Gaspin, 1975; Gaspin *et al.,* 1976; Goertner *et al.,* 1994).

Fish not killed or driven from a location by an explosion might change their behavior, feeding pattern, or distribution. Changes in behavior of fish have been observed as a result of sound produced by explosives, with effect intensified in areas of hard substrate (Wright, 1982). However, Navy would avoid hard substrate to the best extent practical in the course of their activities. Training and testing exercises involving explosions at or near the surface are dispersed in space and time; therefore, repeated exposure of individual fishes are unlikely. Mortality and injury effects to fishes from explosives would be localized around the area of a given explosion, but only if individual fish and the explosive at the surface were co-located at the same time. Fishes deeper in the water column or on the bottom would not be affected by surface explosions. Long-term consequences for fish populations, including key prey species within the PMSR Study Area, would not be expected.

Vessels and in-water devices do not normally collide with adult fish, most of which can detect and avoid them. Exposure of fishes to vessel strike stressors is limited to those fish groups that are large, slow-moving, and may occur near the surface, such as ocean sunfish, whale sharks, basking sharks, and manta rays. These species are distributed widely in offshore portions of the PMSR Study Area. Any isolated cases of a Navy vessel striking an individual could injure that individual, impacting the fitness of an individual fish. Vessel strikes would not pose a risk to most of the other marine fish groups, because many fish can detect and avoid vessel movements, making strikes rare and allowing the fish to return to their normal behavior after the ship or device passes. As a vessel approaches a fish, they could have a detectable behavioral or physiological response (*e.g.,* swimming away and increased heart rate) as the passing vessel displaces them. However, such reactions are not expected to have lasting effects on the survival, growth, recruitment, or reproduction of these marine fish groups at the population level and therefore would not have an impact on marine mammal species as prey items.

In addition to fish, prey sources such as marine invertebrates could potentially be impacted by sound stressors as a result of the proposed activities. However, most marine invertebrates' ability to sense sounds is very limited. In most cases, marine invertebrates would not respond to impulsive sounds. Data on response of invertebrates such as squid, another marine mammal prey species, to anthropogenic sound has been documented (de Soto, 2016; Sole *et al.,* 2017b). Explosions could kill or injure nearby marine invertebrates. Vessels also have the potential to impact marine invertebrates by disturbing the water column or sediments, or directly striking organisms (Bishop, 2008). The propeller wash (water displaced by propellers used for propulsion) from vessel movement and water displaced from vessel hulls can potentially disturb marine invertebrates in the water column and is a likely cause of zooplankton mortality (Bickel *et al.,* 2011). The localized and short-term exposure to at or near the surface explosions or vessels could displace, injure, or kill zooplankton, invertebrate eggs or larvae, and macro-invertebrates. However, mortality or long-term consequences for a few animals is unlikely to have measurable effects on overall populations. Long-term consequences to marine invertebrate populations would not be expected as a result of exposure to sounds of vessels in the PMSR Study Area.

Military expended materials resulting from training and testing activities could potentially result in minor long-term changes to benthic habitat, however the impacts of small amounts of expended materials are unlikely to have measurable effects on overall populations. Military expended materials may be colonized over time by benthic organisms that prefer hard substrate and would provide structure that could attract some species of fish or invertebrates.

Overall, the combined impacts of sound exposure, explosions, vessel strikes, and military expended materials resulting from the proposed activities would not be expected to have measurable effects on populations of marine mammal prey species. Prey species exposed to sound might move away from the sound source or show no obvious direct effects at all, but a rapid return to normal recruitment, distribution, and behavior is anticipated. Long-term consequences to fish or marine invertebrate populations would not be expected as a result of exposure to sounds or vessels in the PMSR Study Area.

Acoustic Habitat—Acoustic habitat is the soundscape which encompasses all of the sound present in a particular location and time, as a whole when considered from the perspective of the animals experiencing it. Animals produce sound for, or listen for sounds produced by, conspecifics (communication during feeding, mating, and other social activities), other animals (finding prey or avoiding predators), and the physical environment (finding suitable habitats, navigating). Together, sounds made by animals and the geophysical environment (*e.g.,* produced by earthquakes, lightning, wind, rain, waves) make up the natural contributions to the total acoustics of a place. These acoustic conditions, termed acoustic habitat, are one attribute of an animal's total habitat.

Soundscapes are also defined by, and acoustic habitat influenced by, the total contribution of anthropogenic sound. This may include incidental emissions from sources such as vessel traffic or may be intentionally introduced to the marine environment for data acquisition purposes (*e.g.,* as in the use of air gun arrays) or for Navy training and testing purposes (as in the use of explosives, and target and missile launches on SNI). Anthropogenic noise varies widely in its frequency, content, duration, and loudness, and these characteristics greatly influence the potential habitat-mediated effects to marine mammals, which may range from local effects for brief periods of time to chronic effects over large areas and for long durations. Depending on the extent of effects to habitat, animals may alter their communications signals (thereby

potentially expending additional energy) or miss acoustic cues (either conspecific or adventitious). Problems arising from a failure to detect cues are more likely to occur when noise stimuli are chronic and overlap with biologically relevant cues used for communication, orientation, and predator/prey detection (Francis and Barber, 2013). For more detail on these concepts see, *e.g.,* Barber *et al.,* 2009; Pijanowski *et al.,* 2011; Francis and Barber, 2013; Lillis *et al.,* 2014. We do not anticipate these problems arising from at or near surface explosions or from launched targets and missiles produced during training and testing activities as they would be more widely dispersed or concentrated in small areas for shorter periods of time. Anthropogenic noise attributable to Navy testing and training activities in the PMSR Study Area emanates from multiple sources including explosives, vessels, and launched targets and missiles occurring in the vicinity of pinniped haul out sites. Sound produced from training and testing activities in the PMSR Study Area would be temporary and transitory; the affected area would be expected to immediately return to the original state when these activities cease.

Water Quality—Training and testing activities may introduce water quality constituents into the water column. Based on the analysis of the 2020 PMSR DSEIS/OEIS, military expended materials (*e.g.,* undetonated explosive materials) would be released in quantities and at rates that would not result in a violation of any water quality standard or criteria. NMFS has reviewed this analysis and concurs that it reflects the best available science. High-order explosions consume most of the explosive material, creating typical combustion products. For example, in the case of the Royal Demolition Explosive, 98 percent of the products are common seawater constituents and the remainder is rapidly diluted below threshold effect level. Explosion by-products associated with high order detonations present no secondary stressors to marine mammals through sediment or water. However, low order detonations and unexploded ordnance present elevated likelihood of impacts on marine mammals.

Indirect effects of explosives and unexploded ordnance to marine mammals via sediment is possible in the immediate vicinity of the ordnance. Degradation products of the Royal Demolition Explosive are not toxic to marine organisms at realistic exposure levels (Rosen and Lotufo, 2010). Relatively low solubility of most explosives and their degradation products means that concentrations of these contaminants in the marine environment are relatively low and readily diluted. Furthermore, while explosives and their degradation products were detectable in marine sediment approximately 6–12 in (0.15–0.3 m) away from degrading ordnance, the concentrations of these compounds were not statistically distinguishable from background beyond 3–6 ft (1–2 m) from the degrading ordnance. Taken together, it is possible that marine mammals could be exposed to degrading explosives, but it would be within a very small radius of the explosive (1–6 ft (0.3–2 m)).

Equipment used by the Navy within the PMSR Study Area, including ships and other marine vessels, aircraft, and other equipment, are also potential sources of by-products. All equipment is properly maintained in accordance with applicable Navy and legal requirements. All such operating equipment meets Federal water quality standards, where applicable.

Airborne Launch Sounds on SNI—Various beaches around SNI are used by pinnipeds as places to rest, molt, and breed. These beaches consist of sand (*e.g.,* Red Eye Beach), rock ledges (*e.g.,* Phoca Reef), and rocky cobble (*e.g.,* Bachelor Beach). Pinnipeds continue to use beaches around the western end of SNI, and indeed are expanding their use of some beaches despite ongoing launch activities for many years. Similarly, it appears that sounds from prior launches have not affected pinniped use of coastal areas at VAFB.

Pinnipeds forage in the open ocean and in the waters near SNI; however, the airborne launch sounds would not persist in the water near SNI. Therefore, it is not expected that the launch activities would impact prey resources, Essential Fish Habitat (EFH), or feeding success of pinnipeds. Three types of EFH are present in the activity area: Groundfish, coastal pelagic species, and highly migratory species, as well as canopy kelp Habitat Areas of Particular Concern (HAPC). However, none of these types of EFH or HAPC will be impacted by the proposed activity.

Boosters from missiles (*e.g.,* jet-assisted take off rocket bottles for BQM drone missiles) may be jettisoned shortly after launch and fall on the island and would be collected, but are not expected to impact beaches. Fuel contained in these boosters is consumed rapidly and completely, so there would be no risk of contamination even in the very unlikely event that a booster did land on a beach or nearshore waters. Overall, the proposed missile launch activity is not expected to cause significant impacts or have permanent, adverse effects on pinniped habitats or on their foraging habitats and prey.

Estimated Take of Marine Mammals

This section indicates the number of takes that NMFS is proposing to authorize, which is based on the maximum amount that is reasonably likely to occur, depending on the type of take and the methods used to estimate it, as described in detail below. NMFS coordinated closely with the Navy in the development of their incidental take application, and preliminarily agrees that the methods the Navy has put forth described herein to estimate take (including the model, thresholds, and density estimates), and the resulting numbers estimated for authorization, are appropriate and based on the best available science.

All takes are by harassment. For a military readiness activity, the MMPA defines ''harassment'' as (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). No serious injury or mortality of marine mammals is expected to occur.

Proposed authorized takes would primarily be in the form of Level B harassment, as use of the explosive sources and may result, either directly or as result of TTS, in the disruption of natural behavioral patterns to a point where they are abandoned or significantly altered (as defined specifically at the beginning of this section, but referred to generally as behavioral disruption). There is also the potential for Level A harassment, in the form of auditory injury to result from exposure to the sound sources utilized in training and testing activities.

Generally speaking, for acoustic impacts NMFS estimates the amount and type of harassment by considering: (1) Acoustic thresholds above which NMFS believes the best available science indicates marine mammals will be taken by Level B harassment or incur some degree of temporary or permanent hearing impairment; (2) the area or volume of water that will be ensonified above these levels in a day or event; (3) the density or occurrence of marine mammals within these ensonified areas;

and (4) the number of days of activities or events.

Acoustic Thresholds

Using the best available science, NMFS, in coordination with the Navy, has established acoustic thresholds that identify the most appropriate received level of underwater sound above which marine mammals exposed to these sound sources could be reasonably expected to directly experience a disruption in behavior patterns to a point where they are abandoned or significantly altered, to incur TTS (equated to Level B harassment), or to incur PTS of some degree (equated to Level A harassment). Thresholds have also been developed to identify the pressure levels above which animals may incur non-auditory injury from exposure to pressure waves from explosive detonation. Refer to the *Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis (Phase III) report* (U.S. Department of the Navy, 2017c) for detailed information on how the criteria and thresholds were derived.

Despite the quickly evolving science, there are still challenges in quantifying expected behavioral responses that qualify as take by Level B harassment, especially where the goal is to use one or two predictable indicators *(e.g.,* received level and distance) to predict responses that are also driven by additional factors that cannot be easily incorporated into the thresholds (*e.g.,* context). So, while the behavioral harassment thresholds have been refined here to better consider the best available science (*e.g.,* incorporating both received level and distance), they also still have some built-in conservative factors to address the challenge noted. For example, while duration of observed responses in the data are now considered in the thresholds, many of the responses that are informing take thresholds are of a very short duration, such that it is possible that responses will not rise to the level of disrupting behavior patterns to a point where they are abandoned or significantly altered. We describe the application of this behavioral harassment threshold as identifying the maximum number of instances in which marine mammals could be reasonably expected to experience a disruption in behavior patterns to a point where they are abandoned or significantly altered. In summary, we believe these behavioral harassment thresholds are the most appropriate method for predicting Level B harassment by behavioral disturbance given the best available science and the associated uncertainty.

Hearing Impairment (TTS/PTS), Tissues Damage, and Mortality

NMFS' Acoustic Technical Guidance (NMFS, 2018) identifies dual criteria to assess auditory injury (Level A harassment) to five different marine mammal groups (based on hearing sensitivity) as a result of exposure to noise from two different types of sources (impulsive or non-impulsive). The Acoustic Technical Guidance also identifies criteria to predict TTS, which is not considered injury and falls into the Level B harassment category. The Navy's proposed activity only includes the use of impulsive (explosives) sources. These thresholds (Table 7) were developed by compiling and synthesizing the best available science and soliciting input multiple times from both the public and peer reviewers. The references, analysis, and methodology used in the development of the thresholds are described in Acoustic Technical Guidance, which may be accessed at: *https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-acoustic-technical-guidance.*

Based on the best available science, the Navy (in coordination with NMFS) used the acoustic and pressure thresholds indicated in Table 7 to predict the onset of TTS, PTS, tissue damage, and mortality for explosives (impulsive) and other impulsive sound sources.

TABLE 7—ONSET OF TTS, PTS, TISSUE DAMAGE, AND MORTALITY THRESHOLDS FOR MARINE MAMMALS FOR EXPLOSIVES AND OTHER IMPULSIVE SOURCES

Functional hearing group	Species	Onset TTS	Onset PTS	Mean onset slight GI tract injury	Mean onset slight lung injury	Mean onset mortality
Low-frequency cetaceans.	All mysticetes	168 dB SEL (weighted) or 213 dB Peak SPL.	183 dB SEL (weighted). or 219 dB Peak SPL.	237 dB Peak SPL	Equation 1	Equation 2
Mid-frequency cetaceans.	Most delphinids, medium and large toothed whales.	170 dB SEL (weighted) or 224 dB Peak SPL.	185 dB SEL (weighted) or 230 dB Peak SPL.	237 dB Peak SPL.		
High-frequency cetaceans.	Porpoises and Kogia spp.	140 dB SEL (weighted) or 196 dB Peak SPL.	155 dB SEL (weighted) or 202 dB Peak SPL.	237 dB Peak SPL.		

Notes:
Equation 1: $47.5M^{1/3}$ $(1+[D_{Rm}/10.1])^{1/6}$ Pa-sec.
Equation 2: $103M^{1/3}$ $(1+[D_{Rm}/10.1])^{1/6}$ Pa-sec.
M = mass of the animals in kg.
D_{Rm} = depth of the receiver (animal) in meters.
SPL = sound pressure level.

Refer to the *Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis* (Phase III) report (U.S. Department of the Navy, 2017c) for detailed information on how the criteria and thresholds were derived. Non-auditory injury (*i.e.,* other than PTS) and mortality are so unlikely as to be discountable under normal conditions and are therefore not considered further in this analysis.

The mitigation measures associated with explosives are expected to be effective in preventing non-auditory tissue damage to any potentially affected species, and when considered in combination with the modeled

exposure results, no species are anticipated to incur non-auditory tissue damage during the period of this rule. Table 16 indicates the range of effects for tissue damage for different explosive types. The Navy will implement mitigation measures (described in the Proposed Mitigation Measures section) during explosive activities, including delaying detonations when a marine mammal is observed in the mitigation zone. Nearly all explosive events will occur during daylight hours to improve the sightability of marine mammals and thereby improve mitigation effectiveness. Observing for marine mammals during the explosive activities will include visual methods before the activity begins, in order to cover the mitigation zone (*e.g.,* 2,500 yds (2,286 m) for explosive bombs).

Behavioral Disturbance

Though significantly driven by received level, the onset of Level B harassment by direct behavioral disturbance from anthropogenic noise exposure is also informed to varying degrees by other factors related to the source (*e.g.,* frequency, predictability, duty cycle, distance), the environment (*e.g.,* bathymetry), and the receiving animals (hearing, motivation, experience, demography, behavioral context) and can be difficult to predict (Ellison *et al.,* 2011; Southall *et al.,* 2007). Based on what the available science indicates and the practical need to use thresholds based on a factor, or factors, that are both predictable and measurable for most activities, NMFS uses generalized acoustic thresholds based primarily on received level (and distance in some cases) to estimate the onset of Level B harassment by behavioral disturbance.

Explosives—Explosive thresholds for Level B harassment by behavioral disturbance for marine mammals are the hearing groups' TTS thresholds minus 5 dB (see Table 8 below and Table 7 for the TTS thresholds for explosives) for events that contain multiple impulses from explosives underwater. This was the same approach as taken in Phase II and Phase III for explosive analysis in other Navy training and testing Study Areas. See the *Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis (Phase III)* report (U.S. Department of the Navy, 2017c) for detailed information on how the criteria and thresholds were derived. NMFS continues to concur that this approach represents the best available science for determining behavioral disturbance of marine mammals from multiple explosives. While marine mammals may also respond to single explosive detonations, these responses are expected to more typically be in the form of startle reaction, rather than a disruption in natural behavioral patterns to the point where they are abandoned or significantly altered. On the rare occasion that a single detonation might result in a more severe behavioral response that qualifies as Level B harassment, it would be expected to be in response to a comparatively higher received level. Accordingly, NMFS considers the potential for these responses to be quantitatively accounted for through the application of the TTS threshold, which as noted above is 5dB higher than the behavioral harassment threshold for multiple explosives.

TABLE 8—THRESHOLDS FOR LEVEL B HARASSMENT BY BEHAVIORAL DISTURBANCE FOR EXPLOSIVES FOR MARINE MAMMALS

Medium	Functional hearing group	SEL (weighted)
Underwater	LF	163
Underwater	MF	165
Underwater	HF	135
Underwater	Otariids	183
Underwater	Phocids	165

Note: Weighted SEL thresholds in dB re 1 μPa^2s underwater. LF = low-frequency, MF = mid-frequency, HF = high-frequency.

Navy's Acoustic Effects Model

The Navy's Acoustic Effects Model calculates sound energy propagation from sonar and other transducers and explosives during naval activities and the sound received by animat dosimeters. Animat dosimeters are virtual representations of marine mammals distributed in the area around the modeled naval activity and each dosimeter records its individual sound ''dose.'' The model bases the distribution of animats over the PMSR Study Area on the density values in the *Navy Marine Species Density Database* and distributes animats in the water column proportional to the known time that species spend at varying depths.

The model accounts for environmental variability of sound propagation in both distance and depth when computing the received sound level received by the animats. The model conducts a statistical analysis based on multiple model runs to compute the estimated effects on animals. The number of animats that exceed the thresholds for effects is tallied to provide an estimate of the number of marine mammals that could be affected.

Assumptions in the Navy model intentionally err on the side of overestimation when there are unknowns. Naval activities are modeled as though they would occur regardless of proximity to marine mammals, meaning that no mitigation is considered and without any avoidance of the activity by the animal. The final step of the quantitative analysis of acoustic effects is to consider the implementation of mitigation and the possibility that marine mammals would avoid continued or repeated sound exposures. For more information on this process, see the discussion in the *Take Estimation* subsection below. Many explosions from ordnance such as bombs and missiles actually occur upon impact with above-water targets. However, for this analysis, sources such as these were modeled as exploding underwater, which overestimates the amount of explosive and acoustic energy entering the water.

The model estimates the impacts caused by individual training and testing exercises. During any individual modeled event, impacts to individual animats are considered over 24-hour periods. The animats do not represent actual animals, but rather a distribution of animals based on density and abundance data, which allows for a statistical analysis of the number of instances that marine mammals may be exposed to sound levels resulting in an effect. Therefore, the model estimates the number of instances in which an effect threshold was exceeded over the course of a year, but does not estimate the number of individual marine mammals that may be impacted over a year (*i.e.,* some marine mammals could be impacted several times, while others would not experience any impact). A detailed explanation of the Navy's Acoustic Effects Model is provided in the technical report *Quantifying Acoustic Impacts on Marine Species: Methods and Analytical Approach for Activities at the Point Mugu Sea Range* (U.S. Department of the Navy, 2020).

Range to Effects

The following section provides range (distance) to effects for explosives, to specific acoustic thresholds determined using the Navy Acoustic Effects Model. Marine mammals exposed within these ranges for the shown duration are predicted to experience the associated effect. Range to effects is important information in not only predicting acoustic impacts, but also in verifying the accuracy of model results against real-world situations and determining adequate mitigation ranges to avoid higher level effects, especially

physiological effects to marine mammals.

Explosives

The following section provides the range (distance) over which specific physiological or behavioral effects are expected to occur based on the explosive criteria (see Section 6, Section 6.5.2.1.1 of the Navy's rulemaking/LOA application and the *Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis (Phase III)* report (U.S. Department of the Navy, 2017c)) and the explosive propagation calculations from the Navy Acoustic Effects Model (see Section 6, Section 6.5.2.1.3, Navy Acoustic Effects Model of the Navy's rulemaking/LOA application). The range to effects is shown for a range of explosive bins, from E1 (up to 0.25 lb net explosive weight) to E10 (up to 500 lb net explosive weight) (Tables 11 through 17). Explosive bins not shown on these tables include E2, E4, E7, E11, and E12, as they are not used in the PMSR Study Area and therefore not included in Tables 11 through 17. Ranges are determined by modeling the distance that noise from an explosion would need to propagate to reach exposure level thresholds specific to a hearing group that would cause behavioral response (to the degree of Level B harassment), TTS, PTS, and non-auditory injury. Ranges are provided for a representative source depth and cluster size for each bin. For events with multiple explosions, sound from successive explosions can be expected to accumulate and increase the range to the onset of an impact based on SEL thresholds. Ranges to non-auditory injury and mortality are shown in Tables 16 and 17, respectively. NMFS has reviewed the range distance to effect data provided by the Navy and concurs with the analysis. For additional information on how ranges to impacts from explosions were estimated, see the technical report *Quantifying Acoustic Impacts on Marine Species: Methods and Analytical Approach for Activities at the Point Mugu Sea Range* (U.S. Department of the Navy, 2020).

Table 11 shows the minimum, average, and maximum ranges to onset of auditory and behavioral effects that likely rise to the level of Level B harassment for high-frequency cetaceans based on the developed thresholds.

TABLE 11—SEL-BASED RANGES (METERS) TO ONSET PTS, ONSET TTS, AND LEVEL B HARASSMENT BY BEHAVIORAL DISTURBANCE FOR HIGH-FREQUENCY CETACEANS

Bin	Cluster size	PTS	TTS	Behavioral
E1	1	353 (130–825)	1,234 (290–3,025)	2,141 (340–4,775)
	25	1,188 (280–3,025)	3,752 (490–8,525)	5,196 (675–12,275)
E3	1	654 (220–1,525)	2,294 (350–4,775)	3,483 (490–7,775)
	12	1,581 (300–3,525)	4,573 (650–10,275)	6,188 (725–14,775)
E5	25	2,892 (440–6,275)	6,633 (725–16,025)	8,925 (800–22,775)
E6	1	1,017 (280–2,525)	3,550 (490–7,775)	4,908 (675–12,275)
E8	1	1,646 (775–2,525)	4,322 (1,525–9,775)	5,710 (1,525–14,275)
E9	1	2,105 (850–4,025)	4,901 (1,525–12,525)	6,700 (1,525–16,775)
E10	1	2,629 (875–5,275)	5,905 (1,525–13,775)	7,996 (1,525–20,025)

[1]Average distance in meters is depicted above the minimum and maximum distances, which are in parentheses.
Notes: SEL = Sound Exposure Level, PTS = permanent threshold shift, TTS = temporary threshold shift.

Table 12 shows the minimum, average, and maximum ranges to onset of auditory and behavioral effects that likely rise to the level of Level B harassment for mid-frequency cetaceans based on the developed thresholds.

TABLE 12—SEL-BASED RANGES (METERS) TO ONSET PTS, ONSET TTS, AND LEVEL B HARASSMENT BY BEHAVIORAL DISTURBANCE FOR MID-FREQUENCY CETACEANS

Bin	Cluster Size	PTS	TTS	Behavioral
E1	1	25 (25–25)	118 (80–210)	178 (100–320)
	25	107 (75–170)	476 (150–1,275)	676 (240–1,525)
E3	1	50 (45–65)	233 (110–430)	345 (130–600)
	12	153 (90–250)	642 (220–1,525)	897 (270–2,025)
E5	25	318 (130–625)	1,138 (280–3,025)	1,556 (310–3,775)
E6	1	98 (70–170)	428 (150–800)	615 (210–1,525)
E8	1	160 (150–170)	676 (500–725)	942 (600–1,025)
E9	1	215 (200–220)	861 (575–950)	1,147 (650–1,525)
E10	1	275 (250–480)	1,015 (525–2,275)	1,424 (675–3,275)

[1]Average distance in meters to mortality is depicted above the minimum and maximum distances, which are in parentheses.
Notes: SEL = Sound Exposure Level, PTS = permanent threshold shift, TTS = temporary threshold shift.

Table 13 shows the minimum, average, and maximum ranges to onset of auditory and behavioral effects that likely rise to the level of Level B harassment for low-frequency cetaceans based on the developed thresholds.

TABLE 13—SEL-BASED RANGES (METERS) TO ONSET PTS, ONSET TTS, AND LEVEL B HARASSMENT BY BEHAVIORAL DISTURBANCE FOR LOW-FREQUENCY CETACEANS

Bin	Cluster size	PTS	TTS	Behavioral
E1	1	51 (40–70)	227 (100–320)	124 (70–160)
	25	205 (95–270)	772 (270–1,275)	476 (190–725)

TABLE 13—SEL-BASED RANGES (METERS) TO ONSET PTS, ONSET TTS, AND LEVEL B HARASSMENT BY BEHAVIORAL DISTURBANCE FOR LOW-FREQUENCY CETACEANS—Continued

Bin	Cluster size	PTS	TTS	Behavioral
E3	1	109 (65–150)	503 (190–1,000)	284 (120–430)
	12	338 (130–525)	1,122 (320–7,775)	761 (240–6,025)
E5	25	740 (220–6,025)	2,731 (460–22,275)	1,414 (350–14,275)
E6	1	250 (100–420)	963 (260–7,275)	617 (200–1,275)
E8	1	460 (170–950)	1,146 (380–7,025)	873 (280–3,025)
E9	1	616 (200–1,275)	1,560 (450–12,025)	1,014 (330–5,025)
E10	1	787 (210–2,525)	2,608 (440–18,275)	1,330 (330–9,025)

[1]Average distance in meters to mortality is depicted above the minimum and maximum distances, which are in parentheses.
Notes: SEL = Sound Exposure Level, PTS = permanent threshold shift, TTS = temporary threshold shift.

TABLE 14—SEL-BASED RANGES (METERS) TO ONSET PTS, ONSET TTS, AND LEVEL B HARASSMENT BY BEHAVIORAL DISTURBANCE FOR OTARIIDS

Bin	Cluster size	PTS	TTS	Behavioral
E1	1	7 (7–7)	34 (30–40)	56 (45–70)
	25	30 (25–35)	136 (80–180)	225 (100–320)
	10	25 (25–30)	115 (70–150)	189 (95–250)
E3	1	16 (15–19)	70 (50–95)	115 (70–150)
	12	45 (35–65)	206 (100–290)	333 (130–450)
	12	55 (50–60)	333 (280–750)	544 (440–1,025)
E5	25	98 (60–120)	418 (160–575)	626 (240–1,000)
E6	1	30 (25–35)	134 (75–180)	220 (100–320)
E8	1	50 (50–50)	235 (220–250)	385 (330–450)
E9	1	68 (65–70)	316 (280–360)	494 (390–625)
E10	1	86 (80–95)	385 (240–460)	582 (390–800)

[1]Average distance in meters to mortality is depicted above the minimum and maximum distances, which are in parentheses.
Notes: SEL = Sound Exposure Level, PTS = permanent threshold shift, TTS = temporary threshold shift.

TABLE 15—SEL-BASED RANGES (METERS) TO ONSET PTS, ONSET TTS, AND LEVEL B HARASSMENT BY BEHAVIORAL DISTURBANCE FOR PHOCIDS

Bin	Cluster size	PTS	TTS	Behavioral
E1	1	45 (40–65)	210 (100–290)	312 (130–430)
	25	190 (95–260)	798 (280–1,275)	1,050 (360–2,275)
E2	1	58 (45–75)	258 (110–360)	383 (150–550)
	10	157 (85–240)	672 (240–1,275)	934 (310–1,525)
E3	1	96 (60–120)	419 (160–625)	607 (220–900)
	12	277 (120–390)	1,040 (370–2,025)	1,509 (525–6,275)
E5	25	569 (200–850)	2,104 (725–9,275)	2,895 (825–11,025)
E6	1	182 (90–250)	767 (270–1,275)	1,011 (370–1,775)
E8	1	311 (290–330)	1,154 (625–1,275)	1,548 (725–2,275)
E9	1	416 (350–470)	1,443 (675–2,025)	1,911 (800–3,525)
E10	1	507 (340–675)	1,734 (725–3,525)	2,412 (800–5,025)

[1] Average distance (in meters) to PTS, TTS, and behavioral thresholds are depicted above the minimum and maximum distances, which are in parentheses. Values depict the range produced by SEL hearing threshold criteria levels.
Notes: SEL = Sound Exposure Level, PTS = permanent threshold shift, TTS = temporary threshold shift.

Table 16 shows the minimum, average, and maximum ranges due to varying propagation conditions to non-auditory injury as a function of animal mass and explosive bin (*i.e.,* net explosive weight). Ranges to gastrointestinal tract injury typically exceed ranges to slight lung injury; therefore, the maximum range to effect is not mass-dependent. Animals within these water volumes would be expected to receive minor injuries at the outer ranges, increasing to more substantial injuries, and finally mortality as an animal approaches the detonation point.

TABLE 16—RANGES [1] TO 50 PERCENT NON-AUDITORY INJURY RISK FOR ALL MARINE MAMMAL HEARING GROUPS

Bin	Range (m) (min-max)
E1	12 (11–13)
E3	25 (25–30)
E5	40 (35–140)
E6	52 (40–120)
E8	117 (75–400)
E9	120 (90–290)
E10	174 (100–480)

Note: All ranges to non-auditory injury within this table are driven by the gastrointestinal (GI) tract injury threshold regardless of animal mass.

Ranges to mortality, based on animal mass, are shown in Table 17 below.

TABLE 17—RANGES [1] TO 50 PERCENT MORTALITY RISK FOR ALL MARINE MAMMAL HEARING GROUPS AS A FUNCTION OF ANIMAL MASS

Bin	Animal mass intervals (kg) [1]					
	10	250	1,000	5,000	25,000	72,000
E1	3 (2–3)	0 (0–3)	0 (0–0)	0 (0–0)	0 (0–0)	0 (0–0)
E3	8 (6–10)	4 (2–8)	1 (0–2)	0 (0–0)	0 (0–0)	0 (0–0)
E5	13 (11–45)	7 (4–35)	3 (3–12)	2 (0–8)	0 (0–2)	0 (0–2)
E6	18 (14–55)	10 (5–45)	5 (3–15)	3 (2–10)	0 (0–3)	0 (0–2)
E8	50 (24–110)	27 (9–55)	13 (0–20)	9 (4–13)	4 (0–6)	3 (0–5)
E9	32 (30–35)	20 (13–30)	10 (8–12)	7 (6–9)	4 (3–4)	3 (2–3)
E10	56 (40–190)	25 (16–130)	13 (11–16)	9 (7–11)	5 (4–5)	4 (3–4)

[1] Average distance (m) to mortality is depicted above the minimum and maximum distances, which are in parentheses.

Marine Mammal Density

A quantitative analysis of impacts on a species or stock requires data on their abundance and distribution that may be affected by anthropogenic activities in the potentially impacted area. The most appropriate metric for this type of analysis is density, which is the number of animals present per unit area. Marine species density estimation requires a significant amount of effort to both collect and analyze data to produce a reasonable estimate. Unlike surveys for terrestrial wildlife, many marine species spend much of their time submerged, and are not easily observed. In order to collect enough sighting data to make reasonable density estimates, multiple observations are required, often in areas that are not easily accessible (*e.g.,* far offshore). Ideally, marine mammal species sighting data would be collected for the specific area and time period *(e.g.,* season) of interest and density estimates derived accordingly. However, in many places, poor weather conditions and high sea states prohibit the completion of comprehensive visual surveys.

For most cetacean species, abundance is estimated using line-transect surveys or mark-recapture studies (*e.g.,* Barlow, 2016, 2010; Barlow and Forney, 2007; Calambokidis *et al.,* 2008; Calambokidis and Barlow, 2020; Cooke, 2019; Forney *et al.,* 2014; Trickey *et al.,* 2020). The result provides one single density estimate value for each species across broad geographic areas. This is the general approach applied in estimating cetacean abundance in NMFS' SARs. Although the single value provides a good average estimate of abundance (total number of individuals) for a specified area, it does not provide information on the species distribution or concentrations within that area, and it does not estimate density for other timeframes or seasons that were not surveyed. More recently, spatial habitat modeling developed by NMFS' Southwest Fisheries Science Center has been used to estimate cetacean densities (Barlow *et al.,* 2009, 2020; Becker *et al.,* 2010, 2012a, b, c, 2014, 2016; Ferguson *et al.,* 2006a; Forney *et al.,* 2012, 2015; Redfern *et al.,* 2006; Rockwood *et al.,* 2020). These models estimate cetacean density as a continuous function of habitat variables (*e.g.,* sea surface temperature, seafloor depth, etc.) and thus allow predictions of cetacean densities on finer spatial scales than traditional line-transect or mark recapture analyses and for areas that have not been surveyed. Within the geographic area that was modeled, densities can be predicted wherever these habitat variables can be measured or estimated.

To characterize marine species density for large oceanic regions, the Navy reviews, critically assesses, and prioritizes existing density estimates from multiple sources, requiring the development of a systematic method for selecting the most appropriate density estimate for each combination of species, area, and season. The selection and compilation of the best available marine species density data resulted in the Navy Marine Species Density Database (NMSDD) (U.S. Department of the Navy, 2017). The finest temporal resolution (seasonal) for the NMSDD data for the HSTT Study Area was also used for the PMSR Study Area. The Navy vetted all cetacean densities with NMFS prior to use in the Navy's acoustic analysis for this proposed rulemaking.

A variety of density data and density models are needed in order to develop a density database that encompasses the entirety of the PMSR Study Area. Because these data are collected using different methods with varying amounts of accuracy and uncertainty, the Navy has developed a hierarchy to ensure the most accurate data is used when available. The technical report titled *Quantifying Acoustic Impacts on Marine Species: Methods and Analytical Approach for Activities at the Point Mugu Sea Range* (U.S. Department of the Navy, 2020), hereafter referred to as the Density Technical Report, describes these models in detail and provides detailed explanations of the models applied to each species density estimate. The list below describes models in order of preference.

1. Spatial density models are preferred and used when available because they provide an estimate with the least amount of uncertainty by deriving estimates for divided segments of the sampling area. These models (see Becker *et al.,* 2016; Forney *et al.,* 2015) predict spatial variability of animal presence as a function of habitat variables (*e.g.,* sea surface temperature, seafloor depth, etc.). This model is developed for areas, species, and, when available, specific timeframes (months or seasons) with sufficient survey data; therefore, this model cannot be used for species with low numbers of sightings.

2. Stratified design-based density estimates use line-transect survey data with the sampling area divided (stratified) into sub-regions, and a density is predicted for each sub-region (see Barlow, 2016; Becker *et al.,* 2016; Bradford *et al.,* 2017; Campbell *et al.,* 2014; Jefferson *et al.,* 2014). While geographically stratified density estimates provide a better indication of a species' distribution within the study area, the uncertainty is typically high because each sub-region estimate is based on a smaller stratified segment of the overall survey effort.

3. Design-based density estimations use line-transect survey data from land and aerial surveys designed to cover a specific geographic area (see Carretta *et al.,* 2015). These estimates use the same survey data as stratified design-based estimates, but are not segmented into sub-regions and instead provide one estimate for a large surveyed area. Although relative environmental suitability (RES) models provide estimates for areas of the oceans that have not been surveyed using

information on species occurrence and inferred habitat associations and have been used in past density databases, these models were not used in the current quantitative analysis.

Below we describe how densities were determined for the species in the PMSR Study Area.

The Navy developed a protocol and database to select the best available data sources based on species, area, and time (season). The resulting Geographic Information System database, used in the NMSDD, includes seasonal density values for every marine mammal species present within the PMSR Study Area. This database is described in the *Quantifying Acoustic Impacts on Marine Species: Methods and Analytical Approach for Activities at the Point Mugu Sea Range* (U.S. Department of the Navy, 2020) (also referred to as the Density Technical Report in this rule).

The Navy describes some of the challenges of interpreting the results of the quantitative analysis summarized above and described in the Density Technical Report: ''It is important to consider that even the best estimate of marine species density is really a model representation of the values of concentration where these animals might occur. Each model is limited to the variables and assumptions considered by the original data source provider. No mathematical model representation of any biological population is perfect, and with regards to marine mammal density, any single model method will not completely explain the actual distribution and abundance of marine mammal species. It is expected that there would be anomalies in the results that need to be evaluated, with independent information for each case, to support if we might accept or reject a model or portions of the model (U.S. Department of the Navy, 2017a).'' There was only one species, the harbor porpoise, where there was no density estimate available within the PMSR Study Area so a new density layer was developed for harbor porpoise. Forney *et al.* (2014) provided uniform density for harbor porpoise for the species as a whole in California (Figure 7–25 in the Density Technical Report). Although these density estimates may not fully describe PMSR interannual variability, fluctuations in population size, or spatial distributions, they represent the best available science due to the paucity of other data.

NMFS coordinated with the Navy in the development of its take estimates and concurs that the Navy's approach for density appropriately utilizes the best available science. Later, in the Preliminary Analysis and Negligible Impact Determination section, we assess how the estimated take numbers compare to abundance in order to better understand the potential number of individuals impacted.

Take Estimation

The 2020 PMSR DEIS/OEIS considered all training and testing activities proposed to occur in the PMSR Study Area that have the potential to result in the MMPA-defined take of marine mammals. The Navy determined that the three stressors below could result in the incidental taking of marine mammals. NMFS has reviewed the Navy's data and analysis and determined that it is complete and accurate and agrees that the following stressors from the Navy's proposed activities have the potential to result in takes by harassment.

- Acoustics (weapons firing noise; Explosions at or near the water surface can introduce loud, impulsive, broadband sounds into the marine environment);
- Explosives (explosive shock wave and sound at or near the water surface (<10 m)); and
- Land-based launch noise on SNI from missiles and rocket launches.

To predict marine mammal exposures to explosives, and because there is currently no means to model impacts on marine mammals from in-air detonations, the Navy's analysis conservatively models all detonations occurring within 10 m above the water's surface, as a point source located 10 centimeters underwater (U.S. Department of the Navy, 2019a). The model also assumes that all acoustic energy from the detonation remains underwater with no sound transmitted into the air. Important considerations must be factored into the analysis of results with these modeling assumptions, given that the peak pressure and sound from a detonation in air significantly decreases as it is partially reflected by the water's surface and partially transmitted underwater, as detailed in the following paragraphs. The Navy performed a quantitative analysis to estimate the probability that marine mammals could be exposed to the sound and energy from explosions during Navy testing and training activities and the effects of those exposures. The effects of underwater explosions on marine mammals depend on a variety of factors including animal size and depth; charge size and depth; depth of the water column; and distance between the animal and the charge. In general, an animal near the water surface would be less susceptible to injury because the pressure wave reflected from the water surface would interfere with the direct path pressure wave, reducing positive pressure exposure.

The quantitative analysis process (used for the 2020 PMSR DEIS/OEIS and the Navy's take request in the rulemaking/LOA application) to estimate potential exposures to marine mammals resulting from acoustic and explosive stressors is detailed in the technical report titled *Quantifying Acoustic Impacts on Marine Species: Methods and Analytical Approach for Activities at the Point Mugu Sea Range* (U.S. Department of the Navy, 2020). The Navy Acoustic Effects Model (NAEMO) brings together scenario simulations of the Navy's activities, sound propagation modeling, and marine mammal distribution (based on density and group size) by species to model and quantify the exposure of marine mammals above identified thresholds for behavioral harassment, TTS, PTS, non-auditory injury (lung and GI), and serious injury and mortality.

NAEMO estimates acoustic and explosive effects without taking mitigation or avoidance into account; therefore, the model overestimates predicted impacts on marine mammals within mitigation zones. The NAEMO (animal movement) model overestimates the number of marine mammals that would be exposed to sound sources that could cause PTS because the model does not consider horizontal movement of animats, including avoidance of high intensity sound exposures. As a general matter, NMFS does not prescribe the methods for estimating take for any applicant, but we review and ensure that applicants use the best available science, and methodologies that are logical and technically sound. Applicants may use different methods of calculating take (especially when using models) and still get to a result that is representative of the best available science and that allows for a rigorous and accurate evaluation of the effects on the affected populations. There are multiple aspects of the Navy's take estimation methods—propagation models, animat movement models, and behavioral thresholds, for example. NMFS evaluates the acceptability of these aspects as they evolve and are used in different rules and impact analyses. Some of the aspects of the Navy's take estimation process have been used in Navy incidental take rules since 2009 and have undergone multiple public comment processes; all of them have undergone extensive internal Navy review, and all of them have undergone comprehensive review by NMFS, has sometimes resulted in

modifications to methods or models. The Navy uses rigorous review processes (verification, validation, and accreditation processes, peer and public review) to ensure the data and methodology it uses represent the best available science. For instance, the NAEMO model is the result of a NMFS-led Center for Independent Experts (CIE) review of the components used in earlier models. The acoustic propagation component of the NAEMO model (CASS/GRAB) is accredited by the Oceanographic and Atmospheric Master Library (OAML), and many of the environmental variables used in the NAEMO model come from approved OAML databases and are based on in-situ data collection. The animal density components of the NAEMO model are base products of the NMSDD, which includes animal density components that have been validated and reviewed by a variety of scientists from NMFS Science Centers and academic institutions. Finally the NAEMO model simulation components underwent QA/QC review and validation for model parts such as the scenario builder, acoustic builder, scenario simulator, etc., conducted by qualified statisticians and modelers to ensure accuracy. Other models and methodologies have gone through similar review processes.

In summary, we believe the Navy's methods, including the underlying NAEMO modeling, are the most appropriate methods for predicting non-auditory injury, PTS, TTS, and behavioral disturbance. We would describe the application of these methods as identifying the maximum number of instances in which marine mammals would be reasonably expected to be taken through PTS, TTS, or behavioral disturbance.

Summary of Estimated Take Request From Training and Testing Activities

Based on the methods discussed in the previous sections and the Navy's model, the Navy provided its take estimate and request for authorization of takes incidental to the use of explosive sources and target/missile launches for training and testing activities both annually (based on the maximum number of activities that could occur per year) and over the seven-year period covered by the Navy's rulemaking/LOA application. NMFS has reviewed the Navy's data, methodology, and analysis and determined that it is complete and accurate. NMFS agrees that the estimates for incidental takes by harassment from all sources requested for authorization are the maximum number of instances in which marine mammals are reasonably expected to be taken.

Estimated Harassment Take From Training and Testing Activities

Tables 18 and 19 summarize the Navy's take estimate, which NMFS concurs with, and includes the maximum amount of Level A harassment and Level B harassment reasonably expected to occur by species and stock for explosives and missile launch activities on SNI expected annually and for the seven-year period.

TABLE 18—PROPOSED ANNUAL AND SEVEN-YEAR TOTAL SPECIES-SPECIFIC TAKE ESTIMATES FROM EXPLOSIVES FOR ALL TRAINING AND TESTING ACTIVITIES IN THE PMSR STUDY AREA (NOT INCLUSIVE OF LAUNCH EVENTS ON SNI)

Common name	Stock/DPS	Proposed annual take by Level A and Level B harassment			Proposed 7-year total take by Level A and Level B harassment **		
		Behavioral response	TTS	PTS	Behavioral response	TTS	PTS
Blue whale *	Eastern North Pacific	7	4	0	52	27	0
Bryde's whale	Eastern Tropical Pacific	0	0	0	0	0	0
Fin whale *	California, Oregon, and Washington.	14	7	1	101	46	7
Gray whale	Eastern North Pacific	9	5	0	65	37	0
	Western North Pacific †	0	0	0	0	0	0
Humpback whale *	California, Oregon, and Washington/Mexico DPS.	7	4	0	52	29	0
	California, Oregon, and Washington/Central America DPS.	1	0	0	6	0	0
Minke whale	California, Oregon, and Washington.	2	1	0	15	6	0
Sei whale *	Eastern North Pacific	0	0	0	0	0	0
Baird's beaked whale	California, Oregon, and Washington.	0	0	0	0	0	0
Bottlenose dolphin	California Coastal	0	0	0	0	0	0
	California, Oregon, and Washington Offshore.	5	5	1	37	36	4
Cuvier's beaked whale	California, Oregon, and Washington.	0	0	0	0	0	0
Dall's porpoise	California, Oregon, and Washington.	261	406	49	1,824	2,845	341
Dwarf sperm whale	California, Oregon, and Washington.	20	31	6	142	217	43
Harbor Porpoise	Morro Bay	0	0	0	0	0	0
Killer whale	Eastern North Pacific Offshore.	0	0	0	0	0	0
	Eastern North Pacific Transient or West Coast Transient [6].	0	0	0	0	0	0
Long-beaked common dolphin.	California	66	44	9	454	310	65

TABLE 18—PROPOSED ANNUAL AND SEVEN-YEAR TOTAL SPECIES-SPECIFIC TAKE ESTIMATES FROM EXPLOSIVES FOR ALL TRAINING AND TESTING ACTIVITIES IN THE PMSR STUDY AREA (NOT INCLUSIVE OF LAUNCH EVENTS ON SNI)—Continued

Common name	Stock/DPS	Proposed annual take by Level A and Level B harassment			Proposed 7-year total take by Level A and Level B harassment**		
		Behavioral response	TTS	PTS	Behavioral response	TTS	PTS
Mesoplodont spp	California, Oregon, and Washington.	0	0	0	0	0	0
Northern right whale dolphin.	California, Oregon, and Washington.	3	2	1	22	16	4
Pacific white-sided dolphin	California, Oregon, and Washington.	11	8	2	76	58	14
Pygmy killer whale	NSD	0	0	0	0	0	0
Pygmy sperm whale	California, Oregon, and Washington.	20	31	6	141	219	44
Risso's dolphins	California, Oregon, and Washington.	6	3	1	39	24	6
Short-beaked common dolphin.	California, Oregon, and Washington.	90	65	15	630	456	103
Short-finned pilot whale	California, Oregon, and Washington.	0	0	0	0	0	0
Sperm whale*	California, Oregon, and Washington.	1	1	0	7	8	0
Striped dolphin	California, Oregon, and Washington.	1	1	0	5	4	0
Harbor seal	California	202	120	14	1,415	842	99
Northern elephant seal	California	37	63	22	258	444	152
California sea lion	U.S. Stock	8	12	2	58	81	16
Guadalupe fur seal*	Mexico to California	1	1	0	5	7	0
Northern fur seal	California	0	0	0	0	0	0

* ESA-listed species in PMSR.
** 7-year total impacts may differ from the annual total times seven as a result of standard rounding.
† Only the indicated DPS is ESA-listed.
Note: NSD = No stock designation.

TABLE 19—ANNUAL AND SEVEN-YEAR TOTAL SPECIES-SPECIFIC TAKE ESTIMATES PROPOSED FROM TARGET AND MISSILE LAUNCH ACTIVITIES ON SNI IN THE PMSR STUDY AREA

Species	Stock	Proposed annual take by Level B harassment	Proposed 7-year total take by Level B harassment
California sea lion	U.S	11,000	77,000
Harbor seal	California	480	3,360
Northern elephant seal	California	40	280

Proposed Mitigation Measures

Under section 101(a)(5)(A) of the MMPA, NMFS must set forth the permissible methods of taking pursuant to the activity, and other means of effecting the least practicable adverse impact on the species or stocks and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of the species or stocks for subsistence uses (''least practicable adverse impact''). NMFS does not have a regulatory definition for least practicable adverse impact. The 2004 NDAA amended the MMPA as it relates to military readiness activities and the incidental take authorization process such that a determination of ''least practicable adverse impact'' shall include consideration of personnel safety, practicality of implementation, and impact on the effectiveness of the military readiness activity.

In evaluating how mitigation may or may not be appropriate to ensure the least practicable adverse impact on species or stocks and their habitat, as well as subsistence uses where applicable, we carefully consider two primary factors. (1) The first factor is the manner in which, and the degree to which, the successful implementation of the measure(s) is expected to reduce impacts to marine mammal species or stocks, and their habitat. This analysis considers the nature of the potential adverse impact (likelihood, scope, and range). It further considers the likelihood that the measure will be effective if implemented (probability of accomplishing the mitigating result if implemented as planned), the likelihood of effective implementation (probability implemented as planned). (2) The second factor is the practicability of the measures for applicant implementation, which may consider such things as cost, impact on operations, and, in the case of a military readiness activity, specifically considers personnel safety, practicality of implementation, and impact on the effectiveness of the military readiness activity.

We refer the reader to the Navy's Northwest Training and Testing (NWTT) rule (85 FR 72312; November 12, 2020) for further explanation of our interpretation of least practicable

adverse impact, and what distinguishes it from the negligible impact standard.

Assessment of Mitigation Measures for the PMSR Study Area

Section 216.104(a)(11) of NMFS' implementing regulations requires an applicant for incidental take authorization to include in its request, among other things, ''the availability and feasibility (economic and technological) of equipment, methods, and manner of conducting such activity or other means of effecting the least practicable adverse impact upon the affected species or stocks, their habitat, and [where applicable] on their availability for subsistence uses, paying particular attention to rookeries, mating grounds, and areas of similar significance.'' Thus NMFS' analysis of the sufficiency and appropriateness of an applicant's measures under the least practicable adverse impact standard will always begin with evaluation of the mitigation measures presented in the application.

NMFS has fully reviewed the specified activities and the mitigation measures included in the Navy's rulemaking/LOA application and the 2020 PMSR DEIS/OEIS to determine if the mitigation measures would result in the least practicable adverse impact on marine mammals and their habitat. NMFS worked with the Navy in the development of the Navy's initially proposed measures, which were informed by years of implementation and monitoring. A complete discussion of the Navy's evaluation process used to develop, assess, and select mitigation, which was informed by input from NMFS, can be found in Section 5 (*Standing Operating Procedures and Mitigation*) of the 2020 PMSR DEIS/OEIS. The process described in Section 5 (*Standing Operating Procedures and Mitigation*) of the 2020 PMSR DEIS/OEIS robustly supported NMFS' independent evaluation of whether the mitigation measures meet the least practicable adverse impact standard. The Navy would be required to implement the mitigation measures identified in this rule for the full seven years to avoid or reduce potential impacts from explosives, launch activities, and physical disturbance and vessel strike stressors.

As a general matter, where an applicant proposes measures that are likely to reduce impacts to marine mammals, the fact that they are included in the application indicates that the measures are practicable, and it is not necessary for NMFS to conduct a detailed analysis of the measures the applicant proposed (rather, they are simply included). However, it is still necessary for NMFS to consider whether there are additional practicable measures that would meaningfully reduce the probability or severity of impacts that could affect reproductive success or survivorship.

Overall, the Navy has agreed to procedural mitigation measures that would reduce the probability and/or severity of impacts expected to result from acute exposure to explosives and launch activities, vessel strike, and impacts to marine mammal habitat. Specifically, the Navy would use a combination of delayed starts, and cease firing to avoid mortality or serious injury, minimize the likelihood or severity of PTS or other injury, and reduce instances of TTS or more severe behavioral disruption caused by explosives and launch activities.

The Navy assessed the practicability of the proposed measures in the context of personnel safety, practicality of implementation, and their impacts on the Navy's ability to meet their Title 10 requirements and found that the measures are supportable. As described in more detail below, NMFS has independently evaluated the measures the Navy proposed in consideration of their ability to reduce adverse impacts on marine mammal species and their habitat and their practicability for implementation. We have preliminarily determined that the measures will significantly and adequately reduce impacts on the affected marine mammal species and stocks and their habitat and, further, be practicable for Navy implementation. Therefore, the mitigation measures assure that the Navy's activities will have the least practicable adverse impact on the species or stocks and their habitat.

The Navy also evaluated numerous measures in the 2020 PMSR DEIS/OEIS that were not included in the Navy's rulemaking/LOA application, and NMFS independently reviewed and preliminarily concurs with the Navy's analysis that their inclusion was not appropriate under the least practicable adverse impact standard based on our assessment. The Navy considered these additional potential mitigation measures in two groups. First, Chapter 5 (*Standing Operating Procedures and Mitigation)* of the 2020 PMSR DEIS/OEIS, in the *Measures Considered but Eliminated* section, includes an analysis of an array of different types of mitigation that have been recommended over the years by non-governmental organizations or the public, through scoping or public comment on environmental compliance documents. As described in Chapter 5 (*Standing Operating Procedures and Mitigation*) of the 2020 PMSR DEIS/OEIS, commenters sometimes recommend that the Navy reduce explosive use, or include area restrictions. Many of these mitigation measures could potentially reduce the number of marine mammals taken, via direct reduction of the activities or amounts. However, as described in Chapter 5 (*Standing Operating Procedures and Mitigation*) of the 2020 PMSR DEIS/OEIS, the Navy needs to train and test in the conditions in which it conducts warfare, and these types of modifications fundamentally change the activity in a manner that would not support the purpose and need for the training and testing (*i.e.,* are entirely impracticable) and therefore are not considered further. NMFS finds the Navy's explanation for why adoption of these recommendations would unacceptably undermine the purpose of the testing and training persuasive. After independent review, NMFS finds Navy's judgment on the impacts of potential mitigation measures to personnel safety, practicality of implementation, and the effectiveness of training and testing within the PMSR Study Area persuasive, and for these reasons, NMFS finds that these measures do not meet the least practicable adverse impact standard because they are not practicable.

Second, in Chapter 5 (*Standing Operating Procedures and Mitigation*) of the 2020 PMSR DEIS/OEIS, the Navy evaluated an additional potential procedural mitigation measure, the use of thermal detection. The use of thermal detection had the potential to incrementally reduce take to some degree in certain circumstances, though the degree to which this would occur is typically low or uncertain. However, as described in the Navy's analysis, the measures would have significant direct negative effects on mission effectiveness and are considered impracticable (see Section 5 *Standing Operating Procedures and Mitigation* of 2020 PMSR DEIS/OEIS). NMFS independently reviewed the Navy's evaluation and concurs with this assessment, which supports NMFS' preliminary findings that the impracticability of this additional mitigation measure would greatly outweigh any potential minor reduction in marine mammal impacts that might result; therefore, this additional mitigation measure is not warranted.

Section 5 (*Standing Operating Procedures and Mitigation*) of the 2020 PMSR DEIS/OEIS also describes a comprehensive method for analyzing potential geographic mitigation that includes consideration of both a

biological assessment of how the potential time/area limitation would benefit the species and its habitat (*e.g.,* is a key area of biological importance or would result in avoidance or reduction of impacts) in the context of the stressors of concern in the specific area and an operational assessment of the practicability of implementation (*e.g.,* including an assessment of the specific importance of that area for training, considering proximity to training ranges and emergency landing fields and other issues). For most of the areas that were considered in the 2020 PMSR DEIS/OEIS but not included in this rule, the Navy found that geographic mitigation was not warranted because the anticipated reduction of adverse impacts on marine mammal species and their habitat was not sufficient to offset the impracticability of implementation.

The Navy considered that moving activities farther from SNI and outside of the SNI Feeding Area would not be practicable, because the added distance would substantially limit the capabilities of ground-based telemetry systems, antennas, surveillance, and metric radar systems, as well as command transmitter systems located at Point Mugu, Laguna Peak, Santa Cruz Island, and SNI. These systems are required to measure, monitor, and control various test platforms in real time; collect transmitted data for post event analysis; and enable surveillance of the area to ensure the safety of the public. Optimal functional distance for some of the ground-based radar systems is 10–200 nmi and may be limited by line-of-sight for some systems. Ground-based telemetry systems rely on using in-place fiber optic cables directly linked to remote locations or microwave to transmit signals. The ground-based command transmitter system provides safe, controlled testing of unmanned targets, platforms, and missiles, including unmanned aircraft, boat or ship targets, ballistic missiles, and other long-range vehicles, all within a 40-mi radius of the transmitter. The command transmitter system also provides flight termination capability for weapons and targets that are considered too hazardous for test flights. Relocating ground-based instrumentation to other locations would result in an extensive cost to the Navy, or potentially reduce military readiness.

NMFS has reviewed the Navy's analysis in Section 5 *Standing Operating Procedures and Mitigation* of the 2020 PMSR DEIS/OEIS, which considers the same factors that NMFS considers to satisfy the least practicable adverse impact standard, and preliminarily concurs with the analysis and conclusions. Therefore, NMFS is not proposing to include any of the measures that the Navy ruled out in the 2020 PMSR DEIS/OEIS. Below are the mitigation measures that NMFS determined will ensure the least practicable adverse impact on all affected species and their habitat, including the specific considerations for military readiness activities. The following sections describe the mitigation measures that would be implemented in association with the training and testing activities analyzed in this document. The mitigation measures all consist of procedural mitigation.

Procedural Mitigation

Procedural mitigation is mitigation that the Navy would implement whenever and wherever an applicable training or testing activity takes place within the PMSR Study Area. Procedural mitigation generally involves: (1) The use of one or more trained Lookouts to diligently observe for specific biological resources (including marine mammals) within a mitigation zone, (2) requirements for Lookouts to immediately communicate sightings of specific biological resources to the appropriate watch station for information dissemination, and (3) requirements for the watch station to implement mitigation (*e.g.,* halt an activity) until certain recommencement conditions have been met. The first procedural mitigation (Table 20) is designed to aid Lookouts and other applicable Navy personnel with their observation, environmental compliance, and reporting responsibilities. The remainder of the procedural mitigation measures (Tables 21 through 29) are organized by stressor type and activity category and include acoustic stressors (*i.e.,* weapons firing noise), explosive stressors (*i.e.,* medium-caliber and large-caliber projectiles, missiles and rockets, bombs), and physical disturbance and strike stressors (*i.e.,* vessel movement, small-, medium-, and large-caliber non-explosive practice munitions, non-explosive missiles, and non-explosive bombs).

TABLE 20—MITIGATION FOR ENVIRONMENTAL AWARENESS AND EDUCATION

Mitigation description
Stressor or Activity: • All testing and training activities, as applicable. *Mitigation Zone Size and Mitigation Requirements:* • Appropriate personnel involved in mitigation and training or testing activity reporting under the Proposed Action will complete one or more modules of the U.S Navy Afloat Environmental Compliance Training Series, as identified in their career path training plan. Modules include: ○ Introduction to the U.S. Navy Afloat Environmental Compliance Training Series. The introductory module provides information on environmental laws (*e.g.,* ESA, MMPA) and the corresponding responsibilities relevant to Navy testing and training. The material explains why environmental compliance is important in supporting the Navy's commitment to environmental stewardship. ○ Marine Species Awareness Training. All bridge watch personnel, Commanding Officers, Executive Officers, maritime patrol aircraft aircrews, anti-submarine warfare and mine warfare rotary-wing aircrews, Lookouts, and equivalent civilian personnel must successfully complete the Marine Species Awareness Training prior to standing watch or serving as a Lookout. The Marine Species Awareness Training provides information on sighting cues, visual observation tools and techniques, and sighting notification procedures. Navy biologists developed Marine Species Awareness Training to improve the effectiveness of visual observations for biological resources, focusing on marine mammals and sea turtles, and including floating vegetation, jellyfish aggregations, and flocks of seabirds. ○ U.S. Navy Protective Measures Assessment Protocol. This module provides the necessary instruction for accessing mitigation requirements during the event planning phase using the Protective Measures Assessment Protocol software tool.

Mitigation measures for weapons firing noise as an acoustic stressor is provided below in Table 21.

TABLE 21—MITIGATION FOR WEAPONS FIRING NOISE

Mitigation description
Stressor or Activity Mitigation Applies to: • Weapons firing noise associated with large-caliber gunnery activities. *Number of Lookouts and Observation Platform:* • 1 Lookout positioned on the ship conducting the firing. —Depending on the activity, the Lookout could be the same as the one described in Table 22 (Mitigation for Small-, Medium-, and Large-Caliber Non-Explosive Practice Munitions). *Mitigation Requirements:* • Mitigation zone: —30° on either side of the firing line out to 70 yd. from the muzzle of the weapon being fired. • Prior to the initial start of the activity: —Observe the mitigation zone for floating vegetation; if observed, relocate or delay the start until the mitigation zone is clear. —Observe the mitigation zone for marine mammals if observed, relocate or delay the start of weapons firing. • During the activity: —Observe the mitigation zone for floating vegetation and marine mammals; if observed, cease weapons firing. • Conditions for commencing/recommencing the activity after a marine mammal before or during the activity: —The Navy will allow a sighted marine mammal to leave the mitigation zone prior to the initial start of the activity (by delaying the start) or during the activity (by not recommencing weapons firing) until one of the following conditions has been met: (1) The animal is observed exiting the mitigation zone; (2) the animal is thought to have exited the mitigation zone based on a determination of its course, speed, and movement relative to the firing ship; (3) the mitigation zone has been clear from any additional sightings for 30 min.; or (4) for mobile activities, the firing ship has transited a distance equal to double that of the mitigation zone size beyond the location of the last sighting and there have been no new sightings.

The Navy will implement mitigation measures to avoid or reduce potential impacts on marine mammals from the explosive stressors occurring at or near the surface resulting in underwater noise and energy. Mitigation measures for explosive stressors are provided in Table 22 through Table 24.

TABLE 22—MITIGATION FOR EXPLOSIVE MEDIUM-CALIBER AND LARGE-CALIBER PROJECTILES

Mitigation description
Stressor or Activity Mitigation Applies to: • Gunnery activities using explosive medium-caliber and large-caliber projectiles. • Activities using a maritime surface target. *Number of Lookouts and Observation Platform:* • 1 Lookout on the vessel or aircraft conducting the activity. —For activities using explosive large-caliber projectiles, depending on the activity, the Lookout could be the same as the one described in Table 21 (Mitigation for Weapons Firing Noise). • If additional platforms are participating in the activity, personnel positioned in those assets (*e.g.,* safety observers, evaluators) will support observing the mitigation zone for applicable biological resources while performing their regular duties. *Mitigation Requirements:* • Mitigation zones: —200 yd (182.88 m) around the intended impact location for air-to-surface activities using explosive medium-caliber projectiles, or —600 yd (548.64 m) around the intended impact location for surface-to-surface activities using explosive medium-caliber projectiles, or —1,000 yd (914.4 m) around the intended impact location for surface-to-surface activities using explosive large-caliber projectiles. • Prior to the start of the activity (*e.g.,* when maneuvering on station): —Observe for floating vegetation and marine mammals; if observed, relocate or delay the start until the mitigation zone is clear. —During the activity, observe for floating vegetation and marine mammals; if resource is observed, cease firing. • Conditions for commencing/recommencing the activity after a marine mammal sighting before or during the activity: —The Navy will allow a sighted marine mammal to leave the mitigation zone prior to the initial start of the activity (by delaying the start) or during the activity (by not recommencing firing) until one of the following conditions has been met until one of the recommencement conditions has been met: (1) The animal is observed exiting the mitigation zone; (2) the animal is thought to have exited the mitigation zone based on a determination of its course, speed, and movement relative to the intended impact location; (3) the mitigation zone has been clear from any additional sightings for 10 min. for aircraft-based firing or 30 min. for vessel-based firing; or (4) for activities using mobile targets, the intended impact location has transited a distance equal to double that of the mitigation zone size beyond the location of the last sighting and there have been no new sightings . • After completion of the activity (*e.g.,* prior to maneuvering off station): —When practical (*e.g.,* when platforms are not constrained by fuel restrictions or mission-essential follow-on commitments), observe the vicinity of where detonations occurred; if any injured or dead marine mammals, follow established incident reporting procedures. If additional platforms are supporting this activity (*e.g.,* providing range clearance), these assets will assist in the visual observation of the area where detonations occurred.

TABLE 23—MITIGATION FOR EXPLOSIVE MISSILES AND ROCKETS

Mitigation description
Stressor or Activity Mitigation Applies to: • Aircraft-deployed explosive missiles and rockets. • Activities using a maritime surface target at ranges up to 75 nmi. *Number of Lookouts and Observation Platform:* • 1 Lookout positioned in an aircraft. • If additional platforms are participating in the activity, personnel positioned in those assets (*e.g.*, safety observers, evaluators) will support observing the mitigation zone for applicable biological resources while performing their regular duties. *Mitigation Requirements:* • Mitigation zones: —900 yd (822.96 m) around the intended impact location for missiles or rockets with 0.6–20 lb net explosive weight. —2,000 yd (1,828.8 m) around the intended impact location for missiles with 21–500 lb net explosive weight. • Prior to the initial start of the activity (e.g., during a fly-over of the mitigation zone): —Observe the mitigation zone for floating vegetation; if observed, relocate or delay the start until the mitigation zone is clear. —Observe the mitigation zone for marine mammals; if observed, relocate or delay the start of firing. • During the activity: —Observe the mitigation zone for floating vegetation and marine mammals; if observed, cease firing. • Conditions for commencing/recommencing the activity after a marine mammal sighting before or during the activity: —The Navy will allow a sighted marine mammal to leave the mitigation zone prior to the initial start of the activity (by delaying the start) or during the activity (by not recommencing firing) until one of the following conditions has been met: (1) The animal is observed exiting the mitigation zone; (2) the animal is thought to have exited the mitigation zone based on a determination of its course, speed, and movement relative to the intended impact location; or (3) the mitigation zone has been clear from any additional sightings for 10 min. when the activity involves aircraft that have fuel constraints, or 30 min. when the activity involves aircraft that are not typically fuel constrained. • After completion of the activity (*e.g.*, prior to maneuvering off station): —When practical (*e.g.*, when platforms are not constrained by fuel restrictions or mission-essential follow-on commitments), observe the vicinity of where detonations occurred; if any injured or dead marine mammals or ESA-listed species are observed, follow established incident reporting procedures. If additional platforms are supporting this activity (*e.g.*, providing range clearance), these assets will assist in the visual observation of the area where detonations occurred.

TABLE 24—MITIGATION FOR EXPLOSIVE BOMBS

Mitigation description
Stressor or Activity Mitigation Applies to: • Explosive bombs. *Number of Lookouts and Observation Platform:* • 1 Lookout positioned in the aircraft conducting the activity. • If additional platforms are participating in the activity, personnel positioned in those assets (*e.g.*, safety observers, evaluators) will support observing the mitigation zone for applicable biological resources while performing their regular duties. *Mitigation Requirements:* • Mitigation zone: —2,500 yd (2,286 m) around the intended target. • Prior to the start of the activity (*e.g.,* when arriving on station): —Observe the mitigation zone for floating vegetation and marine mammals; If floating vegetation or marine mammals are observed, Navy personnel must relocate or delay the start of bomb deployment. • During the activity (*e.g.,* during target approach): —Observe the mitigation zone for floating vegetation and marine mammals; if observed, cease bomb deployment. • Conditions for commencing/recommencing of the activity after a marine mammal sighting before or during the activity: —The Navy will allow a sighted marine mammal to leave the mitigation zone prior to the initial start of the activity (by delaying the start) or during the activity (by not recommencing bomb deployment) until one of the recommencement conditions has been met: (1) The animal is observed exiting the mitigation zone; (2) the animal is thought to have exited the mitigation zone based on a determination of its course, speed, and movement relative to the intended target; (3) the mitigation zone has been clear from any additional sightings for 10 min.; or (4) for activities using mobile targets, the intended target has transited a distance equal to double that of the mitigation zone size beyond the location of the last sighting and there have been no new sightings. • After completion of the activity (*e.g.,* prior to maneuvering off station): —When practical (*e.g.,* when platforms are not constrained by fuel restrictions or mission-essential follow-on commitments), observe the vicinity of where detonations occurred; if any injured or dead marine mammals or ESA-listed species are observed, follow established incident reporting procedures. —If additional platforms are supporting this activity (*e.g.,* providing range clearance), these assets will assist in the visual observation of the area where detonations occurred.

Mitigation for physical disturbance and strike stressors are provided in Table 25 through Table 29.

TABLE 25—MITIGATION FOR VESSEL MOVEMENT

Mitigation description
Stressor or Activity Mitigation Applies to: • Vessel movement. • The mitigation will not be required if (1) the vessel's safety is threatened, (2) the vessel is restricted in its ability to maneuver (*e.g.,* during launching and recovery of aircraft or landing craft, during towing activities, when mooring, etc.), (3) the vessel is operated autonomously, or (4) when impracticable based on mission requirements (*e.g.,* There are a few specific testing and training events that include requirements for certain systems where vessels would operate at higher speeds. As an example, some tests involve using the High-Speed Maneuvering Surface Target (HSMST). During these events, ships must operate across the full spectrum of capable speeds to accomplish the primary testing objectives). *Number of Lookouts and Observation Platform:* • 1 Lookout on the vessel that is underway. *Mitigation Requirements:* • Mitigation zone: —500 yd (457.2 m) around whales. —200 yd (182.88 m) around all other marine mammals (except bow-riding dolphins and pinnipeds hauled out on man-made navigational structures, port structures, and vessels). • *During the activity:* —When underway, observe the mitigation zone for marine mammals; if observed, maneuver to maintain distance. • *Additional requirements:* —If a marine mammal vessel strike occurs, the Navy will follow the established incident reporting procedures.

TABLE 26—MITIGATION FOR SMALL-, MEDIUM-, AND LARGE-CALIBER NON-EXPLOSIVE PRACTICE MUNITIONS

Mitigation description
Stressor or Activity Mitigation Applies to: • Gunnery activities using small-, medium-, and large-caliber non-explosive practice munitions. • Activities using a maritime surface target. *Number of Lookouts and Observation Platform:* • 1 Lookout positioned on the platform conducting the activity. • Depending on the activity, the Lookout could be the same as the one described in Table 21 (Mitigation for Weapons Firing Noise). *Mitigation Requirements:* • Mitigation zone: —200 yd (182.88 m) around the intended impact location. • Prior to the initial start of the activity (*e.g.,* when maneuvering on station): —Observe the mitigation zone for floating vegetation; if observed, relocate or delay the start until the mitigation zone is clear. —Observe the mitigation zone for marine mammals; if observed, relocate or delay the start of firing. • During the activity: —Observe the mitigation zone for floating vegetation and marine mammals; if observed, cease firing. • Conditions for commencing/recommencing the activity after a marine mammal sighting before or during the activity: —The Navy will allow a sighted marine mammal to leave the mitigation zone prior to the initial start of the activity (by delaying the start) or during the activity (by not recommencing firing) until one of the following conditions has been met: (1) The animal is observed exiting the mitigation zone; (2) the animal is thought to have exited the mitigation zone based on a determination of its course, speed, and movement relative to the intended impact location; (3) the mitigation zone has been clear from any additional sightings for 10 min. for aircraft-based firing or 30 min. for vessel-based firing; or (4) for activities using a mobile target, the intended impact location has transited a distance equal to double that of the mitigation zone size beyond the location of the last sighting and there have been no new sightings.

TABLE 27—MITIGATION FOR NON-EXPLOSIVE MISSILES AND ROCKETS

Mitigation description
Stressor or Activity Mitigation Applies to: • Aircraft-deployed non-explosive missiles and rockets. • Activities using a maritime surface target at ranges of up to 75 nmi. *Number of Lookouts and Observation Platform:* • 1 Lookout positioned in an aircraft. *Mitigation Requirements:* • Mitigation zone: —900 yd (822.96 m) around the intended impact location. • Prior to the initial start of the activity (*e.g.,* during a fly-over of the mitigation zone): —Observe the mitigation zone for floating vegetation; if observed, relocate or delay the start until the mitigation zone is clear. —Observe the mitigation zone for marine mammals; if observed, relocate or delay the start of firing. • During the activity: —Observe the mitigation zone for floating vegetation and marine mammals; if observed, cease firing. • Conditions for commencing/recommencing the activity after a marine mammal sighting prior to or during the activity:

TABLE 27—MITIGATION FOR NON-EXPLOSIVE MISSILES AND ROCKETS—Continued

Mitigation description
—The Navy will allow a sighted marine mammal to leave the mitigation zone prior to the initial start of the activity (by delaying the start) or during the activity (by not recommencing firing) until one of the following conditions has been met: (1) The animal is observed exiting the mitigation zone; (2) the animal is thought to have exited the mitigation zone based on a determination of its course, speed, and movement relative to the intended impact location; or (3) the mitigation zone has been clear from any additional sightings for 10 min. when the activity involves aircraft that have fuel constraints, or 30 min. when the activity involves aircraft that are not typically fuel constrained.

TABLE 28—MITIGATION FOR NON-EXPLOSIVE BOMBS

Mitigation description
Stressor or Activity Mitigation Applies to: • Non-explosive bombs. *Number of Lookouts and Observation Platform:* • 1 Lookout positioned in an aircraft. *Mitigation Requirements:* • Mitigation zone: —900 yd (822.96 m) around the intended impact location. • Prior to the start of the activity (*e.g.,* when arriving on station): —Observe the mitigation zone for floating vegetation; if observed, relocate or delay the start of bomb deployment until the mitigation zone is clear. —Observe the mitigation zone for marine mammals; if observed, relocate or delay the start of bomb deployment. • During the activity (*e.g.,* during approach of the target): —Observe the mitigation zone for floating vegetation and marine mammals; if observed, cease bomb deployment. • Conditions for commencing/recommencing the activity after a marine mammal sighting prior to or during the activity: The Navy will allow a sighted marine mammal to leave the mitigation zone prior to the initial start of the activity (by delaying the start) or during the activity (by not recommencing bomb deployment or mine laying) until one of the following conditions has been met: (1) The animal is observed exiting the mitigation zone; (2) the animal is thought to have exited the mitigation zone based on a determination of its course, speed, and movement relative to the intended target or minefield location; (3) the mitigation zone has been clear from any additional sightings for 10 min.; or (4) for activities using mobile targets, the intended target has transited a distance equal to double that of the mitigation zone size beyond the location of the last sighting and there have been no new sightings.

Target and Missile Launches from SNI

Mitigation for target and missile launch activities from SNI are provided below in Table 29.

TABLE 29—MITIGATION FOR TARGET AND MISSILE LAUNCHES FROM SNI

Mitigation description
Stressor or Activity Mitigation Applies to: • Target and Missile launches from SNI. *Mitigation Requirements:* • Navy personnel shall not enter pinniped haulouts or rookeries. Personnel may be adjacent to pinniped haulouts and rookeries prior to and following a launch for monitoring purposes. • Missiles shall not cross over pinniped haulouts at elevations less than 305 m (1,000 ft) above the haulout. • The Navy must not conduct more than 40 launch events annually. • The Navy must not conduct more than 10 launch events at night of the 40 annual launch events. • Launches shall be scheduled to avoid peak pinniped pupping periods between January and July, to the maximum extent practicable. • All manned aircraft and helicopter flight paths must maintain a minimum distance of 305 m (1,000 ft) from recognized pinniped haulouts and rookeries, except in emergencies or for real-time security incidents. • For unmanned aircraft systems (UAS), the following minimum altitudes must be maintained over pinniped haulout areas and rookeries: Class 0–2 UAS must maintain a minimum altitude of 300 ft; Class 3 UAS must maintain a minimum altitude of 500 ft; Class 4 or 5 UAS must not be flown below 1,000 ft. • If a species for which authorization has not been granted is taken, or a species for which authorization has been granted but the authorized takes are met, the Navy must consult with NMFS to determine how to proceed. • The Navy must review the launch procedure and monitoring methods, in cooperation with NMFS, if any incidents of injury or mortality of a pinniped are discovered during post-launch surveys, or if surveys indicate possible effects to the distribution, size, or productivity of the affected pinniped populations as a result of the specified activities. If necessary, appropriate changes must be made through modification to this Authorization prior to conducting the next launch of the same vehicle.

In addition, the Navy proposes to issue awareness notification messages seasonally to alert ships and aircraft to the possible presence of concentrations of large whales in the PMSR Study Area. In order to maintain safety of navigation and to avoid interactions with large whales during transit, vessels will be instructed to remain vigilant to the presence of certain large whale species, which, especially when concentrated seasonally, may become vulnerable to

vessel strikes. Lookouts will use the information from the awareness notification messages to assist their visual observations of mitigation zones and to aid in implementing mitigation. The Navy anticipates that providing Lookouts additional information about the possible presence of concentrations of large whales in certain locations seasonally will likely help the Navy further avoid interactions with these animals during vessel transits and when training and testing activities are conducted in the PMSR Study Area. The Navy would follow reporting requirements should a vessel strike occur. The Navy would issue awareness notification messages (Table 30) for the following species and seasons.

TABLE 30—LARGE WHALE AWARENESS NOTIFICATION MESSAGES

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

Mitigation Conclusions

NMFS has carefully evaluated the Navy's proposed mitigation measures—many of which were developed with NMFS' input during the previous phases of Navy training and testing authorizations—and considered a broad range of other measures (*i.e.,* the measures considered but eliminated in the 2020 PMSR DEIS/OEIS, which reflect many of the comments that have arisen via NMFS or public input in past years) in the context of ensuring that NMFS prescribes the means of effecting the least practicable adverse impact on the affected marine mammal species and their habitat. Our evaluation of potential measures included consideration of the following factors in relation to one another: The manner in which, and the degree to which, the successful implementation of the mitigation measures is expected to reduce the likelihood and/or magnitude of adverse impacts to marine mammal species and their habitat; the proven or likely efficacy of the measures; and the practicability of the measures for applicant implementation, including consideration of personnel safety, practicality of implementation, and impact on the effectiveness of the military readiness activity.

Based on our evaluation of the Navy's proposed measures, as well as other measures considered by the Navy and NMFS, NMFS has preliminarily determined that these proposed mitigation measures are the appropriate means of effecting the least practicable adverse impact on the marine mammal species and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and considering specifically personnel safety, practicality of implementation, and impact on the effectiveness of the military readiness activity. Additionally, an adaptive management provision ensures that mitigation is regularly assessed and provides a mechanism to improve the mitigation, based on the factors above, through modification as appropriate.

The proposed rule comment period provides the public an opportunity to submit recommendations, views, and/or concerns regarding the Navy's activities and the proposed mitigation measures. While NMFS has preliminarily determined that the Navy's proposed mitigation measures would effect the least practicable adverse impact on the affected species and their habitat, NMFS will consider all public comments to help inform our final determination. Consequently, the proposed mitigation measures may be refined, modified, removed, or added to prior to the issuance of the final rule, based on public comments received, and, as appropriate, analysis of additional potential mitigation measures.

Proposed Monitoring

Section 101(a)(5)(A) of the MMPA states that in order to authorize incidental take 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 incidental take authorizations 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.

In the PMSR, the Navy has been monitoring missile launches at SNI in accordance with the MMPA under IHAs or LOAs since 2001 (NMFS, 2014a, 2019a). Associated with those authorizations, monitoring reports submitted to NMFS in various periodic reports have included sound levels measurements from the launches and have documented the behavior of hauled out pinnipeds before, during, and after those launches by direct observation and in video recordings (Burke, 2017; Holst and Lawson, 2002; Holst and Greene Jr., 2005, 2006; Holst and Greene Jr., 2008; Holst and Greene Jr., 2010; Holst *et al.,* 2011; Holst *et al.,* 2003; Ugoretz and Greene Jr., 2012; Ugoretz, 2014, 2015, 2016).

In other locations where Navy testing and training activities occur, the Navy has also been conducting marine mammal research and monitoring in the Pacific Ocean for decades. A formal coordinated marine species monitoring program in support of the MMPA and ESA authorizations for the Navy Range Complexes worldwide was first implemented in 2009. This robust program has resulted in hundreds of technical reports and publications on marine mammals that have informed Navy and NMFS analyses in environmental planning documents, rules, and ESA Biological Opinions. The reports are made available to the public on the Navy's marine species monitoring website (*www.navymarinespecies monitoring.us*), and the data on the Ocean Biogeographic Information System Spatial Ecological Analysis of Megavertebrate Populations (OBIS–SEAMAP) (*http://seamap.env.duke.edu/*).

The Navy will continue collecting monitoring data to inform our understanding of the occurrence of, and impacts of the Navy's activities on, marine mammals on SNI in the PMSR Study Area. NMFS and the Navy will coordinate and discuss how monitoring in the PMSR Study Area could contribute to the Navy's Marine Species Monitoring Program. Taken together, mitigation and monitoring comprise the Navy's integrated approach for reducing environmental impacts from the specified activities. The Navy's overall monitoring approach seeks to leverage and build on existing research efforts whenever possible.

As agreed upon between the Navy and NMFS, the monitoring measures presented here, as well as the mitigation measures described above, focus on the protection and management of potentially affected marine mammals. A well-designed monitoring program can provide important feedback for validating assumptions made in analyses and allow for adaptive management of marine resources. Monitoring is required under the MMPA, and details of the monitoring program for the specified activities have been developed through coordination between NMFS and the Navy through the regulatory process for previous Navy at-sea training and testing activities.

Required Monitoring on SNI

In consultation with NMFS, the Navy shall implement a monitoring plan for beaches exposed to missile launch noise with the goal of assessing baseline pinniped distribution/abundance and potential changes in pinniped use of these beaches after launch events. Marine mammal monitoring shall include:

- Multiple surveys (*e.g.,* time-lapse photography) during the year that record the species, number of animals, general behavior, presence of pups, age class, gender and reactions to launch noise or other natural or human caused disturbances, in addition to environmental conditions that may include tide, wind speed, air temperature, and swell.
- In addition, video and acoustic monitoring of up to three pinniped haulout areas and rookeries must be conducted during launch events that include missiles or targets that have not been previously monitored using video and acoustic recorders for at least three launch events.

Integrated Comprehensive Monitoring Program (ICMP)

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

☐ An increase in 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.,* sound, explosive detonation, or military expended materials) through better understanding of the following: (1) The action and the environment in which it occurs (*e.g.,* sound source characterization, propagation, and ambient noise levels); (2) the affected species (*e.g.,* life history or dive patterns); (3) the likely co-occurrence of marine mammals and/or ESA-listed marine species with the action (in whole or part); and/or (4) the likely biological or behavioral context of exposure to the stressor for the marine mammal and/or ESA-listed marine species (*e.g.,* age class of exposed animals or known pupping, calving or feeding areas);

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

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

☐ A better understanding and record of the manner in which the Navy complies with the incidental take regulations and LOAs and the ESA Incidental Take Statement;

☐ An increase in the probability of detecting marine mammals (through improved technology or methods), both specifically within the mitigation zone (thus allowing for more effective implementation of the mitigation), and in general, to better achieve the above goals; and

☐ Ensuring that adverse impact of activities remains at the least practicable level.

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 intermediate scientific objectives and a conceptual framework incorporating a progression of knowledge spanning occurrence, exposure, response, and consequence. The Strategic Planning Process for Marine Species Monitoring is used to set overarching intermediate scientific objectives; develop individual monitoring project concepts; identify potential species of interest at a regional scale; evaluate, prioritize and select specific monitoring projects to fund or continue supporting for a given fiscal year; execute and manage selected monitoring projects; and report and evaluate progress and results. This process addresses relative investments to different range complexes based on goals across all range complexes, and monitoring will 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/).*

NMFS and the Navy will coordinate and discuss how monitoring in the PMSR Study Area could contribute to the Navy's Marine Species Monitoring Program in addition to the monitoring that would be conducted on SNI.

Past and Current Monitoring in the PMSR Study Area

NMFS has received multiple years' worth of annual monitoring reports addressing launch activities on SNI within the PMSR 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 training and testing activities on SNI within the PMSR Study Area. The Navy's annual exercise and monitoring reports may be viewed at: *https://www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-military-readiness-activities* and *http://www.navymarinespeciesmonitoring.us.*

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

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

NMFS and the Navy also consider data collected during mitigations as monitoring. Data are collected by shipboard personnel on hours spent training, hours of observation, and marine mammals observed within the mitigation zones when mitigations are implemented. These data are provided to NMFS in both classified and unclassified annual exercise reports, which will continue under this rule.

Research funded by the Navy that has included the PMSR Study Area includes, but is not limited to the following efforts:

- The Navy has funded a number of passive acoustic monitoring efforts in the PMSR Study Area as well as locations farther to the south in the SOCAL Range Complex. These studies have helped to characterize the soundscape resulting from general anthropogenic sound as well as the Navy testing and training sound energy contributions (Baumann-Pickering *et al.,* 2013; Baumann-Pickering *et al.,* 2015a; Baumann-Pickering *et al.,* 2018; Curtis *et al.,* 2020; Debich *et al.,* 2015a; Debich *et al.,* 2015b; Hildebrand *et al.,* 2012; Rice *et al.,* 2018a; Rice *et al.,* 2017; Rice *et al.,* 2018b; Sirovic *et al.,* 2016; Sirovic *et al.,* 2017; Sirovic *et al.,* 2015b; Wiggins *et al.,* 2018).
- Fieldwork involving photo-ID, biopsy, visual survey, and satellite tagging of blue, fin, and humpback whales were undertaken by Oregon State University. This research provided seasonal movement tracks, distribution, and behavior of these species in addition to biopsy samples used for sex determination and individual identifications (Mate *et al.,* 2016; Mate *et al.,* 2018b, 2018c; Mate *et al.,* 2015b). The findings from this work have been instrumental in supplementing our understanding of the use of BIAs in the PMSR Study Area for these species.
- The Navy has been collecting abundance data and behavioral reactions of pinnipeds during target and missile launch on SNI since 2001. The marine mammals monitoring reports for SNI can be found here *https://www.navymarinespeciesmonitoring.us/reporting/pacific/.*

Additional details on the scientific objectives for the Navy's marine species monitoring program in the Pacific (and elsewhere) can be found at *https://www.navymarinespeciesmonitoring.us/regions/pacific/current-projects/.* Projects can be either major multi-year efforts, or one to two-year special studies.

The majority of the testing and training activities Navy is proposing for the foreseeable future in the PMSR Study Area are similar if not nearly identical to activities that have been occurring in the same locations for decades. In the PMSR Study Area, there are no Major Exercises, testing and training events are, by comparison to other Navy areas, less frequent and are in general small in scope, so as a result the majority of Navy's research effort has been focused elsewhere. For this reason, the vast majority of scientific fieldwork, research, and monitoring efforts have been expended in the SOCAL Range Complex and Hawaii, where Navy training and testing activities have been more concentrated. Since 2006, the Navy has been submitting exercise reports and monitoring reports to NMFS for the Navy's range complexes in the Pacific and the Atlantic. These publicly available exercise reports, monitoring reports, and the associated research findings have been integrated into adaptive management decisions regarding the focus for subsequent research and monitoring as determined in collaborations between Navy, NMFS, Marine Mammal Commission, and other marine resource subject matter experts using an adaptive management approach. For example, see the 2019 U.S. Navy Annual Marine Species Monitoring Report for the Pacific that was made available to the public in September 2020.

Adaptive Management

The proposed regulations governing the take of marine mammals incidental to Navy training and testing activities in the PMSR Study Area contain an adaptive management component. Our understanding of the effects of Navy training and testing activities on marine mammals continues to evolve, which makes the inclusion of an adaptive management component both valuable and necessary within the context of seven-year regulations.

The reporting requirements associated with this proposed rule are designed to provide NMFS with monitoring data from the previous year to allow NMFS to consider whether any changes to existing mitigation and monitoring requirements are appropriate. 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 or monitoring measures could be modified if new data suggests that such modifications will have a reasonable likelihood of more

effectively accomplishing the goals of the mitigation and monitoring and if the measures are practicable. If the modifications to the mitigation, monitoring, or reporting measures are substantial, NMFS will publish a notice of the proposed LOA in the **Federal Register** and solicit public comment.

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) results from specific stranding investigations; (3) results from general marine mammal and sound research; and (4) any information which reveals that marine mammals may have been taken in a manner, extent, or number not authorized by these regulations or subsequent LOA. The results from monitoring reports and other studies may be viewed at *https://www.navymarinespeciesmonitoring.us.*

Proposed Reporting

In order to issue incidental take authorization for an activity, section 101(a)(5)(A) of the MMPA states that NMFS must set forth requirements pertaining to the monitoring and reporting of such taking. Effective reporting is critical both to compliance as well as ensuring that the most value is obtained from the required monitoring. 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.*

Notification of Injured, Live Stranded or Dead Marine Mammals

The Navy will consult the Notification and Reporting Plan, which sets out notification, reporting, and other requirements when injured, live stranded, or dead marine mammals are detected. The Notification and Reporting Plan is available at *https://www.fisheries.noaa.gov/action/incidental-take-authorization-us-navy-testing-and-training-activities-point-mugu-sea-range.*

Annual SNI Monitoring Report

The Navy would submit an annual report to NMFS of the SNI rocket and missile launch activities. The draft annual monitoring report must be submitted to the Director, Office of Protected Resources, NMFS, within three months after the end of the reporting year. NMFS will submit comments or questions on the draft monitoring report, if any, within three months of receipt. The report will be considered final after the Navy has addressed NMFS' comments, or three months after the submission of the draft if NMFS does not provide comments on the draft report. The report would summarize the launch events conducted during the year; assess any direct impacts to pinnipeds from launch events; assess any cumulative impacts on pinnipeds from launch events; and summarize pinniped monitoring and research activities conducted on SNI and any findings related to effects of launch noise on pinniped populations.

Annual PMSR Training and Testing Exercise Report

Each year the Navy will submit a detailed report (Annual PMSR Training and Testing Activity Report) to NMFS within three months after the one-year anniversary of the date of issuance of the LOA. NMFS will submit comments or questions on the report, if any, within one month of receipt. The report will be considered final after the Navy has addressed NMFS' comments, or one month after submission of the draft if NMFS does not provide comments on the draft report. The annual report will contain information on all explosives used, total annual number of each type of explosive exercises; and total annual expended/detonated rounds (missiles, bombs etc.) for each explosive bin. The annual report will also specifically include information on sound sources used. The annual report will also contain the current year's explosive use data as well as the cumulative sonar and explosive use quantity from previous years' reports. Additionally, if there were any changes to the explosives allowance in the reporting year or cumulatively, the report will include a discussion of why the change was made and include analysis to support how the change did or did not affect the analysis in the 2021 PMSR FEIS/OEIS and MMPA final rule. See the regulatory text below for detail on the content of the annual report.

The final annual/close-out report at the conclusion of the authorization period (year seven) will also serve as the comprehensive close-out report, and will include both the final year annual use compared to annual authorization and a cumulative seven-year annual use compared to seven-year authorization. NMFS must submit comments on the draft close-out report, if any, within three months of receipt. The report will be considered final after the Navy has addressed NMFS' comments, or three months after the submission of the draft if NMFS does not provide comments.

Information included in the annual reports may be used to inform future adaptive management of activities within the PMSR Study Area.

Other Reporting and Coordination

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

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

Preliminary Analysis and Negligible Impact Determination

General Negligible Impact Analysis

Introduction

NMFS has defined negligible impact as an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival (*i.e.,* population-level effects) (50 CFR 216.103). An estimate of the number of takes alone is not enough information on which to base an impact determination. In considering how Level A harassment or Level B harassment factor into the negligible impact analysis, in addition to considering the number of estimated takes, NMFS considers other factors, such as the likely nature of any responses (*e.g.,* intensity, duration), the context of any responses (*e.g.,* critical reproductive time or location, migration), as well as effects on habitat, and the likely effectiveness of the mitigation. Consistent with the 1989 preamble for NMFS' implementing regulations (54 FR 40338; September 29, 1989), the impacts from other past and ongoing anthropogenic activities are incorporated into this analysis via their impacts on the baseline (*e.g.,* as reflected in the regulatory status of the species, population size and growth rate where known).

In the *Estimated Take of Marine Mammals* section of this proposed rule, we identified the subset of potential effects that are reasonably expected to occur and rise to the level of takes based on the methods described. The impact that any given take will have on an individual, and ultimately the species or stock, is dependent on many case-

specific factors that need to be considered in the negligible impact analysis (*e.g.,* the context of behavioral exposures such as duration or intensity of a disturbance, the health of impacted animals, the status of a species that incurs fitness-level impacts to individuals, etc.). For this proposed rule, we evaluated the likely impacts of the number of harassment takes reasonably expected to occur, and proposed for authorization, in the context of the specific circumstances surrounding these predicted takes. Last, we collectively evaluated this information, as well as other more taxa-specific information and mitigation measure effectiveness, in group-specific assessments that support our negligible impact conclusions for each species and stock.

As explained in the *Estimated Take of Marine Mammals* section, no take by serious injury or mortality is proposed for authorization or anticipated to occur.

The Specified Activities reflect maximum levels of training and testing activities. The *Description of the Specified Activity* section describes annual activities. There may be some flexibility in the exact number of detonations that may vary from year to year, but take totals will not exceed the seven-year totals indicated in Table 18 as well as take annual and seven-year totals described for missile launch activities on SNI in Table 19. We base our analysis and negligible impact determination on the maximum number of takes that are reasonably expected to occur and proposed for authorization, although, as stated before, the number of takes are only a part of the analysis, which includes qualitative consideration of other contextual factors that influence the degree of impact of the takes on the affected individuals. To avoid repetition, we provide some general analysis in this *General Negligible Impact Analysis* section that applies to all the species and stocks listed in Tables 18 and 19, given that some of the anticipated effects of the Navy's training and testing activities on marine mammals are expected to be relatively similar in nature. Then, in the *Group and Species-Specific Analyses* section, we subdivide into discussions of Mysticetes, Odontocetes, and Pinnipeds as there are broad life history traits that support an overarching discussion of some factors considered within the analysis for those groups (*e.g.,* high-level differences in feeding strategies). Last, we break our analysis into species and stock, or groups of species where relevant similarities exist, to provide more specific information related to the anticipated effects on individuals of that species or where there is information about the status or structure of any species that would lead to a differing assessment of the effects on the species. Organizing our analysis by grouping species that share common traits or that will respond similarly to effects of the Navy's activities and then providing species-specific information allows us to avoid duplication while assuring that we have analyzed the effects of the specified activities on each affected species and stock.

The Navy's take request, which, as described above, is for harassment only, is based on its acoustic model. The model calculates sound energy propagation from explosives during naval activities; the sound or impulse received by animat dosimeters representing marine mammals distributed in the area around the modeled activity; and whether the sound or impulse energy received by a marine mammal exceeds the thresholds for effects. Assumptions in the Navy model intentionally err on the side of overestimation when there are unknowns. Naval activities are modeled as though they would occur regardless of proximity to marine mammals, meaning that no mitigation is considered and without any avoidance of the activity by the animal. NMFS provided input to, independently reviewed, and concurred with the Navy on this process and the Navy's analysis, which is described in detail in Section 6 of the Navy's rulemaking/LOA application, and which was used to quantify harassment takes for this proposed rule.

Generally speaking, the Navy and NMFS anticipate more severe effects from takes resulting from exposure to higher received levels (though this is in no way a strictly linear relationship for behavioral effects throughout species, individuals, or circumstances), and less severe effects from takes resulting from exposure to lower received levels. However, there is also growing evidence of the importance of distance in predicting marine mammal behavioral response to sound—*i.e.,* sounds of a similar level emanating from a more distant source have been shown to be less likely to evoke a response of equal magnitude (DeRuiter 2012, Falcone *et al.* 2017). The estimated number of Level A harassment and Level B harassment takes does not equate to the number of individual animals the Navy expects to harass (which is lower), but rather to the instances of take (*i.e.,* exposures above the Level A harassment and Level B harassment threshold) that are anticipated to occur annually and over the seven-year period. These instances may represent either brief exposures (seconds) or, in some cases, several exposures within a day. Most explosives detonating at or near the surface, especially those involving the larger explosive bins such as a MISSILEX, have brief exposures lasting only a few milliseconds to minutes for the entire event. Explosive events may be a single event involving one explosion (single exposure) or a series of intermittent explosives (multiple explosives) occurring over the course of a day. Gunnery events, in some cases, may have longer durations of exposure to intermittent sound. In general, gunnery events can last intermittently over 1–3 hrs in total; however the actual exposure during the event would be of a much shorter duration (seconds to minutes).

Behavioral Response

Behavioral reactions from explosive sounds are likely to be similar to reactions studied for other impulsive sounds such as those produced by air guns. Impulsive signals, particularly at close range, have a rapid rise time and higher instantaneous peak pressure than other signal types, making them more likely to cause startle responses or avoidance responses. Most data has come from seismic surveys that occur over long durations (*e.g.,* on the order of days to weeks), and typically utilize large multi-air gun arrays that fire repeatedly. While seismic air gun data provides the best available science for assessing behavioral responses to impulsive sounds (*i.e.,* sounds from explosives) by marine mammals, it is likely that these responses represent a worst-case scenario compared to most Navy explosive noise sources. There are no explosives proposed to detonate underwater, only those that detonate at or near the surface of the water. For explosives detonating at or near the surface, an animal is considered exposed to a sound if the received sound level at the animal's location is above the background ambient noise level within a similar frequency band. For launches of targets and missiles from SNI, years of monitoring have demonstrated that sound levels at the nearest pinniped haulout site would produce short-term, localized changes in behavior, including temporarily vacating haul-outs.

As described in the Navy's application, the Navy identified (with NMFS' input) the types of behaviors that would be considered a take (moderate behavioral responses as characterized in Southall *et al.* (2007) (*e.g.,* altered migration paths or dive profiles, interrupted nursing, breeding

or feeding, or avoidance) that also would be expected to continue for the duration of an exposure). The Navy then compiled the available data indicating the received sound levels and distances from the sources when those responses have occurred to predict how many instances of Level B harassment by behavioral disturbance occur in a day. Take estimates alone do not provide information regarding the potential fitness or other biological consequences of the reactions on the affected individuals. NMFS therefore considers the available activity-specific, environmental, and species-specific information to determine the likely nature of the modeled behavioral responses and the potential fitness consequences for affected individuals.

In the range of potential behavioral effects that might be expected to be part of a response that qualifies as an instance of Level B harassment by behavioral disturbance (which by nature of the way it is modeled/counted, occurs within one day), the less severe end might include exposure to comparatively lower levels of a sound, at a detectably greater distance from the animal, for a few or several minutes. A less severe exposure of this nature could result in a behavioral response such as avoiding an area that an animal would otherwise have chosen to move through or feed in for some amount of time or breaking off one or a few feeding bouts. More severe effects could occur when the animal gets close enough to the source to receive a comparatively higher level, or is exposed intermittently to different sources throughout a day. Such effects might result in an animal having a more severe flight response and leaving a larger area for a day or more or potentially losing feeding opportunities for a day. However, such severe behavioral effects are expected to occur infrequently.

The majority of Level B harassment takes are expected to be in the form of milder responses (*i.e.,* lower-level exposures that still rise to the level of take) of a generally shorter duration. We anticipate more severe effects from takes when animals are exposed to higher received levels or at closer proximity to the source. However, depending on the context of an exposure (*e.g.,* depth, distance, if an animal is engaged in important behavior such as feeding), a behavioral response can vary across species and individuals within a species. Specifically, given a range of behavioral responses that may be classified as Level B harassment, to the degree that higher received levels are expected to result in more severe behavioral responses, only a smaller percentage of the anticipated Level B harassment from Navy activities would be expected to potentially result in more severe responses (see the *Group and Species-Specific Analyses* section below for more detailed information). To fully understand the likely impacts of the predicted/authorized take on an individual (*i.e.,* what is the likelihood or degree of fitness impacts), one must look closely at the available contextual information, such as the duration of likely exposures and the likely severity of the exposures (*e.g.,* whether they will occur for a longer duration over sequential days or the comparative sound level that will be received). Ellison *et al.* (2012) and Moore and Barlow (2013), among others, emphasize the importance of context (*e.g.,* behavioral state of the animals, distance from the sound source) in evaluating behavioral responses of marine mammals to acoustic sources.

Diel Cycle

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). For example, Henderson *et al.* (2016) found that ongoing smaller scale events had little to no impact on foraging dives for Blainville's beaked whale, while multi-day training events may decrease foraging behavior for Blainville's beaked whale (Manzano-Roth *et al.,* 2016). There are very few multi-day training events proposed for PMSR.

Durations of Navy activities utilizing explosives vary and are fully described in Appendix A (*PMSR Scenarios Descriptions*) of the 2020 PMSR DEIS/OEIS. The PMSR has activity occurring daily, but tests range from just a single missile launch or multiple launches, or may only be a captive carry where no munitions are air launched but the test is to determine the aircraft's ability to function properly with a missile on board, to a single or dual target launch from SNI, or a CSSQT where the ship's capability is tested by how it performs with a multiple weapons systems against a target. Also, while some tests are planned well in advance, some portions of or the entire test may be cancelled due to weather or atmospheric conditions, sea state, a particular system or support infrastructure dysfunction, or many other factors. Most proposed explosive detonation events are scheduled to occur over a short duration (one to a few hours); however, the explosive detonation component of the activity only lasts for seconds. Although explosive detonation events 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, or demonstrate sustained behavioral responses. All of these factors make it unlikely that individuals would be exposed to the exercise for extended periods or on consecutive days.

Assessing the Number of Individuals Taken and the Likelihood of Repeated Takes

As described previously, Navy modeling uses the best available science to predict the instances of exposure above certain acoustic thresholds, which are quantified as harassment takes. However, these numbers from the model do not identify whether and when the enumerated instances occur to the same individual marine mammal on different days, or how any such repeated takes may impact those individuals. One method that NMFS can use to help better understand the overall scope of the impacts is to compare the total instances of take against the abundance of that species (or stock if applicable). For example, if there are 100 estimated harassment takes in a population of 100, one can assume either that every individual will be exposed above acoustic thresholds in no more than one day, or that some smaller number will be exposed in one day but a few individuals will be exposed multiple days within a year and a few not exposed at all. However, in this proposed rule the percentage of takes relative to abundance is under five percent for all species and in most cases less than one percent, meaning that it is less likely that individuals of most species will be taken multiple times, although we note that pinnipeds that haul out regularly in areas where activities are regularly conducted are more likely to be taken on multiple days.

Temporary Threshold Shift

NMFS and the Navy have estimated that some species and stocks of marine mammals may sustain some level of TTS from explosive detonations. In general, 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. Explosives are generally referenced as broadband because of the various frequencies. Table 31 indicates the number of takes by TTS that may be incurred by different species from exposure to explosives. The TTS sustained by an animal is primarily classified by three characteristics:

1. Frequency—Available data (of mid-frequency hearing specialists exposed to mid- or high-frequency sounds; Southall *et al.,* 2007) suggest that most TTS occurs in the frequency range of the source up to one octave higher than the source (with the maximum TTS at ½ octave above). TTS from explosives would be broadband.

2. Degree of the shift (*i.e.,* by how many dB the sensitivity of the hearing is reduced)—Generally, both the degree of TTS and the duration of TTS will be greater if the marine mammal is exposed to a higher level of energy (which would occur when the peak dB level is higher or the duration is longer). The threshold for the onset of TTS was discussed previously in this proposed rule. An animal would have to approach closer to the source or remain in the vicinity of the sound source appreciably longer to increase the received SEL. The sound resulting from an explosive detonation is considered an impulsive sound and shares important qualities (*i.e.,* short duration and fast rise time) with other impulsive sounds such as those produced by air guns. Given the anticipated duration and levels of sound exposure, we would not expect marine mammals to incur more than relatively low levels of TTS (*i.e.,* single digits of sensitivity loss).

3. Duration of TTS (recovery time)—In the TTS laboratory studies (as discussed in the *Potential Effects of Specified Activities on Marine Mammals and their Habitat* section of 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. For the same reasons discussed in the Preliminary Analysis and Negligible Impact Determination—*Diel Cycle* section, and because of the short distance animals would need to be from 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.

The TTS takes would be the result of exposure to explosive detonations (broad-band). As described above, we expect the majority of these takes to be in the form of mild (single-digit), short-term (minutes to hours) TTS. This means that for one time a year, for several minutes, a taken individual will have slightly diminished hearing sensitivity (slightly more than natural variation, but nowhere near total deafness). The expected results of any one of these small number of mild TTS occurrences could be that (1) it does not overlap signals that are pertinent to that animal in the given time period, (2) it overlaps parts of signals that are important to the animal, but not in a manner that impairs interpretation, or (3) it reduces detectability of an important signal to a small degree for a short amount of time—in which case the animal may be aware and be able to compensate (but there may be slight energetic cost), or the animal may have some reduced opportunities (*e.g.,* to detect prey) or reduced capabilities to react with maximum effectiveness (*e.g.,* to detect a predator or navigate optimally). However, given the small number of times that any individual might incur TTS, the low degree of TTS and the short anticipated duration, and the low likelihood that one of these instances would occur across a time period in which the specific TTS overlapped the entirety of a critical signal, it is unlikely that TTS of the nature expected to result from the Navy activities would result in behavioral changes or other impacts that would impact any individual's (of any hearing sensitivity) reproduction or survival.

Auditory Masking or Communication Impairment

The ultimate potential impacts of masking on an individual (if it were to occur) are similar to those discussed for TTS, but an important difference is that masking only occurs during the time of the signal, versus TTS, which continues beyond the duration of the signal. Fundamentally, masking is referred to as a chronic effect because one of the key potential harmful components of masking is its duration—the fact that an animal would have reduced ability to hear or interpret critical cues becomes much more likely to cause a problem the longer it is occurring. Also inherent in the concept of masking is the fact that the potential for the effect is only present during the times that the animal and the source are in close enough proximity for the effect to occur (and further, this time period would need to coincide with a time that the animal was utilizing sounds at the masked frequency). As our analysis has indicated, because of the sound sources primarily involved in this rule, we do not expect the exposures with the potential for masking to be of a long duration. Masking is fundamentally more of a concern at lower frequencies, because low frequency signals propagate significantly further than higher frequencies and because they are more likely to overlap both the narrower low-frequency calls of mysticetes, as well as many non-communication cues, such as sounds from fish and invertebrate prey and geologic sounds that inform navigation. Masking is also more of a concern from continuous sources (versus intermittent) where there is no quiet time between a sound source within which auditory signals can be detected and interpreted. Explosions introduce low-frequency, broadband sounds into the environment, which could momentarily mask hearing thresholds in animals that are nearby, although sounds from explosions last for only a few seconds at most. Masking due to these short duration detonations would not be significant. Activities that have multiple, repeated detonations, such as some naval gunfire activities, could result in masking for mysticetes near the target impact area over the duration of the event. Effects of masking are only present when the sound from the explosion is present, and the effect is over the moment the sound is no longer detectable. Therefore, short-term exposure to the predominantly intermittent explosions are not expected to result in a meaningful amount of masking. For the reasons described here, any limited masking that could potentially occur from explosives would be minor and short-term and intermittent. Long-term consequences from physiological stress due to the sound of explosives would not be expected. In conclusion, masking is more likely to occur in the presence of broadband, relatively continuous noise sources such as from vessels; however, the duration of temporal and spatial overlap with any individual animal and the spatially separated sources that the Navy uses would not be expected to result in more than short-term, low impact masking that would not affect reproduction or survival of individuals.

Auditory Injury (Permanent Threshold Shift)

Table 31 indicates the number of individuals of each species for which Level A harassment in the form of PTS resulting from exposure to or explosives is estimated to occur. The number of individuals to potentially incur PTS annually (from explosives) for each species ranges from 0 to 49 (49 is for Dall's porpoise), but is more typically 0 or 1. As described previously, no

species are expected to incur non-auditory injury from explosives.

As discussed previously, the Navy utilizes aerial monitoring in addition to Lookouts on vessels to detect marine mammals for mitigation implementation. These Level A harassment take numbers represent the maximum number of instances in which marine mammals would be reasonably expected to incur PTS, and we have analyzed them accordingly. 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. Any PTS accrued as a result of exposure to Navy activities would be expected to be of a small amount. Permanent loss of some degree of hearing is a normal occurrence for older animals, and many animals are able to compensate for the shift, both in old age or at younger ages as the result of stressor exposure (Green *et al.,* 1987; Houser *et al.,* 2008; Ketten 2012; Mann *et al.,* 2010; McGfown *et al.,* 2020). While a small loss of hearing sensitivity may include some degree of energetic costs for compensating or may mean some small loss of opportunities or detection capabilities, at the expected scale it would be unlikely to impact behaviors, opportunities, or detection capabilities to a degree that would interfere with reproductive success or survival of any individuals.

Physiological Stress Response

Some of the lower level physiological stress responses (*e.g.,* orientation or startle response, change in respiration, change in heart rate) discussed in the Potential Effects of Specified Activities on Marine Mammals and their Habitat would likely co-occur with the predicted harassments, although these responses are more difficult to detect and fewer data exist relating these responses to specific received levels of sound. However, we would not expect the Navy's generally short-term and intermittent activities to create conditions of long-term, continuous noise leading to long-term physiological stress responses in marine mammals that could affect reproduction or survival.

Group and Species-Specific Analyses

In this section, we build on the general analysis that applies to all marine mammals in the PMSR Study Area from the previous section, and include first information and analysis that applies to mysticetes or, separately, odontocetes, and pinnipeds and then within those three sections, more specific information that applies to smaller groups, where applicable, and the affected species and stocks. The specific take numbers proposed for authorization are discussed in Tables 31 and 32, and here we provide some additional context and discussion regarding how we consider the proposed take numbers in those analyses. The maximum amount and type of incidental take of marine mammals reasonably likely to occur from explosive detonations and target and missile launch activities and therefore authorized during the seven-year training and testing period are shown in Tables 31 and 32 below. The vast majority of predicted exposures are expected to be Level B harassment (TTS and behavioral disturbance) from explosive sources during training and testing activities and missile launch activities on SNI.

TABLE 31— ANNUAL ESTIMATED TAKES BY LEVEL A AND LEVEL B HARASSMENT FOR MARINE MAMMALS IN THE PMSR STUDY AREA (EXCLUDING SNI) AND THE NUMBER INDICATING THE INSTANCES OF TOTAL TAKE AS A PERCENTAGE OF STOCK ABUNDANCE

Common name	Stock/DPS	Proposed annual take by Level A and Level B harassment			Total take	Abundance (2020 draft SARS)	Percent taken by abundance
		Behavioral response	TTS	PTS			
Blue whale *	Eastern North Pacific.	7	4	0	11	1,496	0.74
Fin whale *	California, Oregon, and Washington.	14	7	1	22	9,029	0.24
Gray whale	Eastern North Pacific.	9	5	0	14	26,960	0.05
Humpback whale *	California, Oregon, and Washington/ Mexico DPS.	7	4	0	11	2,900	0.38
	California, Oregon, and Washington/ Central America DPS.	1	0	0	1	2,900	0.03
Minke whale	California, Oregon, and Washington.	2	1	0	3	636	0.47
Bottlenose dolphin	California, Oregon, and Washington Offshore.	5	5	1	11	1924	0.57
Dall's porpoise	California, Oregon, and Washington.	261	406	49	716	25,750	2.78
Dwarf sperm whale	California, Oregon, and Washington.	20	31	6	57	4,111	1.39
Long-beaked common dolphin.	California	66	44	9	119	101,305	0.12
Northern right whale dolphin.	California, Oregon, and Washington.	3	2	1	6	26,556	0.02
Pacific white-sided dolphin.	California, Oregon, and Washington.	11	8	2	21	26,814	0.08
Pygmy sperm whale.	California, Oregon, and Washington.	20	31	6	57	4,111	1.39

TABLE 31— ANNUAL ESTIMATED TAKES BY LEVEL A AND LEVEL B HARASSMENT FOR MARINE MAMMALS IN THE PMSR STUDY AREA (EXCLUDING SNI) AND THE NUMBER INDICATING THE INSTANCES OF TOTAL TAKE AS A PERCENTAGE OF STOCK ABUNDANCE—Continued

Common name	Stock/DPS	Proposed annual take by Level A and Level B harassment			Total take	Abundance (2020 draft SARS)	Percent taken by abundance
		Behavioral response	TTS	PTS			
Risso's dolphins	California, Oregon, and Washington.	6	3	1	10	6,336	0.16
Short-beaked common dolphin.	California, Oregon, and Washington.	90	65	15	170	969,861	0.02
Sperm whale*	California, Oregon, and Washington.	1	1	0	2	1,997	0.10
Striped dolphin	California, Oregon, and Washington.	1	1	0	2	29,211	0.01
Harbor seal	California	202	120	14	336	30,968	1.08
Northern elephant seal.	California	37	63	22	122	179,000	0.07
California sea lion	U.S. Stock	8	12	2	22	257,606	0.01
Guadalupe fur seal*.	Mexico to California.	1	1	0	2	34,187	0.01

Note: Percentages taken by abundance may be less for some stocks as the abundance would be less in the PMSR Study Area depending on the range of a particular stock.
* ESA-listed species in PMSR Study Area.

TABLE 32—ANNUAL ESTIMATED TAKES BY LEVEL A AND LEVEL B HARASSMENT FOR PINNIPED ON SNI AND THE NUMBER INDICATING THE INSTANCES OF TOTAL TAKE AS A PERCENTAGE OF STOCK ABUNDANCE

Species	Stock	Proposed annual take by Level B harassment	Abundance (2020 draft SARS)	Percent taken by abundance	Proposed 7-year total take by Level B harassment
California sea lion	U.S.	11,000	257,606	4.27	77,000
Harbor seal	California	480	30,968	1.55	3,360
Northern elephant seal	California	40	179,000	0.02	280

In the discussions below, the estimated takes by Level B harassment represent instances of take, not the number of individuals taken (the much lower and less frequent takes by Level A harassment are far more likely to be associated with separate individuals). The total take numbers (by any method of taking) for species are compared to their associated abundance estimates to evaluate the magnitude of impacts across the species and to individuals. Abundance percentage comparisons are less than three percent for all species and stocks and nearly all are one percent or less and zero in many cases for explosives and less than five percent for all species on SNI from target and missile launch activities. This means that: (1) Not all of the individuals will be taken, and many will not be taken at all; (2) barring specific circumstances suggesting repeated takes of individuals (such as in circumstances where all activities resulting in take are focused in one area and time where the same individual marine mammals are known to congregate, such as pinnipeds on SNI), the average or expected number of days taken for those individuals taken is one per year; and (3) we would not expect any individuals to be taken more than a few times in a year, or for those days to be sequential.

To assist in understanding what this analysis means, we clarify a few issues related to estimated takes and the analysis here. An individual that incurs PTS or TTS may sometimes, for example, also be subject to direct behavioral disturbance at the same time. As described above in this section, the degree of PTS, and the degree and duration of TTS, expected to be incurred from the Navy's activities are not expected to impact marine mammals such that their reproduction or survival could be affected. Similarly, data do not suggest that a single instance in which an animal incurs PTS or TTS and also has an additional direct behavioral response would result in impacts to reproduction or survival. Accordingly, in analyzing the numbers of takes and the likelihood of repeated and sequential takes, we consider all the types of take, so that individuals potentially experiencing both threshold shift and direct behavioral responses are appropriately considered. The number of Level A harassment takes by PTS are so low (and zero in most cases) compared to abundance numbers that it is considered highly unlikely that any individual would be taken at those levels more than once.

On the less severe end, exposure to comparatively lower levels of sound at a detectably greater distance from the animal, for a few or several minutes, could result in a behavioral response such as avoiding an area that an animal would otherwise have moved through or fed in, or breaking off one or a few feeding bouts. More severe behavioral effects could occur when an animal gets close enough to the source to receive a comparatively higher level of sound, is exposed continuously to one source for a longer time, or is exposed intermittently to different sources throughout a day. Such effects might result in an animal having a more severe flight response and leaving a larger area for a day or more, or potentially losing feeding opportunities for a day. However, such severe behavioral effects are not expected to occur.

Occasional, milder behavioral reactions are unlikely to cause long-term

consequences for individual animals or populations, and even if some smaller subset of the takes are in the form of a longer (several hours or a day) and more severe responses, if they are not expected to be repeated over sequential days, impacts to individual fitness are not anticipated. Nearly all studies and experts agree that infrequent exposures of a single day or less are unlikely to impact an individual's overall energy budget (Farmer *et al.,* 2018; Harris e*t al.,* 2017; King *et al.,* 2015; NAS 2017; New *et al.,* 2014; Southall *et al.,* 2007; Villegas-Amtmann *et al.,* 2015).

The analyses below in some cases address species and stocks collectively if they occupy the same functional hearing group (*i.e.,* low, mid, and high-frequency cetaceans and pinnipeds), share similar life history strategies, and/or are known to behaviorally respond similarly to stressors. Because some of these groups or species share characteristics that inform the impact analysis similarly, it would be duplicative to repeat the same analysis for each species. In addition, similar species typically have the same hearing capabilities and behaviorally respond in the same manner.

Thus, our analysis below considers the effects of the Navy's activities on each affected species even where discussion is organized by functional hearing group and/or information is evaluated at the group level. Where there are meaningful differences between species that would further differentiate the analysis, they are either described within the section or the discussion for those species is included as a separate subsection. Specifically, below we first give broad descriptions of the mysticete, odontocete, and pinniped groups and then differentiate into further groups and species as appropriate.

Mysticetes

This section builds on the broader discussion above and brings together the discussion of the different types and amounts of take that different species are likely to incur, the applicable mitigation, and the status of the species to support the negligible impact determinations for each species. We have described (above in the *General Negligible Impact Analysis* section) the unlikelihood of any masking having effects that would impact the reproduction or survival of any of the individual marine mammals affected by the Navy's activities. We also described in the *Potential Effects of Specified Activities on Marine Mammals and their Habitat* section of the proposed rule the unlikelihood of any habitat impacts having effects that would impact the reproduction or survival of any of the individual marine mammals affected by the Navy's activities. There is no predicted non-auditory tissue damage from explosives for any species, and only one take by PTS of any mysticete (fin whale) annually. Much of the discussion below focuses on the behavioral effects and the mitigation measures that reduce the probability or severity of effects. Because there are species-specific considerations, at the end of the section we break out our findings on a species-specific basis.

In Table 31 above, we indicate for each species the total annual numbers of take by Level A and Level B harassment for mysticetes, and a number indicating the instances of total take as a percentage of abundance in the PMSR Study Area. Note also that for mysticetes, the abundance within the PMSR Study Area represents only a portion of the species or stock abundance.

No Bryde's whales, gray whales (Western North Pacific stock), or sei whales would be taken by Level A harassment or Level B harassment and therefore are not discussed further. For other mysticetes, exposure to explosives will result in small numbers of take: 1–14 Takes by Level B harassment by behavioral disturbance per species, and 4–7 by TTS per species. One take by PTS will result for fin whales and 0 for all other mysticetes. Based on this information, the majority of the Level B harassment by behavioral disturbance is expected to be of low severity and of shorter duration. No non-auditory tissue damage from training and testing activities is anticipated or authorized for any species.

Research and observations show that if mysticetes are exposed to impulsive sounds such as those from explosives, they may react in a variety of ways, which may include alerting, startling, breaking off feeding dives and surfacing, diving or swimming away, changing vocalization, or showing no response at all (DOD, 2017; Nowacek, 2007; Richardson, 1995; Southall *et al.,* 2007). Overall and in consideration of the context for an exposure, mysticetes have been observed to be more reactive to acoustic disturbance when a noise source is located directly in their path or the source is nearby (somewhat independent of the sound level) (Dunlop *et al.,* 2016; Dunlop *et al.,* 2018; Ellison *et al.,* 2011; Friedlaender *et al.,* 2016; Henderson *et al.,* 2019; Malme *et al.,* 1985; Richardson *et al.,* 1995; Southall *et al.,* 2007a). Mysticetes have been observed to be more reactive to acoustic disturbance when a noise source is located directly on their migration route. Mysticetes disturbed while migrating could pause their migration or route around the disturbance, while males en route to breeding grounds have been shown to be less responsive to disturbances. Although some may pause temporarily, they will resume migration shortly after the exposure ends. Animals disturbed while engaged in other activities such as feeding or reproductive behaviors may be more likely to ignore or tolerate the disturbance and continue their natural behavior patterns. Because noise from most activities using explosives is short term and intermittent, and because detonations usually occur within a small area, behavioral reactions from mysticetes, if they occur at all, are likely to be short term and of little to no significance.

Noise from explosions is broadband with most energy below a few hundred Hz; therefore, any reduction in hearing sensitivity from exposure to explosive sounds is likely to be broadband with effects predominantly at lower frequencies. Mysticetes that do experience threshold shift (*i.e.,* TTS or the one instance of PTS for fin whale) from exposure to explosives may have reduced ability to detect biologically important sounds (*e.g.,* social vocalizations). For example, during the short period that a mysticete experiences TTS, social calls from conspecifics could be more difficult to detect or interpret, the ability to detect predators may be reduced, and the ability to detect and avoid sounds from approaching vessels or other stressors might be reduced. Any TTS that would occur would be of short duration.

While NMFS can make a negligible impact determination on Navy's estimated take numbers, the implementation of mitigation and the sightability of mysticetes (especially given their large size) reduces the potential for, and severity of, any threshold shift for mysticetes. When we look in ocean areas where the Navy has been intensively training and testing with explosive and other active acoustic sources for decades, there are no data suggesting any long-term consequences to reproduction or survival rates of mysticetes from explosives and other active acoustic sources. All the mysticete species discussed in this section will benefit from the mitigation measures described earlier in the Proposed Mitigation Measures section. Below we compile and summarize the information that supports our determination that the Navy's activities will not adversely affect any species through effects on annual rates of

recruitment or survival for any of the affected mysticete species.

Humpback whale—As noted in the Description of Marine Mammals and Their Habitat in the Area of the Specified Activities section, humpback whales in the PMSR Study Area are part of the ESA-threatened Mexico DPS and ESA-endangered Central America DPS of the CA/OR/WA stock with an increasing population trend. ESA Critical Habitat has been proposed in the PMSR Study Area. There are two biologically important areas for humpback whale feeding that overlap with a portion of the PMSR Study Area—the Morro Bay to Point Sal Feeding Area (designated from April to November) and the Santa Barbara Channel–San Miguel Feeding Area (designated from March to September) (Calambokidis *et al.,* 2015). Navy testing and training activities that use explosives could occur year round within the PMSR Study Area, although they generally would not occur in these relatively nearshore feeding areas, because both areas are close to the northern Channel Islands NMS, oil production platforms, and major vessel routes leading to and from the ports of Los Angeles and Long Beach. Further, even if some small number of humpback whale takes occurred in these BIAs and were to disrupt feeding behaviors, the short-term nature of the anticipated takes from these activities, combined with the likelihood that they would not occur on more than one day for any individual within a year, means that they are not expected to impact the reproduction or survival of any individuals.

NMFS proposes 12 takes by Level B harassment would occur (see Table 31): 7 takes by behavioral disturbance and 4 takes by TTS for Mexico DPS humpback whales and 1 take by behavioral disturbance and 0 takes by TTS for Central America DPS humpback whales (Table 31). Regarding the magnitude of takes by Level B harassment (TTS and behavioral disruption), the number of estimated total instances of take compared to the abundance is less than 1 percent (Table 31). Regarding the severity of those individual takes by Level B harassment by behavioral disturbance, we have explained that the duration of any exposure is expected to be between seconds and minutes (*i.e.,* short duration) (*i.e.,* of a low level and unlikely to evoke a severe response). Regarding the severity of takes by TTS, they are expected to be low-level, of short duration not at a level that will impact reproduction or survival.

Altogether, the CA/OR/WA stock includes the ESA-listed Mexico DPS (threatened) and Central America (endangered) DPS of humpback whales and has an increasing population trend. There is proposed critical habitat for humpback whales in the PMSR Study Area. Our analysis suggests only a very small portion of the stock will be taken and disturbed at a low-level with those individuals disturbed on likely one day within a year. The proposed takes are not expected to result in impacts on the reproduction or survival of any individuals, let alone have impacts on annual rates of recruitment or survival. No Level A harassment, serious injury, or mortality is anticipated or proposed for authorization. This low magnitude and severity of harassment effects is not expected to result in impacts on the reproduction or survival of any individuals, let alone have impacts on annual rates of recruitment or survival. Therefore, the total take will not adversely affect this species through impacts on annual rates of recruitment or survival. For these reasons, we have preliminarily determined, in consideration of all of the effects of the Navy's activities combined, that the proposed take will have a negligible impact on humpback whales.

Blue whale—Blue whales are listed as endangered under the ESA throughout their range. The Eastern North Pacific stock occurs in the PMSR Study Area with a stable population trend (NMFS 2019; Calambokidis and Barlow, 2020). There is no ESA-designated critical habitat, but there are three biologically important areas (BIAs) for feeding identified for blue whales in the PMSR Study Area. The feeding areas overlap (one wholly and two partially) with the PMSR Study Area (June through October). Navy testing and training activities that use explosives could occur year round within the PMSR Study Area. However, activities using explosives generally would not take place in the Point Conception/Arguello to Point Sal Feeding Area or the Santa Barbara Channel and San Miguel Feeding Area, because both areas are close to the northern Channel Islands NMS, oil production platforms, and major vessel routes leading to and from the ports of Los Angeles and Long Beach. The SNI feeding area overlaps a part of the PMSR Study Area that has been in high use for Navy testing and training activities for decades. Over the years, there has been very little change in Navy testing and training off SNI, and the waters within Warning Area 289, which overlap with the SNI Feeding Area, are essential for testing and training given their proximity to SNI. The area is used during activities requiring an aerial target impact area, missile launches from SNI, aerial and ship-based gunnery events, and sea surface missile launches. Even if some small number of blue whale takes occurred in these BIAs and were to disrupt feeding behaviors, the short-term nature of the anticipated takes from these activities, combined with the likelihood that they would not occur on more than one day for any individual within a year, means that they are not expected to impact the reproduction or survival of any individuals.

NMFS proposes to authorize 11 takes by Level B harassment, 7 takes by behavioral disturbance and 4 takes by TTS for blue whales (Table 31). Regarding the magnitude of takes by Level B harassment (TTS and behavioral disruption), the number of estimated total instances of take compared to the abundance is less than 1 percent (Table 31). Regarding the severity of those individual takes by Level B harassment by behavioral disturbance, we have explained that the duration of any exposure is expected to be between seconds and minutes (*i.e.,* short duration) (*i.e.,* of a low- level). Regarding the severity of takes by TTS, they are expected to be low-level, of short duration not at a level that will impact reproduction or survival.

Altogether, blue whales are listed as endangered, though the Eastern North Pacific stock is stable, and has a very large range. Our analysis suggests that a very small portion of the stock will be taken and disturbed at a low-level, with those individuals disturbed on likely one day within a year. No Level A harassment, serious injury, or mortality is anticipated or proposed for authorization. This low magnitude and severity of harassment effects is not expected to result in impacts on the reproduction or survival of any individuals, let alone have impacts on annual rates of recruitment or survival. Therefore, the total take will not adversely affect this species through impacts on annual rates of recruitment or survival. For these reasons, we have preliminarily determined, in consideration of all of the effects of the Navy's activities combined, that the proposed take will have a negligible impact on blue whales.

Fin whale—Fin whales are listed as endangered under the ESA throughout their range, with no ESA designated critical habitat or known biologically important areas identified for this species in the PMSR Study Area. The population trend for the CA/OR/WA stock, found in the PMSR Study Area, is increasing (NMFS 2019).

NMFS proposes to authorize 22 takes by Level B harassment, 14 takes by behavioral disturbance, 7 takes by TTS, and 1 take by PTS for fin whales (Table 31). Regarding the magnitude of takes by Level B harassment (TTS and behavioral disruption), the number of estimated total instances of take compared to the abundance is less than 1 percent (Table 31). Regarding the severity of those individual takes by Level B harassment by behavioral disturbance, we have explained that the duration of any exposure is expected to be between seconds and minutes (*i.e.,* short) (*i.e.,* of a low level). Regarding the severity of takes by TTS, they are expected to be low-level, of short duration not at a level that will impact reproduction or survival.

Altogether, fin whales are listed as endangered, with no designated critical habitat or biologically important areas in the PMSR Study Area, and the CA/OR/WA stock is increasing. Our analysis suggests that a very small portion of the stock will be taken and disturbed at a low level, with those individuals disturbed on likely one day within a year. No serious injury or mortality is anticipated or proposed for authorization. This low magnitude and severity of harassment effects is not expected to result in impacts on the reproduction or survival of any individuals, let alone have impacts on annual rates of recruitment or survival. Therefore, the total take will not adversely affect this species through impacts on annual rates of recruitment or survival. For these reasons, we have preliminarily determined, in consideration of all of the effects of the Navy's activities combined, that the proposed take will have a negligible impact on fin whales.

Gray whale (Eastern North Pacific stock)—The Gray whale (Eastern North Pacific stock) is not listed as endangered or threatened under the ESA and has an increasing population trend. There is an active UME for gray whales off the West Coast. The Eastern North Pacific population of gray whales that migrate along the West Coast has declined about 24 percent since 2016. It now stands at an estimated 20,580 whales (Stellar and Weller 2021). That is similar to previous fluctuations in the Eastern North Pacific population that has since recovered from the days of whaling. The decline coincides with the UME declared in 2019 and resembles a similar 23 percent decline documented after a UME 20 years earlier, in 1999–2000. The gray whale population rebounded following that previous UME to greater numbers than before. The continuing change in gray whale numbers suggests that large-scale fluctuations of this nature are not rare. The observed declines in abundance appear to represent short-term events that have not resulted in any detectable longer-term impacts on the population. We do not anticipate any mortality or impacts on reproduction or survival of any individuals, and given the low magnitude and severity of effects from Level B harassment only, even with the UME, they will not result in impacts on individual reproduction or survival, much less annual rates of recruitment or survival. Therefore, population-level effects to gray whales from the Navy's activities despite the UME are not anticipated.

Four designated biologically important areas for migration for gray whales (Calambokidis *et al.,* 2015) overlap with the PMSR Study Area and are active migration areas from October through July, although each individual area has its own specific date range depending on what portion of the northbound or southbound migration it is meant to cover. Gray whales would cross the PMSR Study Area twice a year during their annual southbound and northbound migrations. Navy testing and training activities that use explosives could occur year round within the PMSR Study Area, but generally they would occur farther offshore than the shallow-water, nearshore habitat generally preferred by gray whales during their migration. In an early study investigating the behavior of migrating gray whales exposed to an impulsive source in their migration path, a startle response was observed in 42 percent of the cases, but the change in behavior, when it occurred, did not persist (Malme *et al.,* 1984; Malme *et al.,* 1988; Richardson, 1995). If a gray whale were to react to sound from an explosion, it may pause its migration until the noise ceases or moves, or it may choose an alternate route around the location of the sound source if the source was directly in the whale's migratory path. Even if some small number of gray whale takes occurred in these BIAs in the form of disrupted feeding behaviors or traveling for migration, the short-term nature of the anticipated takes from these activities, combined with the likelihood that they would not occur on more than one day for any individual within a year, mean that they are not expected to impact the reproduction or survival of any individuals.

NMFS proposes to authorize 14 takes by Level B harassment, 9 takes by behavioral disturbance and 5 takes by TTS for gray whales (Table 31). Regarding the magnitude of takes by Level B harassment (TTS and behavioral disruption), the number of estimated total instances of take compared to the abundance is less than 1 percent (Table 31). Regarding the severity of those individual takes by Level B harassment by behavioral disturbance, we have explained that the duration of any exposure is expected to be between minutes and hours (*i.e.,* relatively short) (*i.e.,* of a moderate or lower level, less likely to evoke a severe response). Regarding the severity of takes by TTS, they are expected to be low-level, of short duration not at a level that will impact reproduction or survival.

Altogether, gray whales (Eastern North Pacific stock) are not listed under the ESA and the population is increasing. Our analysis suggests that a very small portion of the stock will be taken and disturbed at a low level, with those individuals disturbed on likely one day within a year. No Level A harassment, serious injury, or mortality is anticipated or proposed for authorization. This low magnitude and severity of harassment effects is not expected to result in impacts on the reproduction or survival of any individuals, either alone or in combination with the effects of the UME, let alone have impacts on annual rates of recruitment or survival. Therefore, the total take will not adversely affect this species through impacts on annual rates of recruitment or survival. For these reasons, we have preliminarily determined, in consideration of all of the effects of the Navy's activities combined, that the proposed take will have a negligible impact on gray whales.

Minke whale—Minke whale is not listed as endangered or threatened under the ESA and there are no known biologically important areas identified for these species in the PMSR Study Area. The CA/OR/WA stock occurs in the PMSR Study Area with no known population trend.

NMFS proposes to authorize 3 takes by Level B harassment, 2 takes by behavioral disturbance and 1 take by TTS for minke whales (Table 31). Regarding the magnitude of takes by Level B harassment (TTS and behavioral disruption), the number of estimated total instances of take compared to the abundance is less than 1 percent (Table 31). Regarding the severity of those individual takes by Level B harassment by behavioral disturbance, we have explained that the duration of any exposure is expected to be between minutes and hours (*i.e.,* relatively short) (*i.e.,* of a moderate or lower level, less likely to evoke a severe response). Regarding the severity of takes by TTS,

they are expected to be low-level, of short duration not at a level that will impact reproduction or survival.

Altogether, minke whales are not listed under the ESA and with no known population trend. Our analysis suggests that a very small portion of the stock will be taken and disturbed at a low level, with those individuals disturbed likely one day within a year. No Level A harassment, serious injury, or mortality is anticipated or proposed for authorization. This low magnitude and severity of harassment effects is not expected to result in impacts on the reproduction or survival of any individuals, let alone have impacts on annual rates of recruitment or survival. Therefore, the total take will not adversely affect this species through impacts on annual rates of recruitment or survival. For these reasons, we have preliminarily determined, in consideration of all of the effects of the Navy's activities combined, that the proposed take will have a negligible impact on minke whales.

Odontocetes

This section builds on the broader discussion above and brings together the discussion of the different types and amounts of take that different species are likely to incur, the applicable mitigation for each species, and the status of the species to support the negligible impact determinations for each species. We have described (above in the General Negligible Impact Analysis section) the unlikelihood of any masking having effects that would impact the reproduction or survival of any of the individual marine mammals affected by the Navy's activities. We also described in the Potential Effects of Specified Activities on Marine Mammals and their Habitat section of this proposed rule the unlikelihood of any habitat impacts having effects that would impact the reproduction or survival of any of the individual marine mammals affected by the Navy's activities. There is no predicted PTS from explosives for most odontocetes, with the exception of a few species, which is discussed below. There is no predicted non-auditory tissue damage from explosives for any species. Much of the discussion below focuses on the behavioral effects and the mitigation measures that reduce the probability or severity of effects. Here, we include information that applies to all of the odontocete species, which are then further divided and discussed in more detail in the following subsections: Kogia whales; sperm whales; beaked whales; porpoise, and dolphins and small whales. These subsections include more specific information about the groups, as well as conclusions for each species represented.

In Table 31 above, we indicate for each species the total annual numbers of take by Level A and Level B harassment for odontocetes, and a number indicating the instances of total take as a percentage of abundance in the PMSR Study Area. Note also that, for all odontocetes where estimated take is requested, their abundance within the PMSR Study Area represents only a portion of their respective species population.

No Baird's beaked whale, Cuvier's beaked whale, *Mesoplodont* spp. harbor porpoise, bottlenose dolphin (California coastal stock), killer whale, or short-finned pilot whale will be taken by Level A harassment or Level B harassment and therefore are not discussed further.

Odontocete echolocation occurs predominantly at frequencies significantly higher than 20 kHz, though there may be some small overlap at the lower part of their echolocating range for some species, which means that there is little likelihood that threshold shift, either temporary or permanent would interfere with feeding behaviors. Many of the other critical sounds that serve as cues for navigation and prey (*e.g.,* waves, fish, invertebrates) occur below a few kHz and the threshold shift that might be incurred by individuals exposed to explosives would likely be lower frequency (5 kHz or less) and spanning a wider frequency range, which could slightly lower an individual's sensitivity to navigational or prey cues, or a small portion of communication calls, for several minutes to hours (if temporary) or permanently. There is no reason to think that any of the individual odontocetes taken by TTS would incur these types of takes over more than one day, and therefore they are unlikely to result in impacts on reproduction or survival. The number of PTS takes from these activities are very low (0 annually for most, 1–15 for a few species, and 49 for Dall's porpoise), and as discussed previously because of the low degree of PTS (*i.e.,* low amount of hearing sensitivity loss), it is unlikely to affect reproduction or survival of any individuals.

The range of potential behavioral effects of sound exposure on marine mammals generally, and odontocetes specifically, has been discussed in detail previously. There are behavioral patterns that differentiate the likely impacts on odontocetes as compared to mysticetes. First, odontocetes echolocate to find prey, which means that they actively send out sounds to detect their prey. While there are many strategies for hunting, one common pattern, especially for deeper diving species, is many repeated deep dives within a bout, and multiple bouts within a day, to find and catch prey. As discussed above, studies demonstrate that odontocetes may cease their foraging dives in response to sound exposure. If enough foraging interruptions occur over multiple sequential days, and the individual either does not take in the necessary food, or must exert significant effort to find necessary food elsewhere, energy budget deficits can occur that could potentially result in impacts to reproductive success, such as increased cow/calf intervals (the time between successive calving). Second, while many mysticetes rely on seasonal migratory patterns that position them in a geographic location at a specific time of the year to take advantage of ephemeral large abundances of prey (*i.e.,* invertebrates or small fish, which they eat by the thousands), odontocetes forage more homogeneously on one fish or squid at a time. Therefore, if odontocetes are interrupted while feeding, it is often possible to find more prey relatively nearby.

Dwarf Sperm Whales and Pygmy Sperm Whales (Kogia species)—This section builds on the broader odontocete discussion above and brings together the discussion of the different types and amounts of take that these two species are likely to incur, the applicable mitigation, and the status of the species to support the negligible impact determinations for each species. Some Level A harassment by PTS is anticipated annually (6 takes for Dwarf and pygmy whale, see Table 31).

In Table 31 above, we indicate for each species the total annual numbers of take by Level A and Level B harassment above for dwarf sperm whales and pygmy sperm whales, and a number indicating the instances of total take as a percentage of the abundance within the PMSR Study Area. Note also that, for dwarf and pygmy sperm whales (and all odontocetes), the abundance within the PMSR Study Area represents only a portion of the species abundance.

As discussed above, the majority of takes by Level B harassment by behavioral disturbance of odontocetes, and thereby dwarf and pygmy sperm whales, is expected to be in the form of low severity of a shorter duration. As discussed earlier in this section, we anticipate more severe effects from takes when animals are exposed to higher received levels or for longer durations. Occasional milder Level B harassment

by behavioral disturbance, as is expected here, is unlikely to cause long-term consequences for either individual animals or populations.

We note that dwarf and pygmy sperm whales, as HF-sensitive species, have a lower PTS threshold than all other groups and therefore are generally likely to experience larger amounts of TTS and PTS. NMFS accordingly has evaluated slightly higher numbers of take for these species than most odontocetes (some of which would have zero takes of TTS/PTS). Even though the number of TTS and PTS takes are higher than for other odontocetes, any TTS and PTS is expected to be at a low to moderate level and for all of the reasons described above, TTS and PTS takes are not expected to impact reproduction or survival of any individual.

Neither pygmy sperm whales nor dwarf sperm whales are listed under the ESA, and there are no known biologically important areas identified for these species in the PMSR Study Area. The CA/OR/WA stocks specified for pygmy sperm whales and dwarf sperm whales are found in the PMSR Study Area. There is no information on trends for these species within the PMSR Study Area. Both pygmy and dwarf sperm whales will benefit from the mitigation measures described earlier in the Proposed Mitigation Measures section.

Regarding the magnitude of Level B harassment takes (TTS and behavioral disruption), the number of estimated total instances of take compared to the abundance is less than 2 percent for both dwarf and pygmy sperm whales in the PMSR Study Area (Table 31). Regarding the severity of those individual Level B harassment takes by behavioral disruption, we have explained that the duration of any exposure is expected to be between seconds and minutes (*i.e.,* short duration). Regarding the severity of TTS takes, they are expected to be low to moderate level, of short duration, and are broadband that would be expected to interfere with dwarf or pygmy sperm whale communication or other important cues. Therefore, the associated lost opportunities and capabilities are not at a level that will impact reproduction or survival. Dwarf sperm whales and pygmy sperm whales could be taken by a small amount of PTS annually, of likely low to moderate severity as described previously. A small permanent loss of hearing sensitivity (PTS) may include some degree of energetic costs for compensating or may mean some small loss of opportunities or detection capabilities, but at the expected degree the estimated takes by Level A harassment takes by PTS for dwarf sperm whales and pygmy sperm whales are unlikely to impact behaviors, opportunities, or detection capabilities to a degree that will interfere with reproductive success or survival of any individuals, let alone affect annual rates of recruitment or survival for the species.

Altogether, dwarf and pygmy sperm whales are not listed under the ESA and there are no known population trends. Our analysis suggests that a small portion of the stock in the PMSR Study Area will be taken, and disturbed at a low to moderate level, with those individuals likely not disturbed on more than one day a year. No serious injury or mortality is anticipated or proposed for authorization. The low magnitude and low to moderate severity of harassment effects is not expected to result in impacts on the reproduction or survival of any individuals, let alone have impacts on annual rates of recruitment or survival. Therefore, the total take will not adversely affect this species through impacts on annual rates of recruitment or survival. Some individuals are estimated to be taken by PTS of likely low to moderate severity. A small permanent loss of hearing sensitivity (PTS) may include some degree of energetic costs for compensating or may mean some small loss of opportunities or detection capabilities, but at the expected scale the estimated takes by Level A harassment by PTS are unlikely to impact behaviors, opportunities, or detection capabilities to a degree that would interfere with reproductive success or survival of any individuals, let alone affect annual rates of recruitment or survival. For these reasons, we have preliminarily determined, in consideration of all of the effects of the Navy's activities combined, that the proposed take will have a negligible impact on both dwarf and pygmy sperm whales.

Sperm whale—This section brings together the broader discussion above with the discussion of the different types and amounts of take that sperm whales could potentially incur, the applicable mitigation, and the status of the species to support the negligible impact determination.

In Table 31 above, we indicate the total annual numbers of take by Level A and Level B harassment for sperm whales, and a number indicating the instances of total take as a percentage of the abundance within the PMSR Study Area. Note also that, for sperm whales, the abundance within the PMSR Study represents only a portion of the species abundance.

As discussed above, the majority of take by Level B harassment by behavioral disturbance of odontocetes, and thereby sperm whales, is expected to be in the form of low severity of a generally shorter duration and is unlikely to cause long-term consequences for either individual animals or populations.

Sperm whales are listed as endangered under the ESA throughout their range, but there is no ESA designated critical habitat or known biologically important areas identified for this species within the PMSR Study Area. The CA/OR/WA stock occurs in the PMSR Study with a stable population trend (NMFS 2019). Sperm whales will benefit from the mitigation measures described earlier in the Proposed Mitigation Measures section.

Regarding the magnitude of takes by Level B harassment (TTS and behavioral disruption), the number of estimated total instances of take compared to the abundance is less than 1 percent in the PMSR Study Area (Table 31). Regarding the severity of those individual takes by Level B harassment by behavioral disturbance, we have explained that the duration of any exposure is expected to be between seconds and minutes (*i.e.,* short duration) and of a low level. Regarding the severity of TTS takes, they are expected to be low-level, of short duration, and mostly not in a frequency band that would be expected to interfere with important low-frequency cues, and would not be at a level that will impact reproduction or survival.

Altogether, sperm whales are listed as endangered under the ESA and have a stable population trend. Our analysis suggests that very few individuals within the PMSR Study Area will be taken and disturbed at a low level, with those individuals disturbed on likely one day within a year. No Level A harassment, serious injury, or mortality is anticipated or proposed for authorization. This low magnitude and severity of harassment effects is not expected to result in impacts on the reproduction or survival of any individuals, let alone have impacts on annual rates of recruitment or survival. Therefore, the total take will not adversely affect this species through impacts on annual rates of recruitment or survival. For these reasons, we have preliminarily determined, in consideration of all of the effects of the Navy's activities combined, that the proposed take will have a negligible impact on sperm whales.

Porpoise (Dall's Porpoise)—This section builds on the broader odontocete discussion above and brings together the discussion of the different types and amounts of take that Dall's porpoise are likely to incur, the applicable mitigation, and the status of the species to support the negligible impact determinations for each species. Some Level A harassment by PTS is anticipated annually (49 takes, see Table 31).

In Table 31 above, we indicate the total annual numbers of take by Level A and Level B harassment for Dall's porpoise, and a number indicating the instances of total take as a percentage of the abundance within the PMSR Study Area. Note also that, for Dall's porpoise (and all odontocetes), the abundance within the PMSR Study Area represents only a portion of the species abundance.

As discussed above, the majority of takes by Level B harassment by behavioral disturbance of odontocetes, and thereby Dall's porpoise, is expected to be in the form of low to moderate severity of a shorter duration. As discussed earlier in this section, we anticipate more severe effects from takes when animals are exposed to higher received levels or for longer durations. Occasional milder Level B harassment by behavioral disturbance, as is expected here, is unlikely to cause long-term consequences for either individual animals or populations.

We note that Dall's porpoise, as HF-sensitive species, have a lower PTS threshold than all other groups and therefore are generally likely to experience larger amounts of TTS and PTS. NMFS accordingly has evaluated slightly higher numbers of take for these species than most odontocetes (some of which would have zero takes of TTS/PTS). Therefore, even though the number of TTS and PTS takes are higher than for other odontocetes, any TTS or PTS is expected to be at a low to moderate level and for all of the reasons described above, TTS and PTS takes are not expected to impact reproduction or survival of any individual.

Dall's porpoise are not listed under the ESA, and there are no known biologically important areas identified for these species in the PMSR Study Area. The CA/OR/WA stock is found in the PMSR Study Area. There is no information on trends for this species within the PMSR Study Area. Dall's porpoise will benefit from the mitigation measures described earlier in the Proposed Mitigation Measures section.

Regarding the magnitude of Level B harassment takes (TTS and behavioral disruption), the number of estimated total instances of take compared to the abundance is less than 3 percent for Dall' porpoise in the PMSR Study Area (Table 31). Regarding the severity of those individual Level B harassment takes by behavioral disruption, we have explained that the duration of any exposure is expected to be between seconds and minutes (*i.e.,* relatively short duration). Regarding the severity of TTS takes, they are expected to be low to moderate level, of short duration, and mostly not in a frequency band that would be expected to interfere with communication and, therefore, the associated lost opportunities and capabilities are not at a level that will impact reproduction or survival. Dall's porpoise could be taken by a small amount of PTS annually, of likely low to moderate severity as described previously. A small permanent loss of hearing sensitivity (PTS) may include some degree of energetic costs for compensating or may mean some small loss of opportunities or detection capabilities, but at the expected degree the estimated takes by Level A harassment takes by PTS for Dall's porpoise are unlikely to impact behaviors, opportunities, or detection capabilities to a degree that will interfere with reproductive success or survival of any individuals, let alone affect annual rates of recruitment or survival.

Altogether, Dall's porpoise are not listed under the ESA and there are no known population trends for the CA/OR/WA stock. Our analysis suggests that a small portion of the stock will be taken, and disturbed at a low to moderate level, with those individuals likely not disturbed on more than one day or so a year. No serious injury or mortality is anticipated or proposed for authorization. The low magnitude and low to moderate severity of harassment effects is not expected to result in impacts on the reproduction or survival of any individuals, let alone have impacts on annual rates of recruitment or survival. Therefore, the total take will not adversely affect this species through impacts on annual rates of recruitment or survival. Some individuals are estimated to be taken by PTS of likely low to moderate severity. A small permanent loss of hearing sensitivity (PTS) may include some degree of energetic costs for compensating or may mean some small loss of opportunities or detection capabilities, but at the expected scale the estimated takes by Level A harassment by PTS are unlikely to impact behaviors, opportunities, or detection capabilities to a degree that would interfere with reproductive success or survival of any individuals, let alone affect annual rates of recruitment or survival. For these reasons, we have preliminarily determined, in consideration of all of the effects of the Navy's activities combined, that the proposed take will have a negligible impact on Dall's porpoise.

Small Whales and Dolphins—This section builds on the broader discussion above and brings together the discussion of the different types and amounts of take that different small whale and dolphin species are likely to incur, the applicable mitigation, and the status of the species to support the negligible impact determinations for each species.

In Table 31 above, we indicate for each species the total annual numbers of take by Level A and Level B harassment for dolphins and small whales, and a number indicating the instances of total take as a percentage of abundance in the PMSR Study Area. Note also that, for dolphins and small whales, the abundance within the PMSR Study Area represents only a portion of the respective species abundance.

The majority of takes by Level B harassment are expected to be in the form of low severity of a shorter duration. Occasional milder Level B harassment by behavioral disturbance, as is expected here, is unlikely to cause long-term consequences for either individual animals or populations that have any effect on reproduction or survival. Limited Level A harassment (PTS) is anticipated and proposed for six species (Long and short-beaked common dolphins, bottlenose dolphin, Risso's dolphin, Pacific white-sided dolphin, and Northern right whale dolphin).

Research and observations show that if delphinids are exposed to sounds they may react in a number of ways depending on their experience with the sound source and what activity they are engaged in at the time of the acoustic exposure. Delphinids may not react at all until the sound source is approaching within a few hundred meters, such as with a ship with hull-mounted sonar, to within a few kilometers, depending on the environmental conditions and species. Some dolphin species (the more surface-dwelling taxa—typically those with ''dolphin'' in the common name, such as bottlenose dolphins, spotted dolphins, spinner dolphins, rough-toothed dolphins, etc., but not Risso's dolphins), especially those residing in more industrialized or busy areas, have demonstrated more tolerance for disturbance and loud sounds and many of these species are known to approach

vessels to bow-ride. These species are often considered generally less sensitive to disturbance. Dolphins and small whales that reside in deeper waters and generally have fewer interactions with human activities are more likely to demonstrate more typical avoidance reactions and foraging interruptions as described above in the odontocete overview.

All the dolphin and small whale species discussed in this section will benefit from the mitigation measures described earlier in the Proposed Mitigation Measures section.

None of the small whale and dolphin species are listed as endangered or threatened species under the ESA. There are CA/OR/WA stocks for most of the small whales and dolphins found in the PMSR Study Area and most have unknown population trends, with the exception of the Short-beaked common dolphin that has a stable population trend and the Long-beaked common dolphin (California stock) that has an increasing population trend.

Regarding the magnitude of takes by Level B harassment (TTS and behavioral disturbance), the number of estimated total instances of take compared to the abundance is less than one percent for the dolphins and small whales in the PMSR Study Area (Table 31). Regarding the severity of those individual takes by Level B harassment by behavioral disturbance, we have explained the duration of any exposure is expected to be between seconds and minutes (*i.e.,* short duration). Regarding the severity of takes by TTS, they are expected to be low-level, of short duration and not at a level that will impact reproduction or survival. One to two individuals each of four species (Bottlenose dolphin, Northern right whale dolphin, Pacific white-dolphin, Risso's dolphin) are estimated to be taken by one to two PTS annually, of likely low severity as described previously. Slightly more takes by PTS for short-beaked common dolphin and long-beaked common dolphin are proposed for authorization, 15 and 9 takes, respectively. A small permanent loss of hearing sensitivity may include some degree of energetic costs for compensating or may mean some small loss of opportunities or detection capabilities, but at the expected scale the estimated takes by Level A harassment by PTS are unlikely to impact behaviors, opportunities, or detection capabilities to a degree that will interfere with reproductive success or survival of any individuals, let alone affect annual rates of recruitment or survival.

Altogether, none of the small whale or dolphin species are listed under the ESA and there are no known population trends for most species. No serious injury or mortality is anticipated or proposed for authorization. Our analysis suggests that only a small portion of the individuals of any of these species in the PMSR Study Area will be taken and disturbed at a low level, with those individuals likely disturbed no more than a day a year. Some take by PTS for five dolphin species is anticipated and proposed for authorization, but at the expected scale the estimated take by Level A harassment by PTS is unlikely to impact behaviors, opportunities, or detection capabilities to a degree that would interfere with reproductive success or survival of any individuals, let alone annual rates of recruitment or survival. This low magnitude and severity of harassment effects is not expected to result in impacts on the reproduction or survival of any individuals, let alone have impacts on annual rates of recruitment or survival. Therefore, the total take will not adversely affect these species through impacts on annual rates of recruitment or survival. For these reasons, we have preliminarily determined, in consideration of all of the effects of the Navy's activities combined, that the authorized take will have a negligible impact on all of these species of small whales and dolphins.

Pinnipeds

This section builds on the broader discussion above and brings together the discussion of the different types and amounts of take that different species and stocks of pinnipeds will likely incur, the applicable mitigation, and the status of the species and stocks to support the negligible impact determinations for each species or stock. We have described (above in the *General Negligible Impact Analysis* section) the unlikelihood of any masking having effects that will impact the reproduction or survival of any of the individual marine mammals affected by the Navy's activities. We have also described in the Potential Effects of Specified Activities on Marine Mammals and their Habitat section of this proposed rule that the specified activities would not have adverse or long-term impacts on marine mammal habitat, and therefore the unlikelihood of any habitat impacts affecting the reproduction or survival of any individual marine mammals affected by the Navy's activities. For pinnipeds, no serious injury or mortality is anticipated or proposed for authorization. Here, we include information that applies to all of the pinniped species and stocks.

In Table 31 and 32 above, we indicate the total annual numbers of take by Level A and Level B harassment for pinnipeds, and a number indicating the instances of total take as a percentage of the abundance within the PMSR Study Area by explosives and also by missile and rocket launch activities on SNI. Note also that, for pinniped species and stocks, the abundance within the PMSR Study Area represents only a portion of the species abundance.

The majority of take by Level B harassment by behavioral disturbance of pinnipeds, is expected to be in the form of low severity of short duration for explosives and low to moderate severity of short duration for target and missile launches on SNI and is unlikely to cause long-term consequences for either individual animals or populations.

Pinnipeds in the PMSR Study Area are not listed under the ESA with the exception of the threatened Guadalupe fur seal (Mexico stock), but there is no ESA designated critical habitat for the Guadalupe fur seal. Pupping does occur on SNI beaches, January through July. The Guadalupe fur seal has an increasing population trend. Nevertheless, there is an active UME for Guadalupe fur seal. Since 2015, there have been 492 strandings of Guadalupe fur seals (including live and dead seals). However, we do not anticipate any mortality or impacts on reproduction or survival of any individuals, and, given the low magnitude and severity of effects from Level B harassment only (2 Level B harassment takes annually), even with the UME they will not result in impacts on individual reproduction or survival, much less annual rates of recruitment or survival. Therefore, population-level effects to Guadalupe fur seal from the Navy's activities despite the UME are not anticipated. The California sea lion UME was recently closed, as elevated strandings occurred from 2013–2016. The U.S. stock of California sea lions has an increasing population trend. The California stocks of Northern Elephant seal and Northern fur seals also have an increasing population trend. The California stock of harbor seals has a stable population trend. Pinnipeds will benefit from the mitigation measures described earlier in the Proposed Mitigation Measures section.

Regarding the magnitude of takes by Level B harassment (TTS and behavioral disruption) for explosives, the number of estimated total instances of take compared to the abundance is approximately 1 percent or less in the PMSR Study Area (Table 31). Regarding the magnitude of takes by Level B harassment (TTS and behavioral

disruption) for target and missile launches, the number of estimated total instances of take compared to the abundance is less than five percent in the PMSR Study Area (Table 32). Given this information and the ranges of these stocks (*i.e.,* large ranges, but with individuals often staying in the vicinity of haulouts), only a small portion of individuals in these stocks are likely impacted and repeated exposures of individuals are not anticipated during explosives (*i.e.,* individuals are not expected to be taken on more than a few days within a year). Regarding the severity of those individual takes by Level B harassment by behavioral disturbance for explosives, the duration of any exposure is expected to be between seconds and minutes (*i.e.,* short duration). Regarding the severity of TTS takes from explosives, they are expected to be of low-level and short duration, and any associated lost opportunities and capabilities would not be at a level that will impact reproduction or survival.

Three species of pinnipeds (harbor seals, Northern elephant seal, and California sea lions) are estimated to be taken by PTS from explosives, 14, 22, and 2 takes, respectively, of likely low severity. A small permanent loss of hearing sensitivity (PTS) may include some degree of energetic costs for compensating or may mean some small loss of opportunities or detection capabilities, but at the expected scale the estimated takes by Level A harassment by PTS are unlikely to impact behaviors, opportunities, or detection capabilities to a degree that will interfere with reproductive success or survival of any individuals, let alone affect annual rates of recruitment or survival.

For missile launch activities on SNI, the proposed activities may result in take, in the form of Level B harassment only, from airborne sounds of missile launch activities (Table 32). A portion of individuals in these stocks are likely impacted and repeated exposures of individuals are anticipated during missile and target launches for pinnipeds hauled out on SNI (*i.e.,* individuals are expected to be taken on up to several days within a year), however, there is no reason to expect that these disturbances would occur on sequential days.

Regarding the magnitude of takes by Level B harassment, the number of estimated total instances of take compared to the abundance is less than 5 percent on SNI for all pinniped species (Table 32). Based on the best available information, including monitoring reports from similar activities that have been authorized by NMFS, Level B harassment will likely be limited behavioral reactions such as alerting to the noise, with some animals possibly moving toward or entering the water (*i.e.,* movements of more than 10 m and occasional flushing into the water with return to haulouts), depending on the species and the intensity of the launch noise. Regarding the severity of those individual takes by Level B harassment, any exposure is expected to be low to moderate and of relatively short duration and are unlikely to result in hearing impairment or to significantly disrupt foraging behavior. Given the launch acceleration and flight speed of the missiles, most launch events are of extremely short duration. Strong launch sounds are typically detectable near the beaches at western SNI for no more than a few seconds per launch (Holst *et al.,* 2010; Holst *et al.,* 2005a; Holst *et al.,* 2008; Holst *et al.,* 2005b). Pinnipeds hauled out on beaches where missiles fly over launched from the Alpha Launch Complex routinely haul out and continue to use these beaches in large numbers, but at the Building 807 Launch Complex few pinnipeds are known to haul out on the shoreline immediately adjacent to this launch site. We do not expect repeated exposures to occur on sequential days as it can take up to several weeks of planning between launch events. Responses of pinnipeds on beaches during launches are highly variable. Harbor seals can be more reactive when hauled out compared to other species, such as northern elephant seals. Northern elephant seals generally exhibit no reaction at all, except perhaps a heads-up response or some stirring. However, stronger reactions may occur if California sea lions are in the same area mingled with the northern elephant seals and the sea lions react strongly. While the reactions are variable, and can involve abrupt movements by some individuals, biological impacts of these responses appear to be limited. Even some number of repeated instances of Level B harassment (with no particular likelihood of sequential days or more sustained effect) of some small subset of an overall stock is unlikely to result in any decrease in fitness to those individuals, and thus would not result in any adverse impact to a stock as a whole. Flushing of pinnipeds into the water has the potential to result in mother-pup separation, or a stampede, either of which could potentially result in serious injury or mortality. For example, in some cases, harbor seals at SNI appear to be more responsive during the pupping/breeding season (Holst *et al.* 2005a; Holst *et al.* 2008), while in others, mothers and pups seem to react less to launches than lone individuals (Ugoretz and Greene Jr. 2012), and California sea lions seem to be consistently less responsive during the pupping season (Holst *et al.* 2010; Holst *et al.* 2005a; Holst *et al.* 2008; Holst *et al.* 2011; Holst *et al.* 2005b; Ugoretz and Greene Jr. 2012). Though pup abandonment could theoretically result from these reactions, site-specific monitoring data indicate that pup abandonment is not likely to occur as a result of the target and missile launches, as it has not been previously observed. As part of mitigation the Navy would avoid target and missile launches during the peak pinniped pupping season to the maximum extent practicable, and missiles would not cross over pinniped haulouts at elevations less than 305 m (1,000 ft). Based on the best available information, including reports from almost 20 years of marine mammal monitoring during launch events, no injury, serious injury, or mortality of marine mammals has occurred from any flushing events or is anticipated or proposed for authorization.

Altogether, pinnipeds are not listed under the ESA (except for Guadalupe fur seal that are threatened) and all pinniped stocks have increasing, stable, or unknown population trends. Our analysis suggests that a small portion of the stocks will be taken and disturbed at a low-moderate level, with those individuals disturbed on likely one day within a year from explosives and some individuals on SNI likely disturbed a few days a year within a year from target and missile launches. No serious injury or mortality is anticipated or proposed for authorization. No more than 22 individuals from three pinniped stocks are estimated to be taken by PTS, of likely low severity, annually. Additionally, no PTS is expected for Guadalupe fur seal. This low to moderate magnitude and severity of harassment effects is not expected to result in impacts on the reproduction or survival of any individuals (either alone or in combination with the effects of the UME for Guadulupe fur seal), let alone have impacts on annual rates of recruitment or survival, and therefore the total take will not adversely affect this species through impacts on annual rates of recruitment or survival. For these reasons, we have preliminarily determined, in consideration of all of the effects of the Navy's activities combined, that the proposed take will have a negligible impact on pinnipeds.

Determination

Based on the analysis contained herein of the likely effects of the specified activity on marine mammals and their habitat, NMFS preliminarily finds that the total marine mammal take from the Specified Activities will have a negligible impact on all affected marine mammal species. In addition as described previously, the Navy's proposed implementation of monitoring and mitigation measures would further reduce impacts to marine mammals.

Subsistence Harvest of Marine Mammals

In order to issue an incidental take authorization, NMFS must find that the specified activity will not have an ''unmitigable adverse impact'' on the subsistence uses of the affected marine mammal species or stocks by Alaskan Natives. NMFS has defined ''unmitigable adverse impact'' in 50 CFR 216.103 as an impact resulting from the specified activity: (1) That is likely to reduce the availability of the species to a level insufficient for a harvest to meet subsistence needs by: (i) Causing the marine mammals to abandon or avoid hunting areas; (ii) Directly displacing subsistence users; or (iii) Placing physical barriers between the marine mammals and the subsistence hunters; and (2) That cannot be sufficiently mitigated by other measures to increase the availability of marine mammals to allow subsistence needs to be met.

To our knowledge there are no relevant subsistence uses of the affected marine mammal stocks or species implicated by this action. Therefore, NMFS has preliminarily determined that the total taking of affected species or stocks would not have an unmitigable adverse impact on the availability of the species or stocks for taking for subsistence purposes.

Classification

Endangered Species Act

There are six marine mammal species under NMFS jurisdiction that are listed as endangered or threatened under the ESA with confirmed or possible occurrence in the PMSR Study Area: Blue whale, fin whale, gray whale, humpback whale, sei whale, and sperm whale. NMFS published a proposed rule on ESA-designated critical habitat for humpback whales (84 FR 54354; October 9, 2019).

The Navy will consult with NMFS pursuant to section 7 of the ESA for PMSR Study Area activities. NMFS will also consult internally on the issuance of the regulations and LOA under section 101(a)(5)(A) of the MMPA.

National Marine Sanctuaries Act

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

National Environmental Policy Act

To comply with the National Environmental Policy Act of 1969 (NEPA; 42 U.S.C. 4321 *et seq.*) and NOAA Administrative Order (NAO) 216–6A, NMFS must evaluate our proposed actions and alternatives with respect to potential impacts on the human environment. Accordingly, NMFS plans to adopt the PMSR FEIS/OEIS for the PMSR Study Area, provided our independent evaluation of the document finds that it includes adequate information analyzing the effects on the human environment of issuing regulations and LOAs under the MMPA. NMFS is a cooperating agency on the 2020 PMSR DEIS/OEIS and has worked extensively with the Navy in developing the document. The 2020 PMSR DEIS/OEIS was made available for public comment (85 FR 55257, April 24, 2020) (Also see *https://pmsr-eis.com*). We will review all comments submitted in response to the request for comments on the 2020 PMSR DEIS/OEIS and in response to the request for comments on this proposed rule prior to concluding our NEPA process or making a final decision on this proposed rule for the issuance of regulations under the MMPA and any subsequent issuance of a Letter of Authorization (LOA) to the Navy to incidentally take marine mammals during the specified activities.

Executive Order 12866

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

Regulatory Flexibility Act

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

List of Subjects in 50 CFR Part 218

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

Dated: July 1, 2021.

Samuel D. Rauch III,

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

For the reasons set out in the preamble, 50 CFR part 648 is proposed to be 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 follows:

Authority: 16 U.S.C. 1361 *et seq.,* unless otherwise noted.

■ 2. Revise subpart B to read as follows:

Subpart B—Taking and Importing Marine Mammals; U.S. Navy's Point Mugu Sea Range (PMSR) Training and Testing (PMSR) Study Area

Sec.

Subpart B—Taking and Importing Marine Mammals; U.S. Navy's Point Mugu Sea Range (PMSR) Training and Testing (PMSR) Study Area

§ 218.10 Specified activity and 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 described in paragraph (b) of this section and that occurs incidental to the activities listed in paragraph (c) of this section.

(b) The taking of marine mammals by the Navy under this subpart may be authorized in a Letter of Authorization (LOA) only if it occurs within the Point Mugu Sea Range (PMSR) Training and Testing Study Area. The PMSR Study Area is located adjacent to Los Angeles, Ventura, Santa Barbara, and San Luis Obispo Counties along the Pacific Coast of Southern California and includes a 36,000-square-mile sea range. The two primary components of the PMSR Complex are Special Use Airspace and the ocean Operating Areas.

(c) The taking of marine mammals by the Navy is only authorized if it occurs incidental to the Navy conducting training and testing activities, including:

(1) *Training.*

(i) Air warfare;

(ii) Electronic warfare; and

(iii) Surface warfare.

(2) *Testing.*

(i) Air warfare;

(ii) Electronic warfare; and

(iii) Surface warfare.

§ 218.11 Effective dates.

Regulations in this subpart are effective from October 31, 2021, through October 30, 2028.

§ 218.12 Permissible methods of taking.

(a) Under an LOA issued pursuant to §§ 216.106 of this chapter and § 218.16, the Holder of the LOA (hereinafter ''Navy'') may incidentally, but not intentionally, take marine mammals within the area described in § 218.10(b) by Level A harassment and Level B harassment associated with the use of explosives and missile launch activities, provided the activity is in compliance with all terms, conditions, and requirements of the regulations in this subpart and the applicable LOA.

(b) The incidental take of marine mammals by the activities listed in § 218.10(c) is limited to the species and stocks listed in Table 1 of this section.

TABLE 1 TO § 218.12(b)

Common name	Scientific name	Stock
Blue whale	*Balaenoptera musculus*	Eastern North Pacific.
Fin whale	*Balaenoptera physalus*	California, Oregon, and Washington.
Gray whale	*Eschrichtius robustus*	Eastern North Pacific.
Humpback whale	*Megaptera novaeangliae*	California, Oregon, Washington.
Minke whale	*Balaenoptera acutorostrata*	California, Oregon, and Washington.
Common Bottlenose dolphin	*Tursiops truncatus*	California, Oregon, and Washington Offshore.
Dall's porpoise	*Phocoenoides dalli*	California, Oregon, and Washington.
Dwarf sperm whale	*Kogia sima*	California, Oregon, and Washington.
Long-beaked common dolphin	*Delphinus capensis*	California.
Mesoplodont beaked whales [4]	*Mesoplodon spp*	California, Oregon, and Washington.
Northern right whale dolphin	*Lissodelphis borealis*	California, Oregon, and Washington.
Pacific white-sided dolphin	*Lagenorhynchus obliquidens*	California, Oregon, and Washington.
Pygmy killer whale	*Feresa attenuata.*	
Pygmy sperm whale	*Kogia breviceps*	California, Oregon, and Washington.
Risso's dolphins	*Grampus griseus*	California, Oregon, and Washington.
Short-beaked common dolphin	*Delphinus delphis*	California, Oregon, and Washington.
Sperm whale	*Physeter macrocephalus*	California, Oregon, and Washington.
Striped dolphin	*Stenella coeruleoalba*	California, Oregon, and Washington.
Harbor seal	*Phoca vitulina*	California.
Northern elephant seal	*Mirounga angustirostris*	California.
California sea lion	*Zalophus californianus*	U.S. Stock.
Guadalupe fur seal	*Arctocephalus townsendi*	Mexico to California.

§ 218.13 Prohibitions.

Notwithstanding incidental takings contemplated in § 218.12(a) and authorized by an LOA issued under §§ 216.106 of this chapter and 218.16, no person in connection with the activities listed in § 218.10(c) may:

(a) Violate, or fail to comply with, the terms, conditions, and requirements of this subpart or an LOA issued under §§ 216.106 of this chapter and 218.16;

(b) Take any marine mammal not specified in § 218.12(b);

(c) Take any marine mammal specified in § 218.12(b) in any manner other than as specified in the LOA issued under §§ 216.106 of this chapter and 218.16;

(d) Take a marine mammal specified in § 218.12(b) if NMFS determines such taking results in more than a negligible impact on the species or stock of such marine mammal.

§ 218.14 Mitigation requirements.

When conducting the activities identified in § 218.10(c), the mitigation measures contained in any LOA issued under §§ 216.106 of this chapter and 218.16 must be implemented. These mitigation measures include, but are not limited to:

(a) *Procedural mitigation.* Procedural mitigation is mitigation that the Navy must implement whenever and wherever an applicable training or testing activity takes place within the PMSR Study Area for each applicable activity category or stressor category and includes acoustic stressors (*i.e.,* weapons firing noise), explosive stressors (*i.e.,* medium-caliber and large-caliber projectiles, missiles and rockets, bombs), and physical disturbance and strike stressors *(i.e.,* vessel movement; towed in-water devices; small-, medium-, and large-caliber non-explosive practice munitions; non-explosive missiles and rockets; and non-explosive bombs).

(1) *Environmental awareness and education.* Appropriate Navy personnel (including civilian personnel) involved in mitigation and training or testing reporting under the specified activities will complete one or more modules of the U.S Navy Afloat Environmental Compliance Training Series, as identified in their career path training

plan. Modules include: Introduction to the U.S. Navy Afloat Environmental Compliance Training Series, Marine Species Awareness Training; and U.S. Navy Protective Measures Assessment Protocol.

(2) *Weapons firing noise.* Weapons firing noise associated with large-caliber gunnery activities.

(i) *Number of Lookouts and observation platform.* One Lookout must be positioned on the ship conducting the firing. Depending on the activity, the Lookout could be the same as the one provided for under ''Small-, medium-, and large-caliber non-explosive practice munitions'' in paragraph (a)(7)(i) of this section.

(ii) *Mitigation zone and requirements.* The mitigation zone must be thirty degrees on either side of the firing line out to 70 yd from the muzzle of the weapon being fired.

(A) *Prior to the initial start of the activity.* Navy personnel must observe the mitigation zone for floating vegetation and marine mammals; if floating vegetation or marine mammals are observed, Navy personnel must relocate or delay the start of weapons firing.

(B) *During the activity.* Navy personnel must observe the mitigation zone for floating vegetation and marine mammals; if floating vegetation or marine mammals are observed, Navy personnel must cease weapons firing.

(C) *Commencement/recommencement conditions after a marine mammal sighting before or during the activity.* Navy personnel must allow a sighted marine mammal to leave the mitigation zone prior to the initial start of the activity (by delaying the start) or during the activity (by not recommencing weapons firing) until one of the following conditions has been met: The animal is observed exiting the mitigation zone; the animal is thought to have exited the mitigation zone based on a determination of its course, speed, and movement relative to the firing ship; the mitigation zone has been clear from any additional sightings for 30 minutes (min); or for mobile activities, the firing ship has transited a distance equal to double that of the mitigation zone size beyond the location of the last sighting.

(3) *Explosive medium-caliber and large-caliber projectiles.* Gunnery activities using explosive medium-caliber and large-caliber projectiles. Mitigation applies to activities using a surface target.

(i) *Number of Lookouts and observation platform.* One Lookout must be on the vessel or aircraft conducting the activity. For activities using explosive large-caliber projectiles, depending on the activity, the Lookout could be the same as the one described in ''Weapons firing noise'' in paragraph (a)(2)(i) of this section. If additional platforms are participating in the activity, Navy personnel positioned on those assets (*e.g.,* safety observers, evaluators) must support observing the relevant mitigation zone for marine mammals and other applicable biological resources while performing their regular duties.

(ii) *Mitigation zone and requirements.* The relevant mitigation zones are as follows: 200 yd (182.88 m) around the intended impact location for air-to-surface activities using explosive medium-caliber projectiles; 600 yd (548.64 m) around the intended impact location for surface-to-surface activities using explosive medium-caliber projectiles; and 1,000 yd (914.4 m) around the intended impact location for surface-to-surface activities using explosive large-caliber projectiles.

(A) *Prior to the initial start of the activity* (*e.g.,* when maneuvering on station). Navy personnel must observe the mitigation zone for floating vegetation and marine mammals; if floating vegetation or marine mammals are observed, Navy personnel must relocate or delay the start of firing.

(B) *During the activity.* Navy personnel must observe the mitigation zone for floating vegetation and marine mammals; if floating vegetation or marine mammals are observed, Navy personnel must cease firing.

(C) *Commencement/recommencement conditions after a marine mammal sighting before or during the activity.* Navy personnel must allow a sighted marine mammal to leave the mitigation zone prior to the initial start of the activity (by delaying the start) or during the activity (by not recommencing firing) until one of the following conditions has been met: The animal is observed exiting the mitigation zone; the animal is thought to have exited the mitigation zone based on a determination of its course, speed, and movement relative to the intended impact location; the mitigation zone has been clear from any additional sightings for 10 min for aircraft-based firing or 30 min for vessel-based firing; or for activities using mobile targets, the intended impact location has transited a distance equal to double that of the mitigation zone size beyond the location of the last sighting.

(D) *After completion of the activity (e.g., prior to maneuvering off station).* Navy personnel must, when practical (*e.g.,* when platforms are not constrained by fuel restrictions or mission-essential follow-on commitments), observe for marine mammals in the vicinity of where detonations occurred; if any injured or dead marine mammals are observed, Navy personnel must follow established incident reporting procedures. If additional platforms are supporting this activity (*e.g.,* providing range clearance), Navy personnel on these assets must assist in the visual observation of the area where detonations occurred.

(4) *Explosive missiles and rockets.* Aircraft-deployed explosive missiles and rockets. Mitigation applies to activities using a maritime surface target at ranges up to 75 nmi.

(i) *Number of Lookouts and observation platform.* One Lookout must be positioned in an aircraft. If additional platforms are participating in the activity, Navy personnel positioned on those assets (*e.g.,* safety observers, evaluators) must support observing the relevant mitigation zone for marine mammals and other applicable biological resources while performing their regular duties.

(ii) *Mitigation zone and requirements.* The relevant mitigation zones are as follows: 900 yd (822.96 m) around the intended impact location for missiles or rockets with 0.6–20 lb net explosive weight; and 2,000 yd (1,828.8 m) around the intended impact location for missiles with 21–500 lb net explosive weight.

(A) *Prior to the initial start of the activity* (*e.g.,* during a fly-over of the mitigation zone). Navy personnel must observe the mitigation zone for floating vegetation and marine mammals; if floating vegetation or marine mammals are observed, Navy personnel must relocate or delay the start of firing.

(B) *During the activity.* Navy personnel must observe the mitigation zone for floating vegetation and marine mammals; if floating vegetation or marine mammals are observed, Navy personnel must cease firing.

(C) *Commencement/recommencement conditions after a marine mammal sighting before or during the activity.* Navy personnel must allow a sighted marine mammal to leave the mitigation zone prior to the initial start of the activity (by delaying the start) or during the activity (by not recommencing firing) until one of the following conditions has been met: The animal is observed exiting the mitigation zone; the animal is thought to have exited the mitigation zone based on a determination of its course, speed, and movement relative to the intended impact location; or the mitigation zone has been clear from any additional sightings for 10 min when the activity

involves aircraft that have fuel constraints, or 30 min when the activity involves aircraft that are not typically fuel constrained.

(D) *After completion of the activity* (*e.g.,* prior to maneuvering off station). Navy personnel must, when practical (*e.g.,* when platforms are not constrained by fuel restrictions or mission-essential follow-on commitments), observe for marine mammals in the vicinity of where detonations occurred; if any injured or dead marine mammals are observed, Navy personnel must follow established incident reporting procedures. If additional platforms are supporting this activity (*e.g.,* providing range clearance), Navy personnel on these assets will assist in the visual observation of the area where detonations occurred.

(5) *Explosive bombs.*

(i) *Number of Lookouts and observation platform.* One Lookout must be positioned in an aircraft conducting the activity. If additional platforms are participating in the activity, Navy personnel positioned on those assets (*e.g.,* safety observers, evaluators) must support observing the relevant mitigation zone for marine mammals and other applicable biological resources while performing their regular duties.

(ii) *Mitigation zone and requirements.* The relevant mitigation zones is 2,500 yd (2,286 m) around the intended target.

(A) *Prior to the initial start of the activity (e.g., when arriving on station).* Navy personnel must observe the mitigation zone for floating vegetation and marine mammals; if floating vegetation or marine mammals are observed, Navy personnel must relocate or delay the start of bomb deployment.

(B) *During the activity (e.g., during target approach).* Navy personnel must observe the mitigation zone for floating vegetation and marine mammals; if floating vegetation or marine mammals are observed, Navy personnel must cease bomb deployment.

(C) *Commencement/recommencement conditions after a marine mammal sighting before or during the activity.* Navy personnel must allow a sighted marine mammal to leave the mitigation zone prior to the initial start of the activity (by delaying the start) or during the activity (by not recommencing bomb deployment) until one of the following conditions has been met: The animal is observed exiting the mitigation zone; the animal is thought to have exited the mitigation zone based on a determination of its course, speed, and movement relative to the intended target; the mitigation zone has been clear from any additional sightings for 10 min; or for activities using mobile targets, the intended target has transited a distance equal to double that of the mitigation zone size beyond the location of the last sighting.

(D) *After completion of the activity (e.g., prior to maneuvering off station).* Navy personnel must, when practical (*e.g.,* when platforms are not constrained by fuel restrictions or mission-essential follow-on commitments), observe for marine mammals in the vicinity of where detonations occurred; if any injured or dead marine mammals are observed, Navy personnel must follow established incident reporting procedures. If additional platforms are supporting this activity (*e.g.,* providing range clearance), Navy personnel on these assets must assist in the visual observation of the area where detonations occurred.

(6) *Vessel movement.* The mitigation will not be required if: The vessel's safety is threatened; the vessel is restricted in its ability to maneuver (*e.g.,* during launching and recovery of aircraft or landing craft, during towing activities, when mooring); the vessel is submerged or operated autonomously; or if impracticable based on mission requirements (*e.g.,* during Amphibious Assault and Amphibious Raid exercises).

(i) *Number of Lookouts and observation platform.* One Lookout must be on the vessel that is underway.

(ii) *Mitigation zone and requirements.* The relevant mitigation zones are as follows: 500 yd (457.2 m) around whales; and 200 yd (182.88 m) around all other marine mammals (except bow-riding dolphins and pinnipeds hauled out on man-made navigational structures, port structures, and vessels).

(A) *During the activity.* When underway Navy personnel must observe the mitigation zone for marine mammals; if marine mammals are observed, Navy personnel must maneuver to maintain distance.

(B) [Reserved]

(iii) *Reporting.* If a marine mammal vessel strike occurs, Navy personnel must follow the established incident reporting procedures.

(7) *Small-, medium-, and large-caliber non-explosive practice munitions.* Mitigation applies to activities using a surface target.

(i) *Number of Lookouts and observation platform.* One Lookout must be positioned on the platform conducting the activity. Depending on the activity, the Lookout could be the same as the one described for ''Weapons firing noise'' in paragraph (a)(2)(i) of this section.

(ii) *Mitigation zone and requirements.* The relevant mitigation zone is 200 yd (182.88 m) around the intended impact location.

(A) *Prior to the initial start of the activity* (*e.g.,* when maneuvering on station). Navy personnel must observe the mitigation zone for floating vegetation and marine mammals; if floating vegetation or marine mammals are observed, Navy personnel must relocate or delay the start of firing.

(B) *During the activity.* Navy personnel must observe the mitigation zone for floating vegetation and marine mammals; if floating vegetation or marine mammals are observed, Navy personnel must cease firing.

(C) *Commencement/recommencement conditions after a marine mammal sighting before or during the activity.* Navy personnel must allow a sighted marine mammal to leave the mitigation zone prior to the initial start of the activity (by delaying the start) or during the activity (by not recommencing firing) until one of the following conditions has been met: The animal is observed exiting the mitigation zone; the animal is thought to have exited the mitigation zone based on a determination of its course, speed, and movement relative to the intended impact location; the mitigation zone has been clear from any additional sightings for 10 min for aircraft-based firing or 30 min for vessel-based firing; or for activities using a mobile target, the intended impact location has transited a distance equal to double that of the mitigation zone size beyond the location of the last sighting.

(8) *Non-explosive missiles and rockets.* Aircraft-deployed non-explosive missiles and rockets. Mitigation applies to activities using a maritime surface target at ranges of up to 75 nmi.

(i) *Number of Lookouts and observation platform.* One Lookout must be positioned in an aircraft.

(ii) *Mitigation zone and requirements.* The relevant mitigation zone is 900 yd (822.96 m) around the intended impact location.

(A) *Prior to the initial start of the activity (e.g., during a fly-over of the mitigation zone).* Navy personnel must observe the mitigation zone for floating vegetation and marine mammals; if floating vegetation or marine mammals are observed, Navy personnel must relocate or delay the start of firing.

(B) *During the activity.* Navy personnel must observe the mitigation zone for floating vegetation and marine mammals; if floating vegetation or marine mammals are observed, Navy personnel must cease firing.

(C) *Commencement/recommencement conditions after a marine mammal sighting prior to or during the activity.* Navy personnel must allow a sighted marine mammal to leave the mitigation zone prior to the initial start of the activity (by delaying the start) or during the activity (by not recommencing firing) until one of the following conditions has been met: The animal is observed exiting the mitigation zone; the animal is thought to have exited the mitigation zone based on a determination of its course, speed, and movement relative to the intended impact location; or the mitigation zone has been clear from any additional sightings for 10 min when the activity involves aircraft that have fuel constraints, or 30 min when the activity involves aircraft that are not typically fuel constrained.

(9) *Non-explosive bombs.* Non-explosive bombs.

(i) *Number of Lookouts and observation platform.* One Lookout must be positioned in an aircraft.

(ii) *Mitigation zone and requirements.* The relevant mitigation zone is 900 yd (822.96 m) around the intended target.

(A) *Prior to the initial start of the activity (e.g., when arriving on station).* Navy personnel must observe the mitigation zone for floating vegetation and marine mammals; if floating vegetation or marine mammals are observed, Navy personnel must relocate or delay the start of bomb deployment.

(B) *During the activity (e.g., during approach of the target or intended minefield location).* Navy personnel must observe the mitigation zone for floating vegetation and marine mammals and, if floating vegetation or marine mammals are observed, Navy personnel must cease bomb deployment.

(C) *Commencement/recommencement conditions after a marine mammal sighting prior to or during the activity.* Navy personnel must allow a sighted marine mammal to leave the mitigation zone prior to the initial start of the activity (by delaying the start) or during the activity (by not recommencing bomb deployment) until one of the following conditions has been met: The animal is observed exiting the mitigation zone; the animal is thought to have exited the mitigation zone based on a determination of its course, speed, and movement relative to the intended target or minefield location; the mitigation zone has been clear from any additional sightings for 10 min; or for activities using mobile targets, the intended target has transited a distance equal to double that of the mitigation zone size beyond the location of the last sighting.

(10) *Target and Missile Launches from San Nicolas Islands (SNI).* Target and missile launch activities from SNI.

(i) *Mitigation zone and requirements.* 305 m (1,000 ft) over pinniped haulouts. Missiles must not cross over pinniped haulouts at elevations less than 305 m (1,000 ft) above the haulout. All manned aircraft and helicopter flight paths must maintain a minimum distance of 305 m (1,000 ft) from recognized seal haulouts and rookeries, except in emergencies or for real-time security incidents. For unmanned aircraft systems (UAS), the following minimum altitudes must be maintained over pinniped haulout areas and rookeries: Class 0–2 UAS must maintain a minimum altitude of 300 ft; Class 3 UAS must maintain a minimum altitude of 500 ft; Class 4 or 5 UAS must not be flown below 1,000 ft.

(A) *Pinniped haulouts.* Navy personnel must not enter pinniped haulouts or rookeries. Personnel may be adjacent to pinniped haulouts and rookeries prior to and following a launch for monitoring purposes.

(B) *Number of Launch events.* Navy must not conduct more than 40 launch events annually. Up to 10 launch events of the 40 annual launch events may occur at night.

(C) *Launches during the peak pinniped pupping season.* Launches must be scheduled to avoid peak pinniped pupping periods between January and July, to the maximum extent practicable.

(D) *Unauthorized species.* If a species for which authorization has not been granted is taken, or a species for which authorization has been granted but the authorized takes are met, the Navy must consult with NMFS to determine how to proceed.

(E) *Review of launch procedures.* The Navy must review the launch procedure and monitoring methods, in cooperation with NMFS, if any incidents of injury or mortality of a pinniped are discovered during post-launch surveys, or if surveys indicate possible effects to the distribution, size, or productivity of the affected pinniped populations as a result of the specified activities. If necessary, appropriate changes must be made through modification to this LOA prior to conducting the next launch of the same vehicle.

(ii) [Reserved]

(b) *Seasonal awareness messages.* In addition to procedural mitigation, Navy personnel must implement seasonal awareness notification messages throughout the PMSR Study Area to avoid interaction with large whales during transit.

(1) *Blue Whale Awareness Notification Message.*

(i) Navy personnel must issue a seasonal awareness notification message to alert Navy ships and aircraft operating throughout the PMSR Study Area to the possible presence of increased concentrations of blue whales June 1 through October 31.

(ii) To maintain safety of navigation and to avoid interactions with large whales during transits, Navy personnel must instruct vessels to remain vigilant to the presence of blue whales that, when concentrated seasonally, may become vulnerable to vessel strikes.

(iii) Navy personnel must use the information from the awareness notification message to assist their visual observation of applicable mitigation zones during training and testing activities and to aid in the implementation of procedural mitigation.

(2) *Gray Whale Awareness Notification Message.*

(i) Navy personnel must issue a seasonal awareness notification message to alert Navy ships and aircraft operating through the PMSR Study Area to the possible presence of increased concentrations of gray whales November 1 through March 31.

(ii) To maintain safety of navigation and to avoid interactions with large whales during transits, Navy personnel must instruct vessels to remain vigilant to the presence of gray whales that, when concentrated seasonally, may become vulnerable to vessel strikes.

(iii) Navy personnel must use the information from the awareness notification message to assist their visual observation of applicable mitigation zones during training and testing activities and to aid in the implementation of procedural mitigation.

(3) *Fin Whale Awareness Notification Message.*

(i) Navy personnel must issue a seasonal awareness notification message to alert Navy ships and aircraft operating throughout the PMSR Study Area to the possible presence of increased concentrations of fin whales November 1 through May 31.

(ii) To maintain safety of navigation and to avoid interactions with large whales during transits, Navy personnel must instruct vessels to remain vigilant to the presence of fin whales that, when concentrated seasonally, may become vulnerable to vessel strikes.

(iii) Navy personnel must use the information from the awareness notification message to assist their visual observation of applicable mitigation zones during training and testing activities and to aid in the

implementation of procedural mitigation.

§ 218.15 Requirements for monitoring and reporting.

(a) *Unauthorized take.* Navy personnel must notify NMFS immediately (or as soon as operational security considerations allow) if the specified activity identified in § 218.10 is thought to have resulted in the serious injury or mortality of any marine mammals, or in any Level A harassment or Level B harassment of marine mammals not identified in this subpart.

(b) *Monitoring and reporting under the LOA.* The Navy must conduct all monitoring and reporting required under the LOA. The Navy will coordinate and discuss with NMFS how monitoring in the PMSR Study Area could contribute to the Navy's Marine Species Monitoring Program.

(c) *Notification of injured, live stranded, or dead marine mammals.* Navy personnel must consult the Notification and Reporting Plan, which sets out notification, reporting, and other requirements when dead, injured, or live stranded marine mammals are detected. The Notification and Reporting Plan is available at *https://www.fisheries.noaa.gov/action/incidental-take-authorization-us-navy-testing-and-training-activities-point-mugu-sea-range.*

(d) *Pinniped Monitoring Plan on SNI.* In consultation with NMFS, the Navy will implement a monitoring plan for beaches exposed to missile launch noise with the goal of assessing baseline pinniped distribution/abundance and potential changes in pinniped use of these beaches after launch events. Marine mammal monitoring shall include multiple surveys (*e.g.* time-lapse photography) during the year that record the species, number of animals, general behavior, presence of pups, age class, gender and reactions to launch noise or other natural or human caused disturbances, in addition to environmental conditions that may include tide, wind speed, air temperature, and swell. In addition, video and acoustic monitoring of up to three pinniped haulout areas and rookeries must be conducted during launch events that include missiles or targets that have not been previously monitored using video and acoustic recorders for at least three launch events.

(e) *Annual Pinniped Monitoring Report on SNI.* The Navy must submit an annual report to NMFS of the SNI rocket and missile launch activities. The draft annual monitoring report must be submitted to the Director, Office of Protected Resources, NMFS, within three months after the end of the calendar year. NMFS will submit comments or questions on the draft monitoring report, if any, within three months of receipt. The report will be considered final after the Navy has addressed NMFS' comments, or three months after the submission of the draft if NMFS does not provide comments on the draft report. The report will summarize the launch events conducted during the year; assess any direct impacts to pinnipeds from launch events; assess any cumulative impacts on pinnipeds from launch events; and, summarize pinniped monitoring and research activities conducted on SNI and any findings related to effects of launch noise on pinniped populations.

(f) *Annual PMSR Study Area Training and Testing Activity Report.* Each year, the Navy must submit a detailed report PMSR (Annual Training and Testing Activity Report) to the Director, Office of Protected Resources, NMFS, within three months after the one-year anniversary of the date of issuance of the LOA. NMFS will submit comments or questions on the report, if any, within one month of receipt. The report will be considered final after the Navy has addressed NMFS' comments, or one month after submission of the draft if NMFS does not provide comments on the draft report. The annual report will contain information on all sound sources used (total hours or quantity of each bin; total annual number of each type of explosive events; and total annual expended/detonated rounds (missiles, bombs, etc.) for each explosive bin). The annual report will also contain both the current year's data as well as explosive use quantity from previous years' reports. Additionally, if there were any changes to the explosive allowance in a given year, or cumulatively, the report will include a discussion of why the change was made and include analysis to support how the change did or did not affect the analysis in the 2021 PMSR FEIS/OEIS and MMPA final rule. The annual report will also include the details regarding specific requirements associated with monitoring on SNI. The final annual/close-out report at the conclusion of the authorization period (year seven) will serve as the comprehensive close-out report and include both the final year annual use compared to annual authorization as well as a cumulative seven-year annual use compared to seven-year authorization. The detailed reports must contain the information identified in paragraphs (e)(1) through (6) of this section.

(1) *Explosives.* This section of the report must include the following information for explosive activities completed that year.

(i) Activity information gathered for each explosive event.

(A) Location by Special Use Airspace (*e.g.,* Warning Area).

(B) Date and time exercise began and ended.

(C) Total hours of observation by Lookouts before, during, and after exercise.

(D) Total annual expended/detonated ordnance (*i.e.,* missile, bombs etc.) number and types of explosive source bins detonated.

(E) Wave height in feet (high, low, and average) during exercise.

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

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

(A) Date/Time/Location of sighting.

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

(C) Number of individuals.

(D) Initial detection sensor (*e.g.,* sonar or Lookout).

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

(F) Sea state.

(G) Visibility.

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

(I) Distance of marine mammal from actual detonations (or target spot if not yet detonated): Less than 200 yd, 200 to 500 yd, 500 to 1,000 yd, 1,000 to 2,000 yd, or greater than 2,000 yd.

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

(K) The report must indicate whether explosive detonations were delayed, ceased, modified, or not modified due to marine mammal presence and for how long.

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

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

(i) Total annual quantity (per the LOA) of each explosive bin; and

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

(h) *Final Close-Out Report.* The final (year seven) draft annual/close-out report must be submitted within three months after the expiration of this subpart to the Director, Office of Protected Resources, NMFS. NMFS must submit comments on the draft close-out report, if any, within three months of receipt. The report will be considered final after the Navy has addressed NMFS' comments, or three months after the submittal of the draft if NMFS does not provide comments.

§ 218.16 Letters of Authorization.

(a) To incidentally take marine mammals pursuant to the regulations in this subpart, the Navy must apply for and obtain an LOA in accordance with § 216.106 of this chapter.

(b) An LOA, unless suspended or revoked, may be effective for a period of time not to exceed between October 31, 2021, and October 30, 2028.

(c) If an LOA expires prior to October 30, 2028, the Navy may apply for and obtain a renewal of the LOA.

(d) In the event of projected changes to the activity or to mitigation, monitoring, or reporting (excluding changes made pursuant to the adaptive management provision of § 218.17(c)(1)) required by an LOA issued under this subpart, the Navy must apply for and obtain a modification of the LOA as described in § 218.17.

(e) Each LOA will set forth:

(1) Permissible methods of incidental taking;

(2) Geographic areas for incidental taking;

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

(4) Requirements for monitoring and reporting.

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

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

§ 218.17 Renewals and modifications of Letters of Authorization.

(a) An LOA issued under §§ 216.106 of this chapter and 218.16 for the activity identified in § 218.10(c) may be renewed or modified upon request by the applicant, provided that:

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

(2) NMFS determines that the mitigation, monitoring, and reporting measures required by the previous LOA(s) were implemented.

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

(c) An LOA issued under §§ 216.106 of this chapter and 218.16 may be modified by NMFS under the following circumstances:

(1) *Adaptive management.* After consulting with the Navy regarding the practicability of the modifications, NMFS may modify (including adding or removing measures) the existing mitigation, monitoring, or reporting measures if doing so creates a reasonable likelihood of more effectively accomplishing the goals of the mitigation and monitoring.

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

(A) Results from the Navy's annual monitoring report and annual exercise report from the previous year(s);

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

(C) Results from specific stranding investigations; or

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

(ii) If, through adaptive management, the modifications to the mitigation, monitoring, or reporting measures are substantial, NMFS will publish a notice of a new 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 of marine mammals specified in LOAs issued pursuant to §§ 216.106 of this chapter and 218.16, an LOA may be modified without prior notice or opportunity for public comment. Notice will be published in the **Federal Register** within thirty days of the action.

§ 218.18 [Reserved]

§ 218.19 [Reserved]

[FR Doc. 2021–14542 Filed 7–15–21; 8:45 am]

BILLING CODE 3510–22–P