DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

50 CFR Part 218

[Docket No. 200713–0188]

RIN 0648–BJ00

Taking and Importing Marine Mammals; Taking Marine Mammals Incidental to the U.S. Navy Training and Testing Activities in the Mariana Islands Training and Testing (MITT) Study Area

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

ACTION: Final rule; notification of issuance of Letter of Authorization.

SUMMARY: NMFS, upon request from the U.S. Navy (Navy), issues these regulations pursuant to the Marine Mammal Protection Act (MMPA) to govern the taking of marine mammals incidental to the training and testing activities conducted in the Mariana Islands Training and Testing (MITT) Study Area. 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). These regulations, which allow for the issuance of a Letter of Authorization (LOA) for the incidental take of marine mammals during the described activities and timeframes, prescribe the permissible methods of taking and other means of effecting the least practicable adverse impact on marine mammal species and their habitat, and establish requirements pertaining to the monitoring and reporting of such taking.

DATES: Effective from July 31, 2020, to July 30, 2027.

ADDRESSES: A copy of the Navy's application, NMFS' proposed and final rules and subsequent LOA for the existing regulations, and other supporting documents and documents cited herein may be obtained online at: *www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-military-readiness-activities.* In case of problems accessing these documents, please use the contact listed here (see **FOR FURTHER INFORMATION CONTACT**).

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

SUPPLEMENTARY INFORMATION:

Purpose of Regulatory Action

These regulations, issued under the authority of the MMPA (16 U.S.C. 1361 *et seq.*), 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 sonar and other transducers and in-water detonations throughout the MITT Study Area. The MITT Study Area includes the seas off the coasts of Guam and the Commonwealth of the Northern Mariana Islands (CNMI), the in-water areas around the Mariana Islands Range Complex (MIRC), the transit corridor between the MIRC and the Hawaii Range Complex (HRC), and select pierside and harbor locations. The transit corridor is outside the geographic boundaries of the MIRC and represents a great circle route across the high seas for Navy vessels transiting between the MIRC and the HRC. The planned activities also include various activities in Apra Harbor such as sonar maintenance alongside Navy piers located in Inner Apra Harbor.

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 authorized.

Section 101(a)(5)(A) of the MMPA (16 U.S.C. 1371(a)(5)(A)) directs 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, after notice and public comment, the agency makes certain findings and issues regulations that set forth permissible methods of taking pursuant to that activity, as well as monitoring and reporting requirements. Section 101(a)(5)(A) of the MMPA and the implementing regulations at 50 CFR part 216, subpart I, provide the legal basis for issuing this final rule and the subsequent LOAs. As directed by this legal authority, this final rule contains mitigation, monitoring, and reporting requirements.

Summary of Major Provisions Within the Final Rule

The following is a summary of the major provisions of this final rule regarding the Navy's activities. Major provisions include, but are not limited to:

- The use of defined powerdown and shutdown zones (based on activity);
- Measures to eliminate the likelihood of ship strikes;
- Activity limitations in certain areas and times that are biologically important (*i.e.,* for foraging, migration, reproduction) for marine mammals; and
- Implementation of a Notification and Reporting Plan (for dead or live stranded marine mammals); and
- Implementation of a robust monitoring plan to improve our understanding of the environmental effects resulting from the Navy training and testing activities.

Additionally, the rule includes an adaptive management component that allows for timely modification of mitigation or monitoring measures based on new information, when appropriate.

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''); and 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 *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 February 11, 2019, 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 the use of sonar and other transducers and in-water detonations in the MITT Study Area over a seven-year period beginning when the current authorization expires. On March 15, 2019, we published a notice of receipt of application (NOR) in the **Federal Register** (84 FR 9495), requesting comments and information related to the Navy's request for 30 days. On January 31, 2020, we published a notice of the proposed rulemaking (85 FR 5782) and requested comments and information related to the Navy's request for 45 days. All comments received during the NOR and the proposed rulemaking comment periods were considered in this final rule. Comments received on the proposed rule are addressed in this final rule in the *Comments and Responses* section. 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: Amphibious warfare (in-water detonations), anti-submarine warfare (sonar and other transducers, in-water detonations), surface warfare (in-water detonations), and other testing and training (sonar and other transducers). The activities will not include any pile driving/removal or use of air guns.

This will be the third time NMFS has promulgated incidental take regulations pursuant to the MMPA relating to similar military readiness activities in the MITT Study Area, following those effective from August 3, 2010, through August 3, 2015 (75 FR 45527; August 3, 2010) and from August 3, 2015 through August 3, 2020 (80 FR 46112; August 3, 2015). For this third rulemaking, the Navy is proposing to conduct similar activities as they have conducted over the past nine years under the previous rulemakings.

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 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, but the basic nature of sonar and explosive events conducted in the MITT Study Area has remained the same.

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 regulations will cover training and testing activities that will occur for a seven-year period following the expiration of the current MMPA authorization for the MITT Study Area, which expires on August 3, 2020.

Description of the Specified Activity

Additional detail regarding the specified activity was provided in our **Federal Register** notice of proposed rulemaking (85 FR 5782; January 31, 2020); please see that notice of proposed rulemaking or the Navy's application for more information. In addition, since publication of the proposed rule, additional mitigation measures have been added, which are discussed in detail in the *Mitigation Measures* section of this rule. The Navy requested authorization to take marine mammals incidental to conducting training and testing activities. The Navy has determined that acoustic and explosive stressors 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 MITT Final Supplemental Environmental Impact Statement (FSEIS)/Overseas EIS (OEIS) (2020 MITT FSEIS/OEIS) (U.S. Department of the Navy, 2020) and in the Navy's rule making/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 can 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 (see *Mitigation Measures* section). The planned number of training and testing activities are described in the *Detailed Description of the Specified Activities* section (Table 3).

Geographical Region

The MITT Study Area is comprised of three components: (1) The MIRC, (2) additional areas on the high seas, and (3) a transit corridor between the MIRC and the HRC. The MIRC includes the waters south of Guam to north of Pagan (CNMI), and from the Pacific Ocean east of the Mariana Islands to the Philippine Sea to the west, encompassing 501,873 square nautical miles (nmi^2) of open ocean. The additional areas of the high seas include the area to the north of the MIRC that is within the U.S. Exclusive Economic Zone (EEZ) of the CNMI and the areas to the west of the MIRC. The transit corridor is outside the geographic boundaries of the MIRC and represents a great circle route (*i.e.,* the shortest distance) across the high seas for Navy ships transiting between the MIRC and the HRC. Although not part of any defined range complex, the transit corridor is important to the Navy in that it provides available air, sea, and undersea space where vessels and aircraft conduct training and testing while in transit. While in transit and along the corridor, vessels and aircraft will, at times, conduct basic and routine unit-level activities such as gunnery and sonar training. Ships also conduct sonar maintenance, which includes active sonar transmissions.

Additionally, the MITT Study Area includes pierside locations in the Apra Harbor Naval Complex where surface ship and submarine sonar maintenance occur. Activities in Apra Harbor include channels and routes to and from the Navy port in the Apra Harbor Naval Complex, and associated wharves and facilities within the Navy port.

Primary Mission Areas

The Navy categorizes its at-sea activities into functional warfare areas called primary mission areas. These activities generally fall into the following eight primary mission areas: Air warfare; amphibious warfare; anti-submarine warfare (ASW); electronic warfare; expeditionary warfare; mine warfare (MIW); strike warfare; and surface warfare (SUW). Most activities addressed in the MITT Study Area are categorized under one of the primary mission areas. Activities that do not fall within one of these areas are listed as ''other activities.'' Each warfare community (surface, subsurface, aviation, and expeditionary warfare) may train in some or all of these primary mission areas. The testing community also categorizes most, but not all, of its testing activities under these primary mission areas. A description of the sonar, munitions, targets, systems, and other material used during training and testing activities within these primary mission areas is provided in the 2020 MITT FSEIS/OEIS Appendix A (*Training and Testing Activities Descriptions*).

The Navy describes and analyzes the effects of its activities within the 2020 MITT FSEIS/OEIS. In its assessment, the Navy concluded that sonar and other transducers and in-water 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 the various warfare mission areas in which they will be conducted. Those mission areas include the following:

- Amphibious warfare (underwater detonations)
- ASW (sonar and other transducers, underwater detonations)
- MIW (sonar and other transducers, underwater detonations)
- SUW (underwater detonations)
- Other training and testing activities (sonar and other transducers)

The Navy's training and testing activities in air warfare, electronic warfare, and expeditionary warfare do not involve sonar and other transducers, underwater detonations, or any other stressors that could result in harassment, serious injury, or mortality of marine mammals. Therefore, the activities in air, electronic, and expeditionary warfare areas are not discussed further in this rule, but are analyzed fully in the 2020 MITT FSEIS/OEIS. Additional detail regarding the primary mission areas was provided in our **Federal Register** notice of proposed rulemaking (85 FR 5782; January 31, 2020); please see that notice of proposed rulemaking or the Navy's application for more information.

Overview of Major Training Activities and Exercises Within the MITT Study Area

A major training exercise (MTE) for purposes of this rulemaking is comprised of several unit-level activities conducted by several units operating together, commanded and controlled by a single Commander, and typically generating more than 100 hours of active sonar. These exercises typically employ an exercise scenario developed to train and evaluate the exercise participants in tactical and operational tasks. In an MTE, most of the activities being directed and coordinated by the Commander in charge of the exercise are identical in nature to the activities conducted during individual, crew, and smaller unit-level training events. In an MTE, however, these disparate training tasks are conducted in concert, rather than in isolation.

Exercises may also be categorized as integrated or coordinated ASW exercises. The distinction between integrated and coordinated ASW exercises is how the units are being controlled. Integrated ASW exercises are controlled by an existing command structure, and generally occur during the Integrated Phase of the training cycle. Coordinated exercises may have a command structure stood up solely for the event; for example, the commanding officer of a ship may be placed in tactical command of other ships for the duration of the exercise. Not all integrated ASW exercises are considered MTEs, due to their scale, number of participants, duration, and amount of active sonar. The distinction between large, medium, and small integrated or coordinated exercises is based on the scale of the exercise *(i.e.,* number of ASW units participating), the length of the exercise, and the total number of active sonar hours. NMFS considered the effects of all training exercises, not just these major, integrated, and coordinated training exercises in this rule.

Overview of Testing Activities Within the MITT Study Area

The Navy's research and acquisition community engages in a broad spectrum of testing activities in support of the Fleet. These activities include, but are not limited to, basic and applied scientific research and technology development; testing, evaluation, and maintenance of systems (missiles, radar, and sonar) and platforms (surface ships, submarines, and aircraft); and acquisition of systems and platforms. The individual commands within the research and acquisition community include Naval Air Systems Command, Naval Sea Systems Command, and Office of Naval Research.

Description of Stressors

The Navy uses a variety of sensors, 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 the acoustic and explosive stressors for marine mammals and their habitat (including prey species) within the MITT 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 MITT Study Area. Stressor/resource interactions that were determined to have de minimis or no impacts (*i.e.,* vessel, aircraft, or weapons noise, and explosions in air) 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 acoustic signals emitted into the water for a specific purpose, such as sonar and other transducers (devices that convert energy from one form to another—in this case, into sound waves), as well as 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. Characteristics of each of these sound sources are described in the following sections.

In order to better organize and facilitate the analysis of approximately 300 sources of underwater sound 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. 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 (highest source level, longest duty cycle, or 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 (hours/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.

Sonar and Other Transducers

Active sonar and other transducers emit non-impulsive sound waves into the water to detect objects, navigate safely, and communicate. Passive sonars differ from active sound sources in that they do not emit acoustic signals; rather, they only receive acoustic information about the environment, or listen. In this rule, the terms sonar and other transducers will be used to indicate active sound sources unless otherwise specified.

The Navy employs a variety of sonars and other transducers to obtain and transmit information about the undersea environment. Some examples are mid-frequency hull-mounted sonars used to find and track enemy submarines; high-frequency small object detection sonars used to detect mines; high-frequency underwater modems used to transfer data over short ranges; and extremely high-frequency (greater than 200 kilohertz (kHz)) doppler sonars used for navigation, like those used on commercial and private vessels. The characteristics of these sonars and other transducers, such as source level, beam width, directivity, and frequency, depend on the purpose of the source. Higher frequencies can carry more information or provide more information about objects off which they reflect, but attenuate more rapidly. Lower frequencies attenuate less rapidly, so may detect objects over a longer distance, but with less detail.

Additional detail regarding sound sources and platforms and categories of acoustic stressors was provided in our **Federal Register** notice of proposed rulemaking (85 FR 5782; January 31, 2020); please see that notice of proposed rulemaking or the Navy's application for more information.

Sonars and other transducers are grouped into classes that share an attribute, such as frequency range or purpose of use. As detailed below, classes are further sorted by bins based on the frequency or bandwidth; source level; and, when warranted, the application in which the source would be used. Unless stated otherwise, a reference distance of 1 meter (m) is used for sonar and other transducers.

- Frequency of the non-impulsive acoustic source;
  - Low-frequency sources operate below 1 kHz;
  - Mid-frequency sources operate at and above 1 kHz, up to and including 10 kHz;
  - High-frequency sources operate above 10 kHz, up to and including 100 kHz;
  - Very high-frequency sources operate above 100 kHz but below 200 kHz;
- Sound pressure level of the non-impulsive source;
  - Greater than 160 decibels (dB) re 1 micro Pascal (μPa), but less than 180 dB re 1 μPa;
  - Equal to 180 dB re 1 μPa and up to 200 dB re 1 μPa;
  - Greater than 200 dB re 1 μPa;
- Application in which the source would be used;
  - Sources with similar functions that have similar characteristics, such as pulse length (duration of each pulse), beam pattern, and duty cycle.

The bins used for classifying active sonars and transducers that are quantitatively analyzed in the MITT Study Area are shown in Table 1 below. While general parameters or source characteristics are shown in the table, actual source parameters are classified.

TABLE 1—SONAR AND TRANSDUCERS QUANTITATIVELY ANALYZED IN THE MITT STUDY AREA

Source class category	Bin	Description
Low-Frequency (LF): Sources that produce signals less than 1 kHz.	LF4	LF sources equal to 180 dB and up to 200 dB.
	LF5	LF sources less than 180 dB.
Mid-Frequency (MF): Tactical and non-tactical sources that produce signals between 1 and 10 kHz.	MF1	Hull-mounted surface ship sonars (*e.g.,* AN/SQS–53C and AN/SQS–60).
	MF1K	Kingfisher mode associated with MF1 sonars.
	MF3	Hull-mounted submarine sonars (*e.g.,* AN/BQQ–10).
	MF4	Helicopter-deployed dipping sonars (*e.g.,* AN/AQS–22).
	MF5	Active acoustic sonobuoys (*e.g.,* DICASS).
	MF6	Underwater sound signal devices (*e.g.,* MK 84 SUS).

TABLE 1—SONAR AND TRANSDUCERS QUANTITATIVELY ANALYZED IN THE MITT STUDY AREA—Continued

Source class category	Bin	Description
	MF9	Sources (equal to 180 dB and up to 200 dB) not otherwise binned.
	MF11	Hull-mounted surface ship sonars with an active duty cycle greater than 80 percent.
	MF12	Towed array surface ship sonars with an active duty cycle greater than 80 percent.
High-Frequency (HF): Tactical and non-tactical sources that produce signals between 10 and 100 kHz.	HF1	Hull-mounted submarine sonars (*e.g.,* AN/BQQ–10).
	HF3	Other hull-mounted submarine sonars (classified).
	HF4	Mine detection, classification, and neutralization sonar (*e.g.,* AN/SQS–20).
	HF6	Sources (equal to 180 dB and up to 200 dB) not otherwise binned.
Anti-Submarine Warfare (ASW): Tactical sources (*e.g.,* active sonobuoys and acoustic countermeasures systems) used during ASW training and testing activities.	ASW1	MF systems operating above 200 dB.
	ASW2	MF Multistatic Active Coherent sonobuoy (*e.g.,* AN/SSQ–125).
	ASW3	MF towed active acoustic countermeasure systems (*e.g.,* AN/SLQ–25).
	ASW4	MF expendable active acoustic device countermeasures (*e.g.,* MK 3).
	ASW5	MF sonobuoys with high duty cycles.
Torpedoes (TORP): Active acoustic signals produced by torpedoes.	TORP1	Lightweight torpedo (*e.g.,* MK 46, MK 54, or Anti-Torpedo Torpedo).
	TORP2	Heavyweight torpedo (*e.g.,* MK 48).
	TORP3	Heavyweight torpedo (*e.g.,* MK 48).
Forward Looking Sonar (FLS): Forward or upward looking object avoidance sonars used for ship navigation and safety.	FLS2	HF sources with short pulse lengths, narrow beam widths, and focused beam patterns.
Acoustic Modems (M): Sources used to transmit data	M3	MF acoustic modems (greater than 190 dB).
Synthetic Aperture Sonars (SAS): Sonars used to form high-resolution images of the seafloor.	SAS2	HF SAS systems.
	SAS4	MF to HF broadband mine countermeasure sonar.

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 (*Training and Testing Activities Descriptions*) of the 2020 MITT FSEIS/OEIS. Explanations of the terminology and metrics used when describing explosives in the Navy's rule making/LOA application are also in Appendix H (*Acoustic and Explosive Concepts*) of the 2020 MITT FSEIS/OEIS.

The near-instantaneous rise from ambient to an extremely high peak pressure is what makes an explosive shock wave potentially damaging. Farther from an explosive, the peak pressures decay and the explosive waves propagate as an impulsive, broadband sound. Several parameters influence the effect of an explosive: The weight of the explosive in the warhead, the type of explosive material, the boundaries and characteristics of the propagation medium, and, in water, the detonation depth and the depth of the receiver (*i.e.,* marine mammal). The net explosive weight, which is the explosive power of a charge expressed as the equivalent weight of trinitrotoluene (TNT), accounts for the first two parameters. The effects of these factors are explained in Appendix H (*Acoustic and Explosive Concepts*) of the 2020 MITT FSEIS/OEIS.

Explosive detonations during training and testing activities are associated with high-explosive munitions, including, but not limited to, bombs, missiles, rockets, naval gun shells, torpedoes, mines, demolition charges, and explosive sonobuoys. Explosive detonations during training and testing involving the use of high-explosive munitions (including bombs, missiles, and naval gun shells) could occur in the air or at the water's surface. Explosive detonations associated with torpedoes and explosive sonobuoys could occur in the water column; mines and demolition charges could be detonated in the water column or on the ocean bottom. Most detonations will occur in waters greater than 200 ft in depth, and greater than 3 nmi from shore, with the exception of three existing mine warfare areas (Outer Apra Harbor, Piti, and Agat Bay). Nearshore small explosive charges only occur at the three mine warfare areas. Piti and Agat Bay, while nearshore, are in very deep water and used for floating mine neutralization activities. In order to better organize and facilitate the analysis of explosives used by the Navy during training and testing that could detonate in water or at the water surface, explosive classification bins were developed. The use of explosive classification bins provides the same benefits as described for acoustic source classification bins discussed above and in Section 1.4.1 (Acoustic Stressors) of the Navy's rulemaking/LOA application.

Explosives detonated in water are binned by net explosive weight. The bins of explosives that are planned for use in the MITT Study Area are shown in Table 2 below.

TABLE 2—EXPLOSIVES ANALYZED IN THE MITT STUDY AREA

Bin	Net explosive weight (lb)	Example explosive source
E1	0.1–0.25	Medium-caliber projectiles.

TABLE 2—EXPLOSIVES ANALYZED IN THE MITT STUDY AREA—Continued

Bin	Net explosive weight (lb)	Example explosive source
E2	>0.25–0.5	Anti-swimmer grenade.
E3	>0.5–2.5	57 mm projectile.
E4	>2.5–5	Mine neutralization charge.
E5	>5–10	5 in projectiles.
E6	>10–20	Hellfire missile.
E8	>60–100	250 lb bomb; Lightweight torpedo.
E9	>100–250	500 lb bomb.
E10	>250–500	1,000 lb bomb.
E11	>500–650	Heavyweight torpedo.
E12	>650–1,000	2,000 lb bomb.

Notes: (1) Net Explosive Weight refers to the equivalent amount of TNT. The actual weight of a munition may be larger due to other components; (2) in = inch(es), lb = pound(s), ft = feet.

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. Appendix H (*Acoustic and Explosive Concepts*) of the 2020 MITT FSEIS/OEIS explains the characteristics of explosive detonations and how the above factors affect the propagation of explosive energy in the water.

Marine mammals could be exposed to fragments from underwater explosions associated with the specified activities. When explosive ordnance *(e.g.,* bomb or missile) detonates, fragments of the weapon are thrown at high-velocity from the detonation point, which can injure or kill marine mammals if they are struck. These fragments may be of variable size and are ejected at supersonic speed from the detonation. The casing fragments will be ejected at velocities much greater than debris from any target due to the proximity of the casing to the explosive material. Risk of fragment injury reduces exponentially with distance as the fragment density is reduced. Fragments underwater tend to be larger than fragments produced by in-air explosions (Swisdak and Montaro, 1992). Underwater, the friction of the water would quickly slow these fragments to a point where they no longer pose a threat. Opposingly, the blast wave from an explosive detonation moves efficiently through the seawater. Because the ranges to mortality and injury due to exposure to the blast wave are likely to far exceed the zone where fragments could injure or kill an animal, the thresholds for assessing the likelihood of harassment from a blast, which are also used to inform mitigation zones, are assumed to encompass risk due to fragmentation.

Detailed Description of the Specified Activities

Planned Training and Testing Activities

The Navy's Operational Commands and various System Commands have identified activity levels that are needed in the MITT Study Area to ensure naval forces have sufficient training, maintenance, and new technology to meet Navy missions in the Pacific. Training prepares Navy personnel to be proficient in safely operating and maintaining equipment, weapons, and systems to conduct assigned missions. Navy research develops new science and technology followed by concept testing relevant to future Navy needs. Unlike other Navy range complexes, training and testing in the MITT Study Area is more episodic as transiting strike groups or individual units travel through on the way to and from the Western Pacific, or forward deployed assets temporarily travel to the MITT Study Area for individual or group activities. This section analyzes a maximum number of activities that could occur each year and then a maximum total of activities that could occur over seven years. One activity, Torpedo (Explosive) Testing, does not occur every year, but the maximum times it could occur over one year and seven years was analyzed.

The training and testing activities that the Navy proposes to conduct in the MITT Study Area are summarized in Table 3. The table is organized according to primary mission areas and includes the activity name, associated stressors, description of the activity, sound source bin, the locations of those activities in the MITT Study Area, and the number of activities. For further information regarding the primary platform used (*e.g.,* ship or aircraft type) see Appendix A (*Training and Testing Activities Descriptions*) of the 2020 MITT FSEIS/OEIS.

TABLE 3—TRAINING AND TESTING ACTIVITIES ANALYZED ANNUALLY AND FOR A SEVEN-YEAR PERIOD IN THE MITT STUDY AREA

Stressor category	Activity	Description	Typical duration of event	Source bin [1]	Location	Annual number of events	7-Year number of events
Major Training Event—Large Integrated Anti-Submarine Warfare Training (ASW)							
Acoustic	Joint Multi-Strike Group Exercise.	Typically a 10-day Joint exercise, in which up to three carrier strike groups would conduct training exercises simultaneously.	10 days	ASW2, ASW3, ASW4, ASW5, HF1, MF1, MF11, MF3, MF4, MF5, MF12, TORP1.	Study Area; MIRC	1	7

TABLE 3—TRAINING AND TESTING ACTIVITIES ANALYZED ANNUALLY AND FOR A SEVEN-YEAR PERIOD IN THE MITT STUDY AREA—Continued

Stressor category	Activity	Description	Typical duration of event	Source bin [1]	Location	Annual number of events	7-Year number of events
Major Training Event—Medium Integrated ASW							
Acoustic	Joint Expeditionary Exercise.	Typically a 10-day exercise that could include a Carrier Strike Group and Expeditionary Strike Group, Marine Expeditionary Units, Army Infantry Units, and Air Force aircraft together in a joint environment that includes planning and execution efforts as well as military training activities at sea, in the air, and ashore.	10 days	ASW2, ASW3, MF1, MF4, MF5, MF12.	Study Area; Apra Harbor.	1	7
Medium Coordinated ASW							
Acoustic	Marine Air Ground Task Force Exercise (Amphibious)—Battalion.	Typically a 10-day exercise that conducts over the horizon, ship to objective maneuver for the elements of the Expeditionary Strike Group and the Amphibious Marine Air Ground Task Force. The exercise utilizes all elements of the Marine Air Ground Task Force (Amphibious), conducting training activities ashore with logistic support of the Expeditionary Strike Group and conducting amphibious landings.	10 days	ASW3, MF1, MF4, MF12.	Study Area to nearshore; MIRC; Tinian; Guam; Rota; Saipan; Farallon De Medinilla.	4	28
ASW							
Acoustic	Tracking Exercise—Helicopter (TRACKEX—Helo).	Helicopter crews search for, detect, and track submarines.	2–4 hours	MF4, MF5	Study Area >3 NM from land; Transit Corridor.	10	70
Acoustic	Torpedo Exercise—Helicopter (TORPEX—Helo).	Helicopter crews search for, detect, and track submarines. Recoverable air launched torpedoes are employed against submarine targets.	2–5 hours	MF4, MF5, TORP1.	Study Area >3 NM from land.	6	42
Acoustic	Tracking Exercise—Maritime Patrol Aircraft (TRACKEX—Maritime Patrol Aircraft).	Maritime patrol aircraft crews search for, detect, and track submarines.	2–8 hours	MF5	Study Area >3 NM from land.	36	252
Acoustic	Torpedo Exercise—Maritime Patrol Aircraft (TORPEX—Maritime Patrol Aircraft).	Maritime patrol aircraft crews search for, detect, and track submarines. Recoverable air launched torpedoes are employed against submarine targets.	2–8 hours	MF5, TORP1	Study Area >3 NM from land.	6	42
Acoustic	Tracking Exercise –Surface (TRACKEX—Surface).	Surface ship crews search for, detect, and track submarines.	2–4 hours	ASW1, ASW3, MF1, MF11, MF12.	Study Area >3 NM from land*.	91	637
Acoustic	Torpedo Exercise—Surface (TORPEX—Surface).	Surface ship crews search for, detect, and track submarines. Exercise torpedoes are used during this event.	2–5 hours	ASW3, MF1, MF5, TORP1.	Study Area >3 NM from land.	6	42
Acoustic	Tracking Exercise—Submarine (TRACKEX—Sub).	Submarine crews search for, detect, and track submarines.	8 hours	ASW4, HF1, HF3, MF3.	Study Area >3 NM from land; Transit Corridor.	4	28
Acoustic	Torpedo Exercise—Submarine (TORPEX—Sub).	Submarine crews search for, detect, and track submarines. Recoverable exercise torpedoes are used during this event.	8 hours	ASW4, HF1, MF3, TORP2.	Study Area >3 NM from land.	9	63
Acoustic	Small Combined Coordinated ASW exercise (Multi-Sail/GUAMEX).	Typically, a 5-day exercise with multiple ships, aircraft and submarines integrating the use of their sensors, including sonobuoys, to search, detect, and track threat submarines.	5 days	ASW2, ASW3, ASW4, HF1, MF1, MF3, MF4, MF5, MF11, MF12.	Study Area >3 NM from land*.	38	56

TABLE 3—TRAINING AND TESTING ACTIVITIES ANALYZED ANNUALLY AND FOR A SEVEN-YEAR PERIOD IN THE MITT STUDY AREA—Continued

Stressor category	Activity	Description	Typical duration of event	Source bin [1]	Location	Annual number of events	7-Year number of events
Mine Warfare							
Acoustic	Civilian Port Defense.	Maritime security personnel train to protect civilian ports and harbors against enemy efforts to interfere with access to those ports.	Multiple days	HF4, SAS2	MIRC, Mariana littorals, Inner and Outer Apra Harbor.	1	7
Explosive	Mine Neutralization—Remotely Operated Vehicle Sonar (ASQ–235 [AQS–20], SLQ–48).	Ship, small boat, and helicopter crews locate and disable mines using remotely operated underwater vehicles.	1–4 hours	E4	Study Area, Mariana littorals, and Outer Apra Harbor.	4	28
Acoustic	Mine Countermeasure Exercise—Surface Ship Sonar (SQQ–32, MCM).	Ship crews detect, locate, identify, and avoid mines while navigating restricted areas or channels, such as while entering or leaving port.	1–4 hours	HF4	Study Area, Apra Harbor.	4	28
Acoustic	Mine Countermeasure Exercise—Towed Sonar (AQS–20).	Surface ship crews detect and avoid mines while navigating restricted areas or channels using towed active sonar systems.	1–4 hours	HF4	Study Area, Apra Harbor.	4	28
Explosive	Mine Neutralization—Explosive Ordnance Disposal.	Personnel disable threat mines using explosive charges.	Up to 4 hours	E5, E6	Agat Bay site, Piti, and Outer Apra Harbor.	20	140
Acoustic	Submarine Mine Exercise.	Submarine crews practice detecting mines in a designated area.	Varies	HF1	Study Area, Mariana Littorals, Inner/Outer Apra Harbor.	1	7
Acoustic	Surface Ship Object Detection.	Ship crews detect and avoid mines while navigating restricted areas or channels using active sonar.	1–4 hours	MF1K	Study Area	6	42
Explosive	Underwater Demolition Qualification/Certification.	Navy divers conduct various levels of training and certification in placing underwater demolition charges.	Varies	E5, E6	Agat Bay site, Piti, and Outer Apra Harbor.	45	315
Surface Warfare (SUW)							
Explosive	Bombing Exercise (Air-to-Surface).	Fixed-wing aircrews deliver bombs against stationary surface targets.	1 hour	E9, E10, E12	Study Area, Special Use Airspace.	37	259
Explosive	Gunnery Exercise (GUNEX) (Air-to-Surface)—Medium-caliber.	Fixed-wing and helicopter aircrews fire medium-caliber guns at surface targets.	1 hour	E1, E2	Study Area >12 NM from land, Special Use Airspace.	120	840
Explosive	GUNEX (Surface-to-Surface) Boat—Medium-caliber.	Small boat crews fire medium-caliber guns at surface targets.	1 hour	E2	Study Area >12 NM from land, Special Use Airspace.	20	140
Explosive	GUNEX (Surface-to-Surface) Ship—Large-caliber.	Surface ship crews fire large-caliber guns at surface targets.	Up to 3 hours	E5	Study Area >12 NM from land, Special Use Airspace.	255	1,785
Explosive	GUNEX (Surface-to-Surface) Ship—Small- and Medium-caliber.	Surface ship crews fire medium and small-caliber guns at surface targets.	2–3 hours	E1	Study Area >12 NM from land, Special Use Airspace.	234	1,638
Explosive	Maritime Security Operations.	Helicopter, surface ship, and small boat crews conduct a suite of maritime security operations at sea, to include visit, board, search and seizure, maritime interdiction operations, force protection, and anti-piracy operations.	Up to 3 hours	E2	Study Area; MIRC	40	280
Explosive	Missile Exercise (Air-to-Surface) (MISSILEX [A–S]).	Fixed-wing and helicopter aircrews fire air-to-surface missiles at surface targets.	2 hours	E6, E8, E10	Study Area >12 NM from land, Special Use Airspace.	10	70
Explosive	Missile Exercise (Air-to-Surface)—Rocket (MISSILEX [A–S]—Rocket).	Helicopter aircrews fire both precision-guided and unguided rockets at surface targets.	1 hour	E3	Study Area >12 NM from land, Special Use Airspace.	110	770

TABLE 3—TRAINING AND TESTING ACTIVITIES ANALYZED ANNUALLY AND FOR A SEVEN-YEAR PERIOD IN THE MITT STUDY AREA—Continued

Stressor category	Activity	Description	Typical duration of event	Source bin [1]	Location	Annual number of events	7-Year number of events
Explosive	Missile Exercise (Surface-to-Surface). (MISSILEX [S–S])	Surface ship crews defend against surface threats (ships or small boats) and engage them with missiles.	2–5 hours	E6, E10	Study Area >50 NM from land, Special Use Airspace.	28	196
Explosive	Sinking Exercise	Aircraft, ship, and submarine crews deliberately sink a seaborne target, usually a decommissioned ship made environmentally safe for sinking according to U.S. Environmental Protection Agency standards, with a variety of ordnance.	4–8 hours, possibly over 1–2 days.	E5, E8, E10, E11, E12, TORP2.	Study Area >50 NM from land and >1,000 fathoms depth.	1	7
Other Training Activities							
Acoustic	Submarine Navigation.	Submarine crews operate sonar for navigation and detection while transiting into and out of port during reduced visibility.	Up to 2 hours	HF1, MF3	Study Area, Apra Harbor, and Mariana littorals.	8	56
Acoustic	Submarine Sonar Maintenance.	Maintenance of submarine sonar and other system checks are conducted pierside or at sea.	Up to 1 hour	MF3	Study Area; Apra Harbor and Mariana littorals.	86	602
Acoustic	Surface Ship Sonar Maintenance.	Maintenance of surface ship sonar and other system checks are conducted pierside or at sea.	Up to 4 hours	MF1	Study Area; Apra Harbor and Mariana littorals.	44	308
Acoustic	Unmanned Underwater Vehicle Training.	Units conduct training with unmanned underwater vehicles from a variety of platforms, including surface ships, small boats, and submarines.	Up to 24 hours	FLS2, M3, SAS2, SAS4.	MIRC; Apra Harbor and Mariana littorals.	64	448
Testing Activities							
ASW Acoustic; Explosive.	Anti-Submarine Warfare Tracking Test—Maritime Patrol Aircraft (Sonobuoys).	The test evaluates the sensors and systems used by maritime patrol aircraft to detect and track submarines and to ensure that aircraft systems used to deploy the tracking systems perform to specifications and meet operational requirements.	8 hours	ASW2, ASW5, E1, E3, MF5, MF6.	Study Area >3 NM from land.	26	182
Acoustic	Anti-Submarine Warfare Torpedo Test.	This event is similar to the training event torpedo exercise. Test evaluates anti-submarine warfare systems onboard rotary-wing and fixed-wing aircraft and the ability to search for, detect, classify, localize, track, and attack a submarine or similar target.	2–6 flight hours	MF5, TORP1	Study Area >3 NM from land.	20	140
Acoustic	Anti-Submarine Warfare Mission Package Testing.	Ships and their supporting platforms (*e.g.,* helicopters and unmanned aerial systems) detect, localize, and prosecute submarines.	1–2 weeks, with 4–8 hours of active sonar use with intervals of non-activity in between.	ASW1, ASW2, ASW3, ASW5, MF12, MF4, MF5, TORP1.	Mariana Island Range Complex.	100	700
Acoustic	At-Sea Sonar Testing.	At-sea testing to ensure systems are fully functional in an open ocean environment.	From 4 hours to 11 days.	HF1, HF6, M3, MF3, MF9.	Study Area	7	49
Acoustic; Explosive.	Torpedo (Explosive) Testing.	Air, surface, or submarine crews employ explosive and non-explosive torpedoes against artificial targets.	1–2 days during daylight hours.	ASW3, HF1, HF6, MF1, MF3, MF4, MF5, MF6, TORP1, TORP2, E8, E11.	Mariana Island Range Complex.	3	9
Acoustic	Torpedo (Non-explosive) Testing.	Air, surface, or submarine crews employ non-explosive torpedoes against submarines or surface vessels.	Up to 2 weeks	ASW3, ASW4, HF1, HF6, LF4, MF1, MF3, MF4, MF5, MF6, TORP1, TORP2, TORP3.	Mariana Island Range Complex.	7	49

TABLE 3—TRAINING AND TESTING ACTIVITIES ANALYZED ANNUALLY AND FOR A SEVEN-YEAR PERIOD IN THE MITT STUDY AREA—Continued

Stressor category	Activity	Description	Typical duration of event	Source bin [1]	Location	Annual number of events	7-Year number of events
Mine Warfare							
Acoustic; Explosive.	Mine Countermeasure and Neutralization Testing.	Air, surface, and subsurface vessels neutralize threat mines and mine-like objects.	1–10 days, with intermittent use of countermeasure/neutralization systems during this period.	HF4, E4	MIRC; nearshore and littorals.	3	21
Surface Warfare							
Explosive	Air to Surface Missile Test.	Fixed-wing and helicopter aircrews fire air-to-surface missiles at surface targets.	2 hours	E10	Study Area >50 NM from land.	4	28
Vessel Evaluation							
Acoustic	Undersea Warfare Testing.	Ships demonstrate capability of countermeasure systems and underwater surveillance, weapons engagement, and communications systems. This tests ships' ability to detect, track, and engage undersea targets.	Up to 10 days	HF4, MF1, MF4, MF5, TORP1.	MIRC	1	7

[1] Additional activities utilizing sources not listed in the Major Training Event and coordinated exercise bins above may occur during these exercises. All acoustic sources which may be used during training and testing activities have been accounted for in the modeling and analysis presented in this application and in the 2020 MITT FSEIS/OEIS.

* Includes limited occurrence within the Marpi Reef Geographic Mitigation Area and a portion of Chalan Kanoa Reef Geographic Mitigation Area outside of 3 nmi from land (see Figures 1 and 2).

Summary of Acoustic and Explosive Sources Analyzed for Training and Testing

Tables 4 and 5 show the acoustic and explosive source classes, bins, and quantities used in either hours or counts associated with the Navy's training and testing activities over a seven-year period in the MITT Study Area that were analyzed in the Navy's rulemaking/LOA application. Table 4 describes the acoustic source classes (*i.e.,* low-frequency (LF), mid-frequency (MF), and high-frequency (HF)) that could occur over seven years under the planned training and testing activities. Acoustic source bin use in the planned activities will vary annually. The seven-year totals for the planned training and testing activities take into account that annual variability.

TABLE 4—ACOUSTIC SOURCE CLASSES ANALYZED AND NUMBER USED FOR A SEVEN-YEAR PERIOD FOR TRAINING AND TESTING ACTIVITIES IN THE MITT STUDY AREA

Source class category	Bin	Description	Unit	Annual	7-year total
Low-Frequency (LF): Sources that produce signals less than 1 kHz.	LF4	LF sources equal to 180 dB and up to 200 dB	H	1	7
	LF5	LF sources less than 180 dB	H	10	65
Mid-Frequency (MF): Tactical and non-tactical sources that produce signals between 1 and 10 kHz.	MF1	Hull-mounted surface ship sonars (*e.g.,* AN/SQS–53C and AN/SQS–60).	H	1,818	12,725
	MF1K	Kingfisher mode associated with MF1 sonars	H	3	21
	MF3	Hull-mounted submarine sonars (*e.g.,* AN/BQQ–10).	H	227	1,586
	MF4	Helicopter-deployed dipping sonars (*e.g.,* AN/AQS–22).	H	185	1,289
	MF5	Active acoustic sonobuoys (*e.g.,* DICASS)	C	2,094	14,623
	MF6	Active underwater sound signal devices (*e.g.,* MK 84 SUS).	C	74	458
	MF9	Active sources (equal to 180 dB and up to 200 dB) not otherwise binned	H	29	202
	MF11	Hull-mounted surface ship sonars with an active duty cycle greater than 80%.	H	304	2.128
	MF12	Towed array surface ship sonars with an active duty cycle greater than 80%.	H	616	4,320
High-Frequency (HF): Tactical and non-tactical sources that produce signals between 10 and 100 kHz.	HF1	Hull-mounted submarine sonars (*e.g.,* AN/BQQ–10).	H	73	497
	HF3	Other hull-mounted submarine sonars (classified).	H	4	28

TABLE 4—ACOUSTIC SOURCE CLASSES ANALYZED AND NUMBER USED FOR A SEVEN-YEAR PERIOD FOR TRAINING AND TESTING ACTIVITIES IN THE MITT STUDY AREA—Continued

Source class category	Bin	Description	Unit	Annual	7-year total
	HF4	Mine detection, classification, and neutralization sonar (*e.g.,* AN/SQS–20).	H	1,472	10,304
	HF6	Active sources (equal to 180 dB and up to 200 dB) not otherwise binned.	H	309	2,128
Anti-Submarine Warfare (ASW): Tactical sources (*e.g.,* active sonobuoys and acoustic countermeasures systems) used during ASW training and testing activities.	ASW1	MF systems operating above 200 dB	H	192	1,360
	ASW2	MF Multistatic Active Coherent sonobuoy (*e.g.,* AN/SSQ–125).	C	554	3,878
	ASW3	MF towed active acoustic countermeasure systems (*e.g.,* AN/SLQ–25).	H	3,124	21,863
	ASW4	MF expendable active acoustic device countermeasures (*e.g.,* MK 3).	C	332	2,324
	ASW5	MF sonobuoys with high duty cycles	H	50	350
Torpedoes (TORP): Source classes associated with the active acoustic signals produced by torpedoes.	TORP1	Lightweight torpedo (*e.g.,* MK 46, MK 54, or Anti-Torpedo Torpedo).	C	71	485
	TORP2	Heavyweight torpedo (*e.g.,* MK 48)	C	62	398
	TORP3	Heavyweight torpedo test (*e.g.,* MK 48)	C	6	42
Forward Looking Sonar (FLS): Forward or upward looking object avoidance sonars used for ship navigation and safety.	FLS2	HF sources with short pulse lengths, narrow beam widths, and focused beam patterns.	H	4	28
Acoustic Modems (M): Systems used to transmit data through the water.	M3	MF acoustic modems (greater than 190 dB)	H	31	216
Synthetic Aperture Sonars (SAS): Sonars in which active acoustic signals are post-processed to form high-resolution images of the seafloor.	SAS2	HF SAS systems	H	449	3,140
	SAS4	MF to HF broadband mine countermeasure sonar.	H	6	42

Notes: H= hours; C = count.

Table 5 describes the number of in-water explosives that could be used in any year under the planned training and testing activities. Under the planned activities, bin use will vary annually, and the seven-year totals for the planned training and testing activities take into account that annual variability.

TABLE 5—EXPLOSIVE SOURCE BINS ANALYZED AND NUMBER USED ANNUALLY AND FOR A SEVEN-YEAR PERIOD FOR TRAINING AND TESTING ACTIVITIES WITHIN THE MITT STUDY AREA

Bin	Net explosive weight (lb)	Example Explosive Source	Annual	7-year total
E1	0.1–0.25	Medium-caliber projectiles	768	5,376
E2	>0.25–0.5	Anti-swimmer grenade	400	2,800
E3	>0.5–2.5	57 mm projectile	683	4,591
E4	>2.5–5	Mine neutralization charge	44	308
E5	>5–10	5 in projectiles	1,221	8,547
E6	>10–20	15 lb shaped charge	29	203
E8	>60–100	250 lb bomb; Light weight torpedo	134	932
E9	>100–250	500 lb bomb	110	770
E10	>250–500	1,000 lb bomb	78	546
E11	>500–650	Heavy weight torpedo	5	17
E12	>650–1,000	2,000 lb bomb	48	336

Notes: (1) net explosive weight refers to the equivalent amount of TNT. The actual weight of a munition may be larger due to other components. (2) in = inch(es), lb = pound(s), ft = feet.

Vessel Movement

The only areas with projected high concentrations of Navy vessel movement will be within Apra Harbor Guam and the coastal approaches to and from Apra Harbor. Some amphibious training events use Tinian as a landing area so amphibious ships could occur in the offshore waters off that island. Most other activities are spread throughout the greater MITT Study Area with a high degree of spatial and temporal separation between activities. Additional detail on vessel movement was provided in our **Federal Register** notice of proposed rulemaking (85 FR 5782; January 31, 2020); please see that notice of proposed rulemaking or the

Navy's application for more information.

The Navy tabulated annual at-sea vessel steaming days for training and testing activities projected for the MITT Study Area. Across all warfare areas and activities, 493 days of Navy at-sea time will occur annually for training and testing activities in the MITT Study Area (Table 6). Amphibious Warfare activities account for 48 percent of total surface ship days, MTEs account for 38 percent, ASW activities account for 8 percent, and Air Warfare, ASW, and Other activities (sonar maintenance, anchoring) account for 2 percent each (Table 6). In comparison to the Hawaii-Southern California Training and Testing (HSTT) Study Area, the estimated number of at-sea annual days for training and testing activities in the MITT Study Area is approximately ten times less than in the HSTT Study Area over the same time period.

TABLE 6—ANNUAL NAVY SURFACE SHIP DAYS WITHIN THE MITT STUDY AREA

MITT events	Annual days	Percent by event	Annual days by warfare area	Percent by warfare area
Air Warfare			9	1.9
GUNNEX (Lg)	2	0.3		
GUNNEX (Sm)	3	0.6		
MISSILEX	5	0.9		
Amphibious Warfare			299	60.7
Fire Support (Land Target)	5	1.0		
Amphibious Rehearsal	144	29.2		
Amphibious Assault	14	2.8		
Amphibious Raid	3	0.6		
Marine Air Ground Task Force Exercise	40	8.1		
Non-Combatant Evacuation Op	67	13.5		
Humanitarian Assist/Disaster Relief Op	7	1.4		
Special Purpose				
Marine Air Ground Task Force Exercise	20	4.1		
Surface Warfare			41	8.4
MISSILEX	2	0.4		
GUNNEX (Lg)	14	2.8		
GUNNEX (Med)	10	2.0		
GUNNEX (Sm)	6	1.3		
SINKEX	7	1.4		
Maritime Security Op	3	0.5		
Anti–Submarine Warfare			8	1.6
Tracking Exercise	8	1.5		
Torpedo Exercise	1	0.1		
Major Training Exercises			125	24.5
Joint Expeditionary Exercise	63	12.9		
Joint Multi-Strike Group Exercise	62	12.5		
Other			10	2.1
Surface Ship Sonar Maintenance	7	1.5%		
Precision Anchoring	3	0.6%		
Total	493			

Additional details on Navy at-sea vessel movement are provided in the 2020 MITT FSEIS/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. While standard operating procedures are designed for the safety of personnel and equipment and to ensure the success of training and testing activities, their implementation often yields additional benefits on environmental, socioeconomic, public health and safety, and cultural resources.

Because standard operating procedures are essential to safety and mission success, the Navy considers them to be part of the planned Specified Activities, and has included them in the environmental analysis. Additional details on standard operating procedures were provided in our **Federal Register** notice of proposed rulemaking (85 FR 5782; January 31, 2020); please see that notice of proposed rulemaking or the Navy's application for more information.

Comments and Responses

We published the proposed rule in the **Federal Register** on January 31, 2020 (85 FR 5782), with a 45-day comment period. With that proposed rule, we requested public input on our analyses, our preliminary findings, and the proposed regulations, and requested that interested persons submit relevant information and comments. During the 45-day comment period, we received 16 comment letters in total. Of this total, one submission was from another Federal agency, one was from the Marine Mammal Commission, three letters were from organizations or individuals acting in an official capacity (*e.g.,* non-governmental organizations (NGOs), and 11 submissions were from private citizens. NMFS has reviewed and considered all public comments received on the proposed rule and issuance of the LOA. General comments that did not provide information pertinent to NMFS' decisions have been noted, but are not addressed further. All substantive comments and our responses are described below. We provide no response to specific comments that addressed species or statutes not relevant to the rulemaking under section 101(a)(5)(A) of the MMPA (*e.g.,* comments related to sea turtles). We organize our comment responses by major categories.

General Comments

Comment 1: The Navy must be required to submit a Habitat Conservation Plan that will ensure the well being of those mammals to the best extent possible.

Response: A Habitat Conservation Plan (HCP) is a planning document for non-Federal agencies and persons to obtain an ESA incidental take permit under section 10(a)(1)(B) of the Endangered Species Act (ESA). The Navy is a Federal agency that consulted with NMFS under section 7 of the ESA, and therefore obtaining a separate ESA incidental take permit is not required. The Navy will comply with the Reasonable and Prudent Measures and Terms and Conditions that are part of their Incidental Take Statement, which was issued as part of the consultation process under section 7 of the ESA.

Impact Analysis and Thresholds

Comment 2: A commenter recommended that NMFS clarify whether and how the Navy incorporated uncertainty in its density estimates for its animat modeling specific to MITT and if uncertainty was not incorporated, re-estimate the numbers of marine mammal takes based on the uncertainty inherent in the density estimates provided in Department of the Navy (2018b).

Response: Uncertainty was incorporated into the density estimates used for modeling and estimating take for NMFS' rule. The commenter is referred to the technical report titled ''Quantifying Acoustic Impacts on Marine Mammals and Sea Turtles: Methods and Analytical Approach for Phase III Training and Testing'' (U.S. Department of the Navy, 2018) for clarification on the consideration of uncertainty in density estimates. See specifically Section 4.2 (Marine Species Distribution Builder) of the 2020 MITT FSEIS/OEIS where details are provided on how statistical uncertainty surrounding density estimates was incorporated into the modeling for the MITT Study Area, as has been done for all other recent NMFS and Navy analyses of training and testing at sea. To the Commenters more specific question, as with the 2018 HSTT final rule, a lognormal distribution was used in the density regression model. Uncertainty was incorporated into the take estimation through the density estimates and it is not necessary to re-estimate the take numbers for marine mammals.

Comment 3: A Commenter stated that NMFS has largely followed the Navy in revising its hearing loss thresholds to reflect certain new data and modeling approaches. The Commenter suggested they have previously advised that the criteria that NMFS produced to estimate temporary and permanent threshold shift in marine mammals are erroneous and non-conservative. According to the Commenter, Wright (2015) has identified several statistical and numerical faults in NMFS' approach, such as pseudo-replication and inconsistent treatment of data, that tend to bias the criteria towards an underestimation of effects. The Commenter stated that similar and additional issues were raised by a dozen scientists during the public comment period on the draft criteria held by NMFS. The Commenter asserts that the issue is NMFS' broad extrapolation from a small number of individual animals, mostly bottlenose dolphins, without taking account of what Racca *et al.* (2015b) have succinctly characterized as a ''non-linear accumulation of uncertainty.'' The Commenter asserts that NMFS failed to address the basic errors identified by these and other experts, nor did it perform a sensitivity analysis to understand the potential magnitude of those errors. The Commenter suggests that NMFS should not rely exclusively on its auditory guidance in determining ''Level A'' take, but should, at minimum, produce a conservative upper bound such as by retaining the 180 dB threshold, or by performing a sensitivity analysis.

Response: The Acoustic Technical Guidance updates the historical 180 dB rms injury threshold, which was based on professional judgement (*i.e.,* no data were available on the effects of noise on marine mammal hearing at the time this original threshold was derived). NMFS disagrees with any suggestion that the use of the Acoustic Technical Guidance provides erroneous results. The 180 dB rms threshold is plainly outdated, as the best available science indicates that rms SPL is not even an appropriate metric by which to gauge potential auditory injury. Further, NMFS disagrees with the suggestion that NMFS should not rely exclusively on its Technical Guidance in determining take by Level A harassment and should instead also produce an upper bound (either by retaining the 180-dB threshold or performing a sensitivity analysis). The Acoustic Technical Guidance represents the best available science and provides thresholds and weighting functions that allow us to predict when marine mammals are likely to incur permanent threshold shift (PTS). As described in the *Estimated Take of Marine Mammals* section, when the acoustic thresholds, the Navy model, and other inputs into the take calculation are considered, the authorized incidental takes represent the maximum number of instances in which marine mammals are reasonably expected to be taken, which is appropriate under the statute and there is no need or requirement for NMFS to authorize a larger number.

Multiple studies from humans, terrestrial mammals, and marine mammals have demonstrated less temporary threshold shift (TTS) from intermittent exposures compared to continuous exposures with the same total energy because hearing is known to experience some recovery in between noise exposures, which means that the effects of intermittent noise sources such as tactical sonars are likely overestimated. Marine mammal TTS data have also shown that, for two exposures with equal energy, the longer duration exposure tends to produce a larger amount of TTS. Most marine mammal TTS data have been obtained using exposure durations of tens of seconds up to an hour, much longer than the durations of many tactical sources (much less the continuous time that a marine mammal in the field would be exposed consecutively to those levels), further suggesting that the use of these TTS data are likely to overestimate the effects of sonars with shorter duration signals.

Regarding the suggestion of pseudoreplication and erroneous models, since marine mammal hearing and noise-induced hearing loss data are limited, both in the number of species and in the number of individuals available, attempts to minimize pseudoreplication would further reduce these already limited data sets. Specifically, with marine mammal behaviorally derived temporary threshold shift studies, behaviorally derived data are only available for two mid-frequency cetacean species (bottlenose dolphin, beluga) and two phocids (in-water) pinniped species (harbor seal and northern elephant seal), with otariid (in-water) pinnipeds and high-frequency cetaceans only having behaviorally-derived data from one species. Arguments from Wright (2015) regarding pseudoreplication within the TTS data are therefore largely irrelevant in a practical sense because there are so few data. Multiple data points were not included for the same individual at a single frequency. If multiple data existed at one frequency, the lowest TTS onset was always used. There is only a single frequency where TTS onset data exist for two individuals of the same species: 3 kHz for bottlenose dolphins. Their TTS (unweighted) onset values

were 193 and 194 dB re 1 μPa2s. Thus, NMFS believes that the current approach makes the best use of the given data. Appropriate means of reducing pseudoreplication may be considered in the future, if more data become available. Many other comments from Wright (2015) and the comments from Racca *et al.* (2015b) appear to be erroneously based on the idea that the shapes of the auditory weighting functions and TTS/PTS exposure thresholds are directly related to the audiograms; *i.e.,* that changes to the composite audiograms would directly influence the TTS/PTS exposure functions (*e.g.,* Wright (2015) describes weighting functions as ''effectively the mirror image of an audiogram'' (p. 2) and states, ''The underlying goal was to estimate how much a sound level needs to be above hearing threshold to induce TTS.'' (p. 3)). Both statements are incorrect and suggest a fundamental misunderstanding of the criteria/threshold derivation. This would require a constant (frequency-independent) relationship between hearing threshold and TTS onset that is not reflected in the actual marine mammal TTS data. Attempts to create a ''cautionary'' outcome by artificially lowering the composite audiogram thresholds would not necessarily result in lower TTS/PTS exposure levels, since the exposure functions are to a large extent based on applying mathematical functions to fit the existing TTS data.

Comment 4: A Commenter recommended that NMFS specify in the preamble to the final rule whether the data regarding behavioral audiograms (Branstetter *et al.* 2017, Kastelein *et al.* 2017b) and TTS (Kastelein *et al.* 2017a and c, Popov *et al.* 2017, Kastelein *et al.* 2018a and 2019a and b) support the continued use of the current weighting functions and PTS and TTS thresholds.

Response: Thus far, no new information has been published or otherwise conveyed that would fundamentally change the assessment of impacts or conclusions of this rule regarding current weighting functions and PTS and TTS thresholds. Furthermore, the recent peer-reviewed updated marine mammal noise exposure criteria by Southall *et al.* (2019a) provide identical PTS and TTS thresholds to those provided in NMFS' Acoustic Technical Guidance. NMFS' Revised Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (NMFS 2018) (Acoustic Technical Guidance), which was used in the assessment of effects for this rulemaking, compiled, interpreted, and synthesized the best available scientific information for noise-induced hearing effects for marine mammals to derive updated thresholds for assessing the impacts of noise on marine mammal hearing, including the articles that the Commenter referenced that were published subsequent to the publication of the first version of the Acoustic Technical Guidance in 2016. The new data included in those articles are consistent with the thresholds and weighting functions included in the current version of the Acoustic Technical Guidance (NMFS, 2018). NMFS will continue to review and evaluate new relevant data as it becomes available and consider the impacts of those studies on the Acoustic Technical Guidance to determine what revisions/updates may be appropriate.

Comment 5: Commenters recommended that NMFS refrain from using cut-off distances in conjunction with the Bayesian Behavioral Response Functions (BRFs) and re-estimate the numbers of marine mammal takes based solely on the Bayesian BRFs as the use of cut-off distances could be perceived as an attempt to reduce the numbers of takes.

Response: The consideration of proximity (cut-off distances) was part of the criteria developed in consultation between the Navy and NMFS, and is appropriate based on the best available science which shows that marine mammal responses to sound vary based on both sound level and distance. Therefore these cut-off distances were applied within the Navy's acoustic effects model. The derivation of the behavioral response functions and associated cut-off distances is provided in the 2017 technical report titled ''Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis (Phase III)''. To account for non-applicable contextual factors, all available data on marine mammal reactions to actual Navy activities and other sound sources (or other large scale activities such as seismic surveys when information on proximity to sonar sources was not available for a given species group) were reviewed to find the farthest distance to which significant behavioral reactions were observed. These distances were rounded up to the nearest 5 or 10 km interval, and for moderate to large scale activities using multiple or louder sonar sources, these distances were greatly increased—doubled in most cases. The Navy's BRFs applied within these distances provide technically sound methods reflective of the best available science to estimate the impact and potential take for the actions analyzed within the 2020 MITT FSEIS/OEIS and included in these regulations. NMFS has independently assessed the Navy's behavioral harassment thresholds (*i.e.,* their BRFs) and finds that they appropriately apply the best available science and it is not necessary to recalculate take estimates.

The Commenters also specifically expressed concern that distance ''cut-offs'' alleviate some of the exposures that would otherwise have been counted if the received level alone were considered. It is unclear why the Commenters find this inherently inappropriate, as this is what the data show. As noted previously, there are multiple studies illustrating that in situations where one would expect behavioral disturbance of a certain degree because of the received levels at which previous responses were observed, it has not occurred when the distance from the source was larger than the distance of the first observed response.

Comment 6: Regarding the behavioral harassment thresholds for explosives, Commenters recommended that NMFS estimate and ultimately authorize takes of marine mammals by Level B harassment in the form of behavioral disturbance, as well as TTS, during all explosive activities, including those that involve single detonations.

Response: The derivation of the explosive injury criteria is provided in the 2017 technical report titled ''Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis (Phase III),'' and NMFS has applied the general rule a commenter referenced to single explosives for years, *i.e.,* that marine mammals are unlikely to respond to a single instantaneous detonation *at received levels below the TTS threshold* in a manner that would rise to the level of a take. Neither NMFS nor the Navy are aware of evidence to support the assertion that animals will have significant behavioral reactions *(i.e.,* those that would rise to the level of a take) to temporally and spatially isolated explosions at received levels below the TTS threshold.

Marine mammals may be exposed to isolated impulses in their natural environment (*e.g.,* lightning). There is no evidence to support that animals have significant behavioral responses to temporally and spatially isolated impulses (such as military explosions) that may rise to the level of ''harassment'' under the MMPA for military readiness activities. Still, the analysis conservatively assumes that any modeled instance of temporally or spatially separated detonations occurring in a single 24-hour period would result in harassment under the

MMPA for military readiness activities. The Navy has been monitoring detonations since the 1990s and has not observed these types of reactions. To be clear, this monitoring has occurred under the monitoring plans developed specifically for shock trials, the detonations with the largest net explosive weight conducted by the Navy, and no shock trials are proposed in this study area.

Further, to clarify, the current take estimate framework does not preclude the consideration of animals being behaviorally disturbed during single explosions as they are counted as ''taken by Level B harassment'' if they are exposed above the TTS threshold, which is only 5 dB higher than the behavioral harassment threshold. We acknowledge in our analysis that individuals exposed above the TTS threshold may also be behaviorally disturbed and those potential impacts are considered in the negligible impact determination.

Comment 7: A Commenter stated that the behavioral response functions rely on captive animal studies and the risk functions do not incorporate a number of relevant studies on wild marine mammals (specifically referencing a passive acoustic study on blue whales). The Commenter asserts it is not clear from the proposed rule, or from the Navy's recent technical report on acoustic ''criteria and thresholds,'' on which NMFS' approach here is based, exactly how each of the studies that NMFS employed was applied in the analysis, or how the functions were fitted to the data, but the available evidence on behavioral response raises serious concerns that the functions are not conservative for some species. For this reason and others, and given the obvious importance of this analysis for future acoustic impact analyses, the Commenter requests that NMFS make additional technical information available, including from any expert elicitation and peer review, and to re-open public comment on this issue.

Response: We refer the Commenter to the Criteria and Thresholds for the U.S. Navy Acoustic and Explosive Effects Analysis (Phase III) Technical Report (U.S. Department of the Navy, 2017) for details on how the Navy accounted for the differences in captive and wild animals in the development of the behavioral response risk functions, which NMFS has evaluated and deemed appropriate to incorporate into the analysis in the rule. The appendices to this report detail the specific data points used to generate the behavioral response functions. Data points come from published data that is readily available and cited within the technical report, and NMFS disagrees that it is necessary to re-open public comment on this issue.

The Navy uses the best available science in the analysis, which has been reviewed by external scientists and approved by NMFS. The Navy considered all data available at the time for the development of updated criteria and thresholds, and limiting the data to the small number of field studies would not provide enough data with which to develop the new risk functions. In addition, the Navy accounts for the fact that captive animals may be less sensitive, and the scale at which a moderate-to-severe response was considered to have occurred is different for captive animals than for wild animals, as the Navy understands those responses will be different. The new risk functions were developed in 2016, before several recent papers were published or the data were available. The Navy and NMFS continue to evaluate the information as new science is made available. The criteria have been rigorously vetted within the Navy community, among scientists during expert elicitation, and then reviewed by the public before being applied. It is unreasonable to revise and update the criteria and risk functions every time a new paper is published. NMFS concurs with the Navy's evaluation and conclusion that there is no new information that necessitates changing the acoustic thresholds at this time.

These new papers provide additional information, and the Navy is considering them for updates to the criteria in the future, when the next round of updated criteria will be developed. Regarding consideration of research findings involving a passive acoustic study on blue whale vocalizations and behavior, the Navy considered multiple recent references, including but not limited to: Paniagua-Mendoza, 2017; Lesage, 2017; DeRuiter, 2017; Mate, 2016; Lomac-MacNair, 2016; Friedlaender, 2016; Mate, 2015. Thus far, no new information has been published or otherwise conveyed that would fundamentally change the assessment of impacts or conclusions of this Supplemental EIS/OEIS. To be included in the BRF, data sets needed to relate known or estimable received levels to observations of individual or group behavior. Melcon *et al.* (2012) does not relate observations of individual/group behavior to known or estimable received levels at that individual/group. In Melcon *et al.* (2012), received levels at the HARP buoy averaged over many hours are related to probabilities of D-calls, but the received level at the blue whale individuals/group are unknown.

Comment 8: A Commenter commented that dipping sonar, like hull-mounted sonar, appears to be a significant predictor of deep-dive rates in beaked whales, with the dive rate falling significantly (*e.g.,* to 35 percent of that individual's control rate) during sonar exposure, and likewise appears associated with habitat abandonment. According to the Commenter, the data sources used to produce the Navy's behavioral response functions (BRF) concern hull-mounted sonar, an R/V-deployed sonar playback, or an in-pool source. The Navy's generic behavioral response function for beaked whales does not incorporate their heightened response to these sources, although such a response would be presumed to shift its risk function ''leftward.'' Nor do the response functions for other species account for this difference, although unpredictability is known to exacerbate stress response in a diversity of mammalian species and should conservatively be assumed, in this case, to lead to a heightened response in marine mammal species other than beaked whales.

Response: In consultation with NMFS, the Navy relied upon the best science that was available to develop the behavioral response functions. The current beaked whale BRF acknowledges and incorporates the increased sensitivity observed in beaked whales during both behavioral response studies and during actual Navy training events, as well as the fact that dipping sonar can have greater effects than some other sources with the same source level. Specifically, the distance cut-off for beaked whales is 50 km, larger than any other group. Moreover, although dipping sonar has a significantly lower source level than hull-mounted sonar, it is included in the category of sources with larger distance cut-offs, specifically in acknowledgement of its unpredictability and association with observed effects. This means that ''takes'' are reflected at lower received levels that would have been excluded because of the distance for other source types.

An article referenced by the Commenter (Associating patterns in movement and diving behavior with sonar use during military training exercises: A case study using satellite tag data from Cuvier's beaked whales at the Southern California Anti-submarine Warfare Range (Falcone *et al.,* 2017)) was not available at the time the BRFs were developed. However, NMFS and the Navy have reviewed the article and concur that neither this article nor any

other new information that has been published or otherwise conveyed since the proposed rule was published changes the assessment of impacts or conclusions in the 2020 MITT FSEIS/OEIS or in this rulemaking. Additionally, the Navy's current beaked whale BRF covers the responses observed in this study since the beaked whale risk function is more sensitive than the other risk functions at lower received levels. The researchers involved with the study are still refining their analytical approach and integrating additional statistical parameters for future reporting. Nonetheless, the new information and data presented in the article were thoroughly reviewed by the Navy and will be quantitatively incorporated into future behavioral response functions, as appropriate, when and if other new data that would meaningfully change the functions would necessitate their revision.

Furthermore, ongoing Navy funded beaked whale monitoring at the same site where the dipping sonar tests were conducted has not documented habitat abandonment by beaked whales. Passive acoustic detections of beaked whales have not significantly changed over ten years of monitoring (DiMarzio *et al.,* 2018, updated in 2020). From visual surveys in the area since 2006 there have been repeated sightings of: The same individual beaked whales, beaked whale mother-calf pairs, and beaked whale mother-calf pairs with mothers on their second calf (Schorr *et al.,* 2018, 2020). Satellite tracking studies of beaked whales documented high site fidelity to this area (Schorr *et al.,* 2018, updated in 2020).

Comment 9: A Commenter recommends that NMFS (1) explain why, if the constants and exponents for onset mortality and onset slight lung injury thresholds for the current phase of incidental take rulemaking for the Navy (Phase III) have been amended to account for lung compression with depth, they result in lower rather than higher absolute thresholds when animals occur at depths greater than 8 m and (2) specify what additional assumptions were made to explain this counterintuitive result.

Response: The derivation of the explosive injury equations, including any assumptions, is provided in the 2017 technical report titled ''Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis (Phase III).'' Specifically, the equations were modified in Phase III to fully incorporate the injury model in Goertner (1982), specifically to include lung compression with depth. NMFS independently reviewed and concurred with this approach.

The impulse mortality/injury equations are depth dependent, with thresholds increasing with depth due to increasing hydrostatic pressure in the model for both the previous 2015–2020 phase of rulemaking (Phase II) and Phase III. The underlying experimental data used in Phase II and Phase III remain the same, and two aspects of the Phase III revisions explain the relationships the Commenter notes:

(1) The numeric coefficients in the equations are computed by inserting the Richmond et al. (1973) experimental data into the model equations. Because the Phase III model equation accounts for lung compression, the plugging of experimental exposure values into a different model results in different coefficients. The numeric coefficients are slightly larger in Phase III versus Phase II, resulting in a slightly greater threshold near the surface.

(2) The rate of increase for the Phase II thresholds with depth is greater than the rate of increase for Phase III thresholds with depth because the Phase III equations take into account the corresponding reduction in lung size with depth (making an animal more vulnerable to injury per the Goertner model), as the Commenter notes.

Ranges to effect are based on these injury thresholds, in addition to geometry of exposure (location of an animal relative to the explosive charge, horizontally and vertically), propagation environment, and the impulse integration duration.

Comment 10: A Commenter recommends that NMFS use onset mortality, onset slight lung injury, and onset GI tract injury thresholds rather than the 50-percent thresholds to estimate both the numbers of marine mammal takes and the respective ranges to effect. If NMFS does not implement the recommendation, the Commenter further recommends that NMFS (1) specify why it is inconsistently basing its explosive thresholds for Level A harassment on onset of PTS and Level B harassment on onset of TTS and onset of behavioral response, while the explosive thresholds for mortality and Level A harassment are based on the 50-percent criteria for mortality, slight lung injury, and GI tract injury, (2) provide scientific justification supporting that slight lung and GI tract injuries are less severe than PTS and thus the 50-percent rather than onset criteria are more appropriate for estimating Level A harassment for those types of injuries, and (3) justify why the number of estimated mortalities should be predicated on at least 50 percent rather than 1 percent of the animals dying.

Response: As appropriate, NMFS and the Navy have used a combination of exposure thresholds and consideration of mitigation to inform the take estimates. The Navy used the range to one percent risk of mortality and injury (referred to as ''onset'' in the 2020 MITT FSEIS/OEIS) to inform the development of mitigation zones for explosives. Ranges to effect based on one percent risk criteria were examined to ensure that explosive mitigation zones would encompass the range to any potential mortality or non-auditory injury, affording actual protection against these effects. In all cases, the mitigation zones for explosives extend beyond the range to one percent risk of non-auditory injury, even for a small animal (representative mass = 5 kg).

Given the implementation and expected effectiveness of this mitigation, the application of the indicated threshold is appropriate for the purposes of estimating take. Using the 1 percent non-auditory injury risk criteria to estimate take would result in an over-estimate of take, and would not afford extra protection to any animal. Specifically, calculating take based on marine mammal density within the area that an animal might be exposed above the 1 percent risk criteria would over-predict effects because many of those exposures will not happen because of the effective mitigation. The Navy, in coordination with NMFS, has determined that the 50 percent incidence of occurrence is a reasonable representation of a potential effect and appropriate for take estimation, given the mitigation requirements at the 1 percent threshold, and the area ensonified above this threshold would capture the appropriate reduced number of likely injuries.

Although the commenter implies that the Navy did not use extensive lung hemorrhage as indicative of mortality, that statement is incorrect. Extensive lung hemorrhage is assumed to result in mortality, and the explosive mortality criteria are based on extensive lung injury data. See the 2017 technical report titled ''Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis (Phase III).''

Comment 11: A Commenter stated that NMFS, following the Navy, has applied a post-modeling adjustment to its estimate of lethal take that substantially reduces the total number. That adjustment, in the case of serious injury and mortality, purports to account for the effectiveness of visual observers in detecting marine mammals within the blast zone of an underwater

explosion (or within the radius of permanent acoustic injury), but NMFS' borrowed methods here are non-transparent and misconceived. The Navy's DSEIS/OEIS for the MITT Study Area starts with the species-specific g(0) factors applied in professional marine mammal abundance surveys (the probability that an object that is on the line is detected using standard line-transect methods), then multiplies them by simple factors to reflect the relative effectiveness of its Lookouts in routine operating conditions. Yet the Navy's sighting effectiveness is likely to be much poorer than that of experienced biologists dedicated exclusively to marine mammal detection, operating under conditions that maximize sightings. In any case, the public has no meaningful way to further evaluate the agencies' adjustment since the proposed rule does not provide the scores used to generate the effectiveness factor or the agencies' pre-adjustment take numbers, nor does the Navy in the ancillary report NMFS references. The Commenter suggests that ''[s]ince the Navy has yet to determine the effectiveness of its mitigation measures, it is premature to include any related assumptions to reduce the numbers of marine mammal takes.'' Another Commenter recommends that NMFS (1) specify the total numbers of model estimated Level A harassment (PTS) and mortality takes rather than reduce the estimated numbers of takes based on the Navy's post-model analyses and (2) include the model-estimated Level A harassment and mortality takes in its negligible impact determination analyses.

Response: The consideration of marine mammal avoidance and mitigation effectiveness is integral to NMFS' and the Navy's overall analysis of impacts from sonar and explosive sources. NMFS has independently evaluated the method and agrees that it is appropriately applied to augment the model in the prediction and authorization of injury and mortality as described in the rule. Details of this analysis are provided in the Navy's 2018 technical report titled ''Quantifying Acoustic Impacts on Marine Mammals and Sea Turtles: Methods and Analytical Approach for Phase III Training and Testing.'' Additional information on the mitigation analysis also was included in the proposed rule and NMFS disagrees with the Commenter's suggestion that there was not enough information by which to evaluate the Navy's post-modeling calculations. Also, it should be noted that even before consideration of mitigation effectiveness, there were no modeled mortalities to any marine mammals.

Sound levels diminish quickly below levels that could cause PTS. Specifically, behavioral response literature, including the recent 3S and SOCAL BRS studies, indicate that multiple species from different cetacean suborders do in fact avoid approaching sound sources by a few hundred meters or more, which would reduce received sound levels for individual marine mammals to levels below those that could cause PTS (see Appendix B of the ''Criteria and Thresholds for U.S. Navy Acoustic and Explosive Impacts to Marine Mammals and Sea Turtles Technical Report'' (U.S. Department of the Navy, 2017) and Southall *et al.* (2019a)). The ranges to PTS for most marine mammal groups are within a few tens of meters and the ranges for the most sensitive group, the HF cetaceans, average about 200 m, to a maximum of 270 m in limited cases. For blue whales and other LF cetaceans, the range to PTS is 65 m for MF1 30 sec duration exposure, which is well within the mitigation zones for hull-mounted MFAS. Therefore, the anticipated avoidance to the distances discussed would greatly reduce the likelihood of impacts to hearing such as TTS and PTS. As discussed in the Navy's report, animats in the Navy's acoustic effects model do not move horizontally or ''react'' to sound in any way. Accordingly, NMFS and the Navy's analysis appropriately applies a quantitative adjustment to the exposure results calculated by the model (which does not consider avoidance or mitigation).

As discussed in the Navy's report, the Navy's acoustic effects model does not consider procedural mitigations (*i.e.,* power-down or shut-down of sonars, or pausing explosive activities when animals are detected in specific zones adjacent to the source), which necessitates consideration of these factors in the Navy's overall acoustic analysis. Credit taken for mitigation effectiveness is extremely conservative. For example, if Lookouts can see the whole area, they get credit for it in the calculation; if they can see more than half the area, they get half credit; if they can see less than half the area, they get no credit. Not considering animal avoidance and mitigation effectiveness would lead to a great overestimate of injurious impacts. NMFS concurs with the analytical approach used, *i.e.,* we believe the estimated take by Level A harassment numbers represent the maximum number of these takes that are likely to occur and it would not be appropriate to authorize a higher number or consider a higher number in the negligible impact analysis.

The Navy assumes that Lookouts will not be 100 percent effective at detecting all individual marine mammals within the mitigation zones for each activity. This is due to the inherent limitations of observing marine species and because the likelihood of sighting individual animals is largely dependent on observation conditions (*e.g.,* time of day, sea state, mitigation zone size, observation platform) and animal behavior (*e.g.,* the amount of time an animal spends at the surface of the water). The Navy quantitatively assessed the effectiveness of its mitigation measures on a per-scenario basis for four factors: (1) Species sightability, (2) a Lookout's ability to observe the range to permanent threshold shift (for sonar and other transducers) and range to mortality (for explosives), (3) the portion of time when mitigation could potentially be conducted during periods of reduced daytime visibility (to include inclement weather and high sea-state) and the portion of time when mitigation could potentially be conducted at night, and (4) the ability for sound sources to be positively controlled (*e.g.,* powered down). The Navy's report clearly describes how these factors were considered, and it is not necessary to view the many tables of numbers generated in the assessment to evaluate the method.

The g(0) values used by the Navy for their mitigation effectiveness adjustments take into account the differences in sightability with sea state, and utilize averaged g(0) values for sea states of 1–4 and weighted as suggested by Barlow (2015). Using g(0) values is an appropriate and conservative approach (*i.e.,* underestimates the protection afforded by the Navy's mitigation measures) for the reasons detailed in the technical report. For example, during line-transect surveys, there are typically two primary observers searching for animals. Each primary observer looks for marine species in the forward 90-degree quadrant on their side of the survey platform and scans the water from the vessel out to the limit of the available optics (*i.e.,* the horizon). Because Navy Lookouts focus their observations on established mitigation zones, their area of observation is typically much smaller than that observed during line-transect surveys. The mitigation zone size and distance to the observation platform varies by Navy activity. For example, during hull-mounted mid-frequency active sonar activities, the mitigation zone extends 1,000 yd from the ship

hull. During the conduct of training and testing activities, there is typically at least one, if not numerous, support personnel involved in the activity (*e.g.,* range support personnel aboard a torpedo retrieval boat or support aircraft). In addition to the Lookout posted for the purpose of mitigation, these additional personnel observe for and disseminate marine species sighting information amongst the units participating in the activity whenever possible as they conduct their primary mission responsibilities. However, as a conservative approach to assigning mitigation effectiveness factors, the Navy elected to account only for the minimum number of required Lookouts used for each activity; therefore, the mitigation effectiveness factors may underestimate the likelihood that some marine mammals may be detected during activities that are supported by additional personnel who may also be observing the mitigation zone.

Although NAEMO predicted PTS, no mortality or non-auditory injury were predicted by NAEMO. Of these two non-auditory effects (mortality and non-auditory injury), only mortality would have been subject to mitigation consideration in the quantitative analysis, if there had been any. Also, as discussed in *Comment 43,* the Navy will be providing NMFS with a report summarizing the status of and/or providing its final assessment on the Navy's Lookout Effectiveness Study following the end of CY 2021.

Comment 12: One Commenter asserted that NMFS and the Navy make certain post-modeling adjustments to their estimates of non-lethal injury, on flawed assumptions about animal avoidance and mitigation effectiveness. A Commenter stated in regards to the method by which the Navy's post-model calculation considers avoidance specifically *(i.e.,* assuming animals present beyond the range of PTS for the first few pings will be able to avoid it and incur only TTS, which results in a 95 percent reduction in the number of estimated PTS takes predicted by the model), given that sound sources are moving, it may not be until later in an exercise that the animal is close enough to experience PTS, and it is those few close pings that contribute to the potential to experience PTS. Marine mammals may remain in important habitat, and the most vulnerable individuals may linger in an area, notwithstanding the risk of harm; marine mammals cannot necessarily predict where an exercise will travel. In addition, Navy vessels may move faster than the ability of the animals to evacuate the area. The Commenter expressed concern that this method underestimates the number of PTS takes and that NMFS should not create an under-supported, nonconservative adjustment for avoidance. The Commenter further suggested that the Navy could query the dosimeters on the animats in its model to test its assumption.

Response: The consideration of marine mammals avoiding the area immediately around the sound source is provided in the Navy's 2018 technical report titled ''*Quantitative Analysis for Estimating Acoustic and Explosive Impacts to Marine Mammals and Sea Turtles.*'' As the Commenter correctly articulates: ''For avoidance, the Navy assumed that animals present beyond the range to onset PTS for the first three to four pings are assumed to avoid any additional exposures at levels that could cause PTS. That equated to approximately 5 percent of the total pings or 5 percent of the overall time active; therefore, 95 percent of marine mammals predicted to experience PTS due to sonar and other transducers were instead assumed to experience TTS.''

In regard to the comment about vessels moving faster than animals' ability to get out of the way, as discussed in the Navy's 2018 technical report titled ''*Quantitative Analysis for Estimating Acoustic and Explosive Impacts to Marine Mammals and Sea Turtles,*'' animats in the Navy's acoustic effects model do not move horizontally or ''react'' to sound in any way, necessitating the additional step of considering animal avoidance of close-in PTS zones. NMFS independently reviewed these assumptions and this approach and concurs that they are fully supported by the best available science. Based on a growing body of behavioral response research, animals do in fact avoid the immediate area around sound sources to a distance of a few hundred meters or more depending upon the species. Avoidance to this distance greatly reduces the likelihood of impacts to hearing such as TTS and PTS, respectively. Specifically, the ranges to PTS for most marine mammal groups are within a few tens of meters and the ranges for the most sensitive group, the HF cetaceans, average about 200 m, to a maximum of 270 m in limited cases. The Commenter's point about speed is not applicable to the initially distant animals that are discounted by this method, most of which would be able to avoid the source as there is more time (because they are farther from the source) to do so. Further, the Commenter ignores the corollary to their point, which is that given the speed the Navy vessels operating sonar are typically traveling relative to the speed and direction of marine mammals, the likelihood of individuals remaining in close enough proximity to the source for a duration that would result in TTS or PTS is lessened.

Querying the dosimeters of the animats would not produce useful information since, as discussed previously, the animats do not move in the horizontal and are not programmed to ''react'' to sound or any other stimulus.

Humpback Whales

Comment 13: Commenters assert that the proposed reporting requirement for MF1 MFAS (with the lack of any restriction on actual sonar use) in the Chalan Kanoa Reef and Marpi Reef Geographic Mitigation Areas would not protect humpback whales, and particularly calves during this sensitive life stage. Further, the Commenters note that because these areas have not been a high-use area for the Navy and ASW training events and are ''considered generally unsuitable for training needs,'' (85 FR 48388), there is no justification for failing to prohibit sonar use in this sensitive humpback whale habitat off Saipan. One Commenter recommended that NMFS prohibit use of MF1 sonar in the Marpi Reef and Chalan Kanoa Reef Geographic Mitigation Areas during the months that humpbacks are present in the Marianas while another suggested a year-round prohibition.

Response: Following extensive discussions with the Navy during which more specific granular information about the Navy's likely activity was provided and the practicability of additional restrictions were considered, new information about humpback whale occurrence in the mitigation areas emerged, and new analyses were conducted (see the *Estimated Take of Marine Mammals* section), NMFS established a 20-hr annual cap from December 1–April 30 on the use of hull-mounted MF1 MFAS for these two Geographic Mitigation Areas (20 hrs total for both areas combined) to minimize sonar exposure and reduce the amount and/or severity of take by Level B harassment (behavioral disturbance and/or TTS) of humpback whales in these important reproductive areas. It is important to note that in the Navy's rulemaking/LOA application and NMFS' associated analysis for the proposed rule, while high amounts of sonar training may not have been expected, the amount of sonar use in these areas had not been limited.

Our evaluation of potential mitigation measures includes consideration of both

(1) the manner in which, and the degree to which, implementation of the potential measure(s) is expected to reduce adverse impacts to marine mammal species or stocks and their habitat and (2) the practicability of the measures for applicant implementation, which in this case includes the impact on the Navy's military readiness activities. While we did consider completely restricting MF1 MFAS in the two Geographic Mitigation Areas, we also considered the Navy's broader need for flexibility as well as the specific need not to restrict these shallow-water training areas entirely in the MITT Study Area given the proximity to forward deployed operations and the higher likelihood of a need to have the option to conduct training quickly to respond to emergent national security threats. The Navy expects current and future use of the two Geographic Mitigation Areas to remain low, but the 20-hr cap will allow the Navy flexibility to engage in a small amount of necessary training, most likely such as a Small Coordinated ASW Exercise or TRACKEX event(s), which could occur up to five days, but no more than four hours per day (or similar configuration totalling no more than 20 hrs). Areas of shallow depths are limited in the Mariana Archipelago, and NMFS determined (with the Navy's input) that it would be impracticable to completely limit the use of sonar at the Chalan Kanoa Reef and Marpi Reef due to the requirement to have access to such bathymetry for training purposes in order to support mission requirements as established by operational Commanders. The reduction in potential exposure of humpback whales to sonar in these areas and at this time (*i.e.,* the short overall and daily exposure) would reduce the likelihood of impacts that could affect reproduction or survival, by minimizing impacts on calves during this sensitive life stage, avoiding the additional energetic costs to mothers of avoiding the area and minimizing the chances that important behaviors (*e.g.,* cow-calf communication, breeding behaviors) are interrupted to the point that survivorship or reproduction are impacted. Therefore, we have determined that the 20-hr cap on MF1 MFAS sonar in the two Geographic Mitigation Areas will meaningfully reduce impacts on the affected humpback whales and, further, be practicable for Navy implementation. As an additional measure, the Navy will also now report all active sonar use (all bins, by bin) in these areas between December 1 and April 30 to NMFS in their annual reports. This will allow NMFS to evaluate the sonar use in the two Geographic Mitigation Areas over the seven-year period and to determine if further mitigation is warranted.

Comment 14: A Commenter recommended a prohibition on mid-frequency air deployed dipping sonar, year-round in the Geographic Mitigation Areas. The Commenter also commented that dipping sonar has been shown to have disproportionate impacts on beaked whales and may impact other species such as humpback whales in a similar manner, due to the unpredictability of the signal.

Response: Regarding the applicability of the data the Commenter cites to humpback whale responses, the research was focused exclusively on beaked whales and, further, in regard to the data cited, certain limitations are still under investigation such as the proximity of the source and other factors. Behavioral responses of beaked whales from dipping and other sonars cannot be universally applied to other marine mammal species, especially since beaked whales are known to be more sensitive to lower level sounds, which is reflected in our analysis through a lower behavioral harassment threshold. For example, Navy-funded behavioral response studies of blue whales to simulated surface ship sonar have demonstrated there are distinct individual variations as well as strong behavioral state considerations that influence any response or lack of response. The majority of take by Level B harassment results from MF1 sonar, which is practicable to limit in the Chalan Kanoa Reef and Marpi Reef Geographic Mitigation Areas. Sonar activities in this area have been limited historically, there is insufficient evidence to suggest that MF4 sonar would have disproportionately adverse effects, and further limitation of MF4 dipping sonar use in these areas would not be expected to meaningfully reduce impacts to humpback whales.

With regards to beaked whales, water depths in the Chalan Kanoa Reef and Marpi Reef Geographic Mitigation Areas are not suitable habitats for beaked whales. There is no evidence to suggest that prohibiting the use of mid-frequency dipping sonar in the Geographic Mitigation Areas would have any benefit to beaked whales.

Comment 15: A Commenter recommended prohibiting use of low-frequency active sonar from December through April in the Marpi Reef and Chalan Kanoa Reef Geographic Mitigation Areas, because they assert that baleen whales are vulnerable to the impacts of low-frequency active sonar, particularly in calving areas where low-amplitude communication calls between mothers and calves can be easily masked.

Response: Low-frequency sonar use in this rule has been significantly scaled down from previous authorizations. The Navy is only seeking authorization for 11 hrs or less per year of low-frequency sonar use in the MITT Study Area, with most of these systems used further offshore. Furthermore, the most used source at approximately 10 hrs (LF5) has source levels less than 180 dB and one hour of LF4 with source levels greater than 180 dB and less than or equal to 200 dB, with the associated harassment zones significantly smaller than for MF1. Based on historical sonar use in the MITT Study Area, it is highly unlikely that the few planned low-frequency sonar hours would occur in the Geographic Mitigation Areas from December through April. Given that, and the smaller impact zones, a prohibition would have very limited or no potential benefit to humpback whales and other baleen whales and would unnecessarily impose a restriction on training and testing in the MITT Study Area.

Comment 16: A Commenter recommended extending the Marpi Reef Geographic Mitigation Area boundaries to include a buffer that encompasses the humpback whale sightings data beyond the 400-m depth contour and the southernmost point of the proposed Marpi Reef Geographic Mitigation Area.

Response: NMFS extended the boundary out to the 400-m isobath for both Marpi Reef and Chalan Kanoa Reef Geographic Mitigation Areas prior to the publication of the proposed rule. NMFS and the Navy considered using bathymetry to define the Marpi Reef Geographic Mitigation Area when initially evaluating potential mitigation areas, but instead relied on confirmed sightings of humpback whales to define the area. After reviewing the detailed bathymetry of the reef coupled with marine mammal sightings, NMFS and the Navy reevaluated how the Marpi Reef Geographic Mitigation Area was bounded and redefined the area based on the extent of the 400-m isobath. Given most sightings of humpback whales were in waters less than 200 m in depth, this provides an additional buffer between most sighting locations and the boundary for the area. Seafloor areas extending beyond the reef are not necessarily areas of potential biological importance (*i.e.,* whales may have been transiting to or from the reef when sighted). Scientists from NMFS' Pacific Islands Fisheries Science Center, who have conducted numerous humpback

whale surveys in Hawaii and the Mariana Islands, have observed that the majority of humpback whale breeding activity (mother-calf pairs, competitive behavior) happens in water depths of 200 m or less, with more mother-calf pairs in water depths 50 m or less (Hill *et al.,* 2020). In addition, during a review of the Marpi Reef sightings and bathymetry, the Navy found that the mitigation graphics in Appendix I (Geographic Mitigation Assessment) of the 2020 MITT FSEIS/OEIS had errors where bathymetric lines plotted were incorrectly shifted. This issue was fixed using a more accurate small-scale bathymetric dataset. Revised figures for the 2020 MITT FSEIS/OEIS show that all humpback whale sightings near Marpi Reef where suspected reproductive behaviors were observed (mother-calf pairs, competitive behavior) were shallower than the 200-m isobath.

Comment 17: A Commenter recommends implementing vessel speed restrictions from December through April in the Marpi Reef and Chalan Kanoa Reef Geographic Mitigation Areas as they argue that ship strike and vessel noise pose a serious risk to humpback whales, particularly in calving and breeding areas. They say it is important that NMFS prescribe vessel speed limits in this important breeding habitat and that mandatory speed limits, such as those that NMFS has put in place to protect North Atlantic right whales, have proven effective. NMFS has no basis on which to determine that its ''notification message'' measure—which would depend on non-specialist, non-dedicated Navy observers operating effectively in unfavorable sea states—would be as effective, or effective at all. The Commenter states there is no reason why NMFS cannot reasonably accommodate national security needs to create exceptions to the rule if needed.

Response: To avoid physical disturbance and strike from vessel movements, the Navy maneuvers to maintain a 500 yd mitigation zone from whales and other marine mammals (except bow-riding dolphins). As further described in Section 5.3.4.1 (Vessel Movement) of the 2020 MITT FSEIS/OEIS implementing mitigation to limit vessel speeds in the MITT Study Area would be incompatible with the Navy's criteria for safety, sustainability, and mission requirements. For example, Navy vessel operators need to train to proficiently operate vessels as they would during military missions and combat operations, including being able to react to changing tactical situations and evaluate system capabilities. Navy studies from other range complexes demonstrated that median speeds near coasts are already low, varying from 5 to 12 knots. Furthermore, given that there have been no vessel strikes involving humpback whales or other marine mammals while Navy vessels conducted training and testing activities in the MITT Study Area, implementing vessel speed restrictions in the Geographic Mitigation Areas or other locations in the Study Area would not be an effective mitigation measure because it would not result in discernible avoidance or reduction of impacts. Given the lack of meaningful reduction in impacts combined with the impracticability of ship speed restrictions, NMFS has found that this measure is not warranted and it is not required in this rule.

Serious Injury and Mortality, Beaked Whales

Comment 18: Commenters stated that NMFS underestimated serious injury and mortality for beaked whales around the Mariana Islands, ignored the best available scientific information, and failed to make any meaningful assessment and negligible impact determination of the likelihood that Navy training and testing activities triggered strandings in the MITT Study Area. A Commenter stated that NMFS has failed to demonstrate a rational basis for its assumption that ''[n]o mortality or Level A harassment [of beaked whales] is expected'' from MITT activities, rendering NMFS's preliminary determination of negligible impact arbitrary and capricious. Another Commenter noted that in the Guam press, at least six beaked whale stranding events, each involving as many as three animals, have been reported in the archipelago since 2006, as compared with only a single stranding in the previous 35 years. That number of recent stranding events was subsequently corrected to eight, in a paper that appeared earlier this year in a major, peer-reviewed journal. The Simonis *et al.* (2020) paper, whose co-authors include several NMFS biologists, correlated four of these events with Navy operations, a correlation that it describes as ''highly significant.'' The Commenter argued that the best available science shows that serious injuries and mortalities are likely to far exceed the number of reported strandings. Numerous studies along multiple lines of evidence, including post-stranding pathology, laboratory study of organ tissue, and theoretical work on dive physiology, in addition to expert reviews, indicate that behaviorally-mediated injury and mortality is occurring through maladaptive alteration of the dive pattern in response to Navy sonar exposure—impacts that occur at sea, independent of a whale's stranding. The Commenter argues that in light of the available scientific evidence, this position is both arbitrary and irresponsible. They state that NMFS' method in the proposed rule is to cast doubt on an undefined subset of previous stranding events on the grounds that the precise mechanism of harm could not be established, even while describing in detail the abundance of pathological and forensic evidence.

In a related comment, another Commenter asserted that although NMFS does not expect injury or mortality of any of beaked whales to occur as a result of the Navy's active sonar training exercises, NMFS's justification for authorizing beaked whale mortalities under Phase I and the previous Phase II regulations is still valid. The Commenter argues that NMFS cannot ignore that there remains the potential for the operation of MFAS to contribute to the mortality of beaked whales. Given that the potential for beaked whale mortalities cannot be obviated, the Commenter recommends that NMFS authorize at least 10 mortality takes of beaked whales associated with MFA sonar use in the MITT Study Area in the final rule.

Response: In the final rule, NMFS has included additional information and analysis and expanded the explanation of why the best available science does not indicate that the Navy's activities are likely to result in mortality of beaked whales through stranding. Please see the *Stranding* subsection of the *Potential Effects of Specified Activities on Marine Mammals and Their Habitat* section, which addresses the issues raised by the Commenters; comments not addressed in that section are addressed below. To specifically correct an inaccuracy in the Comment, it should be noted, that of the eight events the Commenter refers to, only three had Navy sonar use before. Four events cited in the paper was an error the authors acknowledged.

In regard to the authorization of mortality in MMPA regulations for Phase I and II of MITT training and testing activities, the Commenter is in error. Mortality was authorized in the Phase I MITT final rule, in an abundance of caution given the events, worldwide, in which there was a causal link between naval sonar and strandings, and noting that there could be a stranding that co-occurred with Navy sonar that was not caused by it. However, the rule explicitly stated that

''Neither NMFS nor the Navy anticipates that marine mammal strandings or mortality will result from the use of mid- or high-frequency sonar during Navy exercises within the MIRC Study Area.'' However, no mortality was authorized in the Phase II final rule for the MITT Study Area. The Navy initially requested mortality takes of beaked whales, however, after further discussion of the lack of incidents in which strandings were causally associated with sonar in the Marianas, or a perceived reasonable likelihood that they would be at the time, NMFS and the Navy determined that authorization of mortality was not appropriate. NMFS does not argue that there is no possibility for mortality to occur as a result of Navy activities, rather, we reason that consideration of all applicable information (the best available science) does not indicate that such mortality is reasonably likely to result from the Navy's activities within the seven-year span of the rule.

Comment 19: A Commenter stated that in addition to documenting the substantial risk of injury and mortality to beaked whales from MITT activities, Simonis *et al.* (2020) confirmed the existence of biologically important areas for beaked whales near Saipan and Tinian. The study found that at least three species of beaked whales—Cuvier's, Blainville's, and a third unidentified species that may be the ginkgo-toothed beaked whale—occur in the Mariana Archipelago throughout the year, similar to other island-associated populations around the world. The Commenter argues that before finalizing its MMPA take regulations and issuing an LOA, NMFS must fully evaluate this new scientific information, which supports the establishment of a geographic mitigation area in the waters around Saipan and Tinian to protect vulnerable beaked whales from Navy sonar.

Response: NMFS has evaluated the new scientific information from Simonis *et al.* (2020) as well as years of field surveys conducted under interagency agreements between the Navy and NMFS Pacific Islands Fisheries Science Center and Navy-funded beaked whale monitoring, and there remains a lack of scientific information available on beaked whale distribution in the Marianas Islands. Simonis *et al.* (2020) confirm that the acoustic record from their HARPs indicates that the habitats near the recording locations are used by Blainville's, Cuvier's and an unidentified beaked whale, however, they only suggest that the locations ''may be considered as potentially important beaked whale habitat,'' given that beaked whales were present a large portion of the time at each recording site. Specifically, they note that the presence of beaked whale signals in a recording can be indicative of relative occurrence and seasonal fluctuations, however, given there are only two recorders, the relative occurrence may only be compared between the two locations, and the authors do not compare the recordings to any other locations, making it impossible to draw conclusions regarding how any inferred occurrence rates might compare to other parts of the MITT Study Area or the species' range. The information presented in Simonis *et al.* (2020), while informative, does not provide sufficient information to warrant the addition of geographic mitigation measures beyond the procedural mitigation measures put in place through this final rule to reduce the number and severity of takes for all marine mammals.

Without sufficient scientific data on beaked whale habitat use, bathymetry, and seasonality, NMFS is unable to develop mitigation measures that will meaningfully further reduce impacts to beaked whales and not be impracticable for the Navy. That said, NMFS and the Navy are committed to further actions (see the *Changes from the Proposed Rule to the Final Rule* section) to expand the science and inform future management actions related to beaked whales in the MITT Study Area. For example, the Navy will co-fund the Pacific Marine Assessment Program for Protected Species (PACMAPPS) survey in spring-summer 2021 to help document beaked whale occurrence, abundance, and distribution in the Mariana Islands. This effort will include deployments of a towed array as well as floating passive acoustic buoys. The Navy will monitor future beaked whale occurrence within select portions of the MITT Study Area starting in 2022. Additionally, the Navy will include Cuvier's beaked whales as a priority species for analysis under a 2020–2023 Navy-funded research program entitled Marine Species Monitoring for Potential Consequences of Disturbance (MSM4PCOD). Finally, the Navy will fund and co-organize with NMFS an expert panel to provide recommendations on scientific data gaps and uncertainties for further protective measure consideration to minimize the impact of Navy training and testing activities on beaked whales in the Mariana Islands.

Comment 20: One Commenter made several recommendations related to NMFS' assessment and mitigation of beaked whale impacts. The Commenter recommended that given beaked whales infrequent exposure to active sonar in the MITT Study Area, more conservative behavioral response curves be used to predict behavioral disturbance. The Commenter also challenged NMFS' assertion that suitable alternative foraging habitat is available for beaked whales in the MITT Study Area. Noting the scarcity of beaked whale data, the Commenter recommended that acoustic monitoring be implemented as the preferred method for estimating density of beaked whales, instead of using Hawaii data and, further, recommended more broadly that acoustic monitoring of beaked whales be conducted to better understand the impacts of Navy activities on beaked whales. The Commenter recommended that the Navy be more transparent in their monitoring in sharing data indicating the timing of Navy activities in relation to strandings. The Commenter noted that additional personnel and support for local stranding response and records is needed in order to better investigate causes of strandings that coincide with Navy activities in the MITT Study Area. Last, the Commenter notes that in order to detect any trend in the population, there is a strong need to conduct consistent surveys, with adequate methods for the species under consideration, over multiple years.

Response: Regarding the recommendation to modify the behavioral harassment thresholds (specifically, lower the received levels at which they would be considered taken) based on the infrequent exposures of beaked whales to sonar in the Marianas, we first note that although the amount of activities in the MITT Study Area is below the amount in the AFTT or HSTT study areas, active sonar has been in regular use in the MITT Study Area since the 1960s, and it is unlikely that marine mammals in the area are naive to sonar exposure. Further, while NMFS acknowledges the importance of context and considers it in evaluating behavioral responses, there is not sufficient data upon which to base a quantitative modification of the behavioral harassment thresholds. Further, the behavioral thresholds for beaked whales are already lower than for other taxa to address their sensitivity and, as with other taxa, take the form of a dose response curve, allowing for variation in individual responses given different contexts.

Regarding the comment that NMFS claims that suitable alternative habitat options exist if beaked whales are disturbed during feeding is not credible, we first direct the Commenter to the discussion of the impacts of noise

exposure during feeding behaviors described in the *Odontocete* subsection of the *Analysis and Negligible Impact Determination* section, which discusses the energetic impacts that interruption of feeding bouts can have on feeding odontocetes if interruptions occur over repeated sequential days. However, in the context of the MITT Study Area, as predicted and discussed, the magnitude and severity of takes is such that disturbance of low-moderate levels is expected to occur on no more than a few non-sequential days for any individual beaked whales, which would not result in the sort of energetic concerns that the Commenter is raising. Further, the Commenter repeatedly references concerns for small resident populations of beaked whales with high site fidelity, but there are no data to confirm the population structure of beaked whales in this area and, again, the magnitude and severity is low such that, regardless, adverse energetic impacts would be unlikely to result from Navy activities.

Regarding the recommendation that acoustic monitoring be implemented in order to provide better density information for beaked whales, and to better understand behavioral responses, as noted in the *Changes from the Proposed Rule* section, the Navy will be co-funding the Pacific Marine Assessment Program for Protected Species (PACMAPPS) survey in spring-summer 2021 to help document beaked whale occurrence, abundance, and distribution in the Mariana Islands. This effort will include deployments of a towed acoustic array as well as floating passive acoustic buoys. The Navy has further committed to monitoring future beaked whale occurrence within select portions of the MITT Study Area starting in 2022 (so as to not duplicate PACMAPPS efforts).

Regarding the recommendation that the Navy be more transparent in their monitoring and sharing data indicating the timing of Navy activities in relation to strandings, there is certain information that the Navy is unable to share freely because it is classified. Specific classified information is shared in the Navy's classified monitoring reports, and the Navy has always cooperated to provide additional detail in an unclassified format when needed. Further, though, the Navy has specifically targeted, for monitoring pursuant to this rule, increased analysis for any future beaked whale stranding in the Mariana Islands to include detailed Navy review of available records of sonar use.

Regarding the comment that additional personnel and support for local stranding response and records is needed in order to better investigate causes of strandings that coincide with Navy activities in the MITT Study Area, as discussed in the rule the Navy has committed to continuing to fund additional stranding response/necropsy analyses for the Pacific Islands region. Further, the Navy is submitting a proposal through the annual Federally Funded Research and Development Center (FFRDC) call to fund the Center for Naval Analysis (CNA) to develop a framework to improve the analysis of single and mass stranding events, including the development of more advanced statistical methods to better characterize the uncertainty associated with data parameters.

Last, the Commenter notes that in order to detect any trend in the population, there is a strong need to conduct consistent surveys, with adequate methods for the species under consideration, over multiple years. NMFS and the Navy do not disagree with this recommendation and, as noted, the Navy and NMFS are co-funding the PACMAPPS survey and the Navy has committed to additional beaked whale surveys. However, the ability to conduct consistent surveys is dependent upon the availability of resources at both NMFS and the Navy, and surveys may not always be conducted with the ideal regularity.

Comment 21: A Commenter recommends that the Navy conduct more visual monitoring efforts, at sea and along coastlines, for stranded cetaceans before, during, and after naval exercises.

Response: It is not practicable for the Navy to conduct additional visual monitoring at sea and along the coastlines for stranded cetaceans before, during, and after training and testing activities beyond what will occur through the procedural mitigation requirements under this rule. Pursuant to the mitigation, the Navy will be required to conduct monitoring for marine mammals before, during, and after in-water explosive exercises as described in the *Mitigation Measures* section of this rule. During operations of hull-mounted mid-frequency sonar and low frequency sonar above 200 dB, monitoring will be conducted in support of mitigation requirements, and during all operations of any sort the Navy will be required to report if any injured or dead marine mammals are observed and follow established incident reporting procedures. In addition, the Navy has been providing funding to augment stranding response and necropsy examinations in Hawaii and the Mariana Islands since 2018. Additional funding to continue this support has been programmed and is pending issuance in FY20.

Comment 22: A Commenter recommends that NMFS consider the full range of options in determining the mitigation measures needed to meet its responsibility under both the ''negligible impact'' and ''least practicable adverse impact'' provisions of the MMPA for beaked whales. Given the expertise needed to produce an optimal mitigation plan, the Commenter strongly advises NMFS to assemble a group of subject-matter experts, including experts on beaked whale distribution, monitoring, and conservation from the Southwest Fisheries Science Center, researchers from the Pacific Islands Fisheries Science Center who have led the work on beaked whales in the archipelago, and outside experts on the conservation biology of beaked whales.

Response: The procedural mitigation measures required by the final rule provide protection for all species of marine mammals by reducing the probability and severity of impacts from active sonar and explosives. As noted, there is limited data available addressing the distribution of marine mammals in the Marianas, and there is no information supporting the existence of any known biologically important areas that would warrant the development of a geographic mitigation area for beaked whales. NMFS had thorough discussions with the Navy about the possibility of crafting a mitigation measure to minimize any potential risk that Navy activities could contribute in any way to the potential stranding of beaked whales. These discussions included consideration of all public comments that recommended beaked whale mitigation measures. However, despite years of field surveys conducted under interagency agreements between the Navy and NMFS' PIFSC along with Navy funded beaked whale monitoring, there remains a lack of scientific information available on beaked whale distribution and other essential species information in the Mariana Islands. Without sufficient scientific data on beaked whale habitat use, bathymetry, and seasonality, and from that a better understanding of the circumstances that could affect the likelihood of a stranding in the MITT Study Area, NMFS is unable to develop mitigation measures that would meaningfully reduce the likelihood of stranding and/or will not result in unreasonable operational/practicability concerns.

Consequently, NMFS recommended to the Navy that the two agencies convene a panel of experts, both from

the region, as well as beaked whale behavioral response experts from other geographic areas, and Navy experts on biology, operations, and mitigation to review the status of the science, identify data gaps, and identify information applicable for consideration for future mitigation through the Adaptive Management process. The Navy has agreed to fund and co-organize this effort. Additional measures that the Navy has agreed to conduct to increase understanding and decrease uncertainty around beaked whales in the MITT Study Area are discussed in the *Monitoring* section.

Comment 23: A Commenter recommends that the impact assessment consider whether beaked whales would be startled by explosions or active sonar causing them to rush from great depths to the surface at dangerous speed causing injury from gas expansion in their blood and whether repeated impacts causing TTS could lead to PTS.

Response: The proposed rule addressed the impacts the commenter raises in the *Potential Effects of Specified activities on Marine Mammals and Their Habitat* section (*Acoustically Mediated Bubble Growth and other Pressure-related Injury).* Further, NMFS has expanded the discussion and rationale describing why the Navy's activities are not expected to result in the mortality of beaked whales in the *Stranding* section of this final rule.

As described in the proposed rule, very prolonged or repeated exposure to sound strong enough to elicit TTS, or shorter-term exposure to sound levels well above the TTS threshold, can cause PTS, however, circumstances that would be expected to lead to this are not present for Navy activities in the MITT Study Area. For this rulemaking, the Navy's modeling has considered the proximity of marine mammals to Navy activities and the likelihood of exposure to levels above which TTS or PTS might be incurred, throughout a full day (*i.e.,* considering potential repeated exposures within a day), and very few PTS takes are expected (see the *Estimated Take of Marine Mammals* section). Further, as discussed in the *Analysis and Negligible Impact Determination* section, there is no information suggesting that any marine mammals will be exposed to levels resulting in TTS across more than a few non-sequential days, much less at a level or duration that is expected to accrue to PTS across those days.

Also of note, ongoing research on beaked whale response to sonar does not indicate a panic response and rush to the surface. Instead, beaked whales move away from the source underwater and increase the slope of their ascent glide to bring them further from the source (Falcone et al. 2017).

Comment 24: A Commenter stated that similar to beaked whales, NMFS has failed to analyze seriously whether melon-headed whales and other marine mammal species known to be vulnerable to harm from Navy sonar and explosives are likely to suffer injury and/or death from MITT activities.

Response: There have not been significant instances of stranding of melon-headed whales or other blackfish species in the Mariana Islands. Effects analyses concluding that strandings of these species are unlikely to result from the Navy's activities are contained in the 2020 MITT FSEIS/OEIS. In review of NMFS' and Guam Department of Agriculture's Division of Aquatic and Wildlife Resources stranding data from 1962 through February 2019, only two instances of melon-headed whale strandings were reported (1980 and 2015). Stranding data for other species over the same time period include: false killer whale 3 (2000, 2003, 2007), dwarf sperm whale 4 (1970, 1974, 1993, 2002), pygmy killer whale 1 (1974), pygmy sperm whale 3 (1989 (2), 1997), sperm whale 6 (1962, 1993 (2), 2011, 2012, 2013), and short-finned pilot whale 1 (1980). Given the low numbers of strandings of these species in the Marianas and the absence of any evidence of association with active sonar operation, the likelihood that Navy activities would result in serious injury or mortality of these species is considered discountable.

Comment 25: A Commenter stated that NMFS assumes, counter to the available evidence, that beaked whales around the Mariana Archipelago have no population structure and are part of large, cosmopolitan populations. While limited information on population structure is available, the best available science shows differences in the echolocation signal frequency of Blainville's beaked whales between the Northern Marianas Islands and other locations in the Pacific, Western Atlantic, and Gulf of Mexico, indicative of a population specific to the Northern Marianas Islands. This finding is consistent with studies in other parts of the world, which have demonstrated remarkable site-fidelity in beaked whale populations. Range-limited populations have been found on the shelf break approximately 50 km east of Cape Hatteras, as well as off Canada, in the Mediterranean, off Southern California, in the Bahamas, and around the Hawaiian Islands.

Response: There is no satellite tag or photographic identification data supporting the assertion that the populations around the Marianas are resident populations, much less identifying what the size or shape of those resident populations might be within the Mariana Islands (*i.e.,* abundance and range size). The Commenter points to data differentiating vocalizations of Blainville's beaked whales in the Mariana Islands versus other parts of the Pacific, and to the presence of known resident populations of beaked whales in Hawaii and other islands of the world. These points support the potential for resident populations to exist in the Marianas, but do not provide any information that would support analyzing impacts in a manner differently than was done by the Navy and NMFS. Specifically, for example, even if the beaked whales within the Marianas comprise a separate population from those elsewhere in the Pacific, it would not suggest that beaked whales should be analyzed differently than they were within the MITT Study Area.

While NMFS cannot explicitly define the beaked whale population structure at this time, the magnitude and severity of the estimated take and the negligible impact analyses remain valid and applicable based on the best available science regardless of whether the beaked whales in the MITT Study Area are from a larger global population or a Marianas Islands associated population. NMFS and the Navy are committed to actions that will expand our understanding of beaked whales, including their distribution in the MITT Study Area (see the *Monitoring* and *Adaptive Management* sections below for detailed descriptions). For example, the Navy will co-fund the Pacific Marine Assessment Program for Protected Species (PACMAPPS) survey in spring-summer 2021 to help document beaked whale occurrence, abundance, and distribution in the Mariana Islands. This effort will include deployments of a towed array as well as floating passive acoustic buoys. The Navy will monitor future beaked whale occurrence within select portions of the MITT Study Area starting in 2022. Additionally, the Navy will include Cuvier's beaked whales as a priority species for analysis under a 2020–2023 Navy research-funded program entitled Marine Species Monitoring for Potential Consequences of Disturbance (MSM4PCOD). Finally, the Navy will fund and co-organize with NMFS an expert panel to provide recommendations on scientific data gaps and uncertainties.

Mitigation and Monitoring

Least Practicable Adverse Impact Determination

Comment 26: A Commenter cited two judicial decisions and commented that the ''least practicable adverse impact'' standard has not been met. The Commenter stated that contrary to the *Pritzker* Court decision, NMFS, while clarifying that population-level impacts are mitigated ''through the application of mitigation measures that limit impacts to individual animals,'' has again set population-level impact as the basis for mitigation in the proposed rule. Because NMFS' mitigation analysis is opaque, it is not clear what practical effect this position may have on its rulemaking. The Commenter stated that the proposed rule is also unclear in its application of the ''habitat'' emphasis in the MMPA's mitigation standard, and that while NMFS' analysis is opaque, its failure to incorporate or even, apparently, to consider viable time-area measures suggests that the agency has not addressed this aspect of the *Pritzker* decision. The Commenter argued that the MMPA sets forth a ''stringent standard'' for mitigation that requires the agency to minimize impacts to the lowest practicable level, and that the agency must conduct its own analysis and clearly articulate it and not just parrot what the Navy says. The baselessness of this approach can be seen from the outcome of the *Conservation Council* decision, where the parties were able to reach a settlement agreement establishing time-area management measures, among other things, on the Navy's Southern California and Hawaii Range Complexes notwithstanding NMFS' finding, following the Navy, that all such management measures would substantially affect military readiness and were not practicable. Unfortunately, there is no indication in the proposed rule that NMFS has, as yet, done anything different here.

Response: First, the Commenter's reference to mitigation measures implemented pursuant to a prior settlement agreement is entirely inapplicable to a discussion of NMFS' responsibility to ensure the least practicable adverse impact under the MMPA. Specifically, for those areas that were previously covered under the 2015 settlement agreement for the HSTT Study Area, it is essential to understand that: (1) The measures were developed pursuant to negotiations with the plaintiffs and were specifically not selected and never evaluated based on an examination of the best available science that NMFS otherwise applies to a mitigation assessment and (2) the Navy's agreement to restrictions on its activities as part of a relatively short-term settlement (which did not extend beyond the expiration of the 2013 regulations) did not mean that those restrictions were practicable to implement over the longer term.

Regarding the remainder of the comment, NMFS disagrees with much of what the Commenter asserts. First, we have carefully explained our interpretation of the least practicable adverse impact standard and how it applies to both stocks and individuals, including in the context of the *Pritzker* decision, in the *Mitigation Measures* section. Further, we have applied the standard correctly in this rule in requiring measures that reduce impacts to individual marine mammals in a manner that reduces the probability and/or severity of population-level impacts.

When a suggested or recommended mitigation measure that would reduce impacts is not practicable, NMFS has explored variations of that mitigation to determine if a practicable form of related mitigation exists. This is clearly illustrated in NMFS' independent mitigation analysis process explained in the *Mitigation Measures* section of the final rule. First, some types of mitigation required under this rule are area-specific and vary by mitigation area, demonstrating that NMFS has engaged in a site-specific analysis to ensure mitigation is tailored when practicability demands, *i.e.,* some forms of mitigation were practicable in some areas but not others. For instance, while it was not practicable for the Navy to restrict all use of the Chalan Kanoa Reef and Marpi Reef Geographic Mitigation Areas, NMFS did expand the seaward extent of the areas out to the 400-m isobath. Additionally, while it was not practicable for the Navy to eliminate all training in those two Geographic Mitigation Areas, restrictions in those areas have been expanded such that the Navy will not use explosives year-round and MF1 MFAS will be limited to 20 hours between December 1 and April 30 annually to minimize impacts from sonar on humpback whales during the time when they are engaged in important reproductive behaviors.

Regarding the comment about mitigation of habitat impacts, marine mammal habitat value is informed by marine mammal presence and use and, in some cases, there may be overlap in measures for the species or stock directly and for use of habitat. In this rule, we have required time-area mitigations based on a combination of factors that include higher densities and observations of specific important behaviors of marine mammals themselves, but also that clearly reflect preferred habitat (*e.g.,* reproductive areas of Marpi and Chalan Kanoa Reefs, resting habitat for spinner dolphins in Agat Bay). In addition to being delineated based on physical features that drive habitat function (*e.g.,* bathymetric features), the high densities and concentration of certain important behaviors (*e.g.,* breeding, resting) in these particular areas clearly indicate the presence of preferred habitat. The Commenter seems to suggest that NMFS must always consider separate measures aimed at marine mammal habitat; however, the MMPA does not specify that effects to habitat must be mitigated in separate measures, and NMFS has clearly identified measures that provide significant reduction of impacts to both ''marine mammal species and stocks and their habitat,'' as required by the statute.

NMFS agrees, however, that the agency must conduct its own analysis, which it has done here, and not just accept what is provided by the Navy. That does not mean, however, that NMFS cannot review the Navy's analysis of effectiveness and practicability of its proposed mitigation measures, which by regulation the Navy was required to submit with its application, and concur with those aspects of the Navy's analysis with which NMFS agrees. The Commenter seems to suggest that NMFS must describe in the rule in detail the rationale for not adopting every conceivable permutation of mitigation, which is neither reasonable nor required by the MMPA. NMFS has described our well-reasoned process for identifying the measures needed to meet the least practicable adverse impact standard in the *Mitigation Measures* section in this rule, and we have followed the approach described there when analyzing potential mitigation for the Navy's activities in the MITT Study Area. Responses to specific recommendations for mitigation measures provided by the Commenter on the proposed rule are discussed separately.

Comment 27: A Commenter noted that they have previously indicated that, under the least practicable adverse impact requirement, and more generally under the purposes and policies of the MMPA, Congress embraced a policy that minimizes, whenever it is practicable, the risk of killing or seriously injuring a marine mammal incidental to an activity subject to section 101(a)(5)(A), including taking measures in an authorization to eliminate or reduce the

likelihood of lethal taking. Accordingly, the Commenter had recommended that NMFS address this point explicitly in its least practicable adverse impact analysis and clarify whether it agrees that the incidental serious injury or death of a marine mammal always should be considered an adverse impact for purposes of applying the least practicable adverse impact standard. In the preamble to the Atlantic Fleet Training and Testing (AFTT) final rule, NMFS indicated that it was unnecessary or unhelpful to address explicitly the point made by the Commenter that an incidental death or serious injury of a marine mammal should always be considered an adverse impact on the species or stock (83 FR 57117). The Commenter disagrees. The Commenter does not see how NMFS can meet the mandate of the MMPA to reduce adverse impacts to the lowest level practicable if it does not first identify clearly which impacts are adverse and may require mitigation under section 101(a)(5)(A)(i)(II)(aa). The Commenter appreciates NMFS' statement that it has adopted a practice to mitigate mortality to the greatest degree possible, but disagrees with the agency's conclusions that one mortality does not affect the population in a quantifiable or meaningful way. However, the MMPA requires NMFS to go beyond that and reduce any adverse impacts to the greatest extent practicable, even though population-level impacts are not significant.

Response: NMFS continues to disagree that it is necessary or helpful to explicitly address the point the Commenter raises specifically in the discussion on the least practicable adverse impact standard. It is always NMFS' practice to mitigate serious injury and mortality to the greatest degree possible, as death is the impact that is most easily linked to reducing the probability of adverse impacts to populations. However, we cannot agree that one mortality will always decrease any population in a quantifiable or meaningful way. For example, for very large populations, one mortality may fall well within typical known annual variation and not have any effect on population rates. Mortality is not anticipated or authorized in this rule.

Comment 28: A Commenter continues to recommend that NMFS clearly separate its application of the least practicable adverse impact requirement from its negligible impact determination. Once NMFS determines that an applicant's proposed activities would have a negligible impact, it still has a responsibility to determine whether the activities would nevertheless have adverse impacts on marine mammal species and stocks and their habitat. If so, NMFS must condition the authorization to eliminate or reduce those impacts whenever, and to the greatest extent, practicable. As the statute is written, it is inappropriate to conflate the two standards, as NMFS seems to be doing.

Response: NMFS has made clear in this and other rules that the agency separates its application of the least practicable adverse impact requirement in the *Mitigation Measures* section from its negligible impact analyses and determinations for each species or stock in a separate section. Further, NMFS has made this separation clear in practice for years by requiring mitigation measures to reduce impacts to marine mammal species and stocks and their habitat for all projects, even those for which the anticipated take would clearly not approach the negligible impact threshold, even in the absence of mitigation.

Comment 29: A Commenter recommended that NMFS follow an analysis consisting of three elements to (1) determine whether the impacts of the proposed activities are negligible at the species/stock level, (2) if so, determine whether some of those impacts nevertheless are adverse either to marine mammal species or stocks or key marine mammal habitat, and (3) if so, whether it is practicable for the applicant to reduce or eliminate those impacts through modifying those activities or by other means (*e.g.,* requiring additional mitigation measures to be implemented).

Response: In the *Mitigation Measures* section of the rule, NMFS has explained in detail our interpretation of the least practicable adverse impact standard, the rationale for our interpretation, and then how we implement the standard. The method the agency is using addresses all of the necessary components of the standard and produces effective mitigation measures that result in the least practicable adverse impact on both the species or stocks and their habitat. The Commenter has failed to illustrate why NMFS' approach is inadequate or why the Commenter's proposed approach would be better, and we therefore decline to accept the recommendation.

Comment 30: Regarding the habitat component of the least practicable adverse impact standard, a Commenter recommends that NMFS (1) adopt a clear decision-making framework that recognizes the species and stock component *and* the marine mammal habitat component of the least practicable adverse impact provision and (2) always consider whether there are potentially adverse impacts on marine mammal habitat and whether it is practicable to minimize them. The MMPA requires that NMFS address both types of impacts, not that there be no overlap between the mitigation measures designed to reduce those impacts.

Response: NMFS' decision-making framework for applying the least practicable adverse impact standard clearly recognizes the habitat component of the provision (see *Mitigation Measures* section of the rule). NMFS does always consider whether there are adverse impacts on habitat and how they can be mitigated. Marine mammal habitat value is informed by marine mammal presence and use and, in some cases, there may be overlap in measures for the species or stock directly and for use of habitat. In this rule, we have required time-area mitigation measures based on a combination of factors that include higher densities and observations of specific important behaviors of marine mammal species themselves, but also that clearly reflect preferred habitat (*e.g.,* reproductive habitat off Marpi and Chalan Kanoa Reefs and resting habitat in Agat Bay). In addition to being delineated based on physical features that drive habitat function (*e.g.,* bathymetric features), the high densities and concentration of certain important behaviors (*e.g.,* reproduction, feeding, resting) in these particular areas clearly indicate the presence of preferred habitat. The Commenter seems to suggest that NMFS must include mitigation measures aimed at marine mammal habitat that are wholly separate from addressing adverse impacts directly on the species or stocks. However, the MMPA does not specify that effects to habitat must be mitigated in separate measures, and NMFS has clearly included measures that provide significant reduction of impacts to both marine mammal species or stocks and their habitat, as required by the statute.

Comment 31: A Commenter recommended that NMFS rework its evaluation criteria for applying the least practicable adverse impact standard to separate the factors used to determine whether a potential impact on marine mammals or their habitat is adverse and whether possible mitigation measures would be effective.

Response: In the *Mitigation Measures* section, NMFS has explained in detail our interpretation and application of the least practicable adverse impact standard. The Commenter has recommended an alternate way of

interpreting and implementing the least practicable adverse impact standard, in which NMFS would consider the effectiveness of a measure in our evaluation of its practicability. The Commenter erroneously asserts that NMFS currently considers the effectiveness of a measure in a determination of whether the potential effects of an activity are adverse, but the Commenter has misunderstood NMFS' practice—rather, NMFS appropriately considers the effectiveness of a measure in the evaluation of the degree to which a measure will reduce adverse impacts on marine mammal species or stocks and their habitat, as a less effective measure will less successfully reduce these impacts on marine mammals. Further, the Commenter has not provided information that shows that their proposed approach would more successfully evaluate mitigation against the LAPI standard, and we decline to accept it.

Comment 32: A Commenter stated that although NMFS has written extensively on the least practicable adverse impact standard, it remains unclear exactly how each authorization's proposed ''mitigation measures are sufficient to meet the statutory legal standard,'' or even what standard NMFS is using. As such, the Commenter again recommends that NMFS address these shortcomings by adopting a simple, two-step analysis that more closely tracks the statutory provisions being implemented. As the Commenter has stated previously, the first step should be to identify impacts on marine mammal species or stocks or their habitat that, although negligible, are nevertheless adverse. If such impacts are identified, then NMFS must identify and require the applicant to adopt measures to reduce those impacts to the lowest level practicable. If NMFS is using some other legal standard to implement the least practicable adverse impact requirements, the Commenter further recommends that NMFS provide a clear and concise description of that standard and explain why it believes it to be ''sufficient'' to meet the statutory legal requirements.

Response: NMFS disagrees with the Commenter's assertion that analysis of the rule's mitigation measures under the least practicable adverse impact standard remains unclear or that the suggested shortcomings exist. Further, the Commenter provides no rationale as to why the two-step process they describe is better than the process that NMFS uses to evaluate the least practicable adverse impact and, therefore, we decline to accept the recommendation.

Comment 33: A Commenter stated that since NMFS has expounded on the least practicable adverse impact standard at some length in a series of proposed authorizations, it has been an evolutionary process that varies depending on each specific situation. The Commenter continues to recommend that NMFS adopt general regulations to govern the process and set forth the basic steps and criteria that apply across least practicable adverse impact determinations. Those standards should not be shifting on a case by-case basis, as now appears to be the case. Rather, the analytical framework and decision-making standards should be consistent across authorizations. Variations between authorizations should be based on the facts underlying each application, not the criteria that underpin the least practicable adverse impact standard.

Response: The commenter misunderstands the agency's process. Neither the least practicable adverse impact standard nor NMFS' process for evaluating it shifts on a case-by-case basis. Rather, as the Commenter suggests should be the case, the evaluation itself is case-specific to the proposed activity, the predicted impacts, and the mitigation under consideration.

Regarding the recommendation to adopt general regulations, we appreciate the recommendation and may consider the recommended approach in the future. However, providing directly relevant explanations of programmatic approaches or interpretations related to the incidental take provisions of the MMPA in a proposed incidental take authorization is an effective and efficient way to provide information to and solicit focused input from the public. Further, this approach affords the same opportunities for public comment as a stand-alone rulemaking would.

Geographic Mitigation Measures

Comment 34: A Commenter cites the judicial decision in *Pritzker,* and suggests that NMFS should adjust its approach to geographic mitigation as follows: First, NMFS must not dismiss the existence of persistent areas of primary productivity. Second, NMFS must not conflate the lack of survey effort with an absence of biologically important habitat. Third, NMFS, in following the Navy, overlooks evidence of island-associated small or resident populations, and relative risk to those populations. It is entirely remiss for NMFS to ignore evidence of small and resident populations within the MITT Study Area and afford them no additional protections.

Response: To support its argument that NMFS must not dismiss the existence of persistent areas of primary productivity, the Commenter cites to the 2019 MITT DSEIS/OEIS and its general discussion of the West Marianas Ridge area and areas of productivity, and references some general information about how certain features may be tied to biodiversity hotspots. The West Marianas Trench is a huge area hundreds of miles long. The commenter does not provide any information about particular features or areas that are specifically known to be important to marine mammals in the West Marianas Trench, much less provide any specific recommendations about how geographic mitigation might potentially provide a reduction in impacts that the Navy's activities might be having on marine mammal species or stocks and their habitat. As described in section I.4.1 of the 2020 MITT FSEIS/OEIS, which NMFS reviewed and concurs with, the available data do not indicate that the West Mariana Ridge or surrounding area is an area of key biological importance for marine mammals or other marine species, nor is it clear that limiting the use of sonar and explosives in the area would result in an avoidance or reduction of impacts. Therefore, the West Mariana Ridge area does not warrant geographic mitigation. NMFS does not dismiss the existence of persistent areas of primary productivity, however, NMFS is unaware of, and the Commenter has failed to demonstrate the existence of, data supporting areas or habitat of specific importance to marine mammals, nor has the Commenter recommended any particular geographic mitigation measure. Additional discussion of areas of primary productivity is included below in the response to Comment 35.

Second, the commenter asserts that NMFS must not conflate the lack of survey effort with an absence of biologically important habitat. NMFS has not done this. In the final rule, we have clarified that there are no *known* biologically important areas for most of the species in the MITT Study Area. In addition, while both the Navy and NMFS have discussed the paucity of survey data and habitat information in and around the Marianas, and the limited amount of information indicating specific important habitat for marine mammals, we have not suggested that this lack of data indicates that no biologically important areas exist. However, in the absence of data supporting a specific area in which biologically important behaviors are known to be concentrated, or important

habitat is otherwise located, and in which a reasonable argument can be made that limitation of Navy activities would meaningfully reduce impacts to marine mammal species or stocks and their habitat, it is not reasonable to require geographic mitigation beyond the procedural mitigation that is already in place to reduce impacts to all marine mammals in all locations.

Third, the Commenter asserts that NMFS overlooks evidence of island-associated small or resident populations, and relative risk to those populations. NMFS and the Navy acknowledge the potential for island-associated odontocete populations in the Marianas and, in fact, the species that the Commenter focuses on in their comment (spinner dolphins) is the driver for the Agat Bay Mitigation Area, which will minimize impacts to spinner dolphins resting in a Bay on the west side of Guam where they are known to concentrate. However, as discussed in more detail in section I.4.2 of the 2020 MITT FSEIS/OEIS, which NMFS reviewed and concurs with, while some of the species that have been identified as island-associated residents in Hawaii have been detected from nearshore small boat surveys in the Marianas, these same species have been detected using offshore areas beyond the 3,500-m isobath in offshore surveys or by satellite tags. There is no satellite tag or photographic identification data supporting the assertion that the populations around the Marianas are resident populations, much less that their ranges are spatially limited in a manner that would support the consideration of geographic mitigation measures.

Comment 35: A Commenter recommended that NMFS should consider the guidelines for capturing biologically important marine mammal habitat in data-poor areas, provided by NMFS' subject-matter experts and addressed by the Ninth Circuit Court of Appeals in *NRDC* v. *Pritzker* 828 F.3d 1125 (9th Cir. 2016), as those guidelines are relevant to the broader MITT Study Area, much of which is comprised of data-poor, offshore areas. These ''White Paper'' guidelines call for: (1) Designation as Offshore Biologically Important Areas (OBIAs) of all continental shelf waters and waters 100 km seaward of the continental slope as biologically important for marine mammals; (2) establishment of OBIAs within 100 km of all islands and seamounts that rise within 500 m of the surface; and (3) nomination as OBIAs of high-productivity regions that are not included in the continental shelf, continental slope, seamount, and island ecosystems above as biologically important.

Response: In discussing OBIAs, the commenter references a process and set of recommendations that were specifically developed in the context of the Navy's SURTASS LFA sonar activities, in which five vessels operated primarily in the Pacific Ocean use low frequency active sonar only in deep offshore waters to train and search for enemy submarines. The geographic area of the SURTASS LFA regulations includes the western and central North Pacific Ocean and eastern Indian Ocean outside of the territorial seas of foreign nations (generally 12 nmi (22 km) from most foreign nations). By referencing designation as OBIAs, we assume the Commenter is suggesting restricting active sonar (at a minimum) in the areas identified. Below we discuss the consideration of these areas for mitigation in the MITT Study Area.

Regarding recommendations (1) and (2), restricting the Navy's MITT activities in these areas is impracticable, as many of the Navy's activities specifically necessitate use of the varied bathymetry that occurs between the continental slope and 100 km seaward or around seamounts, and many can occur only within designated training or testing areas that fall within this area.

The Navy has communicated to NMFS that the MITT Study Area includes dedicated range assets, special use airspace, and other infrastructure to support training and testing activities that would not be available to the Navy should it have to conduct activities beyond the continental shelf waters (including a 100 km buffer). Mid-frequency and high-frequency sonar sources, which are the primary sources used in the MITT training and testing activities, have a much smaller propagation range than LF sources. Therefore, moving further and further offshore, from seamounts, from islands, etc. would result in completely ineffective training/testing because the sonar system would not be able to perform in locations of the bathymetries required to meet proficiency with standoff/buffer distances proposed. Shelf, slope, sea mount, and shallow island associated waters are the type of complex training environments required by the Navy since those are the types of bathymetric conditions that deployed units to the Navy's 7th Fleet will be most presented with when operating in the Philippine Sea, South China Sea, etc. Therefore, it is impracticable to limit activities in the locations recommended by the white paper.

Also, regarding the 100 km offshore of the slope limitation, density data from other regions where more granular survey data is available generally indicate that while some species may typically be more concentrated in shelf and slope waters, certain mysticete species and sperm whales often have higher densities outside of the mitigation area the Commenter suggests (100 km beyond the Continental Slope), and focusing activities in those areas would shift impacts from more coastal species to more pelagic species, making any overall reduction in impacts uncertain. Regarding seamounts, while data have shown higher species diversity or aggregations of some species at some seamounts during certain periods of time (Morato *et al.,* 2008), they also suggest that these aggregations are often specific to a seamount or time period (*i.e.,* not all seamounts exhibit these aggregations at all times) and, further, that marine mammal species are more loosely associated with seamounts than other taxa (Pitcher *et al.,* 2007). When this information is considered in combination with the fact that no more than a few takes of any individual marine mammal are expected throughout the MITT Study Area annually, any potential reduction in impacts would be limited. For additional information regarding marine mammal use of seamounts, see the *White Paper Specific Recommendations* section of NMFS' Final Rule for SURTASS LFA Sonar (84 FR 40132, 40192, August 13, 2019). Given the lack of evidence supporting the likelihood that this approach would provide meaningful reduction of impacts to marine mammal species and their habitat in the MITT Study Area, combined with the impracticability for Navy implementation, NMFS finds that these measures are not warranted beyond the procedural mitigation measures that reduce the likelihood of injury or more severe behavioral impacts for all species in all areas.

Regarding restricting Navy activities in areas of high productivity, we first refer the reader to our response immediately above, which addresses the West Marianas Trench, and further note that the Commenter does not identify, and nor is NMFS aware of, any other known areas of high productivity within the MITT Study Area. More generally, areas of the highest productivity tend to be found in areas of high latitude (not found in the MITT Study Area) or near river mouths (small boat surveys in the MITT Study Area have already allowed for the identification of specifically important nearshore areas for marine mammals, which have been designated as geographic mitigation areas)

(Wolverton, 2009). More moderate areas of productivity tend to occupy large, and often ephemeral, offshore areas that are difficult to consistently define because of interannual spatial and temporal variability. Regions of high productivity have the potential to provide good foraging habitat for some species of marine mammals, however, there is not sufficient data to support the designation of any specific area. Further, the fact that no more than a few takes of any individual marine mammal are expected throughout the MITT Study Area annually suggests that any potential reduction in impacts would be limited. When this limited benefit is balanced against the general impracticability of restricting Navy training and testing in large portions of the MITT Study Area, and given the lack of information to identify an appropriate area, NMFS finds that this measure is not warranted beyond the procedural mitigation measures that reduce the likelihood of injury or more severe behavioral impacts for all species in all areas.

Comment 36: A Commenter recommends that NMFS determine whether the Navy's implementation of geographic mitigation measures at the North Guam, Ritidian Point, and Tumon Bay Offshore Areas would be practicable and if so, include them as mitigation areas in the final rule. In either case, all of the relevant information for North Guam, Ritidian Point, and Tumon Bay Offshore Areas must be included in the preamble to the final rule.

Response: NMFS has considered the best available information (which for mitigation measures discussed here and below includes both best available science and information on practicability) for these suggested mitigation areas. The areas of North Guam, Ritidian Point, and Tumon Bay Offshore Areas were reviewed as potential mitigation areas. While sightings and transits of the area by some species were noted in review of available scientific research, there is currently no information on specific uses for biologically important life processes beyond normal species broad-area occurrence (*e.g.,* the areas are not exclusive feeding areas, migration routes, or breeding locations). Given this, there is no evidence that limiting operations in these areas would reduce impacts on marine mammals, and accordingly, no geographic mitigation is warranted, regardless of whether it would be practicable.

Comment 37: A Commenter recommends that NMFS should establish mitigation areas for spinner dolphin resting habitat at Bile Bay, Tumon Bay, and Double Reef, Guam, and Tanapaq Bay, Saipan.

Response: NMFS has considered the best available information for these suggested mitigation areas. Previously reported spinner dolphin high-use areas nearshore at Guam include Bile Bay, Tumon Bay, Double Reef, as well as north Agat Bay, and off Merizo (Cocos Lagoon area), where these animals congregate during the day to rest (Amesbury *et al.,* 2001; Eldredge, 1991). More recently, high-use areas have included Agat Bay; the Merizo channel, tucked into the several small remote bays between Merizo and Facpi Point; Piti Bay; Hagatna; Tumon Bay; and Pugua Point (Ligon *et al.,* 2011). During the 2010–2018 small boat surveys in the Mariana Islands, there were 157 encounters with pods of spinner dolphins (Hill *et al.,* 2019). The approximate distance from shore for these encounters was 1 km, indicative of their preference for nearshore habitat and prevalence in the MITT Study Area (Hill *et al.,* 2017a; Hill *et al.,* 2018b; Hill *et al.,* 2019). As described in Section I.3.3 (Agat Bay Nearshore Geographic Mitigation Area) of the 2020 MITT FSEIS/OEIS, the nearshore area of Agat Bay represents an area of biological importance and is practicable for implementation, and has been included in the final rule as a geographic mitigation area for spinner dolphin resting behavior. The data suggesting numerous other locations around Guam and other islands where resting behavior has been observed or has the potential to occur (*i.e.,* the habitat is suitable) indicates that no single area is of particular concentration or biological importance. See Section 3.4.1.32.2 (Geographic Range and Distribution) of the 2020 MITT FSEIS/OEIS for more information. Accordingly, specific geographic mitigation for these areas, beyond the procedural mitigation measures that reduce the likelihood of injury or more severe behavioral impacts for spinner dolphins and all other species during all activities, is not warranted.

Comment 38: A Commenter recommends extending the southern boundary of the Agat Bay Nearshore Geographic Mitigation Area seaward to the 100 m depth contour and including a buffer area sufficient to accomplish the goal of avoiding mass disruption of spinner dolphins, and expanding the same restriction, at minimum, to dipping sonar.

Response: NMFS has considered the best available information for this suggested mitigation area. The current western boundary of the Agat Bay Nearshore Geographic Mitigation Area essentially follows the 100-m isobath except at the southern extent of the area. At its northern extent, the area includes deeper waters beyond the 100-m isobath to include an area with a cluster of sea turtle sightings. The greater number of spinner dolphin sightings may indicate that the northern or middle portion of the Agat Bay Nearshore Mitigation Area may be of greater importance than the southern portion due to some physical or biological features. The point of land at the southern end of the Agat Bay Nearshore Mitigation Area is a convenient physical feature for defining the area, and as with other sightings data, it is reasonable to assume that animals just outside of the boundary of the area may be transiting to (or from) the northern portion of the area and that areas beyond the boundary do not constitute areas of any particular biological significance. The expansion of the area to include a buffer at the southern end would not be likely to meaningfully further reduce impacts to spinner dolphins and is, therefore, not warranted. Dipping sonar, as described in the *Detailed Description of the Specified Activities* section, is used during ASW exercises, which occur primarily more than 3 nmi from shore, and would especially not occur in areas as shallow as Agat Bay and with a high number of small tour boats. As also indicated previously, the vast majority of the takes from sonar exposure are related to MF1 sonar, and dipping sonar has a significantly lower source level and has not been associated with any particular impacts of concern to dolphins. Given this, there is no additional protective value to be gained by adding a restriction on dipping sonar in this area and it is, therefore, not warranted.

Comment 39: A Commenter recommends that NMFS should establish a mitigation area for offshore Agat Bay encompassing the continental shelf break and slope and extending out to the 2,000 m depth contour to protect this potentially important calving and nursing area for endangered sperm whales. Additionally the Commenter also recommends the NMFS should establish a second mitigation area for sperm whale calving and nursery habitat offshore of Apra Harbor, encompassing the continental shelf break and slope and extending out to the 2,000 m depth contour.

Response: NMFS has considered the best available information for these suggested mitigation areas. While there were multiple sightings of sperm whale calves (not in Agat Bay or concentrated in a particular area) during the course of

the large boat surveys conducted around the Marianas in 2007, the recommendation that NMFS should consider an area off Agat Bay as a breeding and nursery area for sperm whales seems to be largely based on two Associated Press File photographs, taken opportunistically by a local photographer, showing a group of three adult sperm whales and a calf during an encounter from a commercial dive boat on June 15, 2001, ''. . . about four miles off the coast of the Agat Marina in Guam'' (Bangs, 2001). During the 2010–2018 small boat surveys in the Mariana Islands, a total of seven sperm whales were detected over four encounters (in 2010, 2013, 2016, and 2018) in a median depth of approximately 1,200 m and median distance from shore of approximately 12 km (Hill e*t al.,* 2017a; Hill *et al.,* 2018c; Hill *et al.,* 2018d; Hill *et al.,* 2019). Sightings and acoustic monitoring detections recorded both before and since 2007 indicate that sperm whales range widely in the MITT Study Area with no known areas of concentration in the Mariana Islands. Sperm whales are highly nomadic, mobile predators, and the available data do not support areas offshore of Agat Bay or Apra Harbor as important reproductive areas for sperm whales in the MITT Study Area. For instance, a sperm whale with a satellite tracking tag attached traveled in deep offshore waters from west of Guam to west of Saipan in less than 10 days (Hill et al. 2019). Accordingly, specific geographic mitigation in these areas, beyond the procedural mitigation measures that reduce the likelihood of injury or more severe behavioral impacts for sperm whales and all other species during all activities, is not warranted.

Comment 40: A Commenter recommended that NMFS should protect Cocos Lagoon and the continental shelf and slope waters west of Cocos Island seaward to the 2,000 m depth contour as an important habitat area for multiple species, particularly breeding habitat for a possibly resident pygmy killer whale population and resting habitat for spinner dolphin at Cocos Island and Lagoon, Guam.

Response: NMFS has considered the best available information for this suggested mitigation area. Like similar deep-water and deep-diving species, pygmy killer whales are likely highly mobile in the marine environment with no known concentration areas in the Mariana Islands. There was only one pygmy killer whale sighting of a group of six animals during the 2007 systematic survey of the MITT Study Area (Fulling *et al.,* 2011). The sighting occurred near the Mariana Trench, south of Guam, where the bottom depth was over 4,413 m. This is consistent with the known habitat preference of this species for deep, oceanic waters. However, in the Mariana Islands, pygmy killer whale sightings close to shore are not unexpected due to deep bathymetry surrounding most islands. There is no information on population range of pygmy killer whales off Guam (Hill *et al.,* 2019), or any information suggesting that the area recommended by the Commenter is of specific biological importance such that mitigation measures would result in a reduction of impacts. Therefore, consideration of geographic mitigation, beyond the procedural mitigation measures that reduce the likelihood of injury or more severe behavioral impacts for pygmy killer whales and all other species during all activities, is not warranted. See Section 3.4.1.26.1 (Geographic Range and Distribution) of the 2020 MITT FSEIS/OEIS for more information.

For spinner dolphin habitat, there are numerous other locations around Guam and other islands where resting behavior has been observed or has the potential to occur (*i.e.,* the habitat is suitable), however, the data suggest that no single area, including the area recommended by the Commenter, is of particular biological importance (*i.e.,* with the predictable regular recurrence of larger pods of resting dolphins seen at Agat Bay). See Section 3.4.1.32.2 (Geographic Range and Distribution) of the 2020 MITT FSEIS/OEIS for more information. As such, a mitigation area here is not likely to meaningfully reduce impacts to spinner dolphins and, therefore, consideration of geographic mitigation, beyond the procedural mitigation measures that reduce the likelihood of injury or more severe behavioral impacts for spinner dolphins and all other species during all activities, is not warranted.

Comment 41: A Commenter recommended that NMFS should designate a mitigation area to protect, at minimum, the ten percent ''highest use area'' for short-finned pilot whales in core use areas, west of Guam and Rota.

Response: NMFS has considered the best available information for this suggested mitigation area. During the 2010–2018 small boat surveys in the Mariana Islands, short-finned pilot whale groups were encountered on 23 occasions in a median depth of approximately 720 m and median distance from shore of approximately 5 km, including one pod of 35 individuals off Marpi Reef north of Saipan (Hill *et al.,* 2014; Hill *et al.,* 2017a; Hill *et al.,* 2018b; Hill *et al.,* 2018d; Hill *et al.,* 2019). Satellite tags deployed on 17 individuals between 2013 and 2018 suggest multiple areas are used frequently by short-finned pilot whales in the Marianas, including but not limited to areas west of Guam and Rota (Hill *et al.,* 2018d; Hill *et al.,* 2019). Satellite tags on short-finned pilot whales lasting from approximately 9–128 days showed that individuals ranged from south at Tumon Bay off Guam to as far north as the waters west of Anatahan (Hill *et al.,* 2019). The Commenter uses tag data from the movement of eleven individuals to suggest probability density contours centered northwest of Guam, however, multiple locations of eleven animals are not necessarily representative of the distribution of all of the animals in the population. Altogether, tag locations and visual detections suggest multiple areas of frequent use by short-finned pilot whales in the Mariana Islands and do not support that the areas west of Guam and Rota are key areas of biological importance for short-finned pilot whales. Accordingly, specific geographic mitigation measures, beyond the procedural measures that reduce the likelihood of injury or more severe behavioral impacts for short-finned pilot whales during all activities, is not warranted.

Comment 42: A Commenter recommended that NMFS should establish a mitigation area to protect important habitat for multiple species of marine mammals at Rota Bank, particularly as important habitat for spinner and bottlenose dolphins and potential feeding habitat for Bryde's whales.

Response: NMFS has considered the best available information for this suggested mitigation area. As discussed in Appendix I (Geographic Mitigation Assessment) of the 2020 MITT FSEIS/OEIS, there is insufficient evidence to identify Rota Bank as an important area for spinner dolphins or bottlenose dolphins and therefore additional mitigation beyond the procedural measures that reduce impacts for all species is not warranted. The Commenter notes the potentially higher relative abundance of spinner dolphins in the area, as well as the potential for a genetically distinct population of bottlenose dolphins. However, spinner dolphins have also been sighted at multiple other locations around the Marianas, including important resting habitat in Agat Bay where NMFS has developed a geographic mitigation area, and the Commenter includes no information to support why the identification of a genetically distinct population of bottlenose dolphins in the Marianas would support the

identification of a mitigation area at Rota Bank. Further, the single sighting of a Bryde's whale feeding approximately five years ago does not indicate the presence of an established feeding area for the species.

During nine years of surveys from 2010–2018, spinner dolphins were only sighted at Rota Bank on two years, 2011 and 2012 (Hill *et al.,* 2019). More sightings across all years occurred in shallow water less than 100 m and within 1 km of land. Bottlenose dolphins, similar to spinner dolphins, were only sighted at Rota Bank in 2011 and 2012. Tracking of six bottlenose dolphins with attached satellite tags showed wide variations in tag locations between northern Guam and Rota (tag duration only 3.7–20.5 days). Only four Bryde's whale sightings in 2015 near Guam or Rota were reported based on small boat surveys from 2010–2018. Only one of these four sightings was near, although not on, Rota Bank. There were no other Bryde's whale sightings near Rota Bank in any other year. Accordingly, specific geographic mitigation, beyond the procedural measures that reduce the likelihood of injury or more severe behavioral impacts for dolphins and all species during all activities, is not warranted.

Other Mitigation and Monitoring

Comment 43: Based on the fact that the Commenter did not see reference to the Navy's ongoing Lookout effectiveness study in the 2020 MITT FSEIS/OEIS and was concerned that the results of this 10-year study would not be made available, they recommended that NMFS require the Navy to (1) allocate additional resources to the Lookout effectiveness study, (2) consult with the University of St. Andrews to determine how much additional data is necessary to analyze the data in a statistically significant manner, and (3) plan future Lookout effectiveness cruises to maximize the potential number of sightings so that the study can be completed by the end of 2022.

Response: NMFS has ensured that the results of the Lookout effectiveness study will be made available by including a Term and Condition in the ESA Incidental Take Statement associated with this rule that requires the Navy to provide a report summarizing the status of and/or providing a final assessment on the Navy's Lookout Effectiveness Study following the end of Calendar Year (CY) 2021. The report must be submitted no later than 90 days after the end of CY2021. The report will provide a statistical assessment of the data available to date characterizing the effectiveness of Navy Lookouts relative to trained marine mammal observers for the purposes of implementing the mitigation measures.

Comment 44: A Commenter recommends that NMFS require the Navy to use passive and active acoustic monitoring (such as instrumented ranges), whenever practicable, to supplement visual monitoring during the implementation of its mitigation measures for all activities that could cause injury or mortality beyond those explosive activities for which passive acoustic monitoring already was proposed. At the very least, the sonobuoys, active sources, and hydrophones used during an activity should be monitored for marine mammals.

Response: The Navy does employ passive acoustic monitoring to supplement visual monitoring when practicable to do so (*i.e.,* when assets that have passive acoustic monitoring capabilities are already participating in the activity). We note, however, that sonobuoys have a narrow band that does not overlap with the vocalizations of all marine mammals, and there is no bearing or distance on detections based on the number and type of devices typically used; therefore it is not possible to use these to implement mitigation shutdown procedures. For explosive events in which there are no platforms participating that have passive acoustic monitoring capabilities, adding passive acoustic monitoring capability, either by adding a passive acoustic monitoring device (*e.g.,* hydrophone) to a platform already participating in the activity or by adding a platform with integrated passive acoustic monitoring capabilities to the activity (such as a sonobuoy), for mitigation is not practicable. As discussed in Section 5.6.3 (Active and Passive Acoustic Monitoring Devices) of the 2020 MITT FSEIS/OEIS, which NMFS reviewed and concurs accurately assesses the practicability of utilizing additional passive or active acoustic systems for mitigation monitoring, there are significant manpower and logistical constraints that make constructing and maintaining additional passive acoustic monitoring systems or platforms for each training and testing activity impracticable. Additionally, diverting platforms that have passive acoustic monitoring capability would impact their ability to meet their Title 10 requirements and reduce the service life of those systems.

Regarding the use of instrumented ranges for real-time mitigation, the Commenter is correct that the Navy continues to develop the technology and capabilities on its Ranges for use in marine mammal monitoring, which can be effectively compared to operational information after the fact to gain information regarding marine mammal response. There is no instrumented range in the MITT Study Area to use. Further, the Navy's instrumented ranges were not developed for the purpose of mitigation. The manpower and logistical complexity involved in detecting and localizing marine mammals in relation to multiple fast-moving sound source platforms in order to implement real-time mitigation is significant. Although the Navy is continuing to improve its capabilities to use range instrumentation to aid in the passive acoustic detection of marine mammals, at this time it would not be effective or practicable for the Navy to monitor instrumented ranges for the purpose of real-time mitigation for the reasons discussed in Section 5.6.3 (Active and Passive Acoustic Monitoring Devices) of the 2020 MITT FSEIS/OEIS.

Regarding the use of active sonar for mitigation, we note that during Surveillance Towed Array Sensor System low-frequency active sonar (which is not part of this rulemaking, and uses a high-powered low frequency source), the Navy uses a specially designed adjunct high-frequency marine mammal monitoring active sonar known as ''HF/M3'' to mitigate potential impacts. HF/M3 can only be towed at slow speeds (significantly slower than those used for ASW and the other training and testing uses contemplated for the MITT activities) and operates like a fish finder used by commercial and recreational fishermen. Installing the HF/M3 adjunct system on the tactical sonar ships used during activities in this rule would have implications for safety and mission requirements due to impacts on speed and maneuverability. Furthermore, installing the system would significantly increase costs associated with designing, building, installing, maintaining, and manning the equipment. For these reasons, installation of the HF/M3 system or other adjunct marine mammal monitoring devices as mitigation under the rule would be wholly impracticable. Further, NMFS does not generally recommend the use of active sonar for mitigation, except in certain cases where there is a high likelihood of injury or mortality (*e.g.,* gear entanglement) and other mitigations are expected to be less effective in mitigating those effects. Active sonar generates additional noise with the potential to disrupt marine mammal

behavior, and is operated continuously during the activity that it is intended to mitigate. On the whole, adding this additional stressor is not beneficial unless it is expected to offset, in consideration of other mitigations already being implemented, a high likelihood or amount of injury or mortality. For the Navy's MITT activities, mortality is not anticipated, injury is of a small amount of low-level PTS, and the mitigation is expected to be effective at minimizing impacts. Further, the species most likely to incur a small degree of PTS from the Navy's activities are also the species with high frequency sensitivity that would be more likely to be behaviorally disturbed by the operation of the high frequency active source. For all of these reasons, NMFS does not recommend the use of active sonar to mitigate the Navy's training and testing activities in the MITT Study Area.

Comment 45: A Commenter asserted that given the apparent effect of the post-model analysis on the agency's mortality estimates—accounting perhaps for the drop in expected deaths from 150 (during the previous five-year period) to virtually zero—NMFS should have made the Navy's approach transparent and explained the rationale for its acceptance of that approach. NMFS' failure to do so has prevented the public from effectively commenting on NMFS' approach to this issue, in contravention of the Administrative Procedure Act, on a matter of obvious significance to the agency's core negligible impact findings.

Response: The Commenter is mistaken, there were no mortalities modeled or authorized in the Phase II rulemaking (2015–2020) for the MITT Study Area. Please see 80 FR 46112 (Aug. 3, 2015).

Comment 46: A Commenter recommended that NMFS consider additional measures to address mitigation for explosive events at night and during periods of low-visibility, either by enhancing the observation platforms to include aerial and/or passive acoustic monitoring (such as glider use), as has been done here with sinking exercises, or by restricting events to particular Beaufort sea states (depending on likely species presence and practicability). Another Commenter complains that NMFS has not required aerial or passive acoustic monitoring as mandatory mitigation, appears unwilling to restrict operations in low-visibility conditions, and has set safety-zone bounds that are inadequate to protect high-frequency cetaceans even from PTS.

Response: As described in Section 5.6.2 (Explosives) of the 2020 MITT FSEIS/OEIS, when assessing and developing mitigation, NMFS and the Navy considered reducing the number and size of explosives and limiting the locations and time of day of explosive training and testing in the MITT Study Area. The locations and timing of the training and testing activities that use explosives vary throughout the MITT Study Area based on range scheduling, mission requirements, testing program requirements, and standard operating procedures for safety and mission success. Although activities using explosives typically occur during daytime for safety reasons, it is impractical for the Navy to prohibit every type of explosive activity at night or during low visibility conditions or during different Beaufort sea states. Doing so would diminish activity realism, which would impede the ability for Navy Sailors to train and become proficient in using explosive weapons systems (which would result in a significant risk to personnel safety during military missions and combat operations), and would impede the Navy's ability to certify forces to deploy to meet national security needs.

Passive acoustic devices, whether vessel-deployed or using research sensors on gliders or other devices, can serve as queuing information that vocalizing marine mammals could be in the vicinity. Passive acoustic detection does not account for individuals not vocalizing. Navy surface ships train to localize submarines, not marine mammals. Some aviation assets deploying ordnance do not have concurrent passive acoustic sensors. Furthermore, Navy funded civilian passive acoustic sensors do not report in real-time. Instead, a glider is set on a certain path or floating/bottom-mounted sensor deployed. The sensor has to then be retrieved often many months after deployment (1–8 months), data is sent back to the laboratory, and then subsequently analyzed. Combined with lack of localization, gliders with passive acoustic sensors are therefore not suitable for mitigation. Further, a SINKEX is a highly scripted event that due to its complexity has additional assets involved that are not practicable to bring to bear in all the smaller types of training and testing scenarios.

The Navy does employ passive acoustic monitoring when practicable to do so (*i.e.,* when assets that have passive acoustic monitoring capabilities are already participating in the activity) and several of the procedural mitigation measures reflect this, but many platforms do not have passive acoustic monitoring capabilities. Adding a passive acoustic monitoring capability (either by adding a passive acoustic monitoring device (*e.g.,* hydrophone) to a platform already participating in the activity, or by adding a platform with integrated passive acoustic monitoring capabilities to the activity, such as a sonobuoy) for mitigation is not practicable. As discussed in Section 5.6.3 (Active and Passive Acoustic Monitoring Devices) of the 2020 MITT FSEIS/OEIS, there are significant manpower and logistical constraints that make constructing and maintaining additional passive acoustic monitoring systems or platforms for each training and testing activity impracticable. The Navy is required to implement pre-event observation mitigation, as well as post-event observation when practical, for all in-water explosive events. If there are other platforms participating in these events and in the vicinity of the detonation area, they will also visually observe this area as part of the mitigation team.

The Mitigation Section (Section 5) of the 2020 MITT FSEIS/OEIS includes a full analysis discussion of the mitigation measures that the Navy will implement, as well as those that have been considered but eliminated, including potential measures that have been raised by NMFS or the public in the past. The Navy has explained that training and testing in both good visibility (*e.g.,* daylight, favorable weather conditions) and low visibility (*e.g.,* nighttime, inclement weather conditions) is vital because environmental differences between day and night and varying weather conditions affect sound propagation and the detection capabilities of sonar. Temperature layers that move up and down in the water column and ambient noise levels can vary significantly between night and day. This affects sound propagation and could affect how sonar systems function and are operated. While some small reduction in the probability or severity of impacts could result from the implementation of this measure, it would not be practicable for the Navy to restrict operations in low visibility and the measure is not, therefore, warranted.

Regarding the safety zones for high frequency specialists, as the Commenter notes, for some sources the zone in which PTS could be accrued is larger than the mitigation zones. Because of the lower injury thresholds for high frequency specialists, the zones within which these species may incur PTS are significantly larger than other groups, and for some of the louder or more powerful sources, the injury zones are larger than can be effectively monitored

or practicably mitigated at distances beyond the established shutdown zones. In all cases, the required exclusion zones will prevent injury in the area closer to the source, thus alleviating some Level A harassment and preventing more intense or longer duration exposures that would be likely to have more severe impacts, and the small number remaining of anticipated PTS has been evaluated in the negligible impact analysis and appropriately authorized. In addition to the fact that observance and implementation of larger mitigation zones is impracticable, we also note that Navy Lookouts do not differentiate species and therefore it would not be possible to effectively implement a larger shutdown zone that only applied to the two high frequency specialists (dwarf and pygmy sperm whales), especially at the distances at which this differential mitigation would need to apply (beyond the standard zones).

Comment 47: A Commenter recommended that sonar signals might be modified to reduce the level of impact at the source. Mitigating active sonar impacts might be achieved by employing down-sweeps with harmonics or by reducing the level of side bands (or harmonics). The Commenter strongly recommended that NMFS require and set a timeline for this research within the context of the present rulemaking.

Response: The Commenter notes that NOAA's Ocean Noise Strategy Roadmap puts an emphasis on source modification and habitat modification as an important means for reducing impacts, however, where the modification of sources is discussed, the focus of the Roadmap is on modifying technologies for activities in which low frequency, broadband sound (which contribute far more significantly to increased chronic noise levels) is incidental to the activity (*e.g.,* maritime traffic). As described in the 2020 MITT FSEIS/OEIS, at this time, the science on the differences in potential impacts of up or down sweeps of the sonar signal (*e.g.,* different behavioral reactions) is extremely limited and requires further development before a determination of potential mitigation effectiveness can be made. There is data on behavioral responses of a few captive harbor porpoises to varying signals. Although this very limited data set suggests up or down sweeps of the sonar signal may result in different reactions by harbor porpoises in certain circumstances, the author of those studies highlights the fact that different species respond to signals with varying characteristics in a number of ways. In fact, the same signals cited here were also played to harbor seals, and their responses were different from the harbor porpoises. Furthermore, harmonics in a signal result from a high-intensity signal being detected in close proximity; they could be artificially removed for a captive study, but cannot be whitened in the open ocean. Active sonar signals are designed explicitly to provide optimum performance at detecting underwater objects (*e.g.,* submarines) in a variety of acoustic environments. If future studies indicate that modifying active sonar signals could be an effective mitigation approach, then NMFS with the Navy will investigate if and how the mitigation would affect the sonar's performance and how that mitigation may be applied in future authorizations, but currently NMFS does not have a set timeline for this research and how it may be applied to future rulemakings.

Comment 48: A Commenter recommends that NMFS should consider requiring the Navy to employ thermal detection in optimal conditions, or, alternatively, require the establishment of a pilot program for thermal detection, with annual review under the adaptive management system. According to the 2019 MITT DSEIS/OEIS, the Navy ''plans to continue researching thermal detection technology to determine their effectiveness and compatibility with Navy applications.''

Response: Thermal detection systems are more useful for detecting marine mammals in some marine environments than others. Current technologies have limitations regarding water temperature and survey conditions (*e.g.,* rain, fog, sea state, glare, ambient brightness), for which further effectiveness studies are required. Thermal detection systems are generally thought to be most effective in cold environments, which have a large temperature differential between an animal's temperature and the environment. Current thermal detection systems have proven more effective at detecting large whale blows than the bodies of small animals, particularly at a distance. The effectiveness of current technologies has not been demonstrated for small marine mammals. Research to better understand, and improve, thermal technology continues, as described below.

The Navy has been investigating the use of thermal detection systems with automated marine mammal detection algorithms for future mitigation during training and testing, including on autonomous platforms. Thermal detection technology being researched by the Navy, which is largely based on existing foreign military grade hardware, is designed to allow observers and eventually automated software to detect the difference in temperature between a surfaced marine mammal (*i.e.,* the body or blow of a whale) and the environment (*i.e.,* the water and air). Although thermal detection may be reliable in some applications and environments, the current technologies are limited by their: (1) Low sensor resolution and a narrow fields of view, (2) reduced performance in certain environmental conditions, (3) inability to detect certain animal characteristics and behaviors, and (4) high cost and uncertain long-term reliability.

Thermal detection systems for military applications are deployed on various Department of Defense (DoD) platforms. These systems were initially developed for night time targeting and object detection (*e.g.,* a boat, vehicle, or people). Existing specialized DoD infrared/thermal capabilities on Navy aircraft and surface ships are designed for fine-scale targeting. Viewing arcs of these thermal systems are narrow and focused on a target area. Furthermore, sensors are typically used only in select training events, not optimized for marine mammal detection, and have a limited lifespan before requiring expensive replacement. Some sensor elements can cost upward of $300,000 to $500,000 per device, so their use is predicated on a distinct military need.

One example of trying to use existing DoD thermal systems is being proposed by the U.S. Air Force. The Air Force agreed to attempt to use specialized U.S. Air Force aircraft with military thermal detection systems for marine mammal detection and mitigation during a limited at-sea testing event. It should be noted, however, these systems are specifically designed for and integrated into a small number of U.S. Air Force aircraft and cannot be added or effectively transferred universally to Navy aircraft. The effectiveness remains unknown in using a standard DoD thermal system for the detection of marine mammals without the addition of customized system-specific computer software to provide critical reliability (enhanced detection, cueing for an operator, reduced false positive, etc.)

Current DoD thermal sensors are not always optimized for marine mammal detections versus object detection, nor do these systems have the automated marine mammal detection algorithms the Navy is testing via its ongoing research program. The combination of thermal technology and automated algorithms are still undergoing demonstration and validation under Navy funding.

Thermal detection systems specifically for marine mammal detection have not been sufficiently studied both in terms of their effectiveness within the environmental conditions found in the MITT Study Area and their compatibility with Navy training and testing (*i.e.,* polar waters vs. temperate waters). The effectiveness of even the most advanced thermal detection systems with technological designs specific to marine mammal surveys is highly dependent on environmental conditions, animal characteristics, and animal behaviors. At this time, thermal detection systems have not been proven to be more effective than, or equally effective as, traditional techniques currently employed by the Navy to observe for marine mammals (*i.e.,* naked-eye scanning, hand-held binoculars, high-powered binoculars mounted on a ship deck). The use of thermal detection systems instead of traditional techniques would compromise the Navy's ability to observe for marine mammals within its mitigation zones in the range of environmental conditions found throughout the MITT Study Area. Furthermore, thermal detection systems are designed to detect marine mammals and do not have the capability to detect other resources for which the Navy is required to implement mitigation, including sea turtles. Focusing on thermal detection systems could also provide a distraction from and compromise the Navy's ability to implement its established observation and mitigation requirements. The mitigation measures discussed in the *Mitigation Measures* section include the maximum number of Lookouts the Navy can assign to each activity based on available manpower and resources; therefore, it would be impractical to add personnel to serve as additional Lookouts. For example, the Navy does not have available manpower to add Lookouts to use thermal detection systems in tandem with existing Lookouts who are using traditional observation techniques.

The Defense Advanced Research Projects Agency funded six initial studies to test and evaluate infrared-based thermal detection technologies and algorithms to automatically detect marine mammals on an unmanned surface vehicle. Based on the outcome of these initial studies, the Navy is pursuing additional follow-on research efforts. Additional studies are currently being planned for 2020+ but additional information on the exact timing and scope of these studies is not currently available (still in the development stage).

The Office of Naval Research Marine Mammals and Biology program also funded a project (2013–2019) to test the thermal limits of infrared-based automatic whale detection technology. That project focused on capturing whale spouts at two different locations featuring subtropical and tropical water temperatures, optimizing detector/classifier performance on the collected data, and testing system performance by comparing system detections with concurrent visual observations. Results indicated that thermal detection systems in subtropical and tropical waters can be a valuable addition to marine mammal surveys within a certain distance from the observation platform (*e.g.,* during seismic surveys, vessel movements), but have challenges associated with false positive detections of waves and birds (Boebel, 2017). While Zitterbart *et al.* (2020) reported on the results of land-based thermal imaging of passing whales, their conclusion was that thermal technology under the right conditions and from land can detect a whale within 3 km although there could also be lots of false positives, especially if there are birds, boats, and breaking waves at sea. Thermal detection systems exhibit varying degrees of false positive detections (*i.e.,* incorrect notifications) due in part to their low sensor resolution and reduced performance in certain environmental conditions. False positive detections may incorrectly identify other features (*e.g.,* birds, waves, boats) as marine mammals. In one study, a false positive rate approaching one incorrect notification per 4 min of observation was noted.

The Navy plans to continue researching thermal detection systems for marine mammal detection to determine their effectiveness and compatibility with Navy applications. If the technology matures to the state where thermal detection is determined to be an effective mitigation tool during training and testing, NMFS and the Navy will assess the practicability of using the technology during training and testing events and retrofitting the Navy's observation platforms with thermal detection devices. The assessment will include an evaluation of the budget and acquisition process (including costs associated with designing, building, installing, maintaining, and manning the equipment); logistical and physical considerations for device installment, repair, and replacement (*e.g.,* conducting engineering studies to ensure there is no electronic or power interference with existing shipboard systems); manpower and resource considerations for training personnel to effectively operate the equipment; and considerations of potential security and classification issues. New system integration on Navy assets can entail up to 5 to 10 years of effort to account for acquisition, engineering studies, and development and execution of systems training. The Navy will provide information to NMFS about the status and findings of Navy-funded thermal detection studies and any associated practicability assessments at the annual adaptive management meetings.

Evidence regarding the current state of this technology does not support the assertion that the addition of these devices would meaningfully increase detection of marine mammals beyond the current rate (especially given the narrow field of view of this equipment and the fact that a Lookout cannot use standard equipment when using the thermal detection equipment) and, further, modification of standard Navy equipment, training, and protocols would be required to integrate the use of any such new equipment, which would incur significant cost. At this time, requiring thermal equipment is not warranted given the prohibitive cost and the uncertain benefit (*i.e.,* reduction of impacts) to marine mammals. Likewise requiring the establishment of a pilot program is not appropriate. However, as noted above, the Navy continues to support research and technology development to improve this technology for potential future use.

Comment 49: A Commenter stated that the proposed rule does not contain any indication that a practicability analysis was conducted, nor does it prescribe any speed reduction measure. They ask that NMFS conduct a practicability analysis and implement vessel speed reduction in (at minimum) the Marpi Reef and Chalan Kanoa Reef Mitigation Areas and other areas of importance to humpback whales, as was done for the North Atlantic right whale in the AFTT Study Area. They further recommended that the agency require the Navy to collect and report data on ship speed to allow for objective evaluation by NMFS of ship-strike risk, of harassment resulting from vessel activity, and of the potential benefit of additional speed-focused mitigation measures.

Response: NMFS discussed its evaluation of requiring vessel speed restrictions in Marpi Reef and Chalan Kanoa Reef Geographic Mitigation Areas in *Comment 17* above. NMFS and the Navy conducted an operational analysis of potential mitigation areas throughout

the entire MITT Study Area to consider a wide range of mitigation options, including but not limited to vessel speed restrictions. Navy ships transit at speeds that are optimal for fuel conservation or to meet operational requirements. In our assessment of potential mitigation, NMFS and the Navy have considered implementing vessel speed restrictions. However, as described in Section 5 (Mitigation), Section 5.3.4.1 (Vessel Movement) of the 2020 MITT FSEIS/OEIS, including vessel speed restrictions would be impracticable due to implications for safety (the ability to avoid potential hazards), sustainability (maintain readiness), and the Navy's ability to continue meeting its Title 10 requirements to successfully accomplish military readiness objectives. Any vessel speed restrictions would prevent vessel operators from gaining skill proficiency, would prevent the Navy from properly testing vessel capabilities, and/or would increase the time on station during training or testing activities as required to achieve skill proficiency or properly test vessel capabilities, which would significantly increase fuel consumption. NMFS thoroughly reviewed and considered the information and analysis in the 2020 MITT FSEIS/OEIS, and concurred with the Navy's determination that vessel speed restrictions are impracticable. As discussed in the *Mitigation Measures* section of this rule, the Navy will implement mitigation to avoid vessel strikes throughout the Study Area. Given the impracticability of vessel speed restrictions combined with the fact that vessel strike is not anticipated in the MITT Study Area and that the required mitigation for vessel movement will already minimize any potential for ship strike, NMFS finds vessel speed reductions are not warranted.

As required through the Navy's Notification and Reporting Plan (Vessel Strike section), Navy vessels are required to report extensive information, including ship speed, pursuant to any marine mammal vessel strikes. Therefore, the data required for ship strike analysis discussed in the comment is already being collected. Any additional data collection requirement would create an unnecessary burden on the Navy.

Regarding vessel noise from Navy ships, Navy vessels are intentionally designed to be quieter than civilian vessels, and given that adverse impacts from vessel noise are not anticipated to result from Navy activities (see the *Potential Effects of Specified Activities on Marine Mammals and Their Habitat* section in the proposed rule), there is no anticipated harassment caused by vessel activity and therefore no need to collect and report data on ship speed for this purpose.

Comment 50: A Commenter recommended that NMFS should consider a compensatory mitigation scheme to help improve the conservation status or habitat of affected populations. NMFS should consider requiring compensatory mitigation for the adverse impacts of the Navy's activity on marine mammals and their habitat that cannot be prevented or mitigated.

Response: Compensatory mitigation is not required under the MMPA. Instead, authorizations include means of effecting the least practicable adverse impact from the activities on the affected species or stocks and their habitat, which this rule has done through the required procedural and geographic area mitigation measures.

For years, the Navy has implemented a broad and comprehensive range of measures in the MITT Study Area to mitigate potential impacts to marine mammals from its training and testing activities. In addition, from 2010 and ongoing, the Navy has funded extensive marine mammal occurrence studies within the Mariana Islands. As described in this rule, NMFS and the Navy have expanded these measures further where practicable. In addition to the mitigation and monitoring measures required under this rule and past MMPA incidental take authorizations, the Navy engages in an extensive spectrum of other activities that greatly benefit marine species in a more general manner that is not necessarily tied to just military readiness activities. As noted in Section 3, Section 3.0.1.1 (Marine Species Monitoring and Research Programs) of the 2020 MITT FSEIS/OEIS, the Navy provides extensive investment for research programs in basic and applied research. The Navy is one of the largest sources of funding for marine mammal research in the world, which has greatly enhanced the scientific community's understanding of marine species more generally. The Navy's support of marine mammal research includes: Marine mammal detection, including the development and testing of new autonomous hardware platforms and signal processing algorithms for detection, classification, and localization of marine mammals; improvements in density information and development of abundance models of marine mammals; and advancements in the understanding and characterization of the behavioral, physiological (hearing and stress response), and potentially population-level consequences of sound exposure on marine life. Importantly, the Commenter did not recommend any specific measures, rendering it impossible to consider its recommendation at a broader level.

Comment 51: A Commenter recommends that NMFS require that the Navy continue to conduct long-term monitoring and prioritize Navy research projects that aim to quantify the impact of training and testing activities at the individual, and ultimately, population-level. The Commenter recommended individual-level behavioral-response studies, such as focal follows and tagging using DTAGs, carried out before, during, and after Navy operations, that can provide important insights for these species and stocks. The Commenter recommended studies be prioritized that further characterize the suite of vocalizations related to social interaction, such as studies using DTAGs that further characterize social communications between individuals of a species or stock, including between mothers and calves. The Commenter recommends the use of unmanned aerial vehicles for surveying marine species and to provide a less invasive approach to undertaking focal follows. Imagery from unmanned aerial vehicles can also be used to assess body condition and, in some cases, health of individuals. The Commenter recommended that NMFS require the Navy to use these technologies for assessing marine mammal behavior (*e.g.,* swim speed and direction, group cohesion) before, during, and after Navy training and testing. Additionally, the Commenter recommended that the Navy support studies to explore how these technologies can be used to assess body condition, as this can provide an important indication of energy budget and health, which can inform the assessment of population-level impacts.

Response: First, the Navy is pursuing many of the topics that the Commenter identifies, either through the monitoring required under the MMPA or monitoring under the ESA, or through other Navy-funded research programs (ONR and LMR). We are confident that the monitoring conducted by the Navy satisfies the requirements of the MMPA. A list of the monitoring studies that the Navy will be conducting under this rule is at the end of the *Monitoring* section of this final rule.

Broadly speaking, in order to ensure that the monitoring the Navy conducts satisfies the requirements of the MMPA, NMFS works closely with the Navy in the identification of monitoring priorities and the selection of projects to

conduct, continue, modify, and/or stop through the Adaptive Management process, which includes annual review and debriefs by all scientists conducting studies pursuant to the MMPA authorization. The process NMFS and the Navy have developed allows for comprehensive and timely input from NMFS, the Navy, the Marine Mammal Commission, and researchers conducting monitoring under the Navy rule, which is based on rigorous reporting out from the Navy and the researchers doing the work.

With extensive input from NMFS, the Navy established the Strategic Planning Process for Marine Species Monitoring to help structure the evaluation and prioritization of projects for funding. The *Monitoring* section of this rule provides an overview of this Strategic Planning Process. More detail, including the current intermediate scientific objectives, is available in section 5 (Mitigation), Section 5.1.2.2.1.3 (Strategic Planning Process) of the 2020 MITT FSEIS/OEIS and on the monitoring portal as well as in the Strategic Planning Process report. The Navy's evaluation and prioritization process is driven largely by a standard set of criteria that help the internal steering committee evaluate how well a potential project would address the primary objectives of the monitoring program. Given that the Navy's Monitoring Program applies to all of the Navy's major Training and Testing activities and, thereby, spans multiple regions and Study Areas to encompass consideration of the entire U.S. EEZ and beyond, one of the key components of the prioritization process is to focus monitoring in a manner that fills regionally-specific data gaps, where possible (*e.g.,* more limited basic marine mammal distribution data in the MITT Study Area), and also takes advantage of regionally-available assets (*e.g.,* instrumented ranges in the HSTT Study Area). NMFS has opportunities to provide input regarding the Navy's intermediate scientific objectives as well as to provide feedback on individual projects through the annual program review meeting and annual report. For additional information, please visit: *https://www.navymarinespeciesmonitoring.us/about/strategic-planning-process/.*

Details on the Navy's involvement with future research will continue to be developed and refined by the Navy and NMFS through the consultation and adaptive management processes, which regularly consider and evaluate the development and use of new science and technologies for Navy applications. Further, the Navy also works with NMFS to target and prioritize data needs that are more appropriately addressed through Navy research programs, such as the Office of Naval Research and Living Marine Resources programs. The Navy has indicated that it will continue to be a leader in funding of research to better understand the potential impacts of Navy training and testing activities and to operate with the least possible impacts while meeting training and testing requirements. Some of the efforts the Navy is leading or has recently completed are described below.

(1) Individual-level behavioral-response studies—There are no ONR or LMR behavioral response studies in the MITT Study Area. The Mariana Islands are too remote for many of the mainland U.S. and international researchers. There is also insufficient background information or infrastructure to support something as specific as a behavioral response study. For example, Navy instrumented ranges in the HSTT Study Area and the Bahamas are critical in providing consistent beaked whale detections which allow researchers in small boats to more efficiently locate detected whales to apply satellite tracking tags. However, many of the studies on species-specific reactions are likely to be applicable across geographic boundaries (*e.g.,* Cuvier's beaked whale studies in the HSTT Study Area).

(2) Tags and other detection technologies to characterize social communication between individuals of a species or stock, including mothers and calves—DTAGs are just one example of animal movement and acoustics tag. From the Navy's Office of Naval Research and Living Marine Resource programs, Navy funding is being used to improve a suite of marine mammal tags to increase attachment times, improve data being collected, and improve data satellite transmission. The Navy has funded a variety of projects that are collecting data that can be used to study social interactions amongst individuals. For example, as of July 2020 the following studies are currently being funded:

- Assessing performance and effects of new integrated transdermal large whale satellite tags 2018–2021 (Organization: Marine Ecology and Telemetry Research)
- Autonomous Floating Acoustic Array and Tags for Cue Rate Estimation 2019–2020 (Organization: Texas A&M University Galveston)
- Development of the next generation automatic surface whale detection system for marine mammal mitigation and distribution estimation 2019–2021 (Organization: Woods Hole Oceanographic Institution)
- High Fidelity Acoustic and Fine-scale Movement Tags 2016–2020 (Organization: University of Michigan)
- Improved Tag Attachment System for Remotely-deployed Medium-term Cetacean Tags 2019–2023 (Organization: Marine Ecology and Telemetry Research)
- Next generation sound and movement tags for behavioral studies on whales 2016–2020 (Organization: University of St. Andrews)
- On-board calculation and telemetry of the body condition of individual marine mammals 2017–2021 (Organization: University of St. Andrews, Sea Mammal Research Unit)
- The wide-band detection and classification system 2018–2020 (Organization: Woods Hole Oceanographic Institution)

(3) Unmanned Aerial Vehicles to assess marine mammal behavior (*e.g.,* swim speed and direction, group cohesion) before, during, and after Navy training and testing activities—Studies that use unmanned aerial vehicles to assess marine mammal behaviors and body condition are being funded by the Office of Naval Research Marine Mammals and Biology program. Although the technology shows promise (as reviewed by Verfuss *et al.,* 2019), the field limitations associated with the use of this technology have hindered its useful application in behavioral response studies in association with Navy training and testing events. For safety, research vessels cannot remain in close proximity to Navy vessels during Navy training or testing events, so battery life of the unmanned aerial vehicles has been an issue. However, as the technology improves, the Navy will continue to assess the applicability of this technology for the Navy's research and monitoring programs. An example project that the Navy already addressed is integrating remote sensing methods to measure baseline behavior and responses of social delphinids to Navy sonar 2016–2019 (Organization: Southall Environmental Associates Inc.).

(4) Modeling methods that could provide indicators of population-level effects—NMFS asked the Navy to expand funding to explore the utility of other, simpler modeling methods that could provide at least an indicator of population-level effects, even if each of the behavioral and physiological mechanisms are not fully characterized. The Office of Naval Research Marine Mammals and Biology program has invested in the Population

Consequences of Disturbance (PCoD) model, which provides a theoretical framework and the types of data that would be needed to assess population level impacts. Although the process is complicated and many species are data poor, this work has provided a foundation for the type of data that is needed. Therefore, in the future, the relevant data pieces that are needed for improving the analytical approaches for population level consequences resulting from disturbances will be collected during projects funded by the Navy's marine species monitoring program. However, currently, PCoD models are dependent on too many unknown factors to produce a reliable answer for most species and activity types, and further work is needed (and underway) to develop a more broadly applicable generalized construct that can be used in an impact assessment.

As discussed in the *Monitoring* section of the final rule, the Navy's marine species monitoring program typically supports 10–15 projects in the Pacific at any given time. Current projects cover a range of species and topics from collecting baseline data on occurrence and distribution, to tracking whales, to conducting behavioral response studies on beaked whales and pilot whales. The Navy's marine species monitoring web portal provides details on past and current monitoring projects, including technical reports, publications, presentations, and access to available data and can be found at: *https://www.navymarinespeciesmonitoring.us/regions/pacific/current-projects/.*

In summary, NMFS and the Navy work closely together to prioritize, review, and adaptively manage the extensive suite of monitoring that the Navy conducts in order to ensure that it satisfies the MMPA requirements. NMFS has laid out a broad set of goals that are appropriate for any entity authorized under the MMPA to pursue, and then we have worked with the Navy to manage their projects to best target the most appropriate goals given their activities, impacts, and assets in the MITT Study Area. Given the scale of the MITT Study Area and the variety of activities conducted, there are many possible combinations of projects that could satisfy the MMPA standard for the rule. The Commenter has recommended more and/or different monitoring than NMFS is requiring and the Navy is conducting or currently plans to conduct, but has in no way demonstrated that the monitoring currently being conducted does not satisfy the MMPA standard. NMFS appreciates the Commenter's input, and will consider it, as appropriate, in the context of our adaptive management process, but is not recommending any changes at this time.

Comment 52: A Commenter recommended that the Navy conduct research and documentation of the residency of populations of spinner dolphins on Guam and impacts of the training to them. The Commenter states that these populations may particularly be impacted by the mine explosion training in areas at Agat and Asan. The Commenter recommends that the Navy provide better information on the impacts of the explosions on these populations before implementing the training at those sites. The Commenter recognizes and supports that an area frequented by the Agat spinner dolphins is identified as a mitigation area (mostly in National Park Service managed waters) because of their presence.

Response: The Navy has been funding the majority of marine species research and surveys in the Mariana Islands. Over a nine year period from 2010–2018 during the Navy-funded small boat surveys in the Mariana Islands, 22,488 km of on-effort surveys were conducted with 157 encounters with pods of spinner dolphins (Hill *et al.,* 2019). The approximate distance from shore for these encounters was 1 km, indicative of their preference for nearshore habitat and prevalence in the MITT Study Area (Hill *et al.,* 2017a; Hill *et al.,* 2018b; Hill *et al.,* 2019). In addition to visual sightings, a photo-identification catalog for spinner dolphins was developed as well as biopsies taken for genetic analysis (Hill *et al.,* 2019). The Navy has also contributed significant funding for NMFS' Pacific Marine Assessment Program for Protected Species (PACMAPPS) program. PACMAPPS is a partnership among Federal agencies to conduct surveys to assess the abundance of multiple species and their ecosystems (NOAA Fisheries, U.S. Navy, Bureau of Ocean Energy Management, U.S. Fish and Wildlife Service). With Navy funding, NMFS will conduct a 60-day marine mammal survey within the Mariana Island EEZ in the spring and summer of 2021. Future Mariana Islands marine mammal surveys after PACMAPPs will be funded by NMFS' Pacific Islands Fisheries Science Center. For an extensive discussion of spinner dolphin sightings near Agat Bay, see Section I.3.3.1.1.1 of the 2020 MITT FSEIS/OEIS.

Regarding the impacts of explosives, activities, including mine countermeasure activities at the Agat Bay and Apra Harbor sites, were modeled to estimate impacts on marine mammals from explosives. No mortalities of any marine mammals are predicted. Asan is not identified as an underwater detonation area. Further, although called Agat Bay Mine Neutralization Site, the actual detonation site is in waters deeper than 1,000 m and over 8 km west of the shallow water Agat Bay Nearshore Geographic Mitigation Area (see Figure 3 of this rule) and therefore there is not a potential for overlap of explosive activities at the Agat Bay Mine Neutralization Site with spinner dolphin resting. Additionally, the Navy uses the Agat Bay Mine Neutralization Site for smaller charge weight mine neutralization activities that are episodic with large temporal variation between successive events. In consideration of the mine neutralization mitigations established for all marine mammals (see the *Procedural Mitigation* subsection in the *Mitigation Measures* section of the rule) and the distance between the actual detonation site and the shallow water spinner dolphin habitat in Agat Bay, the effects to spinner dolphins will be minimal.

Negligible Impact Determination

Comment 53: A Commenter asserts that most of NMFS' discussion consists, once again, of generalized statements meant to suggest why the estimated levels of take will not result in greater than negligible impacts on marine mammals. For example, NMFS discounts the potential for population-level impacts by asserting that based on the nature of the Navy activities and the movement patterns of marine mammals, it is unlikely any particular subset would be taken over more than a few sequential days 85 FR 5875. Yet NMFS presents no details of the Navy's operations in support of this position. Further a Commenter says that the proposed rule makes no attempt to apply any of the methods used by the marine mammal research community to assess population-level harm. Such methods, involving quantitative or detailed qualitative assessment, include but are not limited to the use of reasonable proxies for population-level impact; models of masking effects; energetic models, such as on foraging success; or quantitative assessments of chronic noise or stress. The Commenter asserts that the agency does not consider the effects of these more frequent exposures on individual and population fitness, nor, again, does NMFS provide more than general statements discounting the significance of the expected take.

Response: NMFS fully considered the potential for aggregate effects from all Navy activities and the Commenter

offers no evidence to support the assertion that any individual marine mammals, of any species, would be subject to ''frequent exposures.'' NMFS has explained in detail in the proposed rule and again in this final rule how the estimated takes were calculated for marine mammals, and then how the large size of the Study Area across which activities may be distributed (and the ASW activities utilizing MF1 sonar, which account for the majority of the takes may occur anywhere in the Study Area and predominantly more than 3 nmi from shore) combined with the comparatively small number of takes as compared to the abundance of any species in the area does not support that any individuals would likely be taken over more than a few non-sequential days. We also consider UMEs (where applicable) and previous environmental impacts, where appropriate, to inform the baseline levels of both individual health and susceptibility to additional stressors, as well as stock status. Further, the species-specific assessments in the *Analysis and Negligible Impact Determination* section pull together and address the combined injury, behavioral disturbance, and other effects of the aggregate MITT activities (and in consideration of applicable mitigation) as well as other information that supports our determinations that the Navy activities will not adversely affect any species via impacts on rates of recruitment or survival. We refer the reader to the *Analysis and Negligible Impact Determination* section for this analysis. NMFS has described and applied a reasoned and comprehensive approach to evaluating the effects of the Navy activities on marine mammal species and their habitat. The Commenter cites various articles in which one analytical approach or another was used to evaluate particular scenarios or impacts, with no explanation of why those methods are more appropriate or applicable.

Regarding the assertion that NMFS does not adequately consider stress responses in its analysis, NMFS does not assume that the impacts are insignificant. However, there is currently neither adequate data nor a mechanism by which the impacts of stress from acoustic exposure can be reliably and independently quantified. Stress effects that result from noise exposure likely often occur concurrently with Level B harassment (behavioral disturbance) and many are likely captured and considered in the quantification of other takes by harassment that occur when individuals come within a certain distance of a sound source (behavioral disturbance, PTS, and TTS). The effects of these takes were fully evaluated in the *Analysis and Negligible Impact Determination* section.

Comment 54: A Commenter asserted that counter to NMFS' assertion that no evidence of population-level consequences exists, an apparent beaked whale population sink is observed on the AUTEC range (in the Bahamas), attributed to the high levels of cumulative noise exposure at the site. They further assert that similar concerns have focused attention on resident beaked whale populations on the Navy's SOCAL range, which exhibit strenuous responses to mid-frequency sonar notwithstanding their repeated exposure.

Response: It is incorrect to conclude that there is a ''population sink'' on the Navy's AUTEC range. In the citation provided (Claridge, 2013), that statement is merely a hypothesis, yet to be demonstrated. When considering the portion of the beaked whale population within the SOCAL portion of the HSTT Study Area and as presented in the 2018 HSTT final rule and the 2018 HSTT FEIS/OEIS, multiple studies have documented continued high abundance of beaked whales and the long-term residency of documented individual beaked whales, specifically where the Navy has been training and testing for decades (see for example Debich et al., 2015a, 2015b; Dimarzio et al., 2018, 2020; Falcone and Schorr, 2012, 2014, 2018, 2020; Hildebrand et al., 2009; Moretti, 2016; Širović et al., 2016; Smultea and Jefferson, 2014). There is no evidence that there have been any population-level impacts to beaked whales resulting from Navy training and testing in the SOCAL portion of the HSTT Study Area. Importantly, no resident beaked whale populations have been identified in the MITT Study Area, and both the level of activities and the magnitude and severity of associated impacts on beaked whales are lower than in the HSTT Study Area.

Comment 55: A Commenter stated that NMFS has not apparently considered the impact of Navy activities on a population basis for many of the marine mammal populations within the MITT Study Area. Instead, it has lodged discussion for many populations within broader categories, most prominently mysticetes and odontocetes, that in some cases correspond to general taxonomic groups. Such grouping of stocks elides important differences in abundance, demography, distribution, and other population-specific factors, making it difficult to assume ''that the effects of an activity on the different stock populations'' are identical. *Conservation Council,* 97 F.Supp.3d at 1223. That is particularly true where small, resident populations are concerned, and differences in population abundance, habitat use, and distribution relative to Navy activities can be profoundly significant.

Response: The Commenter erroneously suggests that NMFS makes findings specific only to the level of Odontocetes and Mysticetes or other general taxonomic groups, which is clearly inaccurate. NMFS *first* provides information regarding broader groups (such as Mysticetes or Odontocetes) in order to avoid repeating information that is applicable across multiple species (or stocks if applicable), but analyses have been conducted and determinations made specific to each species. Thus we avoid repeating information applicable to a broader taxonomic group or number of species (or stocks where applicable), while also presenting and integrating all information needed to support the negligible impact determination for a particular species (where no stock information is available). We note that in the MITT Study Area, species have not been assigned to stocks and there is little or no information at the stock level. Please refer to the *Analysis and Negligible Impact Determination* section of this final rule.

Comment 56: A Commenter asserted that NMFS assumes that all of the Navy's estimated impacts would not affect individuals or populations through repeated activity—even though the takes anticipated each year would affect the same populations and, indeed, would admittedly involve extensive use of some of the same biogeographic areas. And, the Commenter asserts, while NMFS states that behavioral harassment (aside from that caused by masking effects) involves a stress response that may contribute to an animal's allostatic load, it assumes without further analysis that any such impacts would be insignificant. The Commenter further asserts that both statements are factually insupportable given the lack of any substantial population analysis or quantitative assessment of long-term effects in the proposed rule, in addition to the numerous deficiencies in the thresholds and modeling that NMFS has adopted from the Navy.

Response: As previously discussed, Navy activities are spread out in the offshore waters around these islands, most activities are unit level events which have relatively small footprints of tens of kilometers resulting in small percentages of overall habitat affected at

any one time, activities that use sonar or explosives are not conducted every day of the year (active sonar use has traditionally been used on 20 percent of days or less, as reported through the CNA analysis of beaked whale strandings), and even within a day sonar use during an activity is intermittent (1 ping every 50 seconds) and often for short duration periods (minutes to up to a few hours at a time). The impacts of stress have been considered in NMFS' assessment (see the *Potential Effects of Specified Activities on Marine Mammals and Their Habitat* section of the proposed rule) and are also addressed in the response to *Comment 53* above. Regarding the take of marine mammals across the multiple years of the rule, NMFS has found that in each of the seven years of the rule (in which no individuals of any species are expected to be taken on more than a few non-sequential days), the authorized take is not expected to affect the reproductive success or survivorship of any individual marine mammal. Given the lack of any impacts on the reproduction or survival of any affected individuals, there will be no effects on any species' annual rates of recruitment or survival in any year, and therefore no basis to suggest that impacts would accrue over the seven years of the rule in a manner that would have a non-negligible impact on an affected species.

Comment 57: A Commenter stated that NMFS does not consider the potential for acute synergistic effects from multiple activities taking place at one time, as happens during major exercises or from Navy activities in combination with other actions. For example, the agency does not consider the greater susceptibility to vessel strike of animals that have been temporarily harassed or disoriented, nor does NMFS consider (for example) the synergistic effects of noise with other stressors in producing or magnifying a stress response. This lack of analysis is not supportable under the MMPA. Without an accurate assessment of existing threats to marine mammals, NMFS lacks a sufficient environmental baseline to determine whether the Navy's action will have more than a negligible impact on marine mammal species and stocks.

Response: NMFS did analyze the potential for aggregate effects from mortality, injury, masking, habitat effects, energetic costs, stress, hearing loss, and behavioral disturbance from the Navy's activities in reaching the negligible impact determinations. The modeling for MTEs and all activities includes the accumulated energy of all sonar sources and stressors. Outside of MTEs or some or the larger coordinated events, it is unlikely for several unit level activities to be conducted in the same day in the same location/time to produce aggregate effects on an individual. Further, we have explicitly discussed the potential interaction of an individual being impacted by TTS and behavioral disturbance simultaneously. We refer the reader to the *Analysis and Negligible Impact Determination* section of the final rule for the discussion on the potential for aggregate effects of the Navy's activities on individuals as well as how these effects on individuals relate to potential effects on annual rates of recruitment and survival for each species.

In addition, NMFS fully considers the potential for aggregate/synergistic effects from all Navy activities. We also consider UMEs (when applicable) and previous environmental impacts, where appropriate, to inform the baseline levels of both individual health and susceptibility to additional stressors, as well as species/stock status. Further, the species assessments in the *Analysis and Negligible Impact Determination* section (which have been updated and expanded for some species, *i.e.,* humpback whales and beaked whales) pull together and address the combined potential mortality, injury, behavioral disturbance, and other effects of the aggregate MITT activities (and in consideration of applicable mitigation measures) as well as additional information from the *Potential Effects of Specified Activities on Marine Mammals and Their Habitat* and *Estimated Take of Marine Mammals* sections to support our determinations that the Navy activities will not adversely affect any species via impacts on rates of recruitment or survival. We refer the reader to the *Analysis and Negligible Impact Determination* section for this analysis.

Widespread, extensive monitoring since 2006 on Navy ranges that have been used for training and testing for decades has demonstrated no evidence of population-level impacts. Based on the best available science, including research by NMFS and the Navy's marine mammal studies, there is no evidence that ''population-level harm'' to marine mammals is occurring in the MITT Study Area. Through the process described in the rule and regulations, NMFS will work with the Navy to assure that the aggregate or cumulative impacts remain at the negligible impact level.

Regarding the consideration of stress responses, NMFS does not assume that the impacts are insignificant. There is currently neither adequate data nor a mechanism by which the impacts of stress from acoustic exposure can be reliably and independently quantified. However, stress effects that result from noise exposure likely often occur concurrently with behavioral disturbance and many are likely captured and considered in the quantification of other takes by harassment that occur when individuals come within a certain distance of a sound source (behavioral disturbance, PTS, and TTS). Further, the Commenter provides no support for the speculative assertion that animals that are harassed would have greater susceptibility to vessel strike, but regardless, the agency's analysis of the likelihood of vessel strikes considers all available and applicable information (see the *Potential Effects of Vessel Strike* subsection of the *Potential Effects of Specified Activities on Marine Mammals and Their Habitat* section of the proposed rule).

NEPA

Comment 58: A Commenter stated that the Navy (and thereby NMFS, since the agency has adopted the 2020 MITT FSEIS/OEIS to satisfy its NEPA obligations for the MMPA rulemaking and subsequent issuance of the Letter of Authorization) failed its NEPA requirements: (1) To inform the public as to its intentions and the potential impacts of those intentions in relation to their continued weapons testing in the MITT Study Area and (2) To consider all available scientific evidence that their activities are resulting in wider take of marine mammals than previously known.

Response: NMFS disagrees that the Navy and NMFS failed to satisfy any NEPA requirements. The Navy prepared, with NMFS participating as a cooperating agency, and made available for public review and comment the 2019 MITT DSEIS/OEIS, which fully analyzed the Navy's and NMFS' proposed actions. To better accommodate stakeholders and the public, the Navy provided 75 days to review and comment on the 2019 MITT DSEIS/OEIS. The comment period for the DSEIS/OEIS was from February 1, 2019 to April 17, 2019, which is 30 days longer than the minimum required time for review (40 CFR 6.203(c)(3)(v)).

The Navy held four open house public meetings, one each on Tinian (March 14, 2019), Rota (March 15, 2019), Saipan (March 18, 2019), and Guam (March 19, 2019). The public meetings were an ideal opportunity for the public to ask questions of Navy team members (and specific subject matter experts on Saipan and Guam) about the analysis documented in the 2020 MITT FSEIS/OEIS. The Navy encouraged the

public to attend these meetings and broadly notified the public through the media, including paid newspaper advertisements and news releases, and direct mail, including letters, postcards, and emails.

Further, the 2020 MITT FSEIS/OEIS includes the best available information regarding the impacts of the Navy's activities on the human environment, including marine mammals.

Comment 59: A Commenter says that NMFS cannot rely on the EIS to fulfill its obligations under NEPA. Without significant revision, the 2019 MITT DSEIS/OEIS cannot meet NMFS' NEPA obligations. The Commenter urges NMFS to recognize that the alternatives and mitigation set forth in the 2019 MITT DSEIS/OEIS are inadequate and to supplement the document accordingly.

Response: Consistent with the regulations published by the Council on Environmental Quality (CEQ), it is common and sound NEPA practice for NOAA to participate as a cooperating agency and adopt a lead agency's NEPA analysis when, after independent review, NOAA determines the document to be sufficient in accordance with 40 CFR 1506.3. Specifically here, NOAA is satisfied that the 2020 MITT FEIS/OEIS adequately addresses the impacts of issuing the MMPA incidental take authorization and that NOAA's comments and concerns have been adequately addressed. NMFS' early participation in the NEPA process and role in shaping and informing analyses using its special expertise ensured that the analysis in the 2020 MITT FSEIS/OEIS is sufficient for purposes of NMFS' own NEPA obligations related to its issuance of incidental take authorization under the MMPA.

Regarding the alternatives and mitigation, NMFS' early involvement in development of the 2020 MITT FSEIS/OEIS and role in evaluating the effects of incidental take under the MMPA ensured that the 2020 MITT FSEIS/OEIS would include adequate analysis of a reasonable range of alternatives. The 2020 MITT FSEIS/OEIS includes a No Action Alternative specifically to address what could happen if NMFS did not issue an MMPA authorization. The other two Alternatives address two action options that the Navy could potentially pursue while also meeting their mandated Title 10 training and testing responsibilities. More importantly, these alternatives fully analyze a comprehensive variety of mitigation measures. This mitigation analysis supported NMFS' evaluation of our mitigation options in potentially issuing an MMPA authorization, which, if the authorization can be issued under the negligible impact standard, primarily revolves around the appropriate mitigation to prescribe. This approach to evaluating a reasonable range of alternatives is consistent with NMFS policy and practice for issuing MMPA incidental take authorizations. NOAA has independently reviewed and evaluated the 2020 MITT FSEIS/OEIS, including the range of alternatives, and determined that the 2020 MITT FSEIS/OEIS fully satisfies NMFS' NEPA obligations related to its decision to issue the MMPA final rule and associated LOA, and we have adopted it.

Comment 60: To satisfy NEPA's mandate to take a hard look at environmental impacts, NMFS and the Navy must incorporate new information (Simonis *et al.,* 2020) into their analysis of the impacts of MITT activities on marine mammals. Moreover, the agencies must evaluate alternatives that prohibit the use of harmful sonar in the biologically important areas for beaked whales around Saipan and Tinian identified in Simonis *et al.* (2020).

Response: NMFS has considered Simonis *et al.* (2020) in the development of this final rule and directs the reader to the *Stranding* section of the rule, as well as the response to Comment 19, in which we address the areas around Saipan and Tinian referenced in Simonis *et al.* (2020). Likewise the Navy has considered this new information from Simonis *et al.* (2020) in the 2020 MITT FSEIS/OEIS.

Other Comments

Comment 61: The Commenter argued that an analysis based on reported strikes by Navy vessels alone does not account for the additional risk of undetected under-reported whale strikes. In assessing ship-strike risk, NMFS and the Navy should include offsets to account for potentially undetected and unreported collisions.

Response: First, it is important to note that NMFS' assessment of whether ship strike is likely does not rely wholly on whether or not there have been reported strikes by the Navy in the past, but also considers the seasonal occurrence and density of large whales, the stranding record (which could note strikes by other entities), and the relative percentage of Navy vessel traffic. Regarding the likelihood of undetected Navy strikes, under Navy-wide policy Navy ships are mandated to report any Navy ship strike to marine mammals. To date, there have been none in the MITT Study Area from Navy ships. While NMFS agrees that broadly speaking the number of total ship strikes from all sources may be underestimated due to incomplete information from other sectors (shipping, etc.), NMFS is confident that any whales struck by Navy vessels are detected and reported (as has occurred in other Navy study areas), and therefore relying on the history of Navy vessel strikes is appropriate and supported. Navy ships have multiple Lookouts, including on the forward part of the ship that can visually detect a struck whale (which has occasionally occurred elsewhere), in the unlikely event ship personnel do not feel the strike. The Navy's strict internal procedures and mitigation requirements in this and previous rules include reporting of any vessel strikes of marine mammals, and the Navy's discipline, extensive training (not only for detecting marine mammals, but for detecting and reporting any potential navigational obstruction), and strict chain of command give NMFS a high level of confidence that all strikes actually get reported. For more discussion of the specific circumstances that make it less likely that Navy vessels will strike a marine mammal, see the *Potential Effects of Specified Activities on Marine Mammals and Their Habitat* section in the proposed rule. Accordingly, NMFS is confident that the information used to support the vessel-strike analysis is accurate and complete, and there is no need to include offsets to account for potentially undetected and unreported collisions allegedly associated with the Navy's training and testing activities.

Separately, there is no evidence that Navy training and testing activities (including acoustic activities) increase the risk of nearby non-Navy vessels (or other nearby Navy vessels not involved in the training or testing activities) striking marine mammals.

Changes From the Proposed Rule to the Final Rule

Between the proposed rule and the final rule, mitigation, monitoring, reporting, and adaptive management measures have been added, augmented, and clarified, and the negligible impact analysis for humpback whales around Saipan has been modified.

Specifically regarding the humpback whale assessment, since publication of the proposed rule, additional information and analysis have been used to refine the assessment for the impacts of sonar training and testing on humpback whales around Saipan, resulting in an increase in the total take numbers for humpback whales. A subsection describing this additional analysis and how it changes the take numbers (*Humpback Whales Around*

Saipan) has been added to the *Estimated Take of Marine Mammals* section and the total take numbers for humpback whales have been changed in Table 28 and Table 47.

Regarding the changes to mitigation measures, in the Marpi Reef and Chalan Kanoa Reef Geographic Mitigation Areas, where there was previously a limitation on the use of explosives but no limitation on the use of active sonar, there is now a 20-hr annual cap between December 1 and April 30 on the use of hull-mounted MF1 mid-frequency active sonar for these areas (20 hrs total for both areas combined), as well as a requirement that the Navy report all active sonar use (all bins, by bin) in these areas between December 1 and April 30. These changes are discussed in greater detail in the *Mitigation Measures* section of this rule.

In addition, the Navy has committed to the following actions, which will expand the science and inform future adaptive management actions related to beaked whales, specifically, as well as other species in the MITT Study Area:

1. Co-funding the Pacific Marine Assessment Program for Protected Species (PACMAPPS) survey in spring-summer 2021 to help document beaked whale occurrence, abundance, and distribution in the Mariana Islands. This effort will include deployments of a towed array as well as floating passive acoustic buoys.

2. Continuing to fund additional stranding response/necropsy analyses for the Pacific Islands region.

3. Submitting a proposal through the annual Federally Funded Research and Development Center (FFRDC) call to fund Center for Naval Analysis (CNA) to develop a framework to improve the analysis of single and mass stranding events, including the development of more advanced statistical methods to better characterize the uncertainty associated with data parameters.

4. Increasing analysis for any future beaked whale stranding in the Mariana Islands to include detailed Navy review of available records of sonar use.

5. Monitoring future beaked whale occurrence within select portions of the MITT Study Area starting in 2022 (so as to not duplicate efforts from item number 1 above).

6. Including Cuvier's beaked whales as a priority species for analysis under a 2020–2023 Navy research-funded program entitled Marine Species Monitoring for Potential Consequences of Disturbance (MSM4PCOD).

7. Funding and co-organizing with NMFS an expert panel to provide recommendations on scientific data gaps and uncertainties for further protective measure consideration to minimize the impact of Navy training and testing activities on beaked whales in the Mariana Islands.

These changes are discussed in greater detail in the *Monitoring* and *Adaptive Management* sections of this rule.

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 MITT Study Area are presented in Table 7. The Navy anticipates the take of individuals of 26 marine mammal species by Level A and Level B harassment incidental to training and testing activities from the use of sonar and other transducers, and in-water detonations. There are no areas of critical habitat designated under the Endangered Species Act (ESA), National Marine Sanctuaries, or unusual mortality events (UMEs) for marine mammals in the MITT Study Area. However, there are areas known to be important for humpback whale breeding and calving which are described below.

The proposed rule included additional information about the species in this rule, all of which remains valid and applicable but has not been reprinted in this final rule, including a subsection entitled *Marine Mammal Hearing* that described the importance of sound to marine mammals and characterized the different groups of marine mammals based on their hearing sensitivity. Therefore, we refer the reader to our **Federal Register** notice of proposed rulemaking (85 FR 5782; January 31, 2020) for more information.

Information on the status, distribution, abundance, population trends, habitat, and ecology of marine mammals in the MITT 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 MITT FSEIS/OEIS. The marine mammal populations in the MITT Study Area have not been assigned to stocks and there are no associated SARs. There is only one species, humpback whales for which stock information exists for species that occur in the MITT Study Area. Table 7 incorporates the best available science, including data from the U.S. Pacific and the Alaska Marine Mammal Stock Assessments Reports (SARs) (Carretta *et al.,* 2019, Muto *et al.,* 2019), as well as monitoring data from the Navy's marine mammal research efforts. NMFS also has reviewed the most recent 2019 draft SARs (which can be found at: *https://www.fisheries.noaa.gov/national/marine-mammal-protection/draft-marine-mammal-stock-assessment-reports*) and new scientific literature, and determined that none of these nor any other new information changes our determination of which species have the potential to be affected by the Navy's activities or the pertinent information in this final rulemaking.

TABLE 7—MARINE MAMMAL OCCURRENCE WITHIN THE MITT STUDY AREA

Common name	Scientific name	Status		Occurrence *	
		MMPA	ESA	Mariana Islands	Transit Corridor
Mysticetes:					
Blue whale	*Balaenoptera musculus*	D	E	Seasonal	Seasonal.
Bryde's whale	*Balaenoptera edeni*		n/a	Regular	Regular.
Fin whale	*Balaenoptera physalus*	D	E	Rare	Rare.
Humpback whale	*Megaptera novaeangliae*	(1)	E	Seasonal	Seasonal.
Minke whale	*Balaenoptera acutorostrata*		n/a	Seasonal	Seasonal.
Omura's whale	*Balaenoptera omurai*		n/a	Rare	Rare.
Sei whale	*Balaenoptera borealis*	D	E	Seasonal	Seasonal.
Odontocetes:					
Blainville's beaked whale	*Mesoplodon densirostris*		n/a	Regular	Regular.

TABLE 7—MARINE MAMMAL OCCURRENCE WITHIN THE MITT STUDY AREA—Continued

Common name	Scientific name	Status		Occurrence *	
		MMPA	ESA	Mariana Islands	Transit Corridor
Common bottlenose dolphin	*Tursiops truncatus*		n/a	Regular	Regular.
Cuvier's beaked whale	*Ziphius cavirostris*		n/a	Regular	Regular.
Dwarf sperm whale	*Kogia sima*		n/a	Regular	Regular.
False killer whale	*Pseudorca crassidens*		n/a	Regular	Regular.
Fraser's dolphin	*Lagenodelphis hosei*		n/a	Regular	Regular.
Ginkgo-toothed beaked whale	*Mesoplodon ginkgodens*		n/a	Regular	Regular.
Killer whale	*Orcinus orca*		n/a	Regular	Regular.
Longman's beaked whale	*Indopacetus pacificus*		n/a	Regular	Regular.
Melon-headed whale	*Peponocephala electra*		n/a	Regular	Regular.
Pantropical spotted dolphin	*Stenella attenuata*		n/a	Regular	Regular.
Pygmy killer whale	*Feresa attenuata*		n/a	Regular	Regular.
Pygmy sperm whale	*Kogia breviceps*		n/a	Regular	Regular.
Risso's dolphin	*Grampus griseus*		n/a	Regular	Regular.
Rough-toothed dolphin	*Steno bredanensis*		n/a	Regular	Regular.
Short-finned pilot whale	*Globicephala macrorhynchus*		n/a	Regular	Regular.
Sperm whale	*Physeter macrocephalus*	D	E	Regular	Regular.
Spinner dolphin	*Stenella longirostris*		n/a	Regular	Regular.
Striped dolphin	*Stenella coeruleoalba*		n/a	Regular	Regular.

[1] Humpback whales in the Mariana Islands have not been assigned a stock by NMFS in the Alaska or Pacific Stock Assessment Reports given they are not recognized in those reports as being present in U.S. territorial waters (Carretta et al., 2017c; Carretta et al., 2018; Caretta et al., 2019; Muto et al., 2017b; Muto et al., 2018, Muto et al., 2019), but because individuals from the Western North Pacific Distinct Population Segment have been photographically identified in the MITT Study Area, humpback whales in the Mariana Islands are assumed to be part of the Western North Pacific Stock.

Note: Status MMPA, D = depleted; ESA, E = endangered.

* Species occur in both the Mariana Islands and in the Transit Corridor, both of which are included in the overall MITT Study Area. The transit corridor is outside the geographic boundaries of the MIRC, but is a route across the high seas for Navy ships transiting between the MIRC and the HRC. Although not part of a defined range complex, vessels and aircraft would at times conduct basic and routine unit-level activities such as gunnery and sonar training while in transit in the corridor as long as the training would not interfere with the primary objective of reaching their intended destination. Ships also conduct sonar maintenance, which includes active sonar transmissions.

Humpback Reproductive Areas

The humpback whales in the MITT Study Area are indirectly addressed in the Alaska SAR, given that the historic range of humpbacks in the ''Asia wintering area'' includes the Mariana Islands. The observed presence of humpback whales in the Mariana Islands (Hill *et al.,* 2016a; Hill et *al.,* 2017a; Hill *et al.,* 2018; Hill *et al.,* 2020a; Klinck *et al.,* 2016a; Munger *et al.,* 2014; NMFS, 2018; Oleson *et al.,* 2015; Uyeyama, 2014) is consistent with the MITT Study Area as a plausible migratory destination for humpback whales from Alaska (Muto *et al.,* 2017a). It was considered likely that humpback whales in the Mariana Islands are part of the endangered Western North Pacific (WNP) Distinct Population Segment (DPS) based on the best available science (Bettridge *et al.,* 2015; Calambokidis *et al.,* 2008; Calambokidis *et al.,* 2010; Carretta *et al.,* 2017b; Hill *et al.,* 2017b; Hill *et al.,* 2020a; Muto *et al.,* 2017a; NMFS, 2016a; NOAA, 2015b; Wade *et al.,* 2016) although the breeding range of the humpback whale WNP DPS is not fully resolved. Individual photo-identification data for whales sampled off Saipan within the Mariana Archipelago in February–March 2015 to 2018, suggest that these whales belong to the WNP DPS (Hill *et al.,* 2020a). Specifically, comparisons with existing WNP humpback whale photo-identification catalogs showed that 11 of 41 (27 percent) whales within the Mariana Archipelago humpback whale catalog were previously sighted in Western North Pacific humpback whale breeding areas (Japan and Philippines) and/or in a Western North Pacific humpback whale feeding area off Russia (Hill *et al.,* 2020a). Hill et *al.* (2020a) completed DNA profiling of 28 biopsy samples that identified 24 individuals (14 females, 10 males) representing seven mitochondrial DNA haplotypes. The haplotype frequencies from the Mariana Archipelago showed the greatest identity with the Ogasawara breeding ground and Commander Islands feeding ground in the Western North Pacific. This study establishes the Mariana Archipelago as a breeding area for the endangered WNP DPS of humpback whales (Hill *et al.,* 2020a). No ESA critical habitat has been proposed for the WNP DPS of humpback whales in the MITT Study Area, although critical habitat has been proposed in Alaska (84 FR 54534; October 9, 2019).

Humpback whale breeding and calving have been documented in the MITT Study Area and particularly in the shallow waters (mostly within the 200-m isobath) offshore of Saipan at Marpi Reef and Chalan Kanoa Reef. Based on surveys conducted by NMFS' Pacific Islands Fisheries Science Center (PIFSC) during the winter months (January to March) 2015–2019, there were 22 encounters with mother/calf pairs with a total of 14 mother/calf pairs and all calves were considered born within the current season and one neotate (Hill *et al.,* 2020a). Additionally, competitive groups were observed in 2017 and 2018 (Hill *et al.,* 2020a). Surveys and passive acoustic hydrophone recordings in the Mariana Islands has confirmed the presence of mother-calf pairs, non-calf whales, and singing males in the MITT Study Area (Fulling *et al.,* 2011; Hill *et al.,* 2016a; Hill *et al.,* 2018; Munger *et al.,* 2014; Munger *et al.,* 2015; Norris *et al.,* 2012; Oleson and Hill, 2010a; Oleson *et al.,* 2015; U.S. Department of the Navy, 2007; Uyeyama *et al.,* 2012). Future surveys are needed to determine the full extent of the humpback whale breeding habitat throughout the Mariana Archipelago; however, the available data confirms the shallow waters surrounding Marpi Reef and Chalan Kanoa Reef are important to breeding and calving humpback whales.

Species Not Included in the Analysis

Consistent with the analysis provided in the 2015 MITT FEIS/OEIS and the

previous Phase II rulemaking for the MITT Study Area, the species carried forward for analysis and in the Navy's rulemaking/LOA application are those likely to be found in the MITT Study Area based on the most recent sighting, survey, and habitat modeling data available. The analysis does not include species that may have once inhabited or transited the area, but have not been sighted in recent years (*e.g.,* species that no longer occur in the area due to factors such as 19th-century commercial exploitation). These species include the North Pacific right whale (*Eubalaena japonica*), the western subpopulation of gray whale (*Eschrichtius robustus*), short-beaked common dolphin (*Delphinus delphis*), Indo-Pacific bottlenose dolphin (*Tursiops aduncus*), northern elephant seal (*Mirounga angustirostris*), and dugong (*Dugong dugon*). The reasons for not including each of these species was explained in detail in the proposed rulemaking (85 FR 5782; January 31, 2020) and NMFS agrees these species are unlikely to occur in the MITT Study Area.

Potential Effects of Specified Activities on Marine Mammals and Their Habitat

We provided a detailed discussion of the potential effects of the specified activity on marine mammals and their habitat in our **Federal Register** notice of proposed rulemaking (85 FR 5782; January 31, 2020). In the *Potential Effects of Specified Activities on Marine Mammals and Their Habitat* section of the proposed rule, NMFS provided a description of the ways marine mammals may be affected by these activities in the form of, among other things, serious injury or mortality, physical trauma, sensory impairment (permanent and temporary threshold shift and acoustic masking), physiological responses (particularly stress responses), behavioral disturbance, or habitat effects. All of this information remains valid and applicable. Therefore, we do not reprint the information here but refer the reader to that document.

NMFS has also reviewed new relevant information from the scientific literature since publication of the proposed rule. Summaries of the new key scientific literature since publication of the proposed rule are presented below.

Accomando *et al.* (2020) examined the directional dependence of hearing thresholds for 2, 10, 20, and 30 kHz in two adult bottlenose dolphins. They observed that source direction (*i.e.,* the relative angle between the sound source location and the dolphin) impacted hearing thresholds for these frequencies. Sounds projected from directly behind the dolphins resulted in frequency-dependent increases in hearing thresholds of up to 18.5 dB when compared to sounds projected from in front of the dolphins. Sounds projected directly above the dolphins resulted in thresholds that were approximately 8 dB higher than those obtained when sounds were projected below the dolphins. These findings suggest that dolphins may receive lower source levels when they are oriented 180 degrees away from the sound source, and dolphins are less sensitive to sound projected from above (leading to some spatial release from masking). Directional or spatial hearing also allows animals to locate sound sources. This study indicates dolphins can detect source direction at lower frequencies than previously thought, allowing them to successfully avoid or approach biologically significant or anthropogenic sound sources at these frequencies.

Houser *et al.* (2020) measured cortisol, aldosterone, and epinephrine levels in the blood samples of 30 bottlenose dolphins before and after exposure to simulated U.S. Navy mid-frequency sonar from 115–185 dB re: 1 μPa. They collected blood samples approximately one week prior to, immediately following, and approximately one week after exposures and analyzed for hormones via radioimmunoassay. Aldosterone levels were below the detection limits in all samples. While the observed severity of behavioral responses scaled (increased) with SPL, levels of cortisol and epinephrine did not show consistent relationships with received SPL. The authors note that it is still unclear whether intermittent, high-level acoustic stimuli elicit endocrine responses consistent with a stress response, and that additional research is needed to determine the relationship between behavioral responses and physiological responses.

In an effort to compare behavioral responses to continuous active sonar (CAS) and pulsed (intermittent) active sonar (PAS), Isojunno *et al.* (2020) conducted at-sea experiments on 16 sperm whales equipped with animal-attached sound- and movement-recording tags in Norway. They examined changes in foraging effort and proxies for foraging success and cost during sonar and control exposures after accounting for baseline variation. They observed no reduction in time spent foraging during exposures to medium-level PAS transmitted at the same peak amplitude as CAS, however they observed similar reductions in foraging during CAS and PAS when they were received at similar energy levels (SELs). The authors note that these results support the hypothesis that sound energy (SEL) is the main cause of behavioral responses rather than sound amplitude (SPL), and that exposure context and measurements of cumulative sound energy are important considerations for future research and noise impact assessments.

Frankel and Stein (2020) used shoreline theodolite tracking to examine potential behavioral responses of southbound migrating eastern gray whales to a high-frequency active sonar system transmitted by a vessel located off the coast of California. The sonar transducer deployed from the vessel transmitted 21–25 kHz sweeps for half of each day (experimental period), and no sound the other half of the day (control period). In contrast to low-frequency active sonar tests conducted in the same area (Clark et al., 1999; Tyack and Clark, 1998), no overt behavioral responses or deflections were observed in field or visual data. However, statistical analysis of the tracking data indicated that during experimental periods at received levels of approximately 148 dB re: 1 μPa^2 (134 dB re: 1 $\mu Pa^2 s$) and less than 2 km from the transmitting vessel, gray whales deflected their migration paths inshore from the vessel. The authors indicate that these data suggest the functional hearing sensitivity of gray whales extends to at least 21 kHz. These findings agree with the predicted mysticete hearing curve and behavioral response functions used in the analysis to estimate take by Level A harassment (PTS) and Level B harassment (behavioral response) for this rule (see the Technical Report ''Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis (Phase III)'').

Having considered the new information, along with information provided in public comments on the proposed rule, we have determined that there is no new information that substantively affects our analysis of potential impacts on marine mammals and their habitat that appeared in the proposed rule, all of which remains applicable and valid for our assessment of the effects of the Navy's activities during the seven-year period of this rule.

Vessel Strike

NMFS also considered the chance that a vessel utilized in training or testing activities could strike a marine mammal. 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. NMFS' detailed analysis of the likelihood of vessel strike was provided in the *Potential Effects of Vessel Strike* section of our **Federal Register** notice of proposed rulemaking (85 FR 5782; January 31, 2020); please see that notice of proposed rulemaking or the Navy's application for more information. No additional information has been received since publication of the proposed rule that substantively changes the agency's analysis or conclusions. Therefore the information and analysis included in the proposed rule supports NMFS' concurrence with the Navy's conclusion and our final determination that vessel strikes of marine mammals, and associated serious injury or mortality, are not likely to result from the Navy's activities included in this seven-year rule, and vessel strikes are not discussed further.

Stranding

In the proposed rule, NMFS discussed the potential mechanisms that could lead from acoustic exposure to marine mammal strandings and described the small number of global events in which strandings (predominantly of beaked whales) have been causally associated with exposure to active sonar in certain circumstances. Given the available information, NMFS did not anticipate or propose to authorize mortality of beaked whales resulting from the Navy activities covered under the rule. Public commenters questioned this preliminary determination and additional information has become available since the proposed rule was published. Therefore an updated and expanded rationale, in addition to what was included in the proposed rule, describing why NMFS continues to conclude that mortality is not reasonably likely to result from these activities following careful and thorough review of all available information is included here.

In February 2020, a study (Simonis *et al.,* 2020) was published titled ''Co-occurrence of beaked whale strandings and naval sonar in the Mariana Islands, Western Pacific.'' In summary, the authors compiled the publicly available information regarding Navy training exercises from 2006–2019 (from press releases, etc.), as well as the passive acoustic monitoring data indicating sonar use that they collected at two specific locations on HARP recorders over a shorter amount of time, and compared it to the dates of beaked whale strandings. Using this data, they reported that six of the 10 Cuvier's beaked whales, from four of eight events, stranded during or within six days of a naval ASW exercise using sonar. In a Note to the article, the authors acknowledged additional information provided by the Navy while the article was in press that one of the strandings occurred a day prior to sonar transmissions and so should not be considered coincident with sonar. The authors' analysis examined the probability that the now three of eight random days would fall during, or within six days after, a naval event (utilizing the Navy training events and sonar detections of which the authors were aware). Their test results indicated that the probability that three of eight stranding events were randomly associated with naval sonar was one percent.

The authors did not have access to the Navy's classified data (in the Note added to the article, Simonis *et al.* noted that the Navy was working with NMFS to make the broader classified dataset available for further statistical analysis). Later reporting by the Navy indicated there were more than three times as many sonar days in the Marianas during the designated time period than Simonis *et al.* (2020) reported. Primarily for this reason, the Navy tasked the Center for Naval Analysis (CNA) with repeating the statistical examination of Simonis *et al.* using the full classified sonar record, including ship movement information to document the precise times and locations of Navy sonar use throughout the time period of consideration (2007–2019).

CNA re-evaluated the relationship between the strandings and sonar activities using the entire classified data set in two ways. First, from their sonar database, CNA tabulated the number of ''sonar days'' for use in their analysis. The total number of sonar days from the classified database was 923 days (or approximately 19.5 percent of all days in the study timeframe). In comparison, the Simonis *et al.* (2020) analysis assumed only 293 days of sonar (or approximately 6.1 percent of all days in the study timeframe). CNA conducted re-constructions for each stranding event to determine/confirm if Navy sonar use coincided in time and space with each stranding location. The Navy extended the analysis through the entire year of 2019 to capture both sonar use and stranding events. As a result, the CNA analysis included consideration of the November 2019 stranding of a single beaked whale on Rota, which was not addressed in the Simonis *et al.* (2020) paper.

A distance of 80 nmi is used in NMFS' incidental take regulations to evaluate strandings in the context of major training events (MTE), although of note none of the Marianas stranding events occurred during an MTE. All strandings reported to have been coincident with sonar use in Simonis *et al.,* as well as the additional stranding that occurred while Simonis *et al.* was in press, were confirmed to be coincident by the CNA analysis (*i.e.,* within 80 nmi) and, for the first analysis, CNA examined the four strandings in relation to the total sonar days (throughout the MITT Study Area) recorded in the classified data set. Based on the calculations conducted by CNA, when the analysis is conducted consistent with the Simonis *et al.* (2020) assumptions (*i.e.,* without considering proximity of sonar to strandings in counting ''sonar days''), but with consideration of the accurate number of sonar days from the classified record and the additional stranding at Rota, the analysis suggests that the probability that four of nine stranding events were randomly associated with naval events is 10 percent, which the Navy interpreted as insufficient evidence, at $P<0.10$ threshold level, to claim a relationship between sonar use and stranding in the Mariana Islands.

For the second CNA analysis, the same four coincident strandings were considered, but only sonar use within a maximum distance of 80 nmi from a stranding location would be considered as possibly influencing a potential stranding event and, therefore, included in the ''sonar days'' for this analysis. This analysis resulted in the calculations being performed separately for Guam, Rota, and Saipan.

When the analysis was conducted specifically for Guam including only those sonar days within 80 nmi, the results suggested that the probability that the strandings are randomly associated with sonar was notably higher, at 26 percent ($p=0.26$). This is notable because this location had the highest number of overall stranding events ($n=7$), coincident stranding events ($n=2$), and sonar days ($n=681$) of all the locations within the Mariana Islands. The calculations for Saipan and Rota ($p=0.06$ and 0.14, respectively) should be viewed with caution given that statistical analyses considering single data points (*i.e.,* one stranding each) have low power and high uncertainty and, similarly, the Navy reported insufficient evidence to claim a relationship (at $P<0.05$ and 0.10 levels, respectively) between sonar use and strandings. NMFS has evaluated the Navy's analysis and results along with the analysis and results of Simonis *et al.* (2020), and has determined that both

analyses are appropriate to consider in NMFS' assessment of whether beaked whale mortality is reasonably likely to occur as a result of the Navy's activities described in this seven-year rule.

Standard statistical significance thresholds of 0.05 and 0.1 are often used in the interpretation of the results of statistical tests, and the Navy stated that their results show that the data showing the relationship between sonar and stranding is not statistically significant, and does not allow one to rule out a null hypothesis that there is no relationship. NMFS consulted guidance from the American Statistical Association, which cautions against strict interpretations of p-values and notes that ''researchers should bring many contextual factors into play to derive scientific inferences, including the design of a study, the quality of the measurements, the external evidence for the phenomenon under study, and the validity of assumptions that underlie the data analysis. Pragmatic considerations often require binary, ''yes-no'' decisions, but this does not mean that p-values alone can ensure that a decision is correct or incorrect.'' Separately, we also note that the Navy strove to use identical methods as the Simonis *et al.* (2020) paper to conduct their analysis. A miscommunication resulted in the Navy initially using a Poisson distribution, while Simonis *et al.* used a permutation test, however, additional tests were run to ensure an apples-to-apples comparison. The tests were consistent and the results are reflected in the discussion above. Last, and importantly, we note that correlation does not equate to causation.

In addition to examining the correlation (or lack thereof) of activities with strandings, necropsies of stranded animals can provide insight into the potential cause of death. The number of strandings that can be thoroughly investigated through necropsy, sample collection, and advanced diagnostics is limited to animals that are not returned to the sea and those that are found and accessible prior to extensive decomposition. In the case of beaked whale strandings that occurred in the MITT Study Area during this time period, necropsy examinations were performed and high quality tissue samples were collected from three live stranded or fresh dead individuals: one of the whales from the August 2011 Saipan stranding, the single whale from the March 2015 Guam stranding, and the single whale from the January 2019 Guam stranding. For the stranding events for which necropsies and histopathology analyses were conducted, only the 2011 and 2015 events were coincident with the use of Navy sonar.

None of the three beaked whales from the Mariana Islands had evidence of gas bubble formation in the organs examined grossly and histologically. Stranding response staff from the University of Hawaii conducted the examinations and compared the results to the diagnostic features of gas and fat embolic syndrome described by Bernaldo de Quiros *et al.* (2019). Bernaldo de Quiros *et al.* (2019) established that to date, strandings which have a confirmed association with naval exercise have exhibited all seven of the following diagnostic features:

1. Individual or multiple animals stranded within hours or a few days of an exercise in good body condition;
2. Food remnants in the first gastric compartment ranging from undigested food to squid beaks;
3. Abundant gas bubbles widely distributed in veins (subcutaneous, mesenteric, portal, coronary, subarachnoid veins, etc.) composed primarily of N2 in fresh carcasses;
4. Gross subarachnoid and/or acoustic fat hemorrhages;
5. Microscopic multi-organ gas and fat emboli associated with bronchopulmonary shock;
6. Diffuse, mild to moderate, acute, monophasic myonecrosis (hyaline degeneration) with ''disintegration'' of the interstitial connective tissue and related structures, including fat deposits, and their replacement by amorphous hyaline material (degraded material) in fresh and well preserved carcasses; and
7. Multi-organ microscopic hemorrhages of varying severity in lipid-rich tissues such as the central nervous system, spinal cord, and the coronary and kidney fat when present.

Results from the necropsies for the 2011 and 2015 stranded animals indicate that they only exhibited one to three of the diagnostic features, but not all seven. Additionally, the necropsy results from both animals indicated severe parasite infestations. The 2015 specimen also had indication of myocardial fibrosis which could have impacted cardiac function. Results for the 2019 animal, which was a stranding that was not coincident with sonar, indicated that it exhibited up to 3[1] of the 7 diagnostic features. Overall, the results of these necropsies appear to align with evidence from single beaked whale strandings in the Canary Islands between 2002 and 2015 (n=45) which stranded with no known correlation in space or time with active sonar. These individuals had one or more diagnostic features of gas and fat embolic syndrome for beaked whales stranded in association with MFAS exercises, but not all seven (Bernaldo de Quiros *et al.* 2019). NMFS acknowledges that situations could potentially occur in which beaked whales might strand as a result of sonar exposure and not exhibit all seven of the features of gas and fat embolic syndrome described above, however, taken as a whole, these necropsy and histopathology results do not support a conclusion that the 2011 and 2015 strandings resulted from exposure to naval sonar. Furthermore, the role of natural stressors or other non-Navy factors as they affect beaked whale strandings is not understood. The majority of strandings in the MITT Study Area occurred without the presence of Navy sonar.

As noted previously, NMFS has acknowledged that it is possible for naval activities using hull-mounted tactical sonar to contribute to the death of marine mammals in certain circumstances via strandings resulting from behaviorally mediated physiological impacts or other gas-related injuries. In the proposed rule, NMFS discussed these potential causes and outlined the few cases where active naval sonar (in the United States or, largely, elsewhere) had either potentially contributed to or (as with the Bahamas example) been more definitively causally linked with marine mammal mass strandings (more than two animals). There have been no documented mass strandings of beaked whales in the Marianas since stranding data was collected, and the first beaked whale stranding was documented in 2007, while the Navy has been using sonar in the Marianas since the 1960s. As also noted previously, there are a suite of factors that have been associated with the specific cases of strandings directly causally associated with sonar (steep bathymetry, multiple hull-mounted platforms using sonar simultaneously, constricted channels, strong surface ducts, etc.) that are not present together in the MITT Study Area

[1] One of the diagnostic features is ''individual or multiple animals stranded within hours or a few days of an exercise in good body condition,'' however, Bernaldo de Quiros et al. (2019) does not specify if the stranding had to occur after an exercise in which sonar use occurred. One would presume it does since it investigated sonar's ability to cause strandings. The 2019 animal stranded close in time to the outset of a Navy training event, however, sonar use did not occur until the day after the stranding. Therefore, this event is *not* considered coincident, but due to the ambiguity in the description of this diagnostic factor, the 2019 stranding is conservatively assumed to be positive for this factor.

and during the specified activities (and which the Navy takes care across the world not to operate under without additional monitoring). Further none of the documented strandings in the MITT Study Area have coincided with MTEs.

While the results of the Simonis *et al.* (2020) paper and the fuller CNA analysis both suggest (the latter to a notably lesser degree) that it is more probable than not that there was some form of non-random relationship between sonar days and strandings in the Marianas during this period of time, the results of the Navy analysis (using the full dataset) allow, statistically, that the strandings and sonar use may not be related. Given the uncertainties and assumptions inherent in these correlation analyses, the small sample size (in terms of the strandings), and the fact that correlation does not equate to causation—these results, alone, do not indicate a reasonable likelihood that the Navy's activities under this rule will result in serious injury or mortality of beaked whales. Further, the necropsies of the two animals stranded in the MITT Study Area in 2011 and 2015 do not support a conclusion that the 2011 and 2015 strandings resulted from exposure to naval sonar. When this information is considered in combination with the absence of mass beaked whale strandings in the MITT Study Area and the absence of beaked whale strandings coinciding with any MTEs, despite Navy sonar training activity in the area since the 1960s, NMFS has concluded that serious injury or mortality of beaked whales is unlikely to result from the Navy activities covered under this seven-year rule.

While we have found that serious injury or mortality are not likely to result from the activities covered by this rule, we note the number of beaked whale strandings in the MITT Study Area (acknowledging the comparatively lower carcass recovery rate for offshore species), the paucity of beaked whale data in the region, and the Simonis *et al.* and Navy analysis results, all of which highlight the need for additional data-gathering and future analysis. Accordingly, as part of the monitoring and adaptive management requirements of the final rule (as described elsewhere), in addition to continuing to fund stranding investigations in the Marianas and other monitoring measures, the Navy will fund and co-organize with NMFS an expert panel to provide recommendations addressing scientific data gaps and uncertainties to further inform consideration of future protective measures to minimize the impact of Navy training and testing activities on beaked whales in the Mariana Islands.

Estimated Take of Marine Mammals

This section indicates the number of takes that NMFS is authorizing, which are based on the maximum amount of take that NMFS anticipates is likely to occur. NMFS coordinated closely with the Navy in the development of their incidental take application, and agrees that the methods the Navy put forth to estimate take (including the model, thresholds, and density estimates), and the resulting numbers are based on the best available science and appropriate for authorization. Nonetheless, since publication of the proposed rule, additional information and analysis have been used to refine the assessment for the impacts of sonar training and testing on humpback whales around Saipan, resulting in a change in the total take numbers for humpback whales. A subsection describing this additional analysis and how it changes the take numbers (*Humpback Whales Around Saipan*) is included below and the total take numbers for humpback whales has increased in Table 28 and 47.

Takes are in the form of harassment only. For military readiness activities, 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).

Authorized takes will primarily be in the form of Level B harassment, as use of the acoustic and explosive sources (*i.e.,* sonar and explosives) is more likely to result in behavioral disruption (rising to the level of a take as described above) or temporary threshold shift (TTS) for marine mammals than other forms of take. There is also the potential for Level A harassment, however, in the form of auditory injury and/or tissue damage (the latter from explosives only) 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 (in this case, as defined in the military readiness definition of Level B harassment included above) 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. Below, we describe these components in more detail and present the take estimates.

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 experience a disruption in behavior patterns to a point where they are abandoned or significantly altered, or to incur TTS (equated to Level B harassment) or 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.

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, some of the responses that are informing take thresholds are of a very short duration, such that it is possible some of these responses might not always 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 planned activity includes the use of non-impulsive (sonar) and impulsive (explosives) sources. These thresholds (Tables 8 and 9) 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.*

TABLE 8—ACOUSTIC THRESHOLDS IDENTIFYING THE ONSET OF TTS AND PTS FOR NON-IMPULSIVE SOUND SOURCES BY FUNCTIONAL HEARING GROUPS

Functional hearing group	Non-impulsive	
	TTS Threshold SEL (weighted)	PTS threshold SEL (weighted)
Low-Frequency Cetaceans	179	199
Mid-Frequency Cetaceans	178	198
High-Frequency Cetaceans	153	173

Note: SEL thresholds in dB re 1 μPa^{2}s.

Based on the best available science, the Navy (in coordination with NMFS) used the acoustic and pressure thresholds indicated in Table 9 to predict the onset of TTS, PTS, tissue damage, and mortality for explosives (impulsive) and other impulsive sound sources.

TABLE 9—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.

The criteria used to assess the onset of TTS and PTS due to exposure to sonars (non-impulsive, see Table 8 above) are discussed further in the Navy's rulemaking/LOA application (see Hearing Loss from Sonar and Other Transducers in Section 6, Section 6.4.2.1, Methods for Analyzing Impacts from Sonars and Other Transducers). 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 from sonar and other transducers is so unlikely as to be discountable under normal conditions for the reasons explained in the proposed rule under the *Potential Effects of Specified Activities on Marine Mammals and Their Habitat* section—*Acoustically Mediated Bubble Growth and other Pressure-related Injury,* and is therefore not considered further in this analysis. As noted previously, additional information and analysis has been added to the *Potential Effects of Specified Activities on Marine Mammals and Their Habitat* section of this final rule specifically addressing and ruling out the likelihood of mortality of beaked whales through strandings associated with sonar exposure.

The mitigation measures associated with explosives are expected to be effective in preventing tissue damage to

any potentially affected species, and when considered in combination with the modeled exposure results, no species are anticipated to incur tissue damage during the period of this rule. Tables 26 indicate the range to effects for tissue damage for different explosive types. The Navy will implement mitigation measures (described in the *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 and passive acoustic detection methods (when they are available and part of the activity) before the activity begins, in order to cover the mitigation zones that can range from 200 yds (183 m) to 2,500 yds (2,286 m) depending on the source (*e.g.,* explosive sonobuoy, explosive torpedo, explosive bombs), and 2.5 nmi for sinking exercise (see Tables 34–39).

Level B Harassment by Behavioral Disturbance

Though significantly driven by received level, the onset of Level B harassment by 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), 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.

Sonar—As noted above, the Navy coordinated with NMFS to develop, and propose for use in this rule, behavioral harassment thresholds specific to their military readiness activities utilizing active sonar. These behavioral harassment thresholds consist of behavioral response functions (BRFs) and associated cutoff distances, and are also referred to, together, as ''the criteria.'' These criteria are used to estimate the number of animals that may exhibit a behavioral response that rises to the level of a take when exposed to sonar and other transducers. The way the criteria were derived is discussed in detail in the *Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis (Phase III)* report (U.S. Department of the Navy, 2017c). Developing these behavioral harassment thresholds involved multiple steps. All peer-reviewed published behavioral response studies conducted both in the field and on captive animals were examined in order to understand the breadth of behavioral responses of marine mammals to sonar and other transducers. NMFS has carefully reviewed the Navy's criteria, *i.e.,* BRFs and cutoff distances for the species, and agrees that they are the best available science and the appropriate method to use at this time for determining impacts to marine mammals from sonar and other transducers and for calculating take and to support the determinations made in this rule. The Navy and NMFS will continue to evaluate the information as new science becomes available. The criteria have been rigorously vetted within the Navy community, among scientists during expert elicitation, and then reviewed by the public before being applied. It is not necessary or possible to revise and update the criteria and risk functions every time a new paper is published. The Navy is considering new information as it becomes available for updates to the criteria in the future, when the next round of updated criteria will be developed. Thus far, no new information has been published or otherwise conveyed that would fundamentally change the assessment of impacts or conclusions of the 2020 MITT FSEIS/OEIS or this rule.

As discussed above, marine mammal responses to sound (some of which are considered disturbances that rise to the level of a take) are highly variable and context specific, *i.e.,* they are affected by differences in acoustic conditions; differences between species and populations; differences in gender, age, reproductive status, or social behavior; or other prior experience of the individuals. This means that there is support for considering alternative approaches for estimating Level B harassment by behavioral disturbance. Although the statutory definition of Level B harassment for military readiness activities states that a natural behavior pattern of a marine mammal is significantly altered or abandoned, the current state of science for determining those thresholds is somewhat unsettled.

In its analysis of impacts associated with sonar acoustic sources (which was coordinated with NMFS), the Navy used an updated conservative approach that likely overestimates the number of takes by Level B harassment due to behavioral disturbance and response. Many of the behavioral responses identified using the Navy's quantitative analysis are most likely to be of moderate severity as described in the Southall *et al.* (2007) behavioral response severity scale. These ''moderate'' severity responses were considered significant if they were sustained for the duration of the exposure or longer. Within the Navy's quantitative analysis, many reactions are predicted from exposure to sound that may exceed an animal's threshold for Level B harassment by behavioral disturbance for only a single exposure (a few seconds) to several minutes, and it is likely that some of the resulting estimated behavioral responses that are counted as Level B harassment would not constitute significant alteration or abandonment of the natural behavioral patterns. The Navy and NMFS have used the best available science to address the challenging differentiation between significant and non-significant behavioral reactions (*i.e.,* whether the behavior has been abandoned or significantly altered such that it qualifies as harassment), but have erred on the cautious side where uncertainty exists (*e.g.,* counting these lower duration reactions as take), which likely results in some degree of overestimation of Level B harassment by behavioral disturbance. We consider application of these behavioral harassment thresholds, therefore, 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 (*i.e.,* Level B harassment). Because this is the most appropriate method for estimating Level B harassment given the best available science and uncertainty on the topic, it is these numbers of Level B harassment by behavioral disturbance that are analyzed in the *Analysis and Negligible Impact Determination* section and are authorized.

In the Navy's acoustic impact analyses during Phase II (the previous phase of Navy testing and training, 2015–2020; see also Navy's *Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis Technical Report,* 2012), the likelihood of Level B harassment by behavioral disturbance in response to sonar and other transducers was based on a probabilistic function (BRF) that related the likelihood (*i.e.,* probability) of a behavioral response (at the level of a Level B harassment) to the received SPL. The BRF was used to estimate the percentage of an exposed population that is likely to exhibit Level

B harassment due to altered behaviors or behavioral disturbance at a given received SPL. This BRF relied on the assumption that sound poses a negligible risk to marine mammals if they are exposed to SPL below a certain ''basement'' value. Above the basement exposure SPL, the probability of a response increased with increasing SPL. Two BRFs were used in Navy acoustic impact analyses: BRF1 for mysticetes and BRF2 for other species. BRFs were not used for beaked whales during Phase II analyses. Instead, a step function at an SPL of 140 dB re 1 μPa was used for beaked whales as the threshold to predict Level B harassment by behavioral disturbance.

Developing the criteria for Level B harassment by behavioral disturbance for Phase III (the current phase of Navy training and testing activities) involved multiple steps: all available behavioral response studies conducted both in the field and on captive animals were examined to understand the breadth of behavioral responses of marine mammals to sonar and other transducers (see also Navy's *Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis (Phase III) Technical Report,* 2017). Six behavioral response field studies with observations of 14 different marine mammal species reactions to sonar or sonar-like signals and 6 captive animal behavioral studies with observations of 8 different species reactions to sonar or sonar-like signals were used to provide a robust data set for the derivation of the Navy's Phase III marine mammal behavioral response criteria. All behavioral response research that has been published since the derivation of the Navy's Phase III criteria (c.a. December 2016) has been examined and is consistent with the current behavioral response functions. Marine mammal species were placed into behavioral criteria groups based on their known or suspected behavioral sensitivities to sound. In most cases these divisions were driven by taxonomic classifications (*e.g.,* mysticetes, pinnipeds). The data from the behavioral studies were analyzed by looking for significant responses, or lack thereof, for each experimental session. The resulting four Bayesian Biphasic Dose Response Functions (referred to as the BRFs) that were developed for odontocetes, pinnipeds, mysticetes, and beaked whales predict the probability of a behavioral response qualifying as Level B harassment given exposure to certain received levels of sound. These BRFs are then used in combination with the cutoff distances described below to estimate the number of takes by Level B harassment.

The Navy used cutoff distances beyond which the potential of significant behavioral responses (and therefore Level B harassment) is considered to be unlikely (see Table 10 below). This was determined by examining all available published field observations of behavioral reactions to sonar or sonar-like signals that included the distance between the sound source and the marine mammal. The longest distance, rounded up to the nearest 5-km increment, was chosen as the cutoff distance for each behavioral criteria group (*i.e.,* odontocetes, mysticetes, and beaked whales). For animals within the cutoff distance, a behavioral response function based on a received SPL as presented in Section 3, Section 3.1.0 of the Navy's rulemaking/LOA application was used to predict the probability of a potential significant behavioral response. For training and testing events that contain multiple platforms or tactical sonar sources that exceed 215 dB re 1 μPa @1 m, this cutoff distance is substantially increased (*i.e.,* doubled) from values derived from the literature. The use of multiple platforms and intense sound sources (high source level) are factors that probably increase responsiveness in marine mammals overall (however, we note that helicopter dipping sonars were considered in the intense sound source group, despite lower source levels, because of data indicating that marine mammals are sometimes more responsive to the less predictable employment of this source). There are currently few behavioral observations under these circumstances; therefore, the Navy conservatively predicted significant behavioral responses that will rise to Level B harassment at farther ranges as shown in Table 10, versus less intense events.

TABLE 10—CUTOFF DISTANCES FOR MODERATE SOURCE LEVEL, SINGLE PLATFORM TRAINING AND TESTING EVENTS AND FOR ALL OTHER EVENTS WITH MULTIPLE PLATFORMS OR SONAR WITH SOURCE LEVELS AT OR EXCEEDING 215 dB RE 1 μPa @1 m

Criteria group	Moderate SL/ single platform cutoff distance (km)	High SL/ multi-platform cutoff distance (km)
Odontocetes	10	20
Mysticetes	10	20
Beaked Whales	25	50

Note: dB re 1 μPa @1 m = decibels referenced to 1 micropascal at 1 meter; km = kilometer; SL = source level.

The range to received sound levels in 6-dB steps from five representative sonar bins and the percentage of animals that may be taken by Level B harassment at the received level and distance indicated under each behavioral response function are shown in Table 11 through Table 15. Cells are shaded if the mean range value for the specified received level exceeds the distance cutoff range for a particular hearing group and therefore are not included in the estimated take. See Section 6, Section 6.4.2.1.1 (Methods for Analyzing Impacts from Sonars and Other Transducers) of the Navy's rulemaking/LOA application for further details on the derivation and use of the behavioral response functions, thresholds, and the cutoff distances to identify takes by Level B harassment, which were coordinated with NMFS. Table 11 illustrates the maximum likely percentage of exposed individuals taken at the indicated received level and associated range (in which marine mammals would be reasonably expected to experience a disruption in behavior patterns to a point where they are abandoned or significantly altered) for LFAS. As noted previously, NMFS carefully reviewed, and contributed to, the Navy's behavioral harassment thresholds (*i.e.,* the BRFs and the cutoff distances) for the species, and agrees that these methods represent the best available science at this time for determining impacts to marine mammals from sonar and other transducers.

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Table 11--Ranges to estimated Level B harassment by behavioral disturbance for sonar bin LF4 over a representative range of environments within the MITT Study Area

Received Level (dB re 1 μPa)	Average Range (m) with Minimum and Maximum Values in Parenthesis	Probability of Level B Harassment by Behavioral Disturbance for Sonar Bin LF4		
		Odontocetes	Mysticetes	Beaked Whales
196	1 (1–1)	100%	100%	100%
190	3 (3–3)	100%	98%	100%
184	6 (6–6)	99%	88%	100%
178	12 (12–12)	97%	59%	100%
172	25 (25–25)	91%	30%	99%
166	51 (50–55)	78%	20%	97%
160	130 (130–160)	58%	18%	93%
154	272 (270–300)	40%	17%	83%
148	560 (550–675)	29%	16%	66%
142	1,048 (1,025–1,525)	25%	13%	45%
136	2,213 (1,525–4,525)	23%	9%	28%
130	4,550 (2,275–24,025)	20%	5%	18%
124	16,903 (4,025–66,275)	17%	2%	14%
118	43,256 (7,025–87,775)	12%	1%	12%

Tables 12 through 15 identify the maximum likely percentage of exposed individuals taken at the indicated received level and associated range for MFAS.

112	60,155 (7,775–100,000*)	6%	0%	11%
106	80,689 (8,775–100,000*)	3%	0%	11%
100	92,352 (9,025–100,000*)	1%	0%	8%

Notes: dB re 1 μPa = decibels referenced to 1 micropascal, m = meters

* Indicates maximum range to which acoustic model was run, a distance of approximately 100 kilometers from the sound source. Cells are shaded if the mean range value for the specified received level exceeds the distance cutoff range for a particular hearing group. Any impacts within the cutoff range for a criteria group are included in the estimated impacts. Cut-off ranges in this table are for activities with high source levels and/or multiple platforms (see Table 6.4-1 from the Navy's rule making/LOA application for behavioral cut-off distances).

Table 12--Ranges to estimated Level B harassment by behavioral disturbance for sonar bin MF1 over a representative range of environments within the MITT Study Area

Received Level (dB re 1 µPs)	Average Range (m) with Minimum and Maximum Values in Parenthesis	Probability of Level B Harassment by Behavioral Disturbance for Sonar Bin MF1		
		Odontocetes	Mysticetes	Beaked Whales
196	106 (100–110)	100%	100%	100%
190	240 (240–250)	100%	98%	100%
184	501 (490–525)	99%	88%	100%
178	1,019 (975–1,025)	97%	59%	100%
172	3,275 (2,025–5,275)	91%	30%	99%
166	7,506 (2,525–11,025)	78%	20%	97%
160	15,261 (4,775–20,775)	58%	18%	93%

154	27,759 (5,525–36,525)	40%	17%	83%
148	43,166 (7,525–65,275)	29%	16%	66%
142	58,781 (8,525–73,525)	25%	13%	45%
136	71,561 (11,275–90,775)	23%	9%	28%
130	83,711 (13,025–100,000*)	20%	5%	18%
124	88,500 (23,525–100,000*)	17%	2%	14%
118	90,601 (27,025–100,000*)	12%	1%	12%
112	92,750 (27,025–100,000*)	6%	0%	11%
106	94,469 (27,025–100,000*)	3%	0%	11%
100	95,838 (27,025–100,000*)	1%	0%	8%

Notes: dB re 1 µPa = decibels referenced to 1 micropascal, m = meters

* Indicates maximum range to which acoustic model was run, a distance of approximately 100 kilometers from the sound source. Cells are shaded if the mean range value for the specified received level exceeds the distance cutoff range for a particular hearing group. Any impacts within the cutoff range for a criteria group are included in the estimated impacts. Cut-off ranges in this table are for activities with high source levels and/or multiple platforms (see Table 6.4-1 of the Navy's rulemaking/LOA application for behavioral cut-off distances).

Table 13--Ranges to estimated Level B harassment by behavioral disturbance for sonar bin MF4 over a representative range of environments within the MITT Study Area

Received Level (dB re 1 μPa)	Average Range (m) with Minimum and Maximum Values in Parenthesis	Probability of Level B Harassment by Behavioral Disturbance for Sonar Bin MF4		
		Odontocetes	Mysticetes	Beaked Whales
196	8 (8–8)	100%	100%	100%
190	17 (17–17)	100%	98%	100%
184	35 (35–35)	99%	88%	100%
178	70 (65–70)	97%	59%	100%
172	141 (140–150)	91%	30%	99%
166	354 (330–420)	78%	20%	97%
160	773 (725–1,275)	58%	18%	93%
154	1,489 (1,025–3,275)	40%	17%	83%
148	3,106 (1,775–6,775)	29%	16%	66%
142	8,982 (3,025–18,775)	25%	13%	45%
136	15,659 (3,775–31,025)	23%	9%	28%
130	25,228 (4,775–65,775)	20%	5%	18%
124	41,778 (5,525–73,275)	17%	2%	14%
118	51,832 (6,025–89,775)	12%	1%	12%

112	62,390 (6,025–100,000*)	6%	0%	11%
106	69,235 (6,775–100,000*)	3%	0%	11%
100	73,656 (7,025–100,000*)	1%	0%	8%

Notes: dB re 1 µPa = decibels referenced to 1 micropascal, m = meters

*Indicates maximum range to which acoustic model was run, a distance of approximately 100 kilometers from the sound source.

Cells are shaded if the mean range value for the specified received level exceeds the distance cutoff range for a particular hearing group. Any impacts within the cutoff range for a criteria group are included in the estimated impacts. Cut-off ranges in this table are for activities with high source levels and/or multiple platforms (see Table 6.4-1 of the Navy's rulemaking/LOA application for behavioral cut-off distances).

Table 14--Ranges to estimated Level B harassment by behavioral disturbance for sonar bin MF5 over a representative range of environments within the MITT Study Area

Received Level (dB re 1 μPa)	Average Range (m) with Minimum and Maximum Values in Parenthesis	Probability of Level B Harassment by Behavioral Disturbance for Sonar Bin MF5		
		Odontocetes	Mysticetes	Beaked Whales
196	0 (0–0)	100%	100%	100%
190	1 (0–3)	100%	98%	100%
184	4 (0–7)	99%	88%	100%
178	14 (0–15)	97%	59%	100%
172	29 (0–30)	91%	30%	99%
166	58 (0–60)	78%	20%	97%
160	125 (0–150)	58%	18%	93%
154	284 (160–525)	40%	17%	83%
148	607 (450–1,025)	29%	16%	66%
142	1,213 (875–4,025)	25%	13%	45%
136	2,695 (1,275–7,025)	23%	9%	28%
130	6,301 (2,025–12,525)	20%	5%	18%
124	10,145 (3,025–19,525)	17%	2%	14%
118	14,359 (3,525–27,025)	12%	1%	12%

112	19,194 (3,525–37,275)	6%	0%	11%
106	24,153 (4,025–48,025)	3%	0%	11%
100	29,325 (5,025–57,775)	1%	0%	8%

Notes: dB re 1 μPa = decibels referenced to 1 micropascal, m= meters

Cells are shaded if the mean range value for the specified received level exceeds the distance cutoff range for a particular hearing group. Any impacts within the cutoff range for a criteria group are included in the estimated impacts. Cut-off ranges in this table are for activities with high source levels and/or multiple platforms (see Table 6.4-1 of the Navy's rulemaking/LOA application for behavioral cut-off distances).

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TABLE 15—RANGES TO ESTIMATED LEVEL B HARASSMENT BY BEHAVIORAL DISTURBANCE FOR SONAR BIN HF4 OVER A REPRESENTATIVE RANGE OF ENVIRONMENTS WITHIN THE MITT STUDY AREA

Received level (dB re 1 μPa)	Average range (m) with minimum and maximum values in parenthesis	Probability of level B harassment by behavioral disturbance for sonar bin HF4		
		Odontocetes (percent)	Mysticetes (percent)	Beaked whales
196	3 (2–4)	100	100	100
190	8 (6–10)	100	98	100
184	16 (12–20)	99	88	100
178	32 (24–40)	97	59	100
172	63 (45–80)	91	30	99
166	120 (75–160)	78	20	97
160	225 (120–310)	58	18	93
154	392 (180–550)	40	17	83
148	642 (280–1,275)	29	16	66
142	916 (420–1,775)	25	13	45
136	1,359 (625–2,525)	23	9	28
130	1,821 (950–3,275)	20	5	18
124	2,567 (1,275–5,025)	17	2	14
118	3,457 (1,775–6,025)	12	1	12
112	4,269 (2,275–7,025)	6	0	11
106	5,300 (3,025–8,025)	3	0	11
100	6,254 (3,775–9,275)	1	0	8

Notes: dB re 1 μPa = decibels referenced to 1 micropascal, m = meters.

Explosives—Phase III explosive thresholds for Level B harassment by behavioral disturbance for marine mammals is the hearing groups' TTS threshold minus 5 dB (see Table 16 below and Table 9 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 for explosive analysis. 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 impacts to marine mammals from explosives.

TABLE 16—THRESHOLDS FOR LEVEL B HARASSMENT BY BEHAVIORAL DISTURBANCE FOR EXPLOSIVES FOR MARINE MAMMALS

Medium	Functional hearing group	SEL (weighted)
Underwater	LF	163

TABLE 16—THRESHOLDS FOR LEVEL B HARASSMENT BY BEHAVIORAL DISTURBANCE FOR EXPLOSIVES FOR MARINE MAMMALS—Continued

Medium	Functional hearing group	SEL (weighted)
Underwater	MF	165
Underwater	HF	135

Note: Weighted SEL thresholds in dB re 1 $\mu Pa^2 s$ underwater.

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 MITT 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 (*i.e.,* no power down or shut down modeled) 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 they represent 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 Mammals and Sea Turtles: Methods and Analytical Approach for Phase III Training and Testing report* (U.S. Department of the Navy, 2018).

Range to Effects

The following section provides range to effects for sonar and other active acoustic sources, as well as 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.

Sonar

The range to received sound levels in 6-dB steps from five representative sonar bins and the percentage of the total number of animals that may exhibit a significant behavioral response (and therefore Level B harassment) under each behavioral response function are shown in Table 11 through Table 15 above, respectively. See Section 6, Section 6.4.2.1 (Methods for Analyzing Impacts from Sonars and Other Transducers) of the Navy's rulemaking/LOA application for additional details on the derivation and use of the behavioral response functions, thresholds, and the cutoff distances that are used to identify Level B harassment by behavioral disturbance. NMFS has reviewed the range distance to effect data provided by the Navy and concurs with the analysis.

The ranges to PTS for five representative sonar systems for an exposure of 30 seconds is shown in Table 17 relative to the marine mammal's functional hearing group. This period (30 seconds) was chosen based on examining the maximum amount of time a marine mammal would realistically be exposed to levels that could cause the onset of PTS based on platform (*e.g.,* ship) speed and a nominal animal swim speed of approximately 1.5 m per second. The ranges provided in the table include the average range to PTS, as well as the range from the minimum to the maximum distance at which PTS is possible for each hearing group.

TABLE 17—RANGE TO PERMANENT THRESHOLD SHIFT (METERS) FOR FIVE REPRESENTATIVE SONAR SYSTEMS

Hearing group	Approximate range in meters for PTS from 30 second exposure [1]				
	Sonar bin HF4	Sonar bin LF4	Sonar bin MF1	Sonar bin MF4	Sonar bin MF5
High-frequency cetaceans	29 (22–35)	0 (0–0)	181 (180–190)	30 (30–30)	9 (8–10)
Low-frequency cetaceans	0 (0–0)	0 (0–0)	65 (65–65)	15 (15–15)	0 (0–0)
Mid-frequency cetaceans	1 (0–1)	0 (0–0)	16 (16–16)	3 (3–3)	0 (0–0)

[1] PTS ranges extend from the sonar or other active acoustic sound source to the indicated distance. The average range to PTS is provided as well as the range from the estimated minimum to the maximum range to PTS in parenthesis.

The tables below illustrate the range to TTS for 1, 30, 60, and 120 seconds from five representative sonar systems (see Table 18 through Table 22).

TABLE 18—RANGES TO TEMPORARY THRESHOLD SHIFT (METERS) FOR SONAR BIN LF4 OVER A REPRESENTATIVE RANGE OF ENVIRONMENTS WITHIN THE MITT STUDY AREA

Hearing group	Approximate TTS ranges (meters) [1]			
	Sonar bin LF4			
	1 second	30 seconds	60 seconds	120 seconds
High-frequency cetaceans	0 (0–0)	0 (0–0)	0 (0–0)	0 (0–0)
Low-frequency cetaceans	3 (3–3)	4 (4–4)	6 (6–6)	9 (9–9)
Mid-frequency cetaceans	0 (0–0)	0 (0–0)	0 (0–0)	0 (0–0)

[1] Ranges to TTS represent the model predictions in different areas and seasons within the MITT Study Area. The zone in which animals are expected to experience TTS extend from onset-PTS to the distance indicated. The average range to TTS is provided as well as the range from the estimated minimum to the maximum range to TTS in parentheses.

TABLE 19—RANGES TO TEMPORARY THRESHOLD SHIFT (METERS) FOR SONAR BIN MF1 OVER A REPRESENTATIVE RANGE OF ENVIRONMENTS WITHIN THE MITT STUDY AREA

Hearing group	Approximate TTS ranges (meters) [1]			
	Sonar Bin MF1			
	1 second	30 seconds	60 seconds	120 seconds
High-frequency cetaceans	3,181 (2,025–5,025)	3,181 (2,025–5,025)	5,298 (2,275–7,775)	6,436 (2,525–9,775)
Low-frequency cetaceans	898 (850–1,025)	898 (850–1,025)	1,271 (1,025–1,525)	1,867 (1,275–3,025)
Mid-frequency cetaceans	210 (200–210)	210 (200–210)	302 (300–310)	377 (370–390)

[1] Ranges to TTS represent the model predictions in different areas and seasons within the MITT Study Area. The zone in which animals are expected to experience TTS extend from onset-PTS to the distance indicated. The average range to TTS is provided as well as the range from the estimated minimum to the maximum range to TTS in parentheses.

Note: Ranges for 1-second and 30-second periods are identical for Bin MF1 because this system nominally pings every 50 seconds; therefore, these periods encompass only a single ping.

TABLE 20—RANGES TO TEMPORARY THRESHOLD SHIFT (METERS) FOR SONAR BIN MF4 OVER A REPRESENTATIVE RANGE OF ENVIRONMENTS WITHIN THE MITT STUDY AREA

Hearing group	Approximate TTS ranges (meters) [1]			
	Sonar bin MF4			
	1 second	30 seconds	60 seconds	120 seconds
High-frequency cetaceans	232 (220–260)	454 (420–600)	601 (575–875)	878 (800–1,525)
Low-frequency cetaceans	85 (85–90)	161 (160–170)	229 (220–250)	352 (330–410)
Mid-frequency cetaceans	22 (22–22)	35 (35–35)	50 (45–50)	70 (70–70)

[1] Ranges to TTS represent the model predictions in different areas and seasons within the MITT Study Area. The zone in which animals are expected to experience TTS extend from onset-PTS to the distance indicated. The average range to TTS is provided as well as the range from the estimated minimum to the maximum range to TTS in parentheses.

TABLE 21—RANGES TO TEMPORARY THRESHOLD SHIFT (METERS) FOR SONAR BIN MF5 OVER A REPRESENTATIVE RANGE OF ENVIRONMENTS WITHIN THE MITT STUDY AREA

Hearing group	Approximate TTS ranges (meters) [1]			
	Sonar bin MF5			
	1 second	30 seconds	60 seconds	120 seconds
High-frequency cetaceans	114 (110–130)	114 (110–130)	168 (150–200)	249 (210–290)
Low-frequency cetaceans	11 (10–12)	11 (10–12)	16 (16–17)	23 (23–24)
Mid-frequency cetaceans	5 (0–9)	5 (0–9)	12 (11–13)	18 (17–18)

[1] Ranges to TTS represent the model predictions in different areas and seasons within the MITT Study Area. The zone in which animals are expected to experience TTS extend from onset-PTS to the distance indicated. The average range to TTS is provided as well as the range from the estimated minimum to the maximum range to TTS in parentheses.

TABLE 22—RANGES TO TEMPORARY THRESHOLD SHIFT (METERS) FOR SONAR BIN HF4 OVER A REPRESENTATIVE RANGE OF ENVIRONMENTS WITHIN THE MITT STUDY AREA

Hearing group	Approximate TTS ranges (meters) [1]			
	Sonar bin HF4			
	1 second	30 seconds	60 seconds	120 seconds
High-frequency cetaceans	155 (110–210)	259 (180–350)	344 (240–480)	445 (300–600)
Low-frequency cetaceans	1 (0–2)	2 (1–3)	4 (3–5)	7 (5–8)
Mid-frequency cetaceans	10 (7–12)	17 (12–21)	24 (17–30)	33 (25–40)

[1] Ranges to TTS represent the model predictions in different areas and seasons within the MITT Study Area. The zone in which animals are expected to experience TTS extend from onset-PTS to the distance indicated. The average range to TTS is provided as well as the range from the estimated minimum to the maximum range to TTS in parentheses.

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 are shown for a range of explosive bins, from E1 (up to 0.25 lb net explosive weight) to E12 (up to 1,000 lb net explosive weight) (Tables 23 through 27). 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 26 and 27, 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 Mammals and Sea Turtles: Methods and Analytical Approach for Phase III Training and Testing* (U.S. Navy, 2018).

Table 23 shows the minimum, average, and maximum ranges to onset of auditory and likely behavioral effects that rise to the level of Level B harassment for high-frequency cetaceans based on the developed thresholds.

TABLE 23—SEL-BASED RANGES (METERS) TO ONSET PTS, ONSET TTS, AND LEVEL B HARASSMENT BY BEHAVIORAL DISTURBANCE FOR HIGH-FREQUENCY CETACEANS

Range to effects for explosives bin: high-frequency cetaceans [1]					
Bin	Source Depth (m)	Cluster Size	PTS	TTS	Behavioral disturbance
E1	0.1	1	353 (340–370)	1,303 (1,275–1,775)	2,139 (2,025–4,275)
	.....	18	1,031 (1,025–1,275)	3,409 (2,525–8,025)	4,208 (3,025–11,525)
E2	0.1	1	431 (410–700)	1,691 (1,525–2,775)	2,550 (2,025–4,525)
	.....	5	819 (775–1,275)	2,896 (2,275–6,775)	3,627 (2,525–10,275)
E3	0.1	1	649 (625–700)	2,439 (2,025–4,525)	3,329 (2,525–7,525)
	.....	12	1,682 (1,525–2,275)	4,196 (3,025–11,525)	5,388 (4,525–16,275)
	18.25	1	720 (675–775)	4,214 (2,275–6,275)	7,126 (3,525–8,775)
	.....	12	1,798 (1,525–2,775)	10,872 (4,525–13,775)	14,553 (5,525–17,775)
E4	10	2	1,365 (1,025–2,775)	7,097 (4,275–10,025)	9,939 (5,025–15,275)
	60	2	1,056 (875–2,275)	3,746 (2,775–5,775)	5,262 (3,025–7,775)
E5	0.1	20	2,926 (1,525–6,275)	6,741 (4,525–16,025)	9,161 (4,775–20,025)
	30	20	4,199 (3,025–6,275)	13,783 (8,775–17,775)	17,360 (10,525–22,775)
E6	0.1	1	1,031 (1,025–1,275)	3,693 (2,025–8,025)	4,659 (3,025–12,775)
	30	1	1,268 (1,025–1,275)	7,277 (3,775–8,775)	10,688 (5,275–12,525)
E8	0.1	1	1,790 (1,775–3,025)	4,581 (4,025–10,775)	6,028 (4,525–15,775)
	45.75	1	1,842 (1,525–2,025)	9,040 (4,525–12,775)	12,729 (5,025–18,525)
E9	0.1	1	2,343 (2,275–4,525)	5,212 (4,025–13,275)	7,573 (5,025–17,025)
E10	0.1	1	2,758 (2,275–5,025)	6,209 (4,275–16,525)	8,578 (5,275–19,775)
E11	45.75	1	3,005 (2,525–3,775)	11,648 (5,025–18,775)	14,912 (6,525–24,775)
	91.4	1	3,234 (2,525–4,525)	5,772 (4,775–11,775)	7,197 (5,775–14,025)
E12	0.1	1	3,172 (3,025–6,525)	7,058 (5,025–17,025)	9,262 (6,025–21,775)
	.....	4	4,209 (3,775–10,025)	9,817 (6,275–22,025)	12,432 (7,525–27,775)

[1] Average distance (m) to PTS, TTS, and behavioral disturbance thresholds are depicted above the minimum and maximum distances which are in parentheses. Values depict the range produced by SEL hearing threshold criteria levels.

Table 24 shows the minimum, average, and maximum ranges to onset of auditory and likely behavioral effects that rise to the level of Level B harassment for mid-frequency cetaceans based on the developed thresholds.

TABLE 24—SEL-BASED RANGES (METERS) TO ONSET PTS, ONSET TTS, AND LEVEL B HARASSMENT BY BEHAVIORAL DISTURBANCE FOR MID-FREQUENCY CETACEANS

Range to effects for explosives bin: mid-frequency cetaceans [1]					
Bin	Source depth (m)	Cluster size	PTS	TTS	Behavioral disturbance
E1	0.1	1	25 (25–25)	116 (110–120)	199 (190–210)
		18	94 (90–100)	415 (390–440)	646 (525–700)
E2	0.1	1	30 (30–35)	146 (140–170)	248 (230–370)
		5	63 (60–70)	301 (280–410)	481 (430–675)
E3	0.1	1	50 (50–50)	233 (220–250)	381 (360–400)
		12	155 (150–160)	642 (525–700)	977 (700–1,025)
	18.25	1	40 (40–40)	202 (190–220)	332 (320–350)
		12	126 (120–130)	729 (675–775)	1,025 (1,025–1,025)
E4	10	2	76 (70–90)	464 (410–550)	783 (650–975)
	60	2	60 (60–60)	347 (310–675)	575 (525–900)
E5	0.1	20	290 (280–300)	1,001 (750–1,275)	1,613 (925–3,275)
	30	20	297 (240–420)	1,608 (1,275–2,775)	2,307 (2,025–2,775)
E6	0.1	1	98 (95–100)	430 (400–450)	669 (550–725)
	30	1	78 (75–80)	389 (370–410)	619 (600–650)
E8	0.1	1	162 (150–170)	665 (550–700)	982 (725–1,025)
	45.75	1	127 (120–130)	611 (600–625)	985 (950–1,025)
E9	0.1	1	215 (210–220)	866 (625–1,000)	1,218 (800–1,525)
E10	0.1	1	270 (250–280)	985 (700–1,275)	1,506 (875–2,525)
E11	45.75	1	241 (230–250)	1,059 (1,000–1,275)	1,874 (1,525–2,025)
	91.4	1	237 (230–270)	1,123 (900–2,025)	1,731 (1,275–2,775)
E12	0.1	1	332 (320–370)	1,196 (825–1,525)	1,766 (1,025–3,525)
		4	572 (500–600)	1,932 (1,025–4,025)	2,708 (1,275–6,775)

[1] Average distance (m) to PTS, TTS, and behavioral disturbance thresholds are depicted above the minimum and maximum distances which are in parentheses. Values depict the range produced by SEL hearing threshold criteria levels.

Table 25 shows the minimum, average, and maximum ranges to onset of auditory and likely behavioral effects that rise to the level of Level B harassment for low-frequency cetaceans based on the developed thresholds.

TABLE 25—SEL-BASED RANGES (METERS) TO ONSET PTS, ONSET TTS, AND LEVEL B HARASSMENT BY BEHAVIORAL DISTURBANCE FOR LOW-FREQUENCY CETACEANS

Range to effects for explosives bin: low-frequency cetaceans [1]					
Bin	Source depth (m)	Cluster size	PTS	TTS	Behavioral disturbance
E1	0.1	1	51 (50–55)	231 (200–250)	378 (280–410)
		18	183 (170–190)	691 (450–775)	934 (575–1,275)
E2	0.1	1	66 (65–70)	291 (220–320)	463 (330–500)
		5	134 (110–140)	543 (370–600)	769 (490–950)
E3	0.1	1	113 (110–120)	477 (330–525)	689 (440–825)
		12	327 (250–370)	952 (600–1,525)	1,240 (775–4,025)
	18.25	1	200 (200–200)	955 (925–1,000)	1,534 (1,275–1,775)
		12	625 (600–625)	5,517 (2,275–7,775)	10,299 (3,775–13,025)
E4	10	2	429 (370–600)	2,108 (1,775–2,775)	4,663 (3,025–6,025)
	60	2	367 (340–470)	1,595 (1,025–2,025)	2,468 (1,525–4,275)
E5	0.1	20	702 (380–1,275)	1,667 (850–11,025)	2,998 (1,025–19,775)
	30	20	1,794 (1,275–2,775)	8,341 (3,775–11,525)	13,946 (4,025–22,275)
E6	0.1	1	250 (190–410)	882 (480–1,775)	1,089 (625–6,525)
	30	1	495 (490–500)	2,315 (2,025–2,525)	5,446 (3,275–6,025)
E8	0.1	1	415 (270–725)	1,193 (625–4,275)	1,818 (825–8,525)
	45.75	1	952 (900–975)	6,294 (3,025–9,525)	12,263 (4,275–20,025)
E9	0.1	1	573 (320–1,025)	1,516 (725–7,275)	2,411 (950–14,275)
E10	0.1	1	715 (370–1,525)	2,088 (825–28,275)	4,378 (1,025–32,275)
E11	45.75	1	1,881 (1,525–2,275)	12,425 (4,275–27,275)	23,054 (7,025–65,275)
	91.4	1	1,634 (1,275–2,525)	5,686 (3,775–11,275)	11,618 (5,525–64,275)
E12	0.1	1	790 (420–2,775)	2,698 (925–25,275)	6,032 (1,025–31,275)
		4	1,196 (575–6,025)	6,876 (1,525–31,275)	13,073 (3,775–64,275)

[1] Average distance (m) to PTS, TTS, and behavioral disturbance thresholds are depicted above the minimum and maximum distances which are in parentheses. Values depict the range produced by SEL hearing threshold criteria levels.

Table 26 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 26—RANGES [1] TO 50 PERCENT NON-AUDITORY INJURY RISK FOR ALL MARINE MAMMAL HEARING GROUPS

Bin	Range (m) (min-max)
1	12 (11–13)
E2	16 (15–16)
E3	25 (25–25)
E4	30 (30–35)
E5	40 (40–65)
E6	52 (50–60)
E8	98 (90–150)
E9	123 (120–270)
E10	155 (150–430)
E11	418 (410–420)
E12	195 (180–675)

[1] Distances in meters (m). Average distance is shown with the minimum and maximum distances due to varying propagation environments in parentheses.

Note: All ranges to non-auditory injury within this table are driven by gastrointestinal tract injury thresholds regardless of animal mass.

Ranges to mortality, based on animal mass, are shown in Table 27 below.

TABLE 27—RANGES [1] TO 50 PERCENT MORTALITY RISK FOR ALL MARINE MAMMAL HEARING GROUPS AS A FUNCTION OF ANIMAL MASS

Bin	Range to mortality (meters) for various animal mass intervals (kg) [1]					
	10	250	1,000	5,000	25,000	72,000
E1	3 (3–3)	1 (0–2)	0 (0–0)	0 (0–0)	0 (0–0)	0 (0–0)
E2	4 (3–4)	2 (1–3)	1 (0–1)	0 (0–0)	0 (0–0)	0 (0–0)
E3	9 (7–10)	4 (2–8)	2 (1–2)	1 (0–1)	0 (0–0)	0 (0–0)
E4	13 (12–15)	7 (4–12)	3 (3–4)	2 (1–3)	1 (1–1)	1 (0–1)
E5	13 (12–30)	7 (4–25)	3 (2–7)	2 (1–5)	1 (1–2)	1 (0–2)
E6	16 (15–25)	9 (5–23)	4 (3–8)	3 (2–6)	1 (1–2)	1 (1–2)
E8	42 (25–65)	22 (9–50)	11 (6–19)	8 (4–13)	4 (2–6)	3 (1–5)
E9	33 (30–35)	20 (13–30)	10 (9–12)	7 (5–9)	4 (3–4)	3 (2–3)
E10	55 (40–170)	24 (16–35)	13 (11–15)	9 (7–11)	5 (4–5)	4 (3–4)
E11	206 (200–210)	98 (55–170)	44 (35–50)	30 (25–35)	16 (14–18)	12 (10–15)
E12	86 (50–270)	35 (20–210)	16 (13–19)	11 (9–13)	6 (5–6)	5 (4–5)

[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, 2010; Barlow and Forney, 2007; Calambokidis *et al.,* 2008). 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; Becker *et al.,* 2010, 2012a, b, c, 2014, 2016; Ferguson *et al.,* 2006a; Forney *et al.,* 2012, 2015; Redfern *et al.,* 2006). 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.

Ideally, density data would be available for all species throughout the study area year-round, in order to best estimate the impacts of Navy activities on marine species. However, in many places, ship availability, lack of funding, inclement weather conditions, and high sea states prevent the completion of comprehensive year-round surveys. Even with surveys that are completed, poor conditions may result in lower sighting rates for species that would typically be sighted with greater frequency under favorable conditions. Lower sighting rates preclude having an acceptably low uncertainty in the density estimates. A high level of uncertainty, indicating a low level of confidence in the density estimate, is typical for species that are rare or difficult to sight. In areas where survey data are limited or non-existent, known or inferred associations between marine

habitat features and the likely presence of specific species are sometimes used to predict densities in the absence of actual animal sightings. Consequently, there is no single source of density data for every area, species, and season because of the fiscal costs, resources, and effort involved in providing enough survey coverage to consistently estimate density.

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). The Navy vetted all cetacean densities with NMFS prior to use in the Navy's acoustic analysis for this MITT rulemaking.

A variety of density data and density models are needed in order to develop a density database that encompasses the entirety of the MITT Study Area. Because this data is 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 *U.S. Navy Marine Species Density Database Phase III for the Mariana Islands Training and Testing Study Area* (U.S. Department of the Navy, 2018), 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 MITT Study Area. In the MITT Study Area there is a paucity of line-transect survey data, and little is known about the stock structure of the majority of marine mammal species in the region. The only habitat model available for the MITT Study Area was developed for sperm whales based on acoustic data collected during a 2007 line-transect survey (Yack *et al.,* 2016). For other species, the Navy conducted the first comprehensive marine mammal survey of waters off Guam and the Commonwealth of the Northern Mariana Islands in 2007, and data from this survey were used to derive line-transect abundance estimates for 12 cetacean species (Fulling *et al.,* 2011). There has not been a subsequent systematic survey of the MITT Study Area at this scale, so these data still provide the best available density estimates for this region for these species.

In the absence of study-area-specific density data, line-transect estimates derived for Hawaiian waters were used to provide conservative density estimates for the remaining species in the MITT Study Area. For Phase II, these estimates were based on systematic surveys conducted by NMFS' Southwest Fisheries Science Center (SWFSC) within the EEZ of the Hawaiian Islands (2010) and Palmyra Atoll/Kingman Reef (2011–2012) allowed NMFS' PIFSC to update the line-transect density estimates that included new sea-state-specific estimates of trackline detection probability (Bradford *et al.,* 2017) and represent improvements to the estimates used for Phase II. In addition, an updated density estimate for minke whale was available for Phase III based on line-transect analyses of acoustic data collected from a towed hydrophone during the 2007 systematic survey (Norris *et al.,* 2017).

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 MITT Study Area. This database is described in the Density Technical Report.

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 biodiversity, 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).''

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 *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 MITT FSEIS/OEIS considered all training and testing activities planned to occur in the MITT Study Area that have the potential to result in the MMPA-defined take of marine mammals. The Navy determined that the two 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 have the potential to result in takes by harassment of marine mammals from the Navy's planned activities.

- Acoustics (sonar and other transducers);
- Explosives (explosive shock wave and sound, assumed to encompass the risk due to fragmentation).

The quantitative analysis process used for the 2020 MITT FSEIS/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 Mammals and Sea Turtles: Methods and Analytical Approach for Phase III Training and Testing* (U.S. Department of the Navy, 2018). 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, and mortality.

NAEMO estimates acoustic and explosive effects without taking mitigation into account; therefore, the model overestimates predicted impacts on marine mammals within mitigation zones. To account for mitigation for marine species in the take estimates, the Navy conducts a quantitative assessment of mitigation. The Navy conservatively quantifies the manner in which procedural mitigation is expected to reduce the risk for model-estimated PTS for exposures to sonars and for model-estimated mortality for exposures to explosives, based on species sightability, observation area, visibility, and the ability to exercise positive control over the sound source. See the proposed rule (85 FR 5782; January 31, 2020) for a description of the process for assessing the effectiveness of procedural mitigation measures, along with the process for assessing the potential for animal avoidance. Where the analysis indicates mitigation would effectively reduce risk, the model-estimated PTS takes are considered reduced to TTS and the model-estimated mortalities are considered reduced to injury. For a complete explanation of the process for assessing the effects of procedural mitigation, see the Navy's rulemaking/LOA application (Section 6: Take Estimates for Marine Mammals, and Section 11: Mitigation Measures) and the technical report titled *Quantifying Acoustic Impacts on Marine Mammals and Sea Turtles: Methods and Analytical Approach for Phase III Training and Testing* (U.S. Department of the Navy, 2018). The extent to which the mitigation areas reduce impacts on the affected species is addressed qualitatively separately in the *Analysis and Negligible Impact Determination* section.

NMFS coordinated with the Navy in the development of this quantitative method to address the effects of procedural mitigation on acoustic and explosive exposures and takes, and NMFS independently reviewed and concurs with the Navy that it is appropriate to incorporate the quantitative assessment of mitigation into the take estimates based on the best available science.

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 pieces of the Navy take estimation methods—propagation models, animat movement models, and behavioral thresholds, for example. NMFS evaluates the acceptability of these pieces as they evolve and are used in different rules and impact analyses. Some of the pieces of the Navy's take estimation process have been used in Navy incidental take rules since 2009 and undergone multiple public comment processes, all of them have undergone extensive internal Navy review, and all of them have undergone comprehensive review by NMFS, which 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. Several components of the model, for example the Duke University habitat-based density models, have been published in peer reviewed literature. Others like the Atlantic Marine Assessment Program for Protected Species, which was conducted by NMFS Science Centers, have undergone quality assurance and quality control (QA/QC) processes. 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 and the method for incorporating mitigation and avoidance, are the most appropriate methods for predicting non-auditory injury, PTS, TTS, and behavioral disturbance. But even with the consideration of mitigation and avoidance, given some of the more conservative components of the methodology (*e.g.,* the thresholds do not consider ear recovery between pulses), 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 non-auditory injury, PTS, TTS, or behavioral disturbance.

Humpback Whales Around Saipan

As noted above, since publication of the proposed rule, additional information and analysis have been used to refine the assessment for the impacts of sonar training and testing on humpback whales around Saipan, resulting in an increase in the total take numbers for humpback whales. Below, we present updated information describing both the Navy's activities and expected humpback whale occurrence in the specific area, as well as the additional analysis of this information to estimate take of humpback whales in this subset of the MITT Study Area. This information was then used to refine the total take numbers for humpback whales and the change is reflected in Table 28 and Table 47.

Given concern for impacts to humpback whales, including cow-calf pairs, in the Chalan Kanoa Reef and Marpi Reef Geographic Mitigation Areas, more specific information regarding Navy activities, and the

availability of more detailed occurrence data for humpback whales in these areas, and in coordination with NMFS' Interagency Cooperation Division, NMFS has updated and refined the analysis of humpback whale impacts in these areas since publication of the proposed rule. The analysis considers the new annual 20-hour cap on MF1 hull-mounted sonar in both mitigation areas and, specifically, estimates potential take of humpback whales should the Navy conduct the full 20 hours of sonar training and testing in these areas, most likely in the form of a Small Coordinated ASW Exercises or TRACKEX events (or a combination of these two activities).

At the request of NMFS, subsequent to the publication of the proposed rule, the Navy provided refined estimates of the number of humpback whales estimated to be taken as prorated from the NAEMO model. These new estimates were based on 20 hours of MF1 MFAS occurring in the Marpi Reef and Chalan Kanoa Reef Geographic Mitigation Areas (outside of 3 nmi and waters deeper than 60 m) during December through April. The analysis assumed takes could occur in either of the two geographic mitigation areas. The resulting take estimates provided by the Navy were 2.12 takes by behavioral disturbance and 11.08 takes by TTS (a total of 13.20 takes by Level B harassment). These take estimates represent five ASW TRACKEX events with each event using four hours of MF1 sonar. While other configurations of the 20 hours could occur, NMFS and the Navy concur that five 4-hour exercises on five different days best represents the likely scenario that allows for the most appropriate take estimate. A single 4-hr TRACKEX event was expected to result in 0.42 takes by behavioral disturbance and 2.2 takes by TTS (a total of 2.62 takes by Level B harassment). However, the approach used to calculate these take estimates did not adequately consider the concentration of humpback whales found within these established breeding and calving grounds from December through April.

NMFS conducted its own analysis of the take by Level A harassment (by PTS) and Level B harassment (both TTS and behavioral disruption) that could occur in the Chalan Kanoa Reef and Marpi Reef Geographic Mitigation Areas under the 20-hr cap, for the purposes of both better understanding the impacts to adults and calves in this important area and modifying the total take numbers for humpback whales given more granular survey data now being considered in this area. Our exposure analysis is focused on the whales within the areas around Saipan covered by the surveys conducted by the PIFSC and reported in the Hill *et al.* (2020a) paper and the Hill *et al.* (2020b) abundance and density report. We believe this approach more accurately estimates potential exposures and takes of whales as a result of MF1 MFAS in these two Geographic Mitigation Areas. More extensive mark/recapture data in this smaller area provide a more granular and robust estimate of potential abundance and density for this specific area than the density estimate used by the Navy for the broader MITT Study Area. Estimates provided by the PIFSC (Hill *et al.,* 2020b) are preliminary, represent ''snapshots'' of abundance for that survey period based on the timing of the survey, and may change—but these estimates represent the best available scientific data for two reasons: (1) Estimates are area specific; and (2) estimates are far more robust than a non-model approach (*e.g.,* sightings per unit of effort approach).

We used an approach based on the annual abundance estimates from the PIFSC report (Hill *et al.,* 2020b) to derive estimates of animals that may be exposed to MF1 MFAS within these two Geographic Mitigation Areas. Preliminary annual (2015–2019) estimates of abundance, including standard errors (SE), 95 percent confidence intervals (CI), and densities of humpback whales in the PIFSC's study area were calculated using mark-recapture analyses (Table 3 in Hill *et al.,* 2020b). Densities (whales/km^2) are reported for the full survey area (839 km^2) and the truncated survey area where most of the effort and all of the humpback whale encounters occurred (384 km^2) areas off the west side of Saipan to Chalan Kanoa Reef and north to Marpi Reef. The error associated with the average non-calf and total abundance was obtained by summing the variances of the annual estimates even though these estimates are not independent, as using a bootstrap or other approach to estimate uncertainty was beyond the scope of this preliminary analysis. The average non-calf abundance from 2015–2019 was 44 animals (Table 3 in Hill *et al.,* 2020b). PIFSC provided estimates of calf abundance in their annual abundance estimates by increasing the average annual abundance of whales (non-calf) by the proportion of calves seen in the four years of surveys where calves were seen (2015–2018). The proportion of calves ranges from 0.5 to 0.2. This increased the average number of animals (non-calf) from 44 to 61 (total abundance (44) and 17 calves; with a 95 percent CI of 41–91) animals. Therefore, we are conservatively estimating that 61 animals a day could be taken on 5 days in which the exercise occurs for a total of 305 humpback whales taken by Level B harassment annually in the two Geographic Mitigation Areas combined (assuming 20 hrs of MF1 MFAS occurred). The Navy provided updated NAEMO-based calculations (as described above) that estimated 13 takes by Level B harassment during 20 hours of MF1 sonar. Subtracting these 13 takes from our estimate of 305 exposures (takes) results in 292 animals based on the new abundance information. Using the proportions of these takes as presented by the Navy estimated take (12 percent behavioral and 88 percent TTS) results in an additional 35 takes by behavioral disturbance and 257 takes by TTS annually.

This is a greater number of takes and a more conservative approach than the Navy's estimate and increases the total take by Level B harassment, but also provides a more accurate representation of how many takes by Level B harassment could occur during the breeding season in the two Geographic Mitigation Areas. The maximum number of animals (61) that could be taken in a day is a very conservative, worst-case scenario estimate based on the best available abundance data for humpback whales. We do not know how humpback whales move between the two Geographic Mitigation Areas or if more whales may be present in one Geographic Mitigation Area versus the other when the Navy is conducting their activity. We also assume the Navy could engage in exercises that only occur in one of two Geographic Mitigation Areas or it could be split between the two areas and involve multiple ships. We also acknowledge takes of humpback whales would certainly be less if the Navy's MF1 MFAS use occurs at the beginning or toward the end of the breeding season in the Geographic Mitigation Areas.

There is a very low likelihood that a humpback whale would accumulate enough exposure to result in PTS in the two Geographic Mitigation Areas. However, the Navy's approach to accounting for avoidance does not address possible differences in avoidance capability based on an animal's life-stage or particular life function at the time of exposure. Mother-calf pairs on the calving grounds may be less capable of avoiding additional exposures at levels that could cause PTS, as compared to individual adult males or females without calves. The age of the calf may also be a factor in the avoidance capability of a mother-

calf pair (*e.g.,* neonates may be particularly vulnerable). Mother-calf pairs may respond differently to MF1 MFAS at close range. Other potential stressors (*e.g.,* presence of breeding males, other nearby vessel activity, or potential predators) may influence how humpback whales (including cow-calf pairs) respond to acoustic stressors. Therefore, we estimate that up to one mother-calf pair of humpback whales could be taken by Level A harassment by PTS over the total seven-year period of the rule.

Additional mitigation by the Navy will include reporting of all active sonar use (all bins, by bin) in the Marpi Reef and Chalan Kanoa Geographic Mitigation Areas from December 1 through April 30. This will provide NMFS with more specific data in order to evaluate sonar use with current mitigation measures in the Geographic Mitigation Areas and to determine if any changes are needed through Adaptive Management.

Summary of Estimated Take From Training and Testing Activities

Based on the methods discussed in the previous sections and the Navy's model and quantitative assessment of mitigation, the Navy provided its take estimate and request for authorization of takes incidental to the use of acoustic and explosive sources for training and testing activities both annually (based on the maximum number of activities that could occur per 12-month period) 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.

For training and testing activities, Table 28 summarizes the Navy's take estimate and request and includes the maximum amount of Level A harassment and Level B harassment annually and for the seven-year period that NMFS concurs is reasonably likely to occur by species. Note that take by Level B harassment includes both behavioral disturbance and TTS. Tables 6.4–13 through 6.4–38 in Section 6 of the Navy's rulemaking/LOA application provide the comparative amounts of TTS and behavioral disturbance for each species annually, noting that if a modeled marine mammal was ''taken'' through exposure to both TTS and behavioral disruption in the model, it was recorded as a TTS.

TABLE 28—ANNUAL AND SEVEN-YEAR TOTAL SPECIES-SPECIFIC TAKE ESTIMATES AUTHORIZED FROM ACOUSTIC AND EXPLOSIVE SOUND SOURCE EFFECTS FOR ALL TRAINING AND TESTING ACTIVITIES IN THE MITT STUDY AREA

Species	Annual		7-Year total [1]	
	Level B harassment	Level A harassment	Level B harassment	Level A harassment
Mysticetes				
Blue whale *	24	0	169	0
Bryde's whale	298	0	2,078	0
Fin whale *	25	0	173	0
Humpback whale *	771	0	3,348	** 1
Minke whale	95	0	665	0
Omura's whale	29	0	199	0
Sei whale*	155	0	1,083	0
Odontocetes				
Blainville's beaked whale	1,718	0	12,033	0
Bottlenose dolphin	137	0	961	0
Cuvier's beaked whale	646	0	4,529	0
Dwarf sperm whale	8,499	50	59,459	341
False killer whale	762	0	5,331	0
Fraser's dolphin	13,278	1	92,931	8
Ginkgo-toothed beaked whale	3,726	0	26,088	0
Killer whale	44	0	309	0
Longman's beaked whale	6,066	0	42,487	0
Melon-headed whale	2,815	0	19,691	0
Pantropical spotted dolphin	14,896	1	104,242	7
Pygmy killer whale	104	0	726	0
Pygmy sperm whale	3,410	19	23,853	136
Risso's dolphin	3,170	0	22,179	0
Rough-toothed dolphin	197	0	1,379	0
Short-finned pilot whale	1,163	0	8,140	0
Sperm whale *	203	0	1,420	0
Spinner dolphin	1,414	1	9,896	4
Striped dolphin	4,007	0	28,038	0

* ESA-listed species within the MITT Study Area.

** There is one mother-calf pair of humpback whales estimated to be taken by Level A harassment by PTS over the period of the rule. See the *Estimated Take of Marine Mammals* section for further details.

[1] The 7-year totals may be less than the annual totals times seven, given that not all activities occur every year, some activities occur multiple times within a year, and some activities only occur a few times over the course of a 7-year period.

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 *Conservation Council for Hawaii* v. *National Marine Fisheries Service,* 97 F. Supp.3d 1210, 1229 (D. Haw. 2015), the Court stated that NMFS ''appear[s] to think [it] satisf[ies] the statutory 'least practicable adverse impact' requirement with a 'negligible impact' finding.'' More recently, expressing similar concerns in a challenge to a U.S. Navy Surveillance Towed Array Sensor System Low Frequency Active Sonar (SURTASS LFA) incidental take rule (77 FR 50290), the Ninth Circuit Court of Appeals in *Natural Resources Defense Council (NRDC)* v. *Pritzker,* 828 F.3d 1125, 1134 (9th Cir. 2016), stated, ''[c]ompliance with the 'negligible impact' requirement does not mean there [is] compliance with the 'least practicable adverse impact' standard.'' As the Ninth Circuit noted in its opinion, however, the Court was interpreting the statute without the benefit of NMFS' formal interpretation. We state here explicitly that NMFS is in full agreement that the ''negligible impact'' and ''least practicable adverse impact'' requirements are distinct, even though both statutory standards refer to species and stocks. With that in mind, we provide further explanation of our interpretation of least practicable adverse impact, and explain what distinguishes it from the negligible impact standard. This discussion is consistent with previous rules we have issued, such as the Navy's HSTT rule (83 FR 66846; December 27, 2018), Atlantic Fleet Training and Testing rule (84 FR 70712; December 23, 2019), and the Northwest Training and Testing (NWTT) proposed rule (0648–BJ30; June 02, 2020).

Before NMFS can issue incidental take regulations under section 101(a)(5)(A) of the MMPA, it must make a finding that the total taking will have a ''negligible impact'' on the affected ''species or stocks'' of marine mammals. NMFS' and U.S. Fish and Wildlife Service's implementing regulations for section 101(a)(5) both define ''negligible impact'' as an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival (50 CFR 216.103 and 50 CFR 18.27(c)). Recruitment (*i.e.,* reproduction) and survival rates are used to determine population growth rates [2] and therefore are considered in evaluating population level impacts.

As stated in the preamble to the proposed rule for the MMPA incidental take implementing regulations, not every population-level impact violates the negligible impact requirement. The negligible impact standard does not require a finding that the anticipated take will have ''no effect'' on population numbers or growth rates: The statutory standard does not require that the same recovery rate be maintained, rather that no significant effect on annual rates of recruitment or survival occurs. The key factor is the significance of the level of impact on rates of recruitment or survival. (54 FR 40338, 40341–42; September 29, 1989).

While some level of impact on population numbers or growth rates of a species or stock may occur and still satisfy the negligible impact requirement—even without consideration of mitigation—the least practicable adverse impact provision separately requires NMFS to prescribe means of effecting the least practicable adverse impact on the species or stock and its habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, 50 CFR 216.102(b), which are typically identified as mitigation measures.[3]

The negligible impact and least practicable adverse impact standards in the MMPA both call for evaluation at the level of the ''species or stock.'' The MMPA does not define the term ''species.'' However, Merriam-Webster Dictionary defines ''species'' to include ''related organisms or *populations* potentially capable of interbreeding.'' See *www.merriam-webster.com/dictionary/species* (emphasis added). Section 3(11) of the MMPA defines ''stock'' as a group of marine mammals of the same species or smaller taxa in a common spatial arrangement that interbreed when mature. The definition of ''population'' is a group of interbreeding organisms that represents the level of organization at which speciation begins. *www.merriam-webster.com/dictionary/population.* The definition of ''population'' is strikingly similar to the MMPA's definition of ''stock,'' with both definitions involving groups of individuals that belong to the same species and that are located in a manner that allows for interbreeding. In fact under MMPA section 3(11), the term ''stock'' in the MMPA is interchangeable with the statutory term ''population stock.'' Both the negligible impact standard and the least practicable adverse impact standard call for evaluation at the level of the species or stock, and the terms ''species'' and ''stock'' both relate to populations; therefore, it is appropriate to view both the negligible impact standard and the least practicable adverse impact standard as having a population-level focus.

This interpretation is consistent with Congress' statutory findings for enacting the MMPA, nearly all of which are most applicable at the species or stock (*i.e.,* population) level. *See* MMPA section 2 (finding that it is species and population stocks that are or may be in danger of extinction or depletion; that it is species and population stocks that should not diminish beyond being significant functioning elements of their ecosystems; and that it is species and population stocks that should not be permitted to diminish below their optimum sustainable population level). Annual rates of recruitment (*i.e.,* reproduction) and survival are the key biological metrics used in the evaluation of population-level impacts, and accordingly these same metrics are also used in the evaluation of population level impacts for the least practicable adverse impact standard.

Recognizing this common focus of the least practicable adverse impact and negligible impact provisions on the ''species or stock'' does not mean we conflate the two standards; despite some common statutory language, we recognize the two provisions are different and have different functions. First, a negligible impact finding is required before NMFS can issue an incidental take authorization. Although it is acceptable to use the mitigation measures to reach a negligible impact finding (*see* 50 CFR 216.104(c)), no amount of mitigation can enable NMFS to issue an incidental take authorization for an activity that still would not meet the negligible impact standard. Moreover, even where NMFS can reach a negligible impact finding—which we emphasize does allow for the possibility of some ''negligible'' population-level impact—the agency must still prescribe measures that will effect the least practicable amount of adverse impact upon the affected species or stock.

Section 101(a)(5)(A)(i)(II) requires NMFS to issue, in conjunction with its authorization, binding—and

[2] A growth rate can be positive, negative, or flat.

[3] For purposes of this discussion, we omit reference to the language in the standard for least practicable adverse impact that says we also must mitigate for subsistence impacts because they are not at issue in this rule.

enforceable—restrictions (in the form of regulations) setting forth how the activity must be conducted, thus ensuring the activity has the ''least practicable adverse impact'' on the affected species or stocks. In situations where mitigation is specifically needed to reach a negligible impact determination, section 101(a)(5)(A)(i)(II) also provides a mechanism for ensuring compliance with the ''negligible impact'' requirement. Finally, the least practicable adverse impact standard also requires consideration of measures for marine mammal habitat, with particular attention to rookeries, mating grounds, and other areas of similar significance, and for subsistence impacts, whereas the negligible impact standard is concerned solely with conclusions about the impact of an activity on annual rates of recruitment and survival.[4] In *NRDC* v. *Pritzker,* the Court stated, ''[t]he statute is properly read to mean that even if population levels are not threatened *significantly,* still the agency must adopt mitigation measures aimed at protecting *marine mammals* to the greatest extent practicable in light of military readiness needs.'' *Pritzker* at 1134 (emphases added). This statement is consistent with our understanding stated above that even when the effects of an action satisfy the negligible impact standard (*i.e.,* in the Court's words, ''population levels are not threatened significantly''), still the agency must prescribe mitigation under the least practicable adverse impact standard. However, as the statute indicates, the focus of both standards is ultimately the impact on the affected ''species or stock,'' and not solely focused on or directed at the impact on individual marine mammals.

We have carefully reviewed and considered the Ninth Circuit's opinion in *NRDC* v. *Pritzker* in its entirety. While the Court's reference to ''marine mammals'' rather than ''marine mammal species or stocks'' in the italicized language above might be construed as a holding that the least practicable adverse impact standard applies at the individual ''marine mammal'' level, *i.e.,* that NMFS must require mitigation to minimize impacts to each individual marine mammal unless impracticable, we believe such an interpretation reflects an incomplete appreciation of the Court's holding. In our view, the opinion as a whole turned on the Court's determination that NMFS had not given separate and independent meaning to the least practicable adverse impact standard apart from the negligible impact standard, and further, that the Court's use of the term ''marine mammals'' was not addressing the question of whether the standard applies to individual animals as opposed to the species or stock as a whole. We recognize that while consideration of mitigation can play a role in a negligible impact determination, consideration of mitigation measures extends beyond that analysis. In evaluating what mitigation measures are appropriate, NMFS considers the potential impacts of the Specified Activities, the availability of measures to minimize those potential impacts, and the practicability of implementing those measures, as we describe below.

Implementation of Least Practicable Adverse Impact Standard

Given the *NRDC* v. *Pritzker* decision, we discuss here how we determine whether a measure or set of measures meets the ''least practicable adverse impact'' standard. Our separate analysis of whether the take anticipated to result from the Navy's activities meets the ''negligible impact'' standard appears in the *Analysis and Negligible Impact Determination* section below.

Our evaluation of potential mitigation measures includes consideration of two primary factors:

(1) The manner in which, and the degree to which, implementation of the potential measure(s) is expected to reduce adverse impacts to marine mammal species or stocks, their habitat, and their availability for subsistence uses (where relevant). This analysis considers such things as the nature of the potential adverse impact (such as likelihood, scope, and range), the likelihood that the measure will be effective if implemented, and the likelihood of successful implementation; and

(2) The practicability of the measures for applicant implementation. Practicability of implementation may consider such things as cost, impact on activities, 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.

While the language of the least practicable adverse impact standard calls for minimizing impacts to affected species or stocks, we recognize that the reduction of impacts to those species or stocks accrues through the application of mitigation measures that limit impacts to individual animals. Accordingly, NMFS' analysis focuses on measures that are designed to avoid or minimize impacts on individual marine mammals that are likely to increase the probability or severity of population-level effects.

While direct evidence of impacts to species or stocks from a specified activity is rarely available, and additional study is still needed to understand how specific disturbance events affect the fitness of individuals of certain species, there have been improvements in understanding the process by which disturbance effects are translated to the population. With recent scientific advancements (both marine mammal energetic research and the development of energetic frameworks), the relative likelihood or degree of impacts on species or stocks may often be inferred given a detailed understanding of the activity, the environment, and the affected species or stocks—and the best available science has been used here. This same information is used in the development of mitigation measures and helps us understand how mitigation measures contribute to lessening effects (or the risk thereof) to species or stocks. We also acknowledge that there is always the potential that new information, or a new recommendation could become available in the future and necessitate reevaluation of mitigation measures (which may be addressed through adaptive management) to see if further reductions of population impacts are possible and practicable.

In the evaluation of specific measures, the details of the specified activity will necessarily inform each of the two primary factors discussed above (expected reduction of impacts and practicability), and are carefully considered to determine the types of mitigation that are appropriate under the least practicable adverse impact standard. Analysis of how a potential mitigation measure may reduce adverse impacts on a marine mammal stock or species, consideration of personnel safety, practicality of implementation, and consideration of the impact on effectiveness of military readiness activities are not issues that can be meaningfully evaluated through a yes/no lens. The manner in which, and the degree to which, implementation of a measure is expected to reduce impacts, as well as its practicability in terms of these considerations, can vary widely. For example, a time/area restriction could be of very high value for decreasing population-level impacts (*e.g.,* avoiding disturbance of feeding females in an area of established biological importance) or it could be of

[4] Outside of the military readiness context, mitigation may also be appropriate to ensure compliance with the ''small numbers'' language in MMPA sections 101(a)(5)(A) and (D).

lower value (*e.g.,* decreased disturbance in an area of high productivity but of less biological importance). Regarding practicability, a measure might involve restrictions in an area or time that impedes the Navy's ability to certify a strike group (higher impact on mission effectiveness and national security), or it could mean delaying a small in-port training event by 30 minutes to avoid exposure of a marine mammal to injurious levels of sound (lower impact). A responsible evaluation of ''least practicable adverse impact'' will consider the factors along these realistic scales. Accordingly, the greater the likelihood that a measure will contribute to reducing the probability or severity of adverse impacts to the species or stock or its habitat, the greater the weight that measure is given when considered in combination with practicability to determine the appropriateness of the mitigation measure, and vice versa. We discuss consideration of these factors in greater detail below.

1. *Reduction of adverse impacts to marine mammal species or stocks and their habitat.*[5] The emphasis given to a measure's ability to reduce the impacts on a species or stock considers the degree, likelihood, and context of the anticipated reduction of impacts to individuals (and how many individuals) as well as the status of the species or stock.

The ultimate impact on any individual from a disturbance event (which informs the likelihood of adverse species- or stock-level effects) is dependent on the circumstances and associated contextual factors, such as duration of exposure to stressors. Though any proposed mitigation needs to be evaluated in the context of the specific activity and the species or stocks affected, measures with the following types of effects have greater value in reducing the likelihood or severity of adverse species- or stock-level impacts: Avoiding or minimizing injury or mortality; limiting interruption of known feeding, breeding, mother/young, or resting behaviors; minimizing the abandonment of important habitat (temporally and spatially); minimizing the number of individuals subjected to these types of disruptions; and limiting degradation of habitat. Mitigating these types of effects is intended to reduce the likelihood that the activity will result in energetic or other types of impacts that are more likely to result in reduced reproductive success or survivorship. It is also important to consider the degree of impacts that are expected in the absence of mitigation in order to assess the added value of any potential measures. Finally, because the least practicable adverse impact standard gives NMFS discretion to weigh a variety of factors when determining appropriate mitigation measures and because the focus of the standard is on reducing impacts at the species or stock level, the least practicable adverse impact standard does not compel mitigation for every kind of take, or every individual taken, if that mitigation is unlikely to meaningfully contribute to the reduction of adverse impacts on the species or stock and its habitat, even when practicable for implementation by the applicant.

The status of the species or stock is also relevant in evaluating the appropriateness of potential mitigation measures in the context of least practicable adverse impact. The following are examples of factors that may (either alone, or in combination) result in greater emphasis on the importance of a mitigation measure in reducing impacts on a species or stock: The stock is known to be decreasing or status is unknown, but believed to be declining; the known annual mortality (from any source) is approaching or exceeding the potential biological removal (PBR) level (as defined in MMPA section 3(20)); the affected species or stock is a small, resident population; or the stock is involved in a UME or has other known vulnerabilities, such as recovering from an oil spill.

Habitat mitigation, particularly as it relates to rookeries, mating grounds, and areas of similar significance, is also relevant to achieving the standard and can include measures such as reducing impacts of the activity on known prey utilized in the activity area or reducing impacts on physical habitat. As with species- or stock-related mitigation, the emphasis given to a measure's ability to reduce impacts on a species or stock's habitat considers the degree, likelihood, and context of the anticipated reduction of impacts to habitat. Because habitat value is informed by marine mammal presence and use, in some cases there may be overlap in measures for the species or stock and for use of habitat.

We consider available information indicating the likelihood of any measure to accomplish its objective. If evidence shows that a measure has not typically been effective nor successful, then either that measure should be modified or the potential value of the measure to reduce effects should be lowered.

2. *Practicability.* Factors considered may include cost, impact on activities, and, in the case of a military readiness activity, will include personnel safety, practicality of implementation, and impact on the effectiveness of the military readiness activity (see MMPA section 101(a)(5)(A)(ii)).

Assessment of Mitigation Measures for the MITT 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 MITT FSEIS/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 measures, which was informed by input from NMFS, can be found in Section 5 (*Mitigation*) and Appendix I (*Geographic Mitigation Assessment*) of the 2020 MITT FSEIS/OEIS. The process described in Section 5 (*Mitigation*) and Appendix I (*Geographic Mitigation Assessment*) of the 2020 MITT FSEIS/OEIS robustly supported NMFS' independent evaluation of whether the mitigation measures meet the least practicable adverse impact standard.

As a general matter, where an applicant proposes measures that are likely to reduce impacts to marine

[5] We recognize the least practicable adverse impact standard requires consideration of measures that will address minimizing impacts on the availability of the species or stocks for subsistence uses where relevant. Because subsistence uses are not implicated for this action, we do not discuss them. However, a similar framework would apply for evaluating those measures, taking into account the MMPA's directive that we make a finding of no unmitigable adverse impact on the availability of the species or stocks for taking for subsistence, and the relevant implementing regulations.

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). We note that in their application, the Navy added three geographic mitigation areas with accompanying mitigation measures that are new since the 2015–2020 MITT incidental take regulations: (1) Marpi Reef Geographic Mitigation Area—to avoid potential impacts from explosives on marine mammals and report hours of MFAS–MF1 within the mitigation area, which contains a seasonal presence of humpback whales (2) Chalan Kanoa Reef Geographic Mitigation Area—to avoid potential impacts from explosives on marine mammals and report hours of MFAS–MF1 within the mitigation area, which contains a seasonal presence of humpback whales, and (3) Agat Bay Nearshore Geographic Mitigation Area—to avoid potential impacts from explosives and MFAS–MF1 on spinner dolphins.

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. In the case of this rule, we worked with the Navy after it submitted its 2019 rulemaking/LOA application but prior to the development of the proposed rule to expand the mitigation areas for Marpi Reef and Chalan Kanoa Reef Geographic Mitigation Areas to more fully encompass the 400-m isobaths based on the available data indicating the presence of humpback whale mother/calf pairs (seasonal breeding area), which is expected to further avoid impacts from explosives that would be more likely to affect reproduction or survival of individuals and could adversely impact the species. The Navy will also implement the Marpi Reef and Chalan Kanoa Reef Awareness Notification Message Area, which require Navy personnel to broadcast the seasonal presence of humpback whales, further minimizing any potential impacts from vessel strikes during training and testing activities as these areas contain important seasonal breeding habitat for this species.

In addition, since publication of the proposed rule, and in consideration of public comments received, NMFS and the Navy have agreed to include additional mitigation requirements that will further reduce the likelihood and/or severity of adverse impacts on marine mammal species and their habitat and are practicable for implementation. Below we describe the added measures that the Navy will implement and explain the manner in which they are expected to reduce the likelihood or severity of adverse impacts on humpback whales and their habitat.

1. Cap on MF1 mid-frequency active sonar use in the Chalan Kanoa and Marpi Reef Geographic Mitigation Areas. The Navy will implement an annual 20-hour cap from December 1 through April 30 on surface ship hull-mounted MF1 mid-frequency active sonar within the Chalan Kanoa Reef and Marpi Reef Geographic Mitigation Areas to reduce impacts to humpback whales while allowing the Navy to retain critical shallow water training flexibility within the MITT Study Area. This cap on activities (MF1 sonar) in these areas with higher concentrations of humpback whales engaged in important reproductive behaviors is expected to reduce the probability or severity of impacts on humpback whales that would be more likely to adversely affect the reproduction or survival of any individual, which in turn reduces the likelihood that any impacts would translate to adverse impacts on the species.

2. Additional reporting of sonar sources in the Chalan Kanoa and Marpi Reef Geographic Mitigation Areas. In addition to the reporting of the total hours of surface ship hull-mounted MF1 mid-frequency active sonar, the Navy will also report all sonar sources used (all bins, by bin) within the Chalan Kanoa and Marpi Reef Geographic Mitigation Areas from December 1 to April 30 in the annual MITT classified Exercise Reports. This will allow NMFS to evaluate sonar use specifically in these areas with higher concentrations of humpback whales and determine if further mitigation is needed through Adaptive Management.

Overall the Navy has agreed to procedural mitigation measures that will reduce the probability and/or severity of impacts expected to result from acute exposure to acoustic sources and explosives, ship strike, and impacts to marine mammal habitat. Specifically, the Navy will use a combination of delayed starts, powerdowns, and shutdowns 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 acoustic sources or explosives. The Navy will also implement multiple time/area restrictions that will reduce take of marine mammals in areas or at times where they are known to engage in important behaviors, such as calving, where the disruption of those behaviors would have a higher probability of resulting in impacts on reproduction or survival of individuals that could lead to population-level impacts.

The Navy assessed the practicability of these 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 the manner described earlier in this section (*i.e.,* in consideration of their ability to reduce adverse impacts on marine mammal species and their habitat and their practicability for implementation). We have determined that the measures will significantly and adequately reduce impacts on the affected marine mammal species and their habitat and, further, be practicable for Navy implementation. Therefore, the mitigation measures assure that Navy's activities will have the least practicable adverse impact on the species and their habitat.

Measures Evaluated But Not Included

The Navy also evaluated numerous measures in the 2020 MITT FSEIS/OEIS that were not included in the Navy's rulemaking/LOA application, and NMFS independently reviewed and 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, Section 5 (*Mitigation*) of the 2020 MITT FSEIS/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. Appendix I (*Geographic Mitigation Assessment*) of the 2020 MITT FSEIS/OEIS includes an in-depth analysis of time/area restrictions that have been recommended over time. As described in Section 5 (*Mitigation*) of the 2020 MITT FSEIS/OEIS, commenters sometimes recommend that the Navy reduce its overall amount of training and testing, reduce explosive use, modify its sound sources, completely replace live training and testing with computer simulation, or include time of day restrictions. Many of these mitigation measures could potentially reduce the number of marine mammals taken, via direct reduction of the

activities or amount of sound energy put in the water. However, as described in Section 5 (*Mitigation*) of the 2020 MITT FSEIS/OEIS, the Navy needs to train and test in the conditions in which it fights—and these types of modifications fundamentally change the activity in a manner that will 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 will unacceptably undermine the purpose of the testing and training persuasive. After independent review, NMFS finds Navy's judgment on the impacts of these potential mitigation measures to personnel safety, practicality of implementation, and the effectiveness of training and testing within the MITT 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 Section 5 (*Mitigation*) of the 2020 MITT FSEIS/OEIS, the Navy evaluated additional potential procedural mitigation measures, including increased mitigation zones, ramp-up measures, additional passive acoustic and visual monitoring, and decreased vessel speeds. Some of these measures have 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 impracticable (see Section 5 *Mitigation* of 2020 MITT FSEIS/OEIS). NMFS independently reviewed the Navy's evaluation and concurs with this assessment, which supports NMFS' findings that the impracticability of this additional mitigation would greatly outweigh any potential minor reduction in marine mammal impacts that might result; therefore, these additional mitigation measures are not warranted.

Last, Appendix I (*Geographic Mitigation Assessment*) of the 2020 MITT FSEIS/OEIS 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 (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 MITT FSEIS/OEIS but not included as mitigation in this rule, the Navy found that the 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. In some cases, potential benefits to marine mammals were non-existent, while in others the consequences on mission effectiveness were too great.

NMFS has reviewed the analysis in Section 5 (*Mitigation*) and Appendix I (*Geographic Mitigation Assessment*) of the 2020 MITT FSEIS/OEIS, which considers the same factors that NMFS considers under the MMPA to satisfy the least practicable adverse impact standard, and concurs with the analysis and conclusions. Therefore, NMFS is not including any of the measures that the Navy ruled out in the 2020 MITT FSEIS/OEIS.

Below, we describe additional measures that were considered but eliminated during the development of the final rule: (1) A full restriction on MF1 sonar use in the Marpi Reef and Chalan Kanoa Reef Geographic Mitigation Areas (versus the 20-hour annual cap between December 1 and April 30) and (2) measures to further minimize any potential risk that beaked whales would strand as a result of Navy training and testing activities.

Regarding the consideration of a full restriction on MF1 sonar use in the Marpi Reef and Chalan Kanoa Reef Geographic Mitigation Areas, areas of shallow depths, which are important for certain types of training, are limited in the Mariana Archipelago, and the Navy determined it would be impractical to completely limit the use of sonar at Chalan Kanoa Reef and Marpi Reef. The Navy provided additional analysis to NMFS that these two Geographic Mitigation Areas account for up to 14.3 percent of all shallow water areas less than 200 m and outside of 3 nmi in the MITT Study Area (generally surrounding land), and up to 22 percent of all shallow water areas less than 200 m and outside of 3 nmi (generally surrounding land) and south (not inclusive) of Farallon De Medinilla in the MITT Study Area. NMFS agreed with these calculations. The Navy has stressed the broader need for flexibility as well as the specific need not to restrict training areas entirely in this part of the MITT Study Area given the proximity to forward deployed operations (*i.e.,* U.S. 7th fleet's continuous presence in the Indo-Pacific region, which is a National Defense Strategy priority theater of operations) and the need to have the option to conduct training quickly and to respond to emergent national security threats. Given the reductions in potential impacts already provided by the full restriction on explosive use and the 20-hour annual cap on MF1 sonar in the areas between December 1 and April 30, combined with the impracticability for the Navy, NMFS found that this measure was not warranted.

In addition, NMFS had thorough discussions with the Navy about the possibility of crafting a mitigation measure to minimize the potential risk that Navy activities could contribute in any way to the potential stranding of beaked whales. These discussions included consideration of all public comments which recommended beaked whale mitigation measures. However, despite years of field surveys conducted under interagency agreements between the Navy and NMFS' PIFSC along with Navy-funded beaked whale monitoring, there remains a lack of scientific information available on beaked whale distribution and other essential species information in the Mariana Islands. Without sufficient scientific data on beaked whale habitat use, bathymetry, and seasonality, and from that a better understanding of the circumstances that could affect the likelihood of a stranding in the MITT Study Area, NMFS is unable to develop mitigation measures that would meaningfully reduce the likelihood of stranding and/or will not result in unreasonable operational/practicability concerns. Consequently, NMFS recommended to the Navy that the two agencies convene a panel of experts, both from the region, as well as beaked whale behavioral response experts from other geographic areas, and Navy experts on biology, operations, and mitigation to review the status of the science, identify data gaps, and identify information applicable for consideration for future mitigation through the Adaptive Management process. The Navy has agreed to fund and co-organize this effort. Additional measures that the Navy has agreed to conduct to increase understanding and decrease uncertainty around beaked whales in the MITT Study Area are discussed in the *Monitoring* section.

The following sections describe the mitigation measures that will be implemented in association with the training and testing activities analyzed in this document. These are the mitigation measures that NMFS has determined will ensure the least

practicable adverse impact on all affected species and their habitat, including the specific considerations for military readiness activities. The mitigation measures are organized into two categories: Procedural mitigation and mitigation areas.

Procedural Mitigation

Procedural mitigation is mitigation that the Navy will implement whenever and wherever an applicable training or testing activity takes place within the MITT Study Area. The Navy customizes procedural mitigation for each applicable activity category or stressor. 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 measures (Table 29) are designed to train Lookouts and other applicable Navy personnel in their observation, environmental compliance, and reporting responsibilities. The remainder of the procedural mitigation measures (Tables 30 through 46) are organized by stressor type and activity category and includes acoustic stressors (*i.e.,* active sonar, weapons firing noise), explosive stressors (*i.e.,* sonobuoys, torpedoes, medium-caliber and large-caliber projectiles, missiles and rockets, bombs, sinking exercises, mines, anti-swimmer grenades), and physical disturbance and strike stressors (*i.e.,* vessel movement; towed in-water devices; small-, medium-, and large-caliber non-explosive practice munitions; non-explosive missiles and rockets, non-explosive bombs and mine shapes). Note that the procedural mitigation measures for other incidental take regulations in Navy study areas, such as AFTT and HSTT, require that Lookouts observe for floating vegetation in addition to marine mammals because floating vegetation has high ecological protection value (*e.g.,* habitat for juvenile/hatchling sea turtles, potential foraging habitat for marine mammals). The term ''floating vegetation'' in those regulations referred specifically to floating concentrations of detached kelp paddies (off the U.S. West Coast) and sargassum mats (off the U.S. East Coast). However, in the MITT Study Area there are no floating vegetation concentrations so that was not included in the procedural mitigation measures in this rule.

TABLE 29—PROCEDURAL MITIGATION FOR ENVIRONMENTAL AWARENESS AND EDUCATION

Procedural Mitigation Description
Stressor or Activity:
All training and testing activities, as applicable.
Mitigation Requirements:
Appropriate Navy personnel (including civilian personnel) involved in mitigation and training or testing activity 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. The introductory module provides information on environmental laws (*e.g.,* Endangered Species Act, Marine Mammal Protection Act) and the corresponding responsibilities that are relevant to Navy training and testing activities. 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.
—U.S. Navy Sonar Positional Reporting System and Marine Mammal Incident Reporting. This module provides instruction on the procedures and activity reporting requirements for the Sonar Positional Reporting System and marine mammal incident reporting.

TABLE 30—PROCEDURAL MITIGATION FOR ACTIVE SONAR

Procedural Mitigation Description
Stressor or Activity:
• Low-frequency active sonar, mid-frequency active sonar, high-frequency active sonar:
—For vessel-based active sonar activities, mitigation applies only to sources that are positively controlled and deployed from manned surface vessels (*e.g.,* sonar sources towed from manned surface platforms).
—For aircraft-based active sonar activities, mitigation applies only to sources that are positively controlled and deployed from manned aircraft that do not operate at high altitudes (*e.g.,* rotary-wing aircraft). Mitigation does not apply to active sonar sources deployed from unmanned aircraft or aircraft operating at high altitudes (*e.g.,* maritime patrol aircraft).
Number of Lookouts and Observation Platform:
• Hull-mounted sources:
—1 Lookout: Platforms with space or manning restrictions while underway (at the forward part of a small boat or ship) and platforms using active sonar while moored or at anchor (including pierside).
—2 Lookouts: Platforms without space or manning restrictions while underway (at the forward part of the ship).
• Sources that are not hull-mounted:
—1 Lookout on the ship or aircraft conducting the activity.
Mitigation Requirements:
• Mitigation zones:
—Refer to During the activity below.

TABLE 30—PROCEDURAL MITIGATION FOR ACTIVE SONAR—Continued

Procedural Mitigation Description
• Prior to the initial start of the activity (*e.g.,* when maneuvering on station): —Navy personnel will observe the mitigation zone for marine mammals; if marine mammals are observed, Navy personnel will relocate or delay the start of active sonar transmission. • During the activity: —Low-frequency active sonar at or above 200 dB or more, and hull-mounted mid-frequency active sonar: Navy personnel must observe the mitigation zone for marine mammals; Navy personnel will power down active sonar transmission by 6 dB if marine mammals are observed within 1,000 yd of the sonar source; Navy personnel will power down an additional 4 dB (for a total of 10 dB total) within 500 yd; Navy personnel must cease transmission within 200 yd of the sonar source. —Low-frequency active sonar below 200 dB, mid-frequency active sonar sources that are not hull-mounted, and high-frequency active sonar: Navy personnel must observe the mitigation zone for marine mammals; Navy personnel will cease active sonar transmission if observed within 200 yd of the sonar source. • Commencement/recommencement conditions after a marine mammal sighting before or during the activity: —Navy personnel 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 or powering up active sonar transmission) 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 sonar source; (3) the mitigation zone has been clear from any additional sightings for 10 min. for aircraft-deployed sonar sources or 30 min for vessel-deployed sonar sources; (4) for mobile activities, the active sonar source has transited a distance equal to double that of the mitigation zone size beyond the location of the last sighting; or (5) for activities using hull-mounted sonar, the ship concludes that dolphins are deliberately closing in on the ship to ride the ship's bow wave, and are therefore out of the main transmission axis of the sonar (and there are no other marine mammal sightings within the mitigation zone).

TABLE 31—PROCEDURAL MITIGATION FOR WEAPONS FIRING NOISE

Procedural Mitigation Description
Stressor or Activity: • 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 Procedural Mitigation for Explosive Medium- and Large-Caliber Projectiles (Table 34) or Procedural Mitigation for Small-, Medium-, and Large-Caliber Non-Explosive Practice Munitions (Table 43). *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: —Navy personnel will observe the mitigation zone for marine mammals; if observed, Navy personnel will relocate or delay the start of weapons firing. • During the activity: —Navy personnel will observe the mitigation zone for marine mammals; if marine mammals are observed, Navy personnel will cease weapons firing. • Commencement/recommencement conditions after a marine mammal sighting before or during the activity: —Navy personnel 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.

TABLE 32—PROCEDURAL MITIGATION FOR EXPLOSIVE SONOBUOYS

Procedural Mitigation Description
Stressor or Activity: • Explosive sonobuoys. *Number of Lookouts and Observation Platform:* • 1 Lookout positioned in an aircraft or on a small boat. • If additional platforms are participating in the activity, Navy personnel positioned in those assets (*e.g.,* safety observers, evaluators) will support observing the mitigation zone for marine mammals and other applicable biological resources while performing their regular duties. *Mitigation Requirements:* • Mitigation Zone: —600 yd around an explosive sonobuoy. • Prior to the initial start of the activity (*e.g.,* during deployment of a sonobuoy pattern, which typically lasts 20–30 minutes): —Navy personnel will conduct passive acoustic monitoring for marine mammals; Navy personnel will use information from detections to assist visual observations. —Navy personnel will visually observe the mitigation zone for marine mammals; if marine mammals are observed, Navy personnel will relocate or delay the start of sonobuoy or source/receiver pair detonations. • During the activity:

TABLE 32—PROCEDURAL MITIGATION FOR EXPLOSIVE SONOBUOYS—Continued

Procedural Mitigation Description
—Navy personnel will observe the mitigation zone for marine mammals; if marine mammals are observed, cease sonobuoy or source/receiver pair detonations. • Commencement/recommencement conditions after a marine mammal sighting before or during the activity: —Navy personnel 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 detonations) 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 sonobuoy; 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), Navy personnel will observe the vicinity of where detonations occurred; if any injured or dead marine mammals are observed, Navy personnel will follow established incident reporting procedures. —If additional platforms are supporting this activity (*e.g.,* providing range clearance), Navy personnel positioned on these assets will assist in the visual observation of the area where detonations occurred.

TABLE 33—PROCEDURAL MITIGATION FOR EXPLOSIVE TORPEDOES

Procedural Mitigation Description
Stressor or Activity: • Explosive Torpedoes. *Number of Lookouts and Observation Platform:* • 1 Lookout positioned in an aircraft. • If additional platforms are participating in the activity, Navy personnel positioned on those assets (*e.g.,* safety observers, evaluators) will support observing the mitigation zone for marine mammals and other applicable biological resources while performing their regular duties. *Mitigation Requirements:* • Mitigation Zone: —2,100 yd around the intended impact location. • Prior to the initial start of the activity (*e.g.,* during deployment of the target): —Navy personnel will conduct passive acoustic monitoring for marine mammals; Navy personnel will use information from detections to assist visual observations. —Navy personnel will visually observe the mitigation zone for marine mammals; if marine mammals are observed, Navy personnel will relocate or delay the start of firing. • During the activity: —Navy personnel will observe the mitigation zone for marine mammals; if marine mammals are observed, Navy personnel will cease firing. • Commencement/recommencement conditions after a marine mammal sighting before or during the activity: —Navy personnel 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), Navy personnel will observe the vicinity of where detonations occurred; if any injured or dead marine mammals are observed, Navy personnel will follow established incident reporting procedures. —If additional platforms are supporting this activity (*e.g.,* providing range clearance), Navy personnel positioned on these assets will assist in the visual observation of the area where detonations occurred.

TABLE 34—PROCEDURAL MITIGATION FOR EXPLOSIVE MEDIUM-CALIBER AND LARGE-CALIBER PROJECTILES

Procedural Mitigation Description
Stressor or Activity: • Gunnery activities using explosive medium-caliber and large-caliber projectiles. —Mitigation applies to activities using a 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 Weapons Firing Noise (Table 31). • If additional platforms are participating in the activity, Navy personnel positioned on those assets (*e.g.,* safety observers, evaluators) will support observing the mitigation zone for marine mammals and other applicable biological resources while performing their regular duties. *Mitigation Requirements:* • Mitigation zones: —200 yd around the intended impact location for air-to-surface activities using explosive medium-caliber projectiles. —600 yd around the intended impact location for surface-to-surface activities using explosive medium-caliber projectiles.

TABLE 34—PROCEDURAL MITIGATION FOR EXPLOSIVE MEDIUM-CALIBER AND LARGE-CALIBER PROJECTILES—Continued

Procedural Mitigation Description
—1,000 yd around the intended impact location for surface-to-surface activities using explosive large-caliber projectiles. • Prior to the initial start of the activity (*e.g.,* when maneuvering on station): —Navy personnel will observe the mitigation zone for marine mammals; if marine mammals are observed, Navy personnel will relocate or delay the start of firing. • During the activity: —Navy personnel will observe the mitigation zone for marine mammals; if marine mammals are observed, Navy personnel will cease firing. • Commencement/recommencement conditions after a marine mammal sighting before or during the activity: —Navy personnel 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 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. • 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), Navy personnel will observe the vicinity of where detonations occurred; if any injured or dead marine mammals are observed, Navy personnel will follow established incident reporting procedures. —If additional platforms are supporting this activity (*e.g.,* providing range clearance), Navy personnel positioned on these assets will assist in the visual observation of the area where detonations occurred.

TABLE 35—PROCEDURAL MITIGATION FOR EXPLOSIVE MISSILES AND ROCKETS

Procedural Mitigation Description
Stressor or Activity: • Aircraft-deployed explosive missiles and rockets. —Mitigation applies to activities using a surface target. *Number of Lookouts and Observation Platform:* • 1 Lookout positioned in an aircraft. • If additional platforms are participating in the activity, Navy personnel positioned on those assets (*e.g.,* safety observers, evaluators) will support observing the mitigation zone for marine mammals and other applicable biological resources while performing their regular duties. *Mitigation Requirements:* • Mitigation zones: —900 yd around the intended impact location for missiles or rockets with 0.6–20 lb net explosive weight. —2,000 yd 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): —Navy personnel will observe the mitigation zone for marine mammals; if marine mammals are observed, Navy personnel will relocate or delay the start of firing. • During the activity: —Navy personnel will observe the mitigation zone for marine mammals; if marine mammals are observed, Navy personnel will cease firing. • Commencement/recommencement conditions after a marine mammal sighting before or during the activity: —Navy personnel 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), Navy personnel will observe the vicinity of where detonations occurred; if any injured or dead marine mammals are observed, Navy personnel will follow established incident reporting procedures. —If additional platforms are supporting this activity (*e.g.,* providing range clearance), Navy personnel positioned on these assets will assist in the visual observation of the area where detonations occurred.

TABLE 36—PROCEDURAL MITIGATION FOR EXPLOSIVE BOMBS

Procedural Mitigation Description
Stressor or Activity: • 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, Navy personnel positioned on those assets (*e.g.,* safety observers, evaluators) will support observing the mitigation zone for marine mammals and other applicable biological resources while performing their regular duties. *Mitigation Requirements:* • Mitigation zone:

TABLE 36—PROCEDURAL MITIGATION FOR EXPLOSIVE BOMBS—Continued

Procedural Mitigation Description
—2,500 yd around the intended target. • Prior to the initial start of the activity (*e.g.,* when arriving on station): —Navy personnel will observe the mitigation zone for marine mammals; if marine mammals are observed, Navy personnel will relocate or delay the start of bomb deployment. • During the activity (*e.g.,* during target approach): —Navy personnel will observe the mitigation zone for marine mammals; if marine mammals are observed, Navy personnel will cease bomb deployment. • Commencement/recommencement conditions after a marine mammal sighting before or during the activity: —Navy personnel 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 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; (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. • 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), Navy personnel will observe the vicinity of where detonations occurred; if any injured or dead marine mammals are observed, Navy personnel will follow established incident reporting procedures. —If additional platforms are supporting this activity (*e.g.,* providing range clearance), Navy personnel positioned on these assets will assist in the visual observation of the area where detonations occurred.

TABLE 37—PROCEDURAL MITIGATION FOR SINKING EXERCISES

Procedural Mitigation Description
Stressor or Activity: • Sinking exercises. *Number of Lookouts and Observation Platform:* • 2 Lookouts (one positioned in an aircraft and one on a vessel). • If additional platforms are participating in the activity, Navy personnel positioned on those assets (*e.g.,* safety observers, evaluators) will support observing the mitigation zone for marine mammals and other applicable biological resources while performing their regular duties. *Mitigation Requirements:* • Mitigation Zone: —2.5 nmi around the target ship hulk. • Prior to the initial start of the activity (90 min prior to the first firing): —Navy personnel will conduct aerial observations of the mitigation zone for marine mammals; if marine mammals are observed, Navy personnel will delay the start of firing. • During the activity: —Navy personnel will conduct passive acoustic monitoring for marine mammals; Navy personnel will use information from detections to assist visual observations. —Navy personnel will visually observe the mitigation zone for marine mammals from the vessel; if marine mammals are observed, Navy personnel must cease firing. —Immediately after any planned or unplanned breaks in weapons firing of longer than 2 hours, Navy personnel will observe the mitigation zone for marine mammals from the aircraft and vessel; if marine mammals are observed, Navy personnel must delay recommencement of firing. • Commencement/recommencement conditions after a marine mammal sighting before or during the activity: —Navy personnel 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 target ship hulk; or (3) the mitigation zone has been clear from any additional sightings for 30 min. • After completion of the activity (for 2 hours after sinking the vessel or until sunset, whichever comes first): —Navy personnel will observe the vicinity of where detonations occurred; if any injured or dead marine mammals are observed, Navy personnel will follow established incident reporting procedures. —If additional platforms are supporting this activity (*e.g.,* providing range clearance), Navy personnel positioned on these assets will assist in the visual observation of the area where detonations occurred.

TABLE 38—PROCEDURAL MITIGATION FOR EXPLOSIVE MINE COUNTERMEASURE AND NEUTRALIZATION ACTIVITIES

Procedural Mitigation Description
Stressor or Activity: • Explosive mine countermeasure and neutralization activities. *Number of Lookouts and Observation Platform:* • 1 Lookout positioned on a vessel or in an aircraft. • If additional platforms are participating in the activity, Navy personnel positioned on those assets (*e.g.,* safety observers, evaluators) will support observing the mitigation zone for marine mammals and other applicable biological resources while performing their regular duties. *Mitigation Requirements:*

TABLE 38—PROCEDURAL MITIGATION FOR EXPLOSIVE MINE COUNTERMEASURE AND NEUTRALIZATION ACTIVITIES—Continued

Procedural Mitigation Description
• Mitigation Zone: —600 yd around the detonation site. • Prior to the initial start of the activity (*e.g.,* when maneuvering on station; typically, 10 min when the activity involves aircraft that have fuel constraints, or 30 min when the activity involves aircraft that are not typically fuel constrained): —Navy personnel will observe the mitigation zone for marine mammals; if marine mammals are observed, Navy personnel will relocate or delay the start of detonations. • During the activity: —Navy personnel will observe the mitigation zone for marine mammals; if marine mammals are observed, Navy personnel will cease detonations. • Commencement/recommencement conditions after a marine mammal sighting before or during the activity: —Navy personnel 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 detonations) 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 detonation site; 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 (typically 10 min when the activity involves aircraft that have fuel constraints, or 30 min when the activity involves aircraft that are not typically fuel constrained): —Navy personnel will observe the vicinity of where detonations occurred; if any injured or dead marine mammals are observed, Navy personnel will follow established incident reporting procedures. —If additional platforms are supporting this activity (*e.g.,* providing range clearance), Navy personnel positioned on these assets will assist in the visual observation of the area where detonations occurred.

TABLE 39—PROCEDURAL MITIGATION FOR EXPLOSIVE MINE NEUTRALIZATION ACTIVITIES INVOLVING NAVY DIVERS

Procedural Mitigation Description
Stressor or Activity: • Explosive mine neutralization activities involving Navy divers. *Number of Lookouts and Observation Platforms:* • 2 Lookouts (two small boats with one Lookout each, or one Lookout on a small boat and one in a rotary-wing aircraft) when implementing the smaller mitigation zone. • 4 Lookouts (two small boats with two Lookouts each), and a pilot or member of an aircrew will serve as an additional Lookout if aircraft are used during the activity, when implementing the larger mitigation zone. • All divers placing the charges on mines will support the Lookouts while performing their regular duties and will report applicable sightings to their supporting small boat or Range Safety Officer. • If additional platforms are participating in the activity, Navy personnel positioned on those assets (*e.g.,* safety observers, evaluators) will support observing the mitigation zone for marine mammals and other applicable biological resources while performing their regular duties. *Mitigation Requirements:* • Mitigation Zones: —For Lookouts on small boats or aircraft: 500 yd around the detonation site during activities under positive control. —For Lookouts on small boats or aircraft: 1,000 yd around the detonation site during activities using time-delay fuses. —For divers: The underwater detonation location, which is defined as the sea space within the divers' range of visibility but no further than the mitigation zone specified for Lookouts on small boats or aircraft (500 yd or 1,000 yd depending on the charge type). • Prior to the initial start of the activity (when maneuvering on station for activities under positive control; 30 min for activities using time-delay firing devices): —Lookouts on small boats or aircraft will observe the mitigation zone for marine mammals; if marine mammals are observed, Navy personnel will relocate or delay the start of detonations or fuse initiation. • During the activity: —Lookouts on small boats or aircraft will observe the mitigation zone for marine mammals; if marine mammals are observed, Navy personnel will cease detonations or fuse initiation. —While performing their normal duties, during the activity. divers will observe the underwater detonation location for marine mammals. Divers will notify their supporting small boat or Range Safety Officer of marine mammal sightings at the underwater detonation location; if observed, Navy personnel will cease detonations or fuse initiation. —To the maximum extent practical depending on mission requirements, safety, and environmental conditions, boats will position themselves near the mid-point of the mitigation zone radius (but outside of the detonation plume and human safety zone), will position themselves on opposite sides of the detonation location (when two boats are used), and will travel in a circular pattern around the detonation location with one Lookout observing inward toward the detonation site and the other observing outward toward the perimeter of the mitigation zone. —If used, aircraft will travel in a circular pattern around the detonation location to the maximum extent practicable. —Navy personnel will not set time-delay firing devices to exceed 10 min. • Commencement/recommencement conditions after a marine mammal before or during the activity:

TABLE 39—PROCEDURAL MITIGATION FOR EXPLOSIVE MINE NEUTRALIZATION ACTIVITIES INVOLVING NAVY DIVERS—Continued

Procedural Mitigation Description
—Navy personnel will allow a sighted marine mammal to leave the underwater detonation location or mitigation zone (as applicable) prior to the initial start of the activity (by delaying the start) or during the activity (by not recommencing detonations or fuse initiation) until one of the following conditions has been met: (1) The animal is observed exiting the 500 yd or 1,000 yd mitigation zone; (2) the animal is thought to have exited the 500 yd or 1,000 yd mitigation zone based on a determination of its course, speed, and movement relative to the detonation site; or (3) the 500 yd or 1,000 yd mitigation zone ((for Lookouts on small boats or aircraft) and the underwater detonation location (for divers)) has been clear from any additional sightings for 10 min during activities under positive control with aircraft that have fuel constraints, or 30 min during activities under positive control with aircraft that are not typically fuel constrained and during activities using time-delay firing devices.
• After completion of an activity (for 30 min):
—Navy personnel will observe the vicinity of where detonations occurred; if any injured or dead marine mammals are observed, Navy personnel will follow established incident reporting procedures.
—If additional platforms are supporting this activity (*e.g.,* providing range clearance), Navy personnel positioned on these assets will assist in the visual observation of the area where detonations occurred.

TABLE 40—PROCEDURAL MITIGATION FOR MARITIME SECURITY OPERATIONS—ANTI-SWIMMER GRENADES

Procedural Mitigation Description
Stressor or Activity:
• Maritime Security Operations—Anti-Swimmer Grenades.
Number of Lookouts and Observation Platform:
• 1 Lookout positioned on the small boat conducting the activity.
• If additional platforms are participating in the activity, Navy personnel positioned on those assets (*e.g.,* safety observers, evaluators) will support observing the mitigation zone for marine mammals and other applicable biological resources while performing their regular duties.
Mitigation Requirements:
• Mitigation zone:
—200 yd around the intended detonation location.
• Prior to the initial start of the activity (*e.g.,* when maneuvering on station):
—Navy personnel will observe the mitigation zone for marine mammals; if marine mammals are observed, Navy personnel will relocate or delay the start of detonations.
• During the activity:
—Navy personnel will observe the mitigation zone for marine mammals; if marine mammals are observed, Navy personnel will cease detonations.
• Commencement/recommencement conditions after a marine mammal sighting before or during the activity:
—Navy personnel 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 detonations) 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 detonation location; (3) the mitigation zone has been clear from any additional sightings for 30 min; or (4) the intended detonation location has transited a distance equal to double that of the mitigation zone size beyond the location of the last sighting.
• 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), Navy personnel will observe the vicinity of where detonations occurred; if any injured or dead marine mammals are observed, Navy personnel will follow established incident reporting procedures.
—If additional platforms are supporting this activity (*e.g.,* providing range clearance), Navy personnel positioned on these assets will assist in the visual observation of the area where detonations occurred.

TABLE 41—PROCEDURAL MITIGATION FOR VESSEL MOVEMENT

Procedural Mitigation Description
Stressor or Activity:
• Vessel movement:
—The mitigation will not be applied if (1) the vessel's safety is threatened, (2) the vessel is restricted in its ability to maneuver (*e.g.,* during launching and recovery of aircraft or landing craft, during towing activities, when mooring, etc.), (3) the vessel is submerged or operated autonomously, or (4) when impractical based on mission requirements (*e.g.,* during Amphibious Assault and Amphibious Raid exercises).
Number of Lookouts and Observation Platform:
• 1 Lookout on the vessel that is underway.
Mitigation Requirements:
• Mitigation Zones:
—500 yd around whales.
—200 yd around other marine mammals (except bow-riding dolphins).
• During the activity:
—When underway, Navy personnel will observe the mitigation zone for marine mammals; if marine mammals are observed, Navy personnel will maneuver to maintain distance.

TABLE 41—PROCEDURAL MITIGATION FOR VESSEL MOVEMENT—Continued

Procedural Mitigation Description
• Additional requirements: —If a marine mammal vessel strike occurs, Navy personnel will follow the established incident reporting procedures.

TABLE 42—PROCEDURAL MITIGATION FOR TOWED IN-WATER DEVICES

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

TABLE 43—PROCEDURAL MITIGATION FOR SMALL-, MEDIUM-, AND LARGE-CALIBER NON-EXPLOSIVE PRACTICE MUNITIONS

Procedural Mitigation Description
Stressor or Activity: • Gunnery activities using small-, medium-, and large-caliber non-explosive practice munitions. —Mitigation applies to activities using a surface target. *Number of Lookouts and Observation Platform:* • 1 Lookout positioned on the platform conducting the activity. • Depending on the activity, the Lookout could be the same as the one described in Procedural Mitigation for Weapons Firing Noise (Table 31). *Mitigation Requirements:* • Mitigation Zone: —200 yd around the intended impact location. • Prior to the initial start of the activity (*e.g.,* when maneuvering on station): —Navy personnel will observe the mitigation zone for marine mammals; if marine mammals are observed, Navy personnel will relocate or delay the start of firing. • During the activity: —Navy personnel will observe the mitigation zone for marine mammals; if marine mammals are observed, Navy personnel will cease firing. • Commencement/recommencement conditions after a marine mammal sighting before or during the activity: —Navy personnel 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.

TABLE 44—PROCEDURAL MITIGATION FOR NON-EXPLOSIVE MISSILES AND ROCKETS

Procedural Mitigation Description
Stressor or Activity: • Aircraft-deployed non-explosive missiles and rockets. • Mitigation applies to activities using a surface target. *Number of Lookouts and Observation Platform:* • 1 Lookout positioned in an aircraft. *Mitigation Requirements:* • Mitigation Zone: —900 yd around the intended impact location. • Prior to the initial start of the activity (*e.g.,* during a fly-over of the mitigation zone): —Navy personnel will observe the mitigation zone for marine mammals; if marine mammals are observed, Navy personnel will relocate or delay the start of firing. • During the activity: —Navy personnel will observe the mitigation zone for marine mammals; if marine mammals are observed, Navy personnel will cease firing. • Commencement/recommencement conditions after a marine mammal sighting prior to or during the activity:

TABLE 44—PROCEDURAL MITIGATION FOR NON-EXPLOSIVE MISSILES AND ROCKETS—Continued

Procedural Mitigation Description
—Navy personnel 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 45—PROCEDURAL MITIGATION FOR NON-EXPLOSIVE BOMBS AND MINE SHAPES

Procedural Mitigation Description
Stressor or Activity: • Non-explosive bombs. • Non-explosive mine shapes during mine laying activities. *Number of Lookouts and Observation Platform:* • 1 Lookout positioned in an aircraft. *Mitigation Requirements:* • Mitigation Zone: —1,000 yd around the intended target. • Prior to the initial start of the activity (*e.g.,* when arriving on station): —Navy personnel will observe the mitigation zone for marine mammals; if marine mammals are observed, Navy personnel will relocate or delay the start of bomb deployment or mine laying. • During the activity (*e.g.,* during approach of the target or intended minefield location): —Navy personnel will observe the mitigation zone for marine mammals; if marine mammals are observed, Navy personnel will cease bomb deployment or mine laying. • Commencement/recommencement conditions after a marine mammal sighting prior to or during the activity: —Navy personnel 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.

Mitigation Areas

In addition to procedural mitigation, the Navy will implement mitigation measures within mitigation areas to avoid or minimize potential impacts on marine mammals. A full technical analysis (for which the methods were discussed above) of the mitigation areas that the Navy considered for marine mammals is provided in Appendix I (*Geographic Mitigation Assessment*) of the 2020 MITT FSEIS/OEIS. NMFS and the Navy took into account public comments received on the 2019 MITT DSEIS/OEIS and the 2019 MITT proposed rule, best available science, and the practicability of implementing additional mitigation measures and has enhanced the mitigation areas and mitigation measures, beyond the 2015–2020 regulations, to further reduce impacts to marine mammals.

Information on the mitigation measures that the Navy will implement within mitigation areas is provided in Table 46 (see below). The mitigation applies year-round unless specified otherwise in the table.

NMFS conducted an independent analysis of the mitigation areas that the Navy will implement and that are included in this rule, which are described below, in Table 46. NMFS' analysis indicates that the measures in these mitigation areas will reduce the likelihood or severity of adverse impacts to marine mammal species or their habitat in the manner described in this rule and are practicable for the Navy. NMFS is heavily reliant on the Navy's description of operational practicability, since the Navy is best equipped to describe the degree to which a given mitigation measure affects personnel safety or mission effectiveness, and is practical to implement. The Navy considers the measures in this rule to be practicable, and NMFS concurs. We further discuss the manner in which the Geographic Mitigation Areas in the rule will reduce the likelihood or severity of adverse impacts to marine mammal species or their habitat below.

TABLE 46—GEOGRAPHIC MITIGATION AREAS FOR MARINE MAMMALS IN THE MITT STUDY AREA

Mitigation Area Description
Stressor or Activity: • Sonar. • In-water Explosives. *Mitigation Requirements:* • Marpi Reef and Chalan Kanoa Reef Geographic Mitigation Areas (Figures 1 and 2): —Navy personnel will conduct a maximum annual total of 20 hours of surface ship hull-mounted MF1 mid-frequency active sonar from December 1 through April 30 within the Marpi Reef and Chalan Kanoa Reef Geographic Mitigation Areas combined (20 hours total for both areas). —Navy personnel will report the total hours of active sonar (all bins, by bin) used in the Marpi Reef and Chalan Kanoa Reef Geographic Mitigation Areas from December 1 through April 30 in the annual training and testing exercise report submitted to NMFS. —Navy personnel will not use in-water explosives in the Marpi Reef and Chalan Kanoa Reef Geographic Mitigation Areas year-round.

TABLE 46—GEOGRAPHIC MITIGATION AREAS FOR MARINE MAMMALS IN THE MITT STUDY AREA—Continued

Mitigation Area Description
—Navy personnel will issue an annual seasonal awareness notification message to alert Navy ships and aircraft operating in the Marpi Reef and Chalan Kanoa Reef Geographic Mitigation Areas to the possible presence of increased concentrations of humpback whales from December 1 through April 30. To maintain safety of navigation and to avoid interactions with large whales during transits, Navy personnel will instruct vessels to remain vigilant to the presence of humpback whales, that when concentrated seasonally, may become vulnerable to vessel strikes. Navy personnel will use the information from the awareness notification messages to assist their visual observation of applicable mitigation zones during training and testing activities and to aid in the implementation of procedural mitigation.
—Should national security present a requirement to conduct training or testing prohibited by the mitigation requirements specified in this table, Navy personnel will obtain permission from the appropriate designated Command authority prior to commencement of the activity. Navy personnel will provide NMFS with advance notification and include relevant information (*e.g.,* sonar hours, explosives use) in its annual activity reports submitted to NMFS.
• Agat Bay Nearshore Geographic Mitigation Area (Figure 3):
—Navy personnel will not use surface ship hull-mounted MF1 mid-frequency active sonar in the Agat Bay Nearshore Geographic Mitigation Area year-round.
—Navy personnel will not use in-water explosives in the Agat Bay Nearshore Mitigation Area year-round.
—Should national security require the use of MF1 surface ship hull-mounted mid-frequency active sonar or explosives prohibited by the mitigation requirements, Navy personnel will obtain permission from the appropriate designated Command authority prior to commencement of the activity. Navy personnel will provide NMFS with advance notification and include relevant information (*e.g.,* sonar hours, explosives use) in the annual activity reports submitted to NMFS.

Marpi Reef and Chalan Kanoa Reef Geographic Mitigation Areas

The proposed rule included a restriction on the use of explosives in these two mitigation areas, but no limitation on the use of active sonar. The final rule includes a 20-hour annual cap from December 1 through April 30 on the use of hull-mounted MF1 mid-frequency active sonar during training and testing activities within the Marpi Reef and Chalan Kanoa Reef Geographic Mitigation Areas (20 hours for both areas combined). In addition to the reporting of the total hours of surface ship hull-mounted MF1 mid-frequency active sonar, the Navy will now also report all sonar sources used (all bins, by bin) within the Chalan Kanoa and Marpi Reef Geographic Mitigation Areas from December 1 to April 30 in the annual MITT classified Exercise Reports. This will provide NMFS with more specific data in order to evaluate sonar use with current mitigation measures in the geographic mitigation areas and to determine if any changes are needed through Adaptive Management.

While the shallower water within the Chalan Kanoa Reef and Marpi Reef Geographic Mitigation Areas has not been a high-use area for Navy MTEs and ASW training events as the area is considered generally less suitable (Navy training is more typically conducted beyond 3 nmi from shore and in waters greater than 200-m depth, with MTEs typically far offshore), the Navy has stressed the broader need for flexibility as well as the specific need not to restrict training areas entirely in this part of the MITT Study Area given the proximity to forward deployed operations (*i.e.,* U.S. 7th fleet's continuous presence in the Indo-Pacific region, which is a National Defense Strategy priority theater of operation) and the need to have the option to conduct training quickly and to respond to emergent national security threats.

Following extensive discussions with the Navy through which more specific information about the Navy's likely activity in the Chalan Kanoa Reef and Marpi Reef Geographic Mitigation Areas was provided, new information about humpback whale occurrence in the two Geographic Mitigation Areas emerged, and new analyses were conducted (see the *Estimated Take of Marine Mammals* section). NMFS has included a requirement for the Navy to implement the annual 20-hr cap from December 1 through April 30 on hull-mounted MF1 MFAS within the two Geographic Mitigation Areas to minimize sonar exposure and reduce take by Level B harassment of humpback whales in this important reproductive area.

To determine the extent of the Marpi Reef and Chalan Kanoa Reef Geographic Mitigation Areas, the Navy obtained all humpback whale sighting data from 2015–2019 in the Marianas from NMFS' PIFSC (Figures 1 and 2). As described in the *Description of Marine Mammals and Their Habitat in the Area of the Specified Activities* section of the rule, humpback whales, including mother-calf pairs, have been seasonally present in shallow waters (out to the 400-m isobath) and the science indicates the areas may be of biological importance to humpback whales for biologically important life processes associated with reproduction (*e.g.,* breeding, birthing, and nursing) during the winter months, generally December through April.

Calves are considered more sensitive and susceptible to adverse impacts from Navy stressors than adults (especially given their lesser weight and the association between weight and explosive impacts), as well as being especially reliant upon mother-calf communication for protection and guidance. Both gestation and lactation increase energy demands for mothers. Breeding activities typically involve vocalizations and complex social interactions that can include violent interactions between males. Reducing exposure of humpback whales to explosive detonations and sonar use in the Marpi Reef and Chalan Kanoa Reef Geographic Mitigation Areas during the months of December through April is expected to reduce the likelihood of impacts that could affect reproduction or survival of individual animals, by minimizing impacts on calves during this sensitive life stage, avoiding or minimizing the additional energetic costs to mothers of avoiding or leaving the area during explosives exercises and sonar use, and minimizing the chances that important breeding behaviors are interrupted to the point that reproduction is inhibited or abandoned for the year, or otherwise interfered with.

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Figure 1. Marpi Reef Geographic Mitigation Area.

Figure 2. Chalan Kanoa Reef Geographic Mitigation Area.

Agat Bay Nearshore Geographic Mitigation Area

The Agat Bay Nearshore Geographic Mitigation Area encompasses the shoreline between Tipalao, Dadi Beach, and Agat on the west coast of Guam, with a boundary across the bay enclosing an area of approximately 5 km^2 in relatively shallow waters (less than 100 m). The boundaries of the Agat Bay Nearshore Geographic Mitigation Area (Figure 3) were defined by Navy scientists based on spinner dolphin sightings documented during small boat surveys from 2010 through 2014. Spinner dolphins have been the most frequently encountered species during small boat reconnaissance surveys conducted in the Mariana Islands since 2010. Consistent with more intensive studies completed for the species in the Hawaiian Islands, island-associated spinner dolphins are expected to occur in shallow water resting areas (about 50 m deep or less) in the morning and throughout the middle of the day, moving into deep waters offshore during the night to feed (Heenehan *et al.,* 2016b; Heenehan *et al.,* 2017a; Hill *et al.,* 2010; Norris and Dohl, 1980). The best available science, as described above, indicates that Agat Bay is important resting habitat for spinner dolphins.

Behavioral disruptions during resting periods can adversely impact health and energetic budgets by not allowing spinner dolphins to get the needed rest and/or by creating the need to travel and expend additional energy to find other suitable resting areas. Avoiding sonar and explosives in this geographic mitigation area year-round reduces the likelihood of energetic impacts that could accrue and affect reproduction or survival of these individuals.

Figure 3: Agat Bay Nearshore Geographic Mitigation Area.

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Mitigation Conclusions

NMFS has carefully evaluated the Navy's mitigation measures—many of which were developed with NMFS' input during the previous phases of Navy training and testing authorizations but several of which are new since implementation of the 2015 to 2020 regulations—and considered a broad range of other measures (*i.e.,* the measures considered but eliminated in the 2020 MITT FSEIS/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 measures, as well as other measures considered by the Navy and NMFS, NMFS has determined that the mitigation measures included in this final rule 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. Thus, NMFS concludes that the mitigation measures outlined in this final rule satisfy the statutory standard and that any adverse impacts that remain cannot practicably be further mitigated.

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.

Although the Navy has been conducting research and monitoring in the MITT Study Area for over 20 years, it developed a formal marine species monitoring program in support of the MMPA and ESA authorizations 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.navymarinespeciesmonitoring.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 marine mammals in the MITT Study Area; the likely exposure of marine mammals to stressors of concern in the MITT Study Area; the response of marine mammals to exposures to stressors; the consequences of a particular marine mammal response to their individual fitness and, ultimately, populations; and the effectiveness of implemented mitigation measures. Taken together, mitigation and monitoring comprise the Navy's integrated approach for reducing environmental impacts from the specified activities. The Navy's overall monitoring approach 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.

Integrated Comprehensive Monitoring Program (ICMP)

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

Past and Current Monitoring in the MITT Study Area

The monitoring program has undergone significant changes since the first rule was issued for the MITT Study Area in 2009, which highlights the monitoring program's evolution through the process of adaptive management. The monitoring program developed for the first cycle of environmental compliance documents (*e.g.,* U.S. Department of the Navy, 2008) utilized effort-based compliance metrics that were somewhat limiting. Through adaptive management discussions, the Navy designed and conducted monitoring studies according to scientific objectives, thereby eliminating basing requirements upon metrics of level-of-effort. Furthermore, refinements of scientific objective have continued through the latest authorization cycle.

Progress has also been made on the conceptual framework categories from the Scientific Advisory Group for Navy Marine Species Monitoring (U.S. Department of the Navy, 2011c), ranging from occurrence of animals, to their exposure, response, and population consequences. The Navy continues to manage the Atlantic and Pacific program as a whole, with monitoring in each range complex taking a slightly different but complementary approach. The Navy has continued to use the approach of layering multiple simultaneous components in many of the range complexes to leverage an increase in return of the progress toward answering scientific monitoring questions. This includes, in the Marianas for example, (a) glider deployment in offshore areas, (b) analysis of existing passive acoustic monitoring datasets, (c) small boat surveys using visual, biopsy, and satellite tagging and (d) seasonal, humpback whale specific surveys.

Specific monitoring under the 2015–2020 regulations includes:

▪ Review of the available data and analyses in the MITT Study Area 2010 through February 2018 (2019a).

▪ The continuation of annual small vessel nearshore surveys, sightings, satellite tagging, biopsy and genetic analysis, photo-identification, and opportunistic acoustic recording off Guam, Saipan, Tinian, Rota, and Aguigan in partnership with NMFS (Hill *et al.,* 2015; Hill *et al.,* 2016b; Hill *et al.,* 2017a; Hill *et al.,* 2018, Hill *et al.,* 2019b). The satellite tagging and genetic analyses have resulted in the first information discovered on the movement patterns, habitat preference, and population structure of multiple odontocete species in the MITT Study Area.

▪ Since 2015, the addition of a series of small vessel surveys in the winter season dedicated to humpback whales has provided new information relating to the occurrence, calving behavior, and population identity of this species (Hill *et al.,* 2016a; Hill *et al.,* 2017b), which had not previously been sighted during the small vessel surveys in the summer or winter. This work has included sighting data, photo ID matches of individuals to other areas demonstrating migration as well as re-sights within the Marianas across different years, and the collection of biopsy samples for genetic analyses of populations.

▪ The continued deployment of passive acoustic monitoring devices and analysis of acoustic data obtained using bottom-moored acoustic recording devices deployed by NMFS has provided information on the presence and seasonal occurrence of mysticetes, as well as the occurrence of cryptic odontocetes typically found offshore, including beaked whales and *Kogia spp.* (Hill *et al.,* 2015; Hill *et al.,* 2016a; Hill *et al.,* 2016b; Hill *et al.,* 2017a; Munger *et al.,* 2015; Norris *et al.,* 2017; Oleson *et al.,* 2015; Yack *et al.,* 2016).

▪ Acoustic surveys using autonomous gliders were used to characterize the occurrence of odontocetes and mysticetes in abyssal offshore waters near Guam and CNMI, including species not seen in the small vessel visual survey series such as killer whales and Risso's dolphins. Analysis of collected data also provided new information on the seasonality of baleen whales, patterns of beaked whale occurrence and potential call variability, and identification of a new unknown marine mammal call (Klinck *et al.,* 2016b; Nieukirk *et al.,* 2016).

▪ Visual surveys were conducted from a shore-station at high elevation on the north shore of Guam to document the nearshore occurrence of marine mammals in waters where small vessel visual surveys are challenging due to regularly high sea states (Deakos & Richlen, 2015; Deakos et al., 2016).

▪ Analysis of archive data that included marine mammal sightings during Guam Department of Agriculture Division of Aquatic and Wildlife Resources aerial surveys undertaken between 1963 and 2012 (Martin et al., 2016).

▪ Analysis of archived acoustic towed-array data for an assessment of the abundance and density of minke whales (Norris et al., 2017), abundance and density of sperm whales (Yack et al., 2016), and the characterization of sei and humpback whale vocalizations (Norris et al., 2014).

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 procedural mitigations as monitoring. Data are collected by shipboard personnel on hours spent training, hours of observation, hours of sonar, 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.

NMFS has received multiple years' worth of annual exercise and monitoring reports addressing active sonar use and explosive detonations within the MITT 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 within the MITT 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.*

Prior to Phase I monitoring, the information on marine mammal presence and occurrence in the MIRC was largely absent and limited to anecdotal information from incidental sightings and stranding events (U.S. Department of the Navy, 2005). In 2007, the Navy funded the Mariana Islands Sea Turtle and Cetacean Survey (MISTCS) (U.S. Department of the Navy, 2007) to proactively support the baseline data feeding the MIRC EIS (U.S. Department of the Navy, 2010b). The MISTCS research effort was the first systematic marine survey in these waters. This survey provided the first empirically-based density estimates for marine mammals (Fulling *et al.,* 2011). In cooperation with NMFS, the Phase I monitoring program beginning in 2010 was designed to address basic occurrence-level questions in the MIRC, whereas monitoring the impacts of Navy training such as exposure to mid-frequency active sonar was planned for other Navy range complexes where marine mammal occurrence was already better characterized.

This emphasis on studying occurrence continued through Phase I and II monitoring in the MIRC, and combined various complementary methodologies. Small vessel visual surveys collected occurrence information, and began building the first individual identification catalog for multiple species (Hill *et al.,* 2014). During these visual surveys, biopsies were collected for genetic analysis and satellite tags were also applied, resulting in a progressively improving picture of the habitat use and population structure of various species. Deep water passive acoustic deployments, including autonomous gliders with passive acoustic recorders, added complementary information on species groups such as baleen whales and beaked whales that were rarely sighted on the vessel surveys (Klinck *et al.,* 2015; Munger *et al.,* 2014; Munger *et al.,* 2015; Nieukirk *et al.,* 2016; Norris *et al.,* 2015). Other methodologies were also explored to fill other gaps in waters generally inaccessible to the small boat surveys including a shore-station to survey waters on the windward side of Guam (Deakos *et al.,* 2016). When available, platforms of opportunity on large vessels were utilized for visual survey and tagging (Oleson and Hill, 2010b).

At the close of Phase II monitoring, establishing the fundamentals of marine mammal occurrence in the MITT Study Area had been significantly advanced. The various visual and acoustic platforms have encountered nearly all of the species that are expected to occur in the MITT Study Area. The photographic catalogs have progressively grown to the point that abundance analyses may be attempted for the most commonly-encountered species. Beyond occurrence, questions related to exposure to Navy training have been addressed, such as utilizing satellite tag telemetry to evaluate overlap of habitat use with underwater detonation training sites. Also during Phase II monitoring, a pilot study to investigate reports of humpback whales occasionally occurring off Saipan has proven fruitful, yielding confirmation of this species there, photographic matches of individuals to other waters in the Pacific Ocean, as well as genetics data that provide clues as to the population identity of these animals (Hill *et al.,* 2016a; Hill *et al.,* 2017b). Importantly, the compiled data were also used to inform proposals for new mitigation areas for this rule and associated consultations.

The ongoing regional species-specific study questions and results from recent efforts are publicly available on the Navy's Monitoring Program website. With basic occurrence information now well-established, the primary goal of monitoring in the MITT Study Area under this rule will be to close out these studies with final analyses. As the collection and analysis of basic occurrence data across Navy ranges (including MITT) is completed, the focus of monitoring across all Navy range complexes will progressively move toward addressing the important questions of exposure and response to mid-frequency active sonar and other Navy training, as well as the consequences of those exposures, where appropriate. The Navy's hydrophone-instrumented ranges have proven to be a powerful tool towards this end and because of the lack of such an instrumented range in the MITT Study Area, monitoring investments are expected to begin shifting to other Navy range complexes as the currently ongoing research efforts in the Mariana Islands are completed. Any future monitoring results for the MITT Study Area will continue to be published on the Navy's Monitoring Program website, as well as discussed during annual adaptive management meetings between NMFS and the Navy.

The Navy's marine species monitoring program typically supports several monitoring projects in the MITT Study Area at any given time. Additional details on the scientific objectives for each project 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 monitoring projects going into 2020 include:

- Co-fund (with NMFS' Pacific Island Fisheries Science Center) the Pacific Marine Assessment Program for Protected Species (PACMAPPS) Mariana Islands large vessel visual and acoustic survey in spring-summer 2021 to help document marine mammal (including beaked whale) occurrence, abundance, and distribution in the Mariana Islands. This effort will include deployments of a towed array as well as floating passive acoustic buoy;
- Humpback whale visual survey at Farallon De Medinilla;
- Continued coordination with NMFS' PIFSC for small boat humpback

whale surveys at other Mariana Islands (*e.g.,* Saipan);

• Analysis of previously deployed passive acoustic sensors for detection of humpback whale vocalizations at other islands (*e.g.,* Pagan);

• Conduct additional occurrence surveys for beaked whales within the Mariana Islands beginning in fall 2021 or winter-spring 2022 (this allows assessment of PACMAPPs beaked whale analysis to inform decision on deployment locations). This is a new monitoring project since publication of the proposed rule; and

• Funding to researchers with PIFSC for detailed necropsy support for select stranded marine mammals in Hawaii and the Mariana Islands.

Since publication of the proposed rule, the decision has been made that the Navy will not be able to fund support for long-term satellite tag tracking of humpback whales.

The Navy has also committed to a set of actions under the terms of this rule specifically to assist in improving the science on beaked whales (some of which will also benefit other species) and facilitate potential adaptive management actions (*e.g.,* modification of mitigation or monitoring measures) relative to beaked whales in the MITT Study Area:

• Continue to fund additional stranding response/necropsy analyses for the Pacific Islands region. In 2018, the Navy funded the University of Hawaii for two years of additional necropsy support in the MITT Study Area and Hawaii and planned another funding cycle in Fiscal Year 2020. Complementing this, the Navy provided funding for additional stranding data analysis for all species in the MITT Study Area and HRC.

• Fund research on a framework to improve the analysis of single and mass stranding events, including the development of more advanced statistical methods to better characterize the uncertainty associated with data parameters. In addition, the Navy is exploring whether additional funding is available for the Center for Naval Analysis to research improvements to statistical analysis. As of July 2020, the status of this request was still pending.

• Increased analysis for any future beaked whale stranding in the Mariana Islands to include detailed Navy review of available records of sonar use. In the previous regulations (2015–2020), reports included time and location of a stranding. For these regulations, the Navy will provide detailed record reviews including participating units/commands to gain a better idea of what sonar was used and when, For example in the previous regulations, the Navy's report would include if active sonobuoys were deployed, but not information on whether any active pings were transmitted.

• Monitor beaked whale occurrence within select portions of the MITT Study Area starting in 2022, so as to not duplicate efforts from item number 1 above.

• Include Cuvier's beaked whales as a priority species for analysis under a 2020–2023 Navy research-funded program entitled Marine Species Monitoring for Potential Consequences of Disturbance (MSM4PCOD). MSM4PCOD will explore how Navy funded monitoring priorities can be adjusted to provide the best scientific information supporting Population Consequence of Disturbance analysis. The Navy (Living Marine Resources Program) has already funded this program for Fiscal Years 2018–2022 and more information is available here *https://www.navfac.navy.mil/content/dam/navfac/Specialty%20Centers/Engineering%20and%20Expeditionary%20Warfare%20Center/Environmental/lmr/LMRFactSheet_Project43.pdf.* The prioritization for beaked whales was the result of a virtual conference in May 2020. Cuvier's beaked whales in Southern California and Blainville's beaked whales in the Hawaii Range Complex have among the most robust population and exposure studies to date in the Pacific. Given likely similarities between Cuvier's beaked whales across the Pacific, this program will help identify the best way forward for monitoring for Cuvier's beaked whales in the Mariana Islands.

Adaptive Management

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

The reporting requirements associated with this rule are designed to provide NMFS with monitoring data from the previous year to allow NMFS to consider whether any changes 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 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 planned 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.*

Beaked Whale Expert Panel

As noted in the discussion of beaked whale mortality in the *Comments and Responses* section, as well as the *Monitoring* section above, both NMFS and the Navy acknowledge the need for more data and continuing discussion on the topic of beaked whales, mitigation, and monitoring. Accordingly, as recommended by public commenters, the Navy has agreed to fund and co-organize with NMFS an expert panel to provide recommendations on scientific data gaps and uncertainties for further protective measure consideration to minimize the impact of Navy training and testing activities on beaked whales in the Mariana Islands. Two years of additional data will be collected for beaked whales in the MITT Study Area prior to the expert panel meeting.

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.*

Currently, there are several different reporting requirements pursuant to the 2015–2020 regulations. All of these reporting requirements will continue under this rule for the seven-year period.

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/national/marine-mammal-protection/incidental-take-authorizations-military-readiness-activities.*

Annual MITT Monitoring Report

The Navy will submit an annual report to NMFS of the MITT Study Area monitoring which will be included in a Pacific-wide monitoring report including results specific to the MITT Study Area describing the implementation and results from the previous calendar year. Data collection methods will be standardized across Pacific Range Complexes including the MITT, HSTT, NWTT, and Gulf of Alaska (GOA) Study Areas to the best extent practicable, to allow for comparison in different geographic locations. The report must be submitted to the Director, Office of Protected Resources, NMFS, either within three months after the end of the calendar year, or within three months after the conclusion of the monitoring year, to be determined by the Adaptive Management process. 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 submittal of the draft if NMFS does not provide comments on the draft report. Such a report describes progress of knowledge made with respect to monitoring study questions across multiple Navy ranges associated with the ICMP. Similar study questions will be treated together so that progress on each topic is summarized across multiple Navy ranges. The report need not include analyses and content that does not provide direct assessment of cumulative progress on the monitoring study question. This will allow the Navy to provide a cohesive monitoring report covering multiple ranges (as per ICMP goals), rather than entirely separate reports for the MITT, HSTT, NWTT, and GOA Study Areas.

Annual MITT Training and Testing Exercise Report

Each year, the Navy will submit a preliminary report (Quick Look Report) to NMFS detailing the status of authorized sound sources within 21 days after the anniversary of the date of issuance of the LOA. The Navy will also submit a detailed report (MITT Annual Training and Testing Exercise Report) to NMFS within three months after the one-year anniversary of the date of issuance of the LOA. If desired, the Navy may elect to consolidate the MITT Annual Training and Testing Exercise Report with other exercise reports from other range complexes in the Pacific Ocean for a single Pacific Exercise Report. 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 submittal of the draft if NMFS does not provide comments on the draft report. The annual report will contain information on MTEs, Sinking Exercise (SINKEX) events, and a summary of all sound sources used (total hours or quantity of each bin of sonar or other non-impulsive source; total annual number of each type of explosive exercises; and total annual expended/detonated rounds (missiles, bombs, sonobuoys, etc.) for each explosive bin). The annual report will also specifically include information on sound sources used (*i.e.,* total hours of operation of all active sonar (all bins, by bin)) used in the Marpi Reef and Chalan Kanoa Reef Geographic Mitigation Areas from December 1 to April 30. The annual report will also contain both current year's sonar and explosive use data as well as cumulative sonar and explosive use quantity from previous years' reports Additionally, if there were any changes to the sound source 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 2020 MITT FSEIS/OEIS and MMPA final rule. See the regulations below for more 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 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. 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.

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

Specific sub-reporting in these annual reports will include:

- *Sonar Exercise Notification:* The Navy will submit an electronic report to NMFS within fifteen calendar days after the completion of any major training exercise indicating: Location of the exercise; beginning and end dates of the exercise; and type of exercise.

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 (currently, 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).

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 (50 CFR 216.103). A negligible impact finding is based on the lack of likely adverse effects on annual rates of recruitment or survival (*i.e.,* population-level effects). An estimate of the number of takes alone is not enough information on which to base an impact determination. In considering how Level A harassment or Level B harassment (as presented in Table 28) 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. We also assess the number, intensity, and context of estimated takes by evaluating this information relative to population status. Consistent with the 1989 preamble for NMFS' 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, we identified the subset of potential effects that are expected to rise to the level of takes both annually and over the seven-year period covered by this rule, and then identified the maximum number of harassment takes that are reasonably expected to occur 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 rule we evaluated the likely impacts of the enumerated maximum number of harassment takes reasonably expected to occur, and also authorized, 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. Because the marine mammal populations in the MITT Study Area have not been assigned to stocks, all negligible impact analysis and determinations are at the species level.

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

The Specified Activities reflect representative 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 hours, items, or detonations that may vary from year to year, but take totals will not exceed the seven-year totals indicated in Table 28. We base our analysis and negligible impact determination on the maximum number of takes that are reasonably expected to occur and are authorized, although, as stated before, the number of takes are only a part of the analysis, which includes extensive qualitative consideration of other contextual factors that influence the degree of impact of the takes on the affected individuals. To avoid repetition, we provide some general analysis in this *General Negligible Impact Analysis* section that applies to all the species listed in Table 28, 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 and Odontocetes, 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, 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.

Harassment

The Navy's harassment take request is based on its model, as well as the quantitative assessment of mitigation, which NMFS reviewed and concurs appropriately predict the maximum amount of harassment that is likely to occur. The model calculates sound energy propagation from sonar, other active acoustic sources, and explosives during naval activities; the sound or impulse received by animat dosimeters representing marine mammals distributed in the area around the modeled activity; and whether the sound or impulse energy received by a marine mammal exceeds the thresholds for effects. Assumptions in the Navy model intentionally err on the side of overestimation when there are unknowns. Naval activities are modeled as though they would occur regardless of proximity to marine mammals, meaning that no mitigation is considered (*e.g.,* no power down or shut down) and without any avoidance of the activity by the animal. The final step of the quantitative analysis of acoustic effects, which occurs after the modeling, is to consider the implementation of mitigation and the possibility that marine mammals would avoid continued or repeated sound exposures. NMFS provided input to, 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 was used to quantify harassment takes for this rule.

Generally speaking, the Navy and NMFS anticipate more severe effects from takes resulting from exposure to higher received levels (though this is in no way a strictly linear relationship for behavioral effects throughout species, individuals, or circumstances) and less severe effects from takes resulting from exposure to lower received levels. However, there is also growing evidence of the importance of distance in predicting marine mammal behavioral response to sound—*i.e.,* sounds of a similar level emanating from a more distant source have been shown to be less likely to evoke a response of equal magnitude (DeRuiter 2012, 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 minutes) or, in some cases, longer durations of exposure within a day. Some individuals may experience multiple instances of take (meaning over multiple days) over the course of the year, which means that the number of individuals taken is smaller than the total estimated takes. Generally speaking, the higher the number of takes as compared to the population abundance, the more repeated takes of individuals are likely, and the higher the actual percentage of individuals in the population that are likely taken at least once in a year. We look at this comparative metric to give us a relative sense of where a larger portion of a species is being taken by Navy activities, where there is a higher likelihood that the same individuals are being taken across multiple days, and where that number of days might be higher or more likely sequential. Where the number of instances of take is 100 percent or less of the abundance and there is no information to specifically suggest that a small subset of animals will be repeatedly taken over a high

number of sequential days, the overall magnitude is generally considered relatively low, as it could on one extreme mean that every individual taken will be taken on no more than one day (a very minimal impact) or, more likely, that some smaller portion of individuals are taken on one day annually, some are taken on a few not likely sequential days annually, and some are not taken at all.

In the ocean, the use of sonar and other active acoustic sources is often transient and is unlikely to repeatedly expose the same individual animals within a short period, for example within one specific exercise. However, for some individuals of some species repeated exposures across different activities could occur over the year, especially where events occur in generally the same area with more resident species. In short, for some species we expect that the total anticipated takes represent exposures of a smaller number of individuals of which some will be exposed multiple times, but based on the nature of the Navy activities and the movement patterns of marine mammals, it is unlikely that individuals from most species will be taken over more than a few non-sequential days. This means that even where repeated takes of individuals may occur, they are more likely to result from non-sequential exposures from different activities. As described elsewhere, the nature of the majority of the exposures is expected to be of a less severe nature and based on the numbers it is likely that any individual exposed multiple times is still only taken on a small percentage of the days of the year.

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 proposed rule 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. Takes by Level B harassment, then, may have a stress-related physiological component as well; however, we would not expect the Navy's generally short-term, intermittent, and (typically in the case of sonar) transitory activities to create conditions of long-term, continuous noise leading to long-term physiological stress responses in marine mammals that could affect reproduction or survival.

Behavioral Response

The estimates calculated using the behavioral response function do not differentiate between the different types of behavioral responses that rise to the level of take by Level B harassment. 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 at what received levels and distances those responses have occurred, and used the indicated literature to build biphasic behavioral response curves and cutoff distances that are used 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. We therefore consider the available activity-specific, environmental, and species-specific information to determine the likely nature of the modeled behavioral responses and the potential fitness consequences for affected individuals.

Use of sonar and other transducers will typically be transient and temporary. The majority of acoustic effects to individual animals from sonar and other active sound sources during testing and training activities will be primarily from ASW events. It is important to note that although ASW is one of the warfare areas of focus during MTEs, there are significant periods when active ASW sonars are not in use. Nevertheless, behavioral reactions are assumed more likely to be significant during MTEs than during other ASW activities due to the duration (*i.e.,* multiple days), scale (*i.e.,* multiple sonar platforms), and use of high-power hull-mounted sonar in the MTEs. In other words, 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, 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 expected to occur infrequently.

To help assess this, for sonar (LFAS/MFAS/HFAS) used in the MITT Study Area, the Navy provided information estimating the percentage of animals that may be taken by Level B harassment under each behavioral response function that would occur within 6-dB increments (percentages discussed below in the *Group and Species-Specific Analyses* section). As mentioned above, all else being equal, an animal's exposure to a higher received level is more likely to result in a behavioral response that is more likely to lead to adverse effects, which could more likely accumulate to impacts on reproductive success or survivorship of the animal, but other contextual factors (such as distance) are important also. 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 between 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 might necessarily 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). Henderson *et al.* (2016) found that ongoing smaller scale events had little to no impact on foraging dives for Blainville's beaked whale, while multi-day training events may decrease foraging behavior for Blainville's beaked whale (Manzano-Roth *et al.,* 2016). Consequently, a behavioral response lasting less than one day and not recurring on subsequent days is not considered severe unless it could directly affect reproduction or survival (Southall *et al.,* 2007). Note that there is a difference between multiple-day substantive behavioral reactions and multiple-day anthropogenic activities. For example, just because an at-sea exercise lasts for multiple days does not necessarily mean that individual animals are exposed to those exercises for multiple days or, further, exposed in a manner resulting in a sustained multiple day substantive behavioral response. Large multi-day Navy exercises such as ASW activities, typically include vessels that are continuously moving at speeds typically 10–15 kn, or higher, and likely cover large areas that are relatively far from shore (typically more than 3 nmi from shore) and in waters greater than 600 ft deep. Additionally marine mammals are moving as well, which will make it unlikely that the same animal could remain in the immediate vicinity of the ship for the entire duration of the exercise. Further, the Navy does not necessarily operate active sonar the entire time during an exercise. While it is certainly possible that these sorts of exercises could overlap with individual marine mammals multiple days in a row at levels above those anticipated to result in a take, because of the factors mentioned above, it is considered unlikely for the majority of takes. However, it is also worth noting that the Navy conducts many different types of noise-producing activities over the course of the year and it is likely that some marine mammals will be exposed to more than one and taken on multiple days, even if they are not sequential.

That said, the MITT Study Area is different than other Navy ranges where there can be a significant number of Navy surface ships with hull-mounted sonar homeported. In the MITT Study Area, there are no homeported surface ships with hull-mounted sonars permanently assigned. There is no local unit level training in the MITT Study Area for homeported ships such as the case for other ranges. Instead, Navy activities from visiting and transiting vessels are much more episodic in the MITT Study Area. Therefore, there could be long gaps between activities (*i.e.,* weeks, months) in the MITT Study Area.

Durations of Navy activities utilizing tactical sonar sources and explosives vary and are fully described in Appendix A (*Training and Testing Activity Descriptions*) of the 2020 MITT FSEIS/OEIS. Sonar used during ASW will impart the greatest amount of acoustic energy of any category of sonar and other transducers analyzed in the Navy's rulemaking/LOA application and include hull-mounted, towed, line array, sonobuoy, helicopter dipping, and torpedo sonars. Most ASW sonars are MFAS (1–10 kHz); however, some sources may use higher or lower frequencies. ASW training activities using hull-mounted sonar planned for the MITT Study Area generally last for only a few hours (see Table 3). Some ASW training and testing can generally last for 2–10 days, or a 10-day exercise is typical for an MTE-Large Integrated ASW (see Table 3). For these multi-day exercises there will typically be extended intervals of non-activity in between active sonar periods. Because of the need to train in a large variety of situations, the Navy does not typically conduct successive ASW exercises in the same locations. Given the average length of ASW exercises (times of sonar use) and typical vessel speed, combined with the fact that the majority of the cetaceans would not likely remain in proximity to the sound source, it is unlikely that an animal would be exposed to LFAS/MFAS/HFAS at levels or durations likely to result in a substantive response that would then be carried on for more than one day or on successive days.

Most planned explosive events are scheduled to occur over a short duration (1–8 hours); however, the explosive component of the activity only lasts for minutes (see Table 3). Although explosive exercises may sometimes be conducted in the same general areas repeatedly, because of their short duration and the fact that they are in the open ocean and animals can easily move away, it is similarly unlikely that animals would be exposed for long, continuous amounts of time, or demonstrate sustained behavioral responses. Although SINKEXs may last for up to 48 hrs (4–8 hrs, possibly 1–2 days), they are almost always completed in a single day and only one event is planned annually for the MITT training activities. They are stationary and conducted in deep, open water where fewer marine mammals would typically be expected to be encountered. They also have shutdown procedures and rigorous monitoring, *i.e.,* during the activity, the Navy conducts passive acoustic monitoring and visually observes for marine mammals 90 min prior to the first firing, during the event, and 2 hrs after sinking the vessel. 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 equated, as appropriate, to harassment takes (and, for PTS, further corrected to account for mitigation and avoidance). As further noted, for active acoustics it is more challenging to parse out the number of individuals taken by Level B harassment and the number of times those individuals are taken from this larger number of instances. One method that NMFS can use to help better understand the overall scope of the impacts is to compare these total instances of take against the abundance of that 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. Where the number of instances of take exceed the abundance of the population (*i.e.,* are over 100 percent), multiple takes of some individuals are predicted and expected to occur within a year. Generally

speaking, the higher the number of takes as compared to the population abundance, the more multiple takes of individuals are likely, and the higher the actual percentage of individuals in the population that are likely taken at least once in a year. We look at this comparative metric to give us a relative sense of where larger portions of the species or stocks are being taken by Navy activities and where there is a higher likelihood that the same individuals may be taken across multiple days and where that number of days might be higher. It also provides a relative picture of the scale of impacts to each species.

In the ocean, unlike a modeling simulation with static animals, the use of sonar and other active acoustic sources is often transient, and is unlikely to repeatedly expose the same individual animals within a short period, for example within one specific exercise. However, some repeated exposures across different activities could occur over the year with more resident species. Nonetheless, the episodic nature of Navy activities in the MITT Study Area would mean less frequent exposures as compared to some other ranges. While select offshore areas in the MITT Study Area are used more frequently for ASW and other activities, these are generally further offshore than where most island associated resident populations would occur and instead would be in areas with more transitory species. In short, we expect that the total anticipated takes represent exposures of a smaller number of individuals of which some could be exposed multiple times, but based on the nature of the Navy's activities and the movement patterns of marine mammals, it is unlikely that any particular subset would be taken over more than a few non-sequential days.

In using the relationship between predicted instances of take and the population abundance to help estimate the proportion of a population likely taken and the number of days over which some individuals may be taken, it is important to choose an appropriate population estimate against which to make the comparison. The SARs, where available, provide the official population estimate for a given species or stock in U.S. waters in a given year (and are typically based solely on the most recent survey data). When the stock is known to range outside of U.S. EEZ boundaries, population estimates based on surveys conducted only within the U.S. EEZ are known to be underestimates. The marine mammal populations in the MITT Study Area have not been assigned to specific stocks and there are no associated SARs. There is also no information on trends for any of these species. Nonetheless, the information used to estimate take included the best available survey abundance data to model density layers. Further, in calculating the percentage of takes versus abundance for each species in order to assist in understanding both the percentage of the species affected, as well as how many days across a year individuals could be taken, we used the data most appropriate for the situation. The survey data used to calculate abundance in the MITT Study Area is described in the report *Navy Marine Species Density Database Phase III for the Mariana Islands Training and Testing Study Area* (Navy 2018).

Temporary Threshold Shift

NMFS and the Navy have estimated that all species of marine mammals may sustain some level of TTS from active sonar. As discussed in the proposed rule in the *Potential Effects of Specified Activities on Marine Mammals and Their Habitat,* 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. Tables 49–53 indicate the number of takes by TTS that may be incurred by different species from exposure to active sonar and explosives. The TTS sustained by an animal is primarily classified by three characteristics:

1. Frequency—Available data (of mid-frequency hearing specialists exposed to mid- or high-frequency sounds; Southall *et al.,* 2007) suggest that most TTS occurs in the frequency range of the source up to one octave higher than the source (with the maximum TTS at ½ octave above). The Navy's MF sources, which are the highest power and most numerous sources and the ones that cause the most take, utilize the 1–10 kHz frequency band, which suggests that if TTS were to be induced by any of these MF sources it would be in a frequency band somewhere between approximately 2 and 20 kHz, which is in the range of communication calls for many odontocetes, but below the range of the echolocation signals used for foraging. There are fewer hours of HF source use and the sounds would attenuate more quickly, plus they have lower source levels, but if an animal were to incur TTS from these sources, it would cover a higher frequency range (sources are between 10 and 100 kHz, which means that TTS could range up to 200 kHz), which could overlap with the range in which some odontocetes communicate or echolocate. However, HF systems are typically used less frequently and for shorter time periods than surface ship and aircraft MF systems, so TTS from these sources is unlikely. There are fewer LF sources and the majority are used in the more readily mitigated testing environment, but TTS from LF sources would most likely occur below 2 kHz, which is in the range where many mysticetes communicate and also where other non-communication auditory cues are located (waves, snapping shrimp, fish prey). Also of note, the majority of sonar sources from which TTS may be incurred occupy a narrow frequency band, which means that the TTS incurred would also be across a narrower band (*i.e.,* not affecting the majority of an animal's hearing range). This frequency provides information about the cues to which a marine mammal may be temporarily less sensitive, but not the degree or duration of sensitivity loss. 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 rule. An animal would have to approach closer to the source or remain in the vicinity of the sound source appreciably longer to increase the received SEL, which would be difficult considering the Lookouts and the nominal speed of an active sonar vessel (10–15 kn) and the relative motion between the sonar vessel and the animal. In the TTS studies 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, most of the TTS induced was 15 dB or less, though Finneran *et al.* (2007) induced 43 dB of TTS with a 64-second exposure to a 20 kHz source. However, since any hull-mounted sonar, such as the SQS–53, engaged in anti-submarine warfare training would be moving at between 10 and 15 knots and nominally pinging every 50 seconds, the vessel will have traveled a minimum distance of approximately 257 m during the time between those pings and, therefore, incurring those levels of TTS is highly unlikely. A scenario could occur where an animal does not leave the vicinity of a ship or travels a course parallel to the ship, however, the close distances

required make TTS exposure unlikely. For a Navy vessel moving at a nominal 10 knots, it is unlikely a marine mammal could maintain speed parallel to the ship and receive adequate energy over successive pings to suffer TTS.

In short, 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). To add context to this degree of TTS, individual marine mammals may regularly experience variations of 6 dB differences in hearing sensitivity across time (Finneran *et al.,* 2000, 2002; Schlundt *et al.,* 2000).

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.

Based on the range of degree and duration of TTS reportedly induced by exposures to non-pulse sounds of energy higher than that to which free-swimming marine mammals in the field are likely to be exposed during LFAS/MFAS/HFAS training and testing exercises in the MITT Study Area, it is unlikely that marine mammals would ever sustain a TTS from MFAS that alters their sensitivity by more than 20 dB for more than a few hours—and any incident of TTS would likely be far less severe due to the short duration of the majority of the events and the speed of a typical vessel, especially given the fact that the higher power sources resulting in TTS are predominantly intermittent, which have been shown to result in shorter durations of TTS. Also, for the same reasons discussed in the *Analysis and Negligible Impact Determination—Diel Cycle* section, and because of the short distance within which animals would need to approach the sound source, it is unlikely that animals would be exposed to the levels necessary to induce TTS in subsequent time periods such that their recovery is impeded. Additionally, though the frequency range of TTS that marine mammals might sustain would overlap with some of the frequency ranges of their vocalization types, the frequency range of TTS from MFAS would not usually span the entire frequency range of one vocalization type, much less span all types of vocalizations or other critical auditory cues for any given species.

Tables 47–51 indicate the number of incidental takes by TTS for each species that are likely to result from the Navy's activities. As a general point, the majority of these TTS takes are the result of exposure to hull-mounted MFAS (MF narrower band sources), with fewer from explosives (broad-band lower frequency sources), and even fewer from LFAS or HFAS sources (narrower 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), narrower band (only affecting a portion of the animal's hearing range) TTS. This means that for one to several times per year, for several minutes to maybe a few hours (high end) each, a taken individual will have slightly diminished hearing sensitivity (slightly more than natural variation, but nowhere near total deafness). More often than not, such an exposure would occur within a narrower mid- to higher frequency band that may overlap part (but not all) of a communication, echolocation, or predator range, but sometimes across a lower or broader bandwidth. The significance of TTS is also related to the auditory cues that are germane within the time period that the animal incurs the TTS. For example, if an odontocete has TTS at echolocation frequencies, but incurs it at night when it is resting and not feeding, for example, it is not impactful. In short, 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 in 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 relative movement of vessels and 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 LF calls of mysticetes, as well as many non-communication cues such as fish and invertebrate prey, and geologic sounds that inform navigation. It should be noted that the Navy is only proposing authorization for a small subset of more narrow frequency LF sources and for less than 11 hours cumulatively annually. Masking is also more of a concern from continuous sources (versus intermittent sonar signals) where there is no quiet time between pulses within which auditory signals can be detected and interpreted. For these reasons, dense aggregations of, and long exposure to, continuous LF activity are much more of a concern for masking, whereas comparatively short-term exposure to the predominantly intermittent pulses of often narrow frequency range MFAS or HFAS, or explosions are not expected to result in a meaningful amount of masking. While the Navy occasionally uses LF and more continuous sources, it is not in the contemporaneous aggregate amounts that would accrue to a masking concern. Specifically, the nature of the activities and sound sources used by the Navy do

not support the likelihood of a level of masking accruing that would have the potential to affect reproductive success or survival. Additional detail is provided below.

Standard hull-mounted MFAS typically pings every 50 seconds. Some hull-mounted anti-submarine sonars can also be used in an object detection mode known as ''Kingfisher'' mode (*e.g.,* used on vessels when transiting to and from port) where pulse length is shorter but pings are much closer together in both time and space since the vessel goes slower when operating in this mode. Kingfisher mode is typically operated for relatively shorter durations. For the majority of other sources, the pulse length is significantly shorter than hull-mounted active sonar, on the order of several microseconds to tens of milliseconds. Some of the vocalizations that many marine mammals make are less than one second long, so, for example with hull-mounted sonar, there would be a 1 in 50 chance (only if the source was in close enough proximity for the sound to exceed the signal that is being detected) that a single vocalization might be masked by a ping. However, when vocalizations (or series of vocalizations) are longer than the one-second pulse of hull-mounted sonar, or when the pulses are only several microseconds long, the majority of most animals' vocalizations would not be masked.

Most ASW sonars and countermeasures use MF frequencies and a few use LF and HF frequencies. Most of these sonar signals are limited in the temporal, frequency, and spatial domains. The duration of most individual sounds is short, lasting up to a few seconds each. A few systems operate with higher duty cycles or nearly continuously, but they typically use lower power, which means that an animal would have to be closer, or in the vicinity for a longer time, to be masked to the same degree as by a higher level source. Nevertheless, masking could occasionally occur at closer ranges to these high-duty cycle and continuous active sonar systems, but as described previously, it would be expected to be of a short duration when the source and animal are in close proximity. While data are limited on behavioral responses of marine mammals to continuously active sonars, mysticete species are known to be able to habituate to novel and continuous sounds (Nowacek *et al.,* 2004), suggesting that they are likely to have similar responses to high-duty cycle sonars. Furthermore, most of these systems are hull-mounted on surface ships and ships are moving at least 10 kn, and it is unlikely that the ship and the marine mammal would continue to move in the same direction and the marine mammal subjected to the same exposure due to that movement. Most ASW activities are geographically dispersed and last for only a few hours, often with intermittent sonar use even within this period. Most ASW sonars also have a narrow frequency band (typically less than one-third octave). These factors reduce the likelihood of sources causing significant masking. HF signals (above 10 kHz) attenuate more rapidly in the water due to absorption than do lower frequency signals, thus producing only a very small zone of potential masking. If masking or communication impairment were to occur briefly, it would more likely be in the frequency range of MFAS (the more powerful source), which overlaps with some odontocete vocalizations (but few mysticete vocalizations); however, it would likely not mask the entirety of any particular vocalization, communication series, or other critical auditory cue, because the signal length, frequency, and duty cycle of the MFAS/HFAS signal does not perfectly resemble the characteristics of any single marine mammal species' vocalizations.

Other sources used in Navy training and testing that are not explicitly addressed above, many of either higher frequencies (meaning that the sounds generated attenuate even closer to the source) or lower amounts of operation, are similarly not expected to result in masking. For the reasons described here, any limited masking that could potentially occur would be minor and short-term.

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.

Injury (Permanent Threshold Shift)

Tables 47 through 51 indicate the number of individuals of each species for which Level A harassment in the form of PTS resulting from exposure to active sonar and/or explosives is estimated to occur. The number of individuals to potentially incur PTS annually (from sonar and explosives) for each species ranges from 0 to 50 (50 is for Dwarf sperm whale), but is more typically 0 or 1. As described previously, no species are expected to incur tissue damage from explosives.

Data suggest that many marine mammals will deliberately avoid exposing themselves to the received levels of active sonar necessary to induce injury by moving away from or at least modifying their path to avoid a close approach. Additionally, in the unlikely event that an animal approaches the sonar-emitting vessel at a close distance, NMFS has determined that the mitigation measures (*i.e.,* shutdown/powerdown zones for active sonar) would typically ensure that animals would not be exposed to injurious levels of sound. As discussed previously, the Navy utilizes both aerial (when available) and passive acoustic monitoring (during ASW exercises, passive acoustic detections are used as a cue for Lookouts' visual observations when passive acoustic assets are already participating in an activity) in addition to Lookouts on vessels to detect marine mammals for mitigation implementation. As discussed previously, 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.

If a marine mammal is able to approach a surface vessel within the distance necessary to incur PTS in spite of the mitigation measures, the likely speed of the vessel (nominally 10–15 kn) and relative motion of the vessel would make it very difficult for the animal to remain in range long enough to accumulate enough energy to result in more than a mild case of PTS. As discussed previously 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. The majority of any PTS incurred as a result of exposure to Navy sources would be expected to be in the 2–20 kHz range (resulting from the most powerful hull-mounted sonar) and could overlap a small portion of the communication frequency range of many odontocetes, whereas other marine mammal groups have communication calls at lower frequencies. Regardless of the frequency band though, the more important point in this case is that any PTS accrued as a result of exposure to Navy activities would be expected to be of a small amount (single digits). 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. 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.

Group and Species-Specific Analyses

In this section, we build on the general analysis that applies to all marine mammals in the MITT Study Area and Transit Corridor from the previous section, and include first information and analysis that applies to mysticetes or, separately, odontocetes, and then within those two sections, more specific information that applies to smaller groups, where applicable, and the affected species. The specific authorized take numbers are also included in the analyses below, and so here we provide some additional context and discussion regarding how we consider the authorized take numbers in those analyses.

The maximum amount and type of incidental take of marine mammals reasonably likely to occur from exposures to sonar and other active acoustic sources and explosions and therefore authorized during the seven-year training and testing period are shown in Table 28. The vast majority of predicted exposures (greater than 99 percent) are expected to be Level B harassment (TTS and behavioral reactions) from acoustic and explosive sources during training and testing activities at relatively low received levels.

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), and in some cases individuals may be taken more than one time. Below, we compare the total take numbers (including PTS, TTS, and behavioral disturbance) for species to their associated abundance estimates to evaluate the magnitude of impacts across the species and to individuals. Generally, when an abundance percentage comparison is below 100, it suggests the following: (1) That not all of the individuals will be taken; (2) that, 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 at a pupping beach), the average or expected number of days taken for those individuals taken is one per year; and (3) that we would not expect any individuals to be taken more than a few times in a year, or for those days to be sequential. There are no cases in this rule where the percentage of takes as compared to abundance is greater than 100, the highest being 93 percent (for fin whales) and the remaining species at 55 percent or less (most are 20 percent or under).

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 a PTS or TTS take may sometimes, for example, also be subject to 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 is also subject to behavioral disturbance would result in impacts to reproduction or survival. Alternately, we recognize that if an individual is subjected to behavioral disturbance repeatedly for a longer duration and on consecutive days, effects could accrue to the point that reproductive success is jeopardized, although those sorts of impacts are not expected to result from these activities. Accordingly, in analyzing the number of takes and the likelihood of repeated and sequential takes, we consider the total takes, not just the Level B harassment takes by behavioral disruption, so that individuals potentially exposed to both threshold shift and behavioral disruption 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.

Use of sonar and other transducers will typically be transient and temporary. The majority of acoustic effects to mysticetes from sonar and other active sound sources during testing and training activities will be primarily from ASW events. It is important to note that although ASW is one of the warfare areas of focus during MTEs, there are significant periods when active ASW sonars are not in use. Nevertheless, behavioral reactions are assumed more likely to be significant during MTEs than during other ASW activities due to the duration (*i.e.,* multiple days) and scale (*i.e.,* multiple sonar platforms) of the MTEs. 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 expected to occur infrequently.

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 *et al.,* 2017; King *et al.,* 2015; NAS 2017; New *et al.,* 2014; Southall *et al.,* 2007; Villegas-Amtmann *et al.,* 2015).

If impacts to individuals are of a magnitude or severity such that either repeated and sequential higher severity impacts occur (the probability of this goes up for an individual the higher total number of takes it has) or the total number of moderate to more severe impacts occurs across sequential days, then it becomes more likely that the aggregate effects could potentially interfere with feeding enough to reduce energy budgets in a manner that could impact reproductive success via longer cow-calf intervals, terminated pregnancies, or calf mortality. It is important to note that if these impacts occurred they would only accrue to females, which only comprise a portion of the population (typically approximately 50 percent). Based on energetic models, it takes energetic impacts of a significantly greater magnitude to cause the death of an adult marine mammal, and females will always terminate a pregnancy or stop lactating before allowing their health to deteriorate. Also, the death of an adult female has significantly more impact on population growth rates than reductions

in reproductive success, while the death of an adult male has very little effect on population growth rates. However, as will be explained further in the sections below, the severity and magnitude of takes expected to result from the MITT activities are such that energetic impacts of a scale that might affect reproductive success are not expected to occur at all.

The analyses below in some cases address species collectively if they occupy the same functional hearing group (*i.e.,* low, mid, and high-frequency cetaceans), share similar life history strategies, and/or are known to behaviorally respond similarly to acoustic 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 and odontocete 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. No new information has been received that affects that analysis and conclusion. There is no predicted tissue damage from explosives for any species, and one mother-calf pair of humpback whales could be taken by PTS by sonar exposure over the course of the seven-year rule. 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 47 below for mysticetes, we indicate for each species the total annual numbers of take by Level A and Level B harassment, and a number indicating the instances of total take as a percentage of abundance in the MITT Study Area alone, as well as the MITT Study Area plus the Transit Corridor, which was calculated separately. While the density used to calculate take is the same for these two areas, the takes were calculated separately for the two areas for all species in this rule, not just mysticetes, because the activity levels are higher in the MITT Study Area and it is helpful to understand the comparative impacts in the two areas. Note also that for mysticetes, the abundance within the MITT Study Area and Transit Corridor represents only a portion of the species abundance.

TABLE 47—ANNUAL ESTIMATED TAKES BY LEVEL B HARASSMENT AND LEVEL A HARASSMENT FOR MYSTICETES AND NUMBER INDICATING THE INSTANCES OF TOTAL TAKE AS A PERCENTAGE OF ABUNDANCE WITHIN THE MITT STUDY AREA AND TRANSIT CORRIDOR

Species	Instances of indicated types of incidental take (not all takes represent separate individuals, especially for disturbance)					Abundance		Instances of total take as percentage of abundance	
	Level B harassment		Level A harassment	Total takes		MITT study area	MITT study area + transit corridor	MITT study area	MITT study area + transit corridor
	Behavioral disturbance	TTS	PTS	MITT study area	MITT study area + transit corridor				
Blue whale	4	20	0	24	24	134	150	18	16
Bryde's whale	40	258	0	296	298	1,470	1,596	20	19
Fin whale	5	20	0	25	25	27	46	93	54
Humpback whale	92	679	*2	768	771	2,393	2,673	~~20~~ 32	~~18~~ 29
Minke whale	10	85	0	95	95	403	450	23	21
Omura's whale	4	25	0	28	29	143	160	20	18
Sei whale	19	136	0	154	155	780	821	20	19

Note: Abundance was calculated using the following formulas: (1) Density from the Technical Report in animals/km^2 × spatial extent of the MITT Study Area transit corridor = Abundance in the transit corridor and (2) Density from the Technical Report in animals/km^2 × spatial extent of the MITT Study Area = Abundance in the MITT Study. Note that the total annual takes described here may be off by a digit due to rounding. This occurred here as the Level B harassment takes are broken down further into Behavioral Disturbance and TTS compared to the Level B harassment takes presented as one number in the *Estimated Take of Marine Mammals* section.

*There is one mother-calf pair of humpback whales estimated to be taken by Level A Harassment by PTS over the period of the rule. See the *Estimated Take of Marine Mammals* section for further details.

The majority of takes by harassment of mysticetes in the MITT Study Area will be caused by sources from the MF1 MFAS active sonar bin (which includes hull-mounted sonar) because they are high level, narrowband sources in the 1–10 kHz range, which intersect what is estimated to be the most sensitive area of hearing for mysticetes. They also are used in a large portion of exercises (see Tables 3 and 4). Most of the takes (66 percent) from the MF1 bin in the MITT Study Area would result from received levels between 154 and 172 dB SPL, while another 33 percent would result from exposure between 172 and 178 dB SPL. For the remaining active sonar bin types, the percentages are as follows: LF4 = 97 percent between 124 and 136 dB SPL, MF4 = 99 percent between 136 and 154 dB SPL, MF5 = 98 percent between 118 and 142 dB SPL, and HF4 = 98 percent between 100 and 148 dB SPL. For explosives, no blue whales or

fin whales will be taken by Level B harassment or Level A harassment (PTS). For other mysticetes, exposure to explosives will result in small numbers of take: 1–6 takes by Level B harassment by behavioral disturbance per species, and 0–3 TTS takes per species (0 for Omura's whales). Based on this information, the majority of the Level B harassment by behavioral disturbance is expected to be of low to sometimes moderate severity and of a relatively shorter duration. No tissue damage from training and testing activities is anticipated or authorized for any species.

Research and observations show that if mysticetes are exposed to sonar or other active acoustic sources they may react in a number of ways depending on the characteristics of the sound source, their experience with the sound source, and whether they are migrating or on seasonal feeding or breeding grounds. Behavioral reactions may include alerting, breaking off feeding dives and surfacing, diving or swimming away, or no response at all (DOD, 2017; Nowacek, 2007; Richardson, 1995; Southall *et al.,* 2007). Overall, mysticetes have been observed to be more reactive to acoustic disturbance when a noise source is located directly on their migration route. Mysticetes disturbed while migrating could pause their migration or route around the disturbance, 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.

Alternately, adult female mysticetes with calves may be more responsive to stressors. An increase in the disturbance level from noise-generating human activities (such as, for example, sonar or vessel traffic) may increase the risk of mother–calf pair separation (reducing the time available for suckling) or require that louder contact calls are made which, in turn increases the possibility of detection. In either case, increased ambient noise could have negative consequences for calf fitness (Cartwright and Sullivan 2009; Craig *et al.,* 2014).

Lactating humpback whale females mainly rest while stationary at shallow depths within reach of the hull of commercial ships (although not expected from Navy vessels for the reasons discussed in the proposed rule and due to the effectiveness of mitigation measures), increasing the potential for ship strike collisions; and even moderate increases of noise from vessels can decrease the communication range (Bejder *et al.,* 2019). Videsen *et al.* (2017) reported that vocalizations between humpback whale mothers and calves, which included very weak tonal and grunting sounds, were produced more frequently during active dives than suckling dives, suggesting that mechanical stimuli rather than acoustic cues are used to initiate nursing. Their study suggests that the use of mechanical cues for initiating suckling and low level vocalizations with an active space of less than 100 m indicate a strong selection pressure for acoustic crypsis. Furthermore, such inconspicuous behavior likely reduces the risk of exposure to eavesdropping predators and male humpback whale escorts that may disrupt the high proportion of time spent nursing and resting, and hence ultimately compromise calf fitness. Parks *et al.* (2019) explored the potential for acoustic crypsis in North Atlantic right whale mother-calf pairs. Their results show that right whale mother-calf pairs have a strong shift in repertoire usage, significantly reducing the number of higher amplitude, long-distance communication signals they produced when compared with juvenile and pregnant whales in the same habitat. Similarly, Nielsen *et al.* (2019) concluded that acoustic crypsis in southern right whales and other baleen whales decreases the risk of alerting potential predators and hence jeopardizing a substantial energetic investment by the mother. These studies (*i.e.,* Videsen *et al.,* 2017; Parks *et al.,* 2019; and Nielsen *et al.,* 2019) suggest that the small active space of the weak calls between baleen whale mothers and calves is very sensitive to increases in ambient noise from human encroachment, thereby increasing the risk of mother-calf separation.

Few behavioral response studies have specifically looked at mother-calf pairs; most studies have targeted adult animals. In the few behavioral response studies where mothers with calves were targeted, their responses were not different from those in groups without calves. For example, humpback whales in a behavioral response experiment in Australia responded to a 2 kHz tone stimulus by changing their course during migration to move more offshore and surfaced more frequently, but otherwise did not respond (Dunlop *et al.,* 2013; Noad *et al.* 2013). Mother-calf pairs, either alone or with escorts, did not respond any differently to the tonal stimulus than groups without calves. Several humpback whales on breeding grounds have been observed during aerial or visual surveys during Navy training events involving sonar; no avoidance or other behavioral responses were ever noted, even when the whales were observed within 5 km of a vessel with active (or possibly active) sonar and maximum received levels were estimated to be between 135 and 161 dB re 1 μPa (Smultea *et al.,* 2009; Mobley *et al.* 2009; Mobley and Milette 2010; Mobley 2011; Mobley and Pacini 2012; Mobley *et al.,* 201; Smultea *et al.,* 2012).

As noted in the *Potential Effects of Specified Activities on Marine Mammals and Their Habitat* section of the proposed rule, while there are multiple examples from behavioral response studies of odontocetes ceasing their feeding dives when exposed to sonar pulses at certain levels, alternately blue whales (mysticetes) were less likely to show a visible response to sonar exposures at certain levels when feeding than when traveling. However, Goldbogen *et al.* (2013) indicated some horizontal displacement of deep foraging blue whales in response to simulated MFAS. Southall *et al.* (2019b) observed that after exposure to simulated and operational mid-frequency active sonar, more than 50 percent of blue whales in deep-diving states responded to the sonar, while no behavioral response was observed in shallow-feeding blue whales. Southall *et al.* (2019b) noted that the behavioral responses they observed were generally brief, of low to moderate severity, and highly dependent on exposure context (behavioral state, source-to-whale horizontal range, and prey availability). Most Level B harassment by behavioral disturbance of mysticetes is likely to be short-term and of low to sometimes moderate severity, with no anticipated effect on reproduction or survival.

Richardson *et al.* (1995) noted that avoidance (temporary displacement of an individual from an area) reactions are the most obvious manifestations of disturbance in marine mammals. Avoidance is qualitatively different from the startle or flight response, but also differs in the magnitude of the response (*i.e.,* directed movement, rate of travel, etc.). Oftentimes avoidance is temporary, and animals return to the area once the noise has ceased. Some mysticetes may avoid larger activities such as a MTE as they move through an area, although these activities do not typically use the same training locations day-after-day during multi-day activities, except periodically in instrumented ranges, which do not occur within the MITT Study Area.

Therefore, displaced animals could return quickly after a large activity or MTE is completed. Due to the limited number and geographic scope of MTEs, it is unlikely that most mysticetes would encounter an MTE more than once per year and additionally, total hull-mounted sonar hours would be limited in several areas that are important to mysticetes (described below). In the ocean, the use of Navy sonar and other active acoustic sources is transient and is unlikely to expose the same population of animals repeatedly over a short period of time, especially given the broader-scale movements of mysticetes.

The implementation of procedural mitigation and the sightability of mysticetes (especially given their large size) further reduces the potential for a significant behavioral reaction or a threshold shift to occur (*i.e.,* shutdowns are expected to be successfully implemented), which is reflected in the amount and type of incidental take that is anticipated to occur and authorized.

As noted previously, when an animal incurs a threshold shift, it occurs in the frequency from that of the source up to one octave above. This means that the vast majority of threshold shifts caused by Navy sonar sources will typically occur in the range of 2–20 kHz (from the 1–10 kHz MF1 bin, though in a specific narrow band within this range as the sources are narrowband), and if resulting from hull-mounted sonar, will be in the range of 3.5–7 kHz. The majority of mysticete vocalizations occur in frequencies below 1 kHz, which means that TTS incurred by mysticetes will not interfere with conspecific communication. Additionally, many of the other critical sounds that serve as cues for navigation and prey (*e.g.,* waves, fish, invertebrates) occur below a few kHz, which means that detection of these signals will not be inhibited by most threshold shift either. When we look in ocean areas where the Navy has been intensively training and testing with sonar and other active acoustic sources for decades, there is no data suggesting any long-term consequences to reproduction or survival rates of mysticetes from exposure to sonar and other active acoustic sources.

All the mysticete species discussed in this section will benefit from the procedural mitigation measures described earlier in the *Mitigation Measures* section. Additionally, the Navy will limit activities and employ other measures in mitigation areas that will avoid or reduce impacts to humpback whales (discussed in detail below). 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 Mariana Islands are considered most likely part of the ESA-endangered WNP DPS and the Mariana Archipelago is an established breeding ground. No ESA Critical Habitat has been proposed in the MITT Study Area. However, the areas of Marpi and Chalan Kanoa Reefs (out to the 400-m isobath) are known specifically to be used by mother/calf pairs of humpback whales (Hill *et al.,* 2016, 2017, 2018, 2020). Currently, no other areas have been identified for mother/calf pairs of humpback whales in the Mariana Islands. The current population trend for the WPN DPS of humpback whales show the SPLASH abundance estimate for Asia represents a 6.7 percent annual rate of increase over the 1991 to 1993 abundance estimate (Calambokidis *et al.,* 2008). However, the 1991 to 1993 estimate was for Ogasawara and Okinawa only, whereas the SPLASH estimate includes the Philippines, so the annual rate of increase is unknown. The population trend for WNP DPS of humpback is unknown (NMFS 2019).

Regarding the consideration of how Navy activities may affect humpback whales in these important areas with calves, as described previously, this final rule includes the Chalan Kanoa Reef and Marpi Reef Geographic Mitigation Areas, which encompass the area of observed calf detections and include water depths of 400 m or less, with significant parts of the mitigation areas less than 200 m, which is where most humpback whale sightings have been made. The Navy will not use explosives in the Marpi Reef and Chalan Kanoa Reef Geographic Mitigation Areas year-round. These two geographic mitigation areas also will require a 20-hour annual cap (for both areas combined) from December 1 through April 30 on MF1 MFAS use to minimize sonar exposure and reduce take by Level B harassment of humpback whales in these important reproductive areas.

The Navy expects current and future use of these two Geographic Mitigation Areas to remain low, but the 20-hour cap allows for the Navy to engage in a small amount of necessary training, most likely such as a Small Coordinated ASW Exercise or TRACKEX event(s), which could, for example, occur up to five days, but no more than four hours per day (or similar configuration totaling no more than 20 hours annually). As described in the *Humpback Whales Around Saipan* subsection of the *Estimated Take of Marine Mammals* section, our updated analysis indicates that given the maximum of 20 hrs of MF1 MFAS, a maximum annual total of 305 instances of Level B harassment may be incurred by 61 humpback whales, including 17 calves, in these areas during these months in the Geographic Mitigation Areas. One mother-calf pair of humpback whales may be taken by Level A harassment in the form of PTS over the course of the seven years of activities in these areas. Because of the higher density of humpback whales in this area, these individuals could potentially be taken on up to five, most likely non-sequential days. However, the reduction in exposure of humpback whales to sonar and explosive detonations in the Geographic Mitigation Areas and at this time (*i.e.,* the short overall and daily exposure) will reduce the likelihood of impacts that could affect reproduction or survival, by minimizing impacts on calves during this sensitive life stage, avoiding the additional energetic costs to mothers of avoiding the area during explosive exercises, and minimizing the chances that important breeding behaviors are interrupted to the point that reproduction is inhibited or abandoned for the year, or otherwise interfered with. Finally, the Navy will also implement the Marpi Reef and Chalan Kanoa Reef Awareness Notification Message Area that will help alert Navy vessels operating in these areas to the possible presence of increased concentrations of humpback whales from December 1 through April 30 to avoid interactions with large whales that may be vulnerable to vessel strikes.

To be clear about the temporal and spatial distribution of the estimated take, all take of humpback whales is expected to occur from December through April (the months when humpback whales are located in the MITT Study Area), with the number noted in the previous paragraph occurring in the two mitigation areas, and the remainder occurring throughout the MITT Study Area and Transit Corridor. 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 (measured against both the MITT Study Area abundance and the MITT Study Area plus the transit corridor abundance

combined) is 32 and 29 percent, respectively (Table 47). 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) and the received sound levels largely below 172 dB with a portion up to 178 dB (*i.e.,* of a moderate or lower level, less likely to evoke a severe response). While impacts to cow-calf pairs are of particular concern, we have also explained how the restrictions and limitations on explosive and sonar use in the geographic mitigation areas will minimize impacts. Regarding the severity of takes by TTS, they are expected to be low-level, of short duration, and mostly not in a frequency band that would be expected to interfere with communication or other important low-frequency cues. Therefore the associated lost opportunities and capabilities are not at a level that will impact reproduction or survival.

Altogether, the WNP DPS of humpback whales is endangered and while there is not enough information to identify a population trend, the Mariana Archipelago has been identified as a breeding area for the WNP DPS of humpback whales. In consideration of the MITT Study Area as a whole, only a small portion of the total individuals within the MITT Study Area will be taken and disturbed at a low-moderate level, with most of those individuals likely not disturbed on more than a few non-sequential days in a year. As described above for the mitigation areas specifically, if the Navy conducts the maximum five 4-hour exercises in these areas, cow-calf pairs could be taken on up to five likely non-sequential days. However, takes in these mitigation areas would be as a result of brief exposure to one shorter-duration exercise (as discussed earlier, the duration of an exercise does not indicate the duration of exposure to the exercises, which would be significantly shorter given the speed of Navy vessels), and the impacts would not be expected to accrue to the degree that would interfere with important mother-calf communications in a manner leading to cow-calf separation, interfere with social communications in a manner that would impede breeding, or impact humpback cow behaviors in a manner that would have adverse impacts on their energy budget and lactation success. One mother-calf pair could be taken by a small amount of PTS over the course of these seven-year regulations, of likely low 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 for the individual. However, given the smaller degree of PTS, and higher frequency of the hearing loss anticipated to result from MF1 sonar exposure (which is above the frequencies used to communicate with conspecifics and, specifically, calves), the PTS incurred by one mother-calf pair of humpback whales in a given year is unlikely to impact its behaviors, opportunities, or detection capabilities to a degree that will interfere with reproductive success or survival of the individual, let alone affect annual rates of recruitment or survival.

Even considering the potential impacts to cow-calf pairs, given the historic low use in the shallow waters of Marpi and Chalan Kanoa Reefs for Navy's activities as well as the restriction on explosive use and a 20-hr cap on MFAS, as well as the low magnitude and severity of anticipated harassment effects, the authorized 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. Therefore, the total take will not adversely affect this species through impacts on annual rates of recruitment or survival. No mortality is anticipated or authorized. For these reasons, we have determined, in consideration of all of the effects of the Navy's activities combined, that the authorized take will have a negligible impact on humpback whales.

Blue whale—Blue 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 MITT Study Area. There have been no stock(s) specified for the blue whales found in the MITT Study Area and Transit Corridor, and there is no associated SAR. There is also no information on trends for this species within the MITT Study Area. Blue whales are however considered stable generally throughout their range (NMFS 2019). Blue whales would be most likely to occur in the MITT Study Area during the winter and are expected to be few in number. There are no recent sighting records for blue whales in the MITT Study Area (Fulling *et al.,* 2011; Hill *et al.,* 2017a; Uyeyama, 2014). However, some acoustic detections from passive monitoring devices deployed at Saipan and Tinian have recorded the presence of blue whales over short periods of time (a few days) (Oleson *et al.,* 2015). Since blue whale calls can travel very long distances (up to 621 mi (1,000 km)), it is unknown whether the animals were within the MITT Study Area.

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 (measured against both the MITT Study Area abundance and the MITT Study Area plus the transit corridor combined) is 18 and 16 percent, respectively (Table 47). 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) and the received sound levels largely below 172 dB with a portion up to 178 dB (*i.e.,* of a moderate or lower level, less likely to evoke a severe response). 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 communication or other important low-frequency cues. Therefore the associated lost opportunities and capabilities are not at a level that will impact reproduction or survival.

Altogether, blue whales are listed as endangered, there are no known population trends, and blue whales have a very large range and a low abundance in the MITT Study Area. Our analysis suggests that a small portion of the individuals in the MITT Study Area and Transit Corridor (which represent only a small portion of the total abundance of the species) will be taken and disturbed at a low-moderate level, with those individuals disturbed on likely one day within a year. No mortality or Level A harassment is anticipated or authorized. This low magnitude and severity of harassment effects is not expected to result in impacts on the reproduction or survival of any individuals and, therefore, the total take will not adversely affect this species through impacts on annual rates of recruitment or survival, let alone have impacts on annual rates of recruitment or survival. For these reasons, we have determined, in consideration of all of the effects of the Navy's activities combined, that the authorized 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 MITT Study Area. There have been no stock(s) specified for fin

whales found in the MITT Study Area and Transit Corridor, and there is no associated SAR. There is also no information on trends for this species within the MITT Study Area or in other parts of their range (NMFS 2019). There are no sighting records for fin whales in the MITT Study Area (Fulling *et al.,* 2011; Hill *et al.,* 2017a; Oleson *et al.,* 2015; Uyeyama, 2014). However, based on acoustic detections, fin whales are expected to be present in the MITT Study Area, although few in number.

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 (measured against both the MITT Study Area abundance and the MITT Study Area plus the transit corridor combined) is 93 and 54 percent, respectively (Table 47). 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) and the received sound levels largely below 172 dB with a portion up to 178 dB (*i.e.,* of a moderate or lower level, less likely to evoke a severe response). 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 communication or other important low-frequency cues. Therefore, the associated lost opportunities and capabilities are not at a level that will impact reproduction or survival.

Altogether, fin whales are listed as endangered, there are no known population trends, and they have a low abundance in the MITT Study Area. Our analysis suggests that up to half or more of the individuals in the MITT Study Area and Transit Corridor (which represent a small portion of the species abundance) will be taken and disturbed at a low-moderate level, with those individuals likely not disturbed on more than a few non-sequential days a year. No mortality or Level A harassment is anticipated or authorized. 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, 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 determined, in consideration of all of the effects of the Navy's activities combined, that the authorized take will have a negligible impact on fin whales.

Sei whale—Sei 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 MITT Study Area. There have been no stock(s) specified for sei whales found in the MITT Study Area and Transit Corridor, and there are no associated SARs. There is also no information on population trends for this species within the MITT Study Area or in other parts of their range (NMFS 2019).

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 (measured against both the MITT Study Area abundance and the MITT Study Area plus the transit corridor combined) is 20 and 19 percent, respectively (Table 47). 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) and the received sound levels largely below 172 dB with a portion up to 178 dB (*i.e.,* of a moderate or lower level, less likely to evoke a severe response). 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 communication or other important low-frequency cues. Therefore the associated lost opportunities and capabilities are not at a level that will impact reproduction or survival.

Altogether sei whales are listed as endangered, there are no known population trends. Our analysis suggests that a small portion of individuals within the MITT Study Area and Transit Corridor (which is a small portion of the species abundance) will be taken and disturbed at a low-moderate level, with those individuals disturbed on likely one day within a year. No mortality or Level A harassment is anticipated or authorized. 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 determined, in consideration of all of the effects of the Navy's activities combined, that the authorized take will have a negligible impact on sei whales.

Bryde's whale, Minke whale, and Omura's whale—None of these species of whales are listed as endangered or threatened under the ESA and there are no known biologically important areas identified for these species in the MITT Study Area. There have been no specific stock(s) specified for these populations found in the MITT Study Area and Transit Corridor, and there are no associated SARs. There is also no information on population trends for these species within the MITT Study Area.

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 (measured against both the MITT Study Area abundance and the MITT Study Area plus the transit corridor combined) is 20 and 19 percent (Bryde's whale), 23 and 21 percent (Minke whale), and 20 and 18 (Omura's whale) percent, respectively (Table 47). 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) and the received sound levels largely below 172 dB with a portion up to 178 dB (*i.e.,* of a moderate or lower level, less likely to evoke a severe response). 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 communication or other important low-frequency cues. Therefore, the associated lost opportunities and capabilities are not at a level that will impact reproduction or survival.

Altogether, these three species of whales are not listed under the ESA and there are no known population trends. The abundance of Bryde's whales, minke whales, and Omura's whales in the MITT Study Area is thought to be low, and our analysis suggests that a small portion of individuals within the MITT Study Area and Transit Corridor will be taken and disturbed at a low-moderate level, with those individuals disturbed only once. No mortality or Level A harassment is anticipated or authorized. 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 determined, in consideration of all of the effects of the Navy's activities combined, that the authorized take will have a negligible impact on Bryde's whales, minke whales, and Omura's 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 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. No new information has been received that affects the analysis and conclusion. There is no predicted PTS from sonar or explosives for most odontocetes, with the exception of a few species which is discussed below. There is no predicted 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: Dwarf sperm whales and pygmy sperm whales; sperm whales; beaked whales; and dolphins and small whales. These subsections include more specific information about the groups, as well as conclusions for each species represented.

The majority of takes by harassment of odontocetes in the MITT Study Area will be caused by sources from the MFAS bin (which includes hull-mounted sonar) because they are high level, typically narrowband sources at a frequency (in the 1–10 kHz range) that overlaps a more sensitive portion (though not the most sensitive) of the MF hearing range and they are used in a large portion of exercises (see Table 3). For odontocetes other than beaked whales (for which these percentages are indicated separately in that section), most of the takes (98 percent) from the MF1 bin in the MITT Study Area would result from received levels between 154 and 172 dB SPL. For the remaining active sonar bin types, the percentages are as follows: LF4 = 97 percent between 124 and 136 dB SPL, MF4 = 99 percent between 136 and 160 dB SPL, MF5 = 97 percent between 118 and 142 dB SPL, and HF4 = 88.6 percent between 100 and 130 dB SPL. Based on this information, the majority of the takes by Level B harassment by behavioral disturbance are expected to be low to sometimes moderate in nature, but still of a generally shorter duration.

For all odontocetes, takes from explosives (Level B harassment by behavioral disturbance or TTS, or PTS) comprise a very small fraction (and low number) of those caused by exposure to active sonar. For the following odontocetes, zero takes from explosives are expected to occur: Blainville's beaked whales, Cuvier's beaked whales, bottlenose dolphins, false killer whales, killer whales, sperm whales, rough-toothed dolphins, and pygmy killer whales. For Level B harassment by behavioral disturbance from explosives, 1 to 4 takes are expected to occur for all but two of the remaining odontocetes, 25 and 64 takes for pygmy and dwarf sperm whales, respectively. Similarly, the instances of PTS and TTS from explosives are expected to be low. The instances of TTS expected to occur from explosives are 0 to 5 per species and the instances of PTS expected to occur from explosives are 0 to 1 per species, except for pygmy and dwarf sperm whales. Because of the lower TTS and PTS thresholds for HF odontocetes, pygmy and dwarf sperm whales are expected to have 25 and 64 takes by Level B harassment disturbance and 37 and 100 takes by TTS, and 8 and 21 takes by PTS from explosives, respectively.

Because the majority of harassment takes of odontocetes result from the sources in the MFAS bin, the vast majority of threshold shift would occur at a single frequency within the 1–10 kHz range and, therefore, the vast majority of threshold shift caused by Navy sonar sources would be at a single frequency within the range of 2–20 kHz. The frequency range within which any of the anticipated narrowband threshold shift would occur would fall directly within the range of most odontocete vocalizations (2–20 kHz). For example, the most commonly used hull-mounted sonar has a frequency around 3.5 kHz, and any associated threshold shift would be expected to be at around 7 kHz. However, individual odontocete vocalizations typically span a much wider range than this, and alternately, threshold shift from active sonar will often be in a narrower band (reflecting the narrower band source that caused it), which means that TTS incurred by odontocetes would typically only interfere with communication within a portion of their range (if it occurred during a time when communication with conspecifics was occurring) and, as discussed earlier, it would only be expected to be of a short duration and relatively small degree. 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, which means that detection of these signals will not be inhibited by most threshold shift either. The low number of takes by 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, or over a few days at most, and therefore they are unlikely to incur impacts on reproduction or survival. The number of PTS takes from these activities are very low (0 annually for most, 1 for a few species, and 19 and 50 for pygmy and dwarf sperm whales, respectively), and as discussed previously because of the low degree of PTS (*i.e.,* low amount of hearing sensitivity loss), as well as the narrower frequency range in which the majority of the PTS would occur, 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 (50 and 19 takes for Dwarf and pygmy whale, respectively, see Table 48).

In Table 48 below for dwarf sperm whales and pygmy sperm whales, we indicate for each species the total annual numbers of take by Level A and Level B harassment, and a number indicating the instances of total take as a percentage of the abundance within the MITT Study Area alone, as well as the MITT Study Area plus the Transit Corridor, which was calculated separately. While the density used to calculate take is the same for these two areas, the takes were calculated separately for the two areas for dwarf and pygmy sperm whales because the activity levels are higher in the MITT Study Area and it is helpful to understand the comparative impacts in the two areas. Note also that for dwarf and pygmy sperm whales (and all odontocetes), the abundance within the MITT Study Area and Transit Corridor represents only a portion of the species abundance.

TABLE 48—ANNUAL ESTIMATED TAKES BY LEVEL B HARASSMENT AND LEVEL A HARASSMENT FOR DWARF SPERM WHALES AND PYGMY SPERM WHALES AND NUMBER INDICATING THE INSTANCES OF TOTAL TAKE AS A PERCENTAGE OF ABUNDANCE WITHIN THE MITT STUDY AREA AND TRANSIT CORRIDOR

Species	Instances of indicated types of incidental take (not all takes represent separate individuals, especially for disturbance)					Abundance		Instances of total take as percentage of abundance	
	Level B harassment		Level A harass-ment	Total takes		MITT study area	MITT study area + transit corridor	MITT study area	MITT study area + transit corridor
	Behavioral disturbance	TTS	PTS	MITT study area	MITT study area + transit corridor				
Dwarf sperm whale	1,353	7,146	50	8,502	8,549	25,594	27,395	33	31
Pygmy sperm whale	533	2,877	19	3,412	3,429	10,431	11,168	33	31

Note: Abundance was calculated using the following formulas: (1) Density from the Technical Report in animals/km^2 × spatial extent of the MITT Study Area transit corridor = Abundance in the transit corridor and (2) Density from the Technical Report in animals/km^2 × spatial extent of the MITT Study Area = Abundance in the MITT Study. Note that the total annual takes described here may be off by a digit due to rounding. This occurred here as the Level B harassment takes are broken down further into Behavioral Disturbance and TTS compared to the Level B harassment takes presented as one number in the *Estimated Take of Marine Mammals* section.

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 to occasionally moderate severity of a generally 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, even if some smaller subset of the takes are in the form of a longer (several hours or a day) and more moderate response.

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, and NMFS accordingly has evaluated and authorized higher numbers. Also, however, regarding PTS from sonar exposure, *Kogia* whales are still likely to avoid sound levels that would cause higher levels of TTS (greater than 20 dB) or PTS. Therefore, even though the number of TTS and PTS takes are higher than for other odontocetes, any PTS is expected to be at a lower 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 MITT Study Area and Transit Corridor. There have been no stock(s) specified for pygmy sperm whales and dwarf sperm whales found in the MITT Study Area and Transit Corridor, and there is no associated SAR. There is also no information on trends for these species within the MITT Study Area. Both pygmy and dwarf sperm whales will benefit from the procedural mitigation measures described earlier in the *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 33 percent for both dwarf and pygmy sperm whales in the MITT Study Area and 31 percent in the MITT Study Area and the transit corridor combined (Table 48). 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 minutes and hours (*i.e.,* relatively short) and the received sound levels largely below 172 dB (*i.e.,* of a lower, to occasionally moderate, level

and less likely to evoke a severe response). 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 dwarf or pygmy sperm whale communication or other important low-frequency 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 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.

Altogether, dwarf and pygmy sperm whales are not listed under the ESA and there are no known population trends. Our analysis suggests that fewer than half of the individuals in the MITT Study Area and Transit Corridor will be taken, and disturbed at a low-moderate level, with those individuals likely not disturbed on more than a few non-sequential days a year. No mortality is anticipated or authorized. The 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. Some individuals are estimated to be taken by PTS 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 would interfere with reproductive success or survival of any individuals, let alone affect annual rates of recruitment or survival. For these reasons, we have determined, in consideration of all of the effects of the Navy's activities combined, that the authorized 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 49 below for sperm whales, we indicate the total annual numbers of take by Level A and Level B harassment, and a number indicating the instances of total take as a percentage of the abundance within the MITT Study Area alone, as well as the MITT Study Area plus the Transit Corridor, which was calculated separately. While the density used to calculate take is the same for these two areas, the takes were calculated separately for the two areas for sperm whales, because the activity levels are higher in the MITT Study Area and it is helpful to understand the comparative impacts in the two areas. Note also that for sperm whales, the abundance within the MITT Study Area and Transit Corridor represents only a portion of the species abundance.

TABLE 49—ANNUAL ESTIMATED TAKES BY LEVEL B HARASSMENT AND LEVEL A HARASSMENT FOR SPERM WHALES AND NUMBER INDICATING THE INSTANCES OF TOTAL TAKE AS A PERCENTAGE OF ABUNDANCE WITHIN THE MITT STUDY AREA AND TRANSIT CORRIDOR

Species	Instances of indicated types of incidental take (not all takes represent separate individuals, especially for disturbance)					Abundance		Instances of total take as percentage of abundance	
	Level B harassment		Level A harassment	Total takes		MITT study area	MITT study area + transit corridor	MITT study area	MITT study area + transit corridor
	Behavioral disturbance	TTS	PTS	MITT study area	MITT study area + transit corridor				
Sperm whale	192	11	0	189	203	4,216	5,146	4	4

Note: Abundance was calculated using the following formulas: (1) Density from the Technical Report in animals/km^2 x spatial extent of the MITT Study Area transit corridor = Abundance in the transit corridor and (2) Density from the Technical Report in animals/km^2 x spatial extent of the MITT Study Area = Abundance in the MITT Study. Not that the total annual takes described here may be off by a digit due to rounding. This occurred here as the Level B harassment takes are broken down further into Behavioral Disturbance and TTS compared to the Level B harassment takes presented as one number in the *Estimated Take of Marine Mammals* section.

As discussed above, the majority of takes by Level B harassment by behavioral disturbance of odontocetes, and thereby sperm whales, is expected to be in the form of low to moderate severity of a generally shorter duration. As mentioned 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.

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 MITT Study Area. There have been no stock(s) specified for sperm whales found in the MITT Study Area and Transit Corridor, and there is no associated SAR. There is also no information on trends for this species within the MITT Study Area or in other parts of their range (NMFS 2019).

Sperm whales have been routinely sighted in the MITT Study Area and detected in acoustic monitoring records. Sperm whales will benefit from the procedural mitigation measures described earlier in the *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 4 percent in the MITT Study Area and 4 percent in the MITT Study Area and transit corridor combined (Table 49). 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) and the received sound levels largely below 172 dB (*i.e.,* of a lower, to occasionally moderate level and less likely to evoke a severe response). 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. While the narrowband/single frequency threshold shift incurred may overlap with parts of the frequency range that sperm whales use for communication, any associated lost opportunities and capabilities would not be at a level that will impact reproduction or survival.

Altogether, sperm whales are listed as endangered under the ESA and there are no known population trends. Our analysis suggests that a very small portion of the individuals within the MITT Study Area and Transit Corridor will be taken and disturbed at a low-moderate level, with those individuals disturbed on likely one day within a year. No mortality or Level A harassment is anticipated or authorized. 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, 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 determined, in consideration of all of the effects of the Navy's activities combined, that the authorized take will have a negligible impact on sperm whales.

Beaked Whales—This section builds on the broader odontocete discussion above (*i.e.,* that information applies to beaked whales as well), except where we offer alternative information about the received levels for beaked whale for Level B harassment by behavioral disturbance, and brings together the discussion of the different types and amounts of take that different beaked whale species will incur, the applicable mitigation, and the status of each species to support the negligible impact determination for each species. For beaked whales, there is no Level A harassment or mortality anticipated or authorized.

In Table 50 below for beaked whales, we indicate the total annual numbers of take by Level A and Level B harassment for the four species, and a number indicating the instances of total take as a percentage of the abundance in the MITT Study Area alone, as well as the MITT Study Area plus the Transit Corridor, which was calculated separately. While the density used to calculate take is the same for these two areas, the takes were calculated separately for the two areas for beaked whales, because the activity levels are higher in the MITT Study Area and it is helpful to understand the comparative impacts in the two areas. Note also that for beaked whales, the abundance within the MITT Study Area and Transit Corridor represents only a portion of the species abundance.

TABLE 50—ANNUAL ESTIMATED TAKES BY LEVEL B HARASSMENT AND LEVEL A HARASSMENT FOR BEAKED WHALES AND NUMBER INDICATING THE INSTANCES OF TOTAL TAKE AS A PERCENTAGE OF ABUNDANCE IN THE MITT STUDY AREA AND TRANSIT CORRIDOR

Species	Instances of indicated types of incidental take (not all takes represent separate individuals, especially for disturbance)					Abundance		Instances of total take as percentage of abundance	
	Level B harassment		Level A harassment	Total takes		MITT study area	MITT study area + transit corridor	MITT study area	MITT study area + transit corridor
	Behavioral disturbance	TTS	PTS	MITT study area	MITT study area + transit corridor				
Blainville's beaked whale	1,691	27	0	1,698	1,718	3,083	3,376	55	51
Cuvier's beaked whale	642	4	0	534	646	1,075	2,642	50	24
Ginkgo-toothed beaked whale	3,660	66	0	3,662	3,726	6,775	7,567	54	49
Longman's beaked whale	5,959	107	0	6,056	6,066	11,148	11,253	54	54

Note: Abundance was calculated using the following formulas: (1) Density from the Technical Report in animals/km^2 x spatial extent of the MITT Study Area transit corridor = Abundance in the transit corridor and (2) Density from the Technical Report in animals/km^2 x spatial extent of the MITT Study Area = Abundance in the MITT Study. Note that the total annual takes described here may be off by a digit due to rounding. This occurred here as the Level B harassment takes are broken down further into Behavioral Disturbance and TTS compared to the Level B harassment takes presented as one number in the *Estimated Take of Marine Mammals* section.

As discussed above, the majority of takes by Level B harassment by behavioral disturbance of odontocetes, and thereby beaked whales, is expected to be in the form of low to moderate severity of a generally shorter duration. The majority of takes by harassment of beaked whales in the MITT Study Area are caused by sources from the MFAS active sonar bin (which includes hull-mounted sonar) because they are high level narrowband sources that fall within the 1–10 kHz range, which overlap a more sensitive portion (though not the most sensitive) of the MF hearing range. Also, of the sources expected to result in take, they are used in a large portion of exercises (see Table 3). Most of the takes (96 percent) from the MF1 bin in the MITT Study Area would result from received levels between 148 and 160 dB SPL. For the remaining active sonar bin types, the percentages are as follows: LF4 = 99 percent between 124 and 136 dB SPL, MF4 = 98 percent between 130 and 148 dB SPL, MF5 = 97 percent between 100 and 142 dB SPL, and HF4 = 95 percent between 100 and 148 dB SPL. Given the levels they are exposed to and their sensitivity, some responses would be of a lower severity, but many would likely be considered moderate.

Research has shown that beaked whales are especially sensitive to the presence of human activity (Pirotta *et al.,* 2012; Tyack *et al.,* 2011) and therefore have been assigned a lower harassment threshold, with lower received levels resulting in a higher percentage of individuals being harassed and a more distant distance cutoff (50 km for high source level, 25 km for moderate source level). Beaked whales have also been found to respond to naval sonar, in certain circumstances, in a manner that can lead to stranding and in a few cases, globally, beaked whale strandings have been causally associated with active sonar operation. However, as discussed in the *Stranding* section of the *Potential Effects of Specified Activities on Marine Mammals and Their Habitat* section,

NMFS has determined that the activities included in this 7-year rule are not reasonably likely to result in the mortality of beaked whales.

Beaked whales have been documented to exhibit avoidance of human activity or respond to vessel presence (Pirotta *et al.,* 2012). Beaked whales were observed to react negatively to survey vessels or low altitude aircraft by quick diving and other avoidance maneuvers, and none were observed to approach vessels (Wursig *et al.,* 1998). Research and observations show that if beaked whales are exposed to sonar or other active acoustic sources, they may startle, break off feeding dives, and avoid the area of the sound source to levels of 157 dB re 1 μPa, or below (McCarthy *et al.,* 2011). Acoustic monitoring during actual sonar exercises revealed some beaked whales continuing to forage at levels up to 157 dB re 1 μPa (Tyack *et al.,* 2011). Stimpert *et al.* (2014) tagged a Baird's beaked whale, which was subsequently exposed to simulated MFAS. Changes in the animal's dive behavior and locomotion were observed when received level reached 127 dB re 1 μPa. However, Manzano-Roth *et al.* (2013) found that for beaked whale dives that continued to occur during MFAS activity, differences from normal dive profiles and click rates were not detected with estimated received levels up to 137 dB re 1 μPa while the animals were at depth during their dives. In research done at the Navy's fixed tracking range in the Bahamas, animals were observed to leave the immediate area of the anti-submarine warfare training exercise (avoiding the sonar acoustic footprint at a distance where the received level was ''around 140 dB SPL'', according to Tyack *et al.* (2011)), but return within a few days after the event ended (Claridge and Durban, 2009; McCarthy *et al.,* 2011; Moretti *et al.,* 2009, 2010; Tyack *et al.,* 2010, 2011). Tyack *et al.* (2011) report that, in reaction to sonar playbacks, most beaked whales stopped echolocating, made long slow ascent to the surface, and moved away from the sound. A similar behavioral response study conducted in Southern California waters during the 2010–2011 field season found that Cuvier's beaked whales exposed to MFAS displayed behavior ranging from initial orientation changes to avoidance responses characterized by energetic fluking and swimming away from the source (DeRuiter *et al.,* 2013b). However, the authors did not detect similar responses to incidental exposure to distant naval sonar exercises at comparable received levels, indicating that context of the exposures (*e.g.,* source proximity, controlled source ramp-up) may have been a significant factor. The study itself found the results inconclusive and meriting further investigation. Cuvier's beaked whale responses suggested particular sensitivity to sound exposure consistent with results for Blainville's beaked whale.

Populations of beaked whales and other odontocetes in the Bahamas and other Navy fixed ranges that have been operating for decades appear to be stable. Behavioral reactions (avoidance of the area of Navy activity) seem likely in most cases if beaked whales are exposed to anti-submarine sonar within a few tens of kilometers, especially for prolonged periods (a few hours or more) since this is one of the most sensitive marine mammal groups to anthropogenic sound of any species or group studied to date and research indicates beaked whales will leave an area where anthropogenic sound is present (De Ruiter *et al.,* 2013; Manzano-Roth *et al.,* 2013; Moretti *et al.,* 2014; Tyack *et al.,* 2011). Research involving tagged Cuvier's beaked whales in the SOCAL Range Complex reported on by Falcone and Schorr (2012, 2014) indicates year-round prolonged use of the Navy's training and testing area by these beaked whales and has documented movements in excess of hundreds of kilometers by some of those animals. Given that some of these animals may routinely move hundreds of kilometers as part of their normal pattern, leaving an area where sonar or other anthropogenic sound is present may have little, if any, cost to such an animal. Photo identification studies in the SOCAL Range Complex, a Navy range that is utilized for training and testing, have identified approximately 100 Cuvier's beaked whale individuals with 40 percent having been seen in one or more prior years, with re-sightings up to seven years apart (Falcone and Schorr, 2014). These results indicate long-term residency by individuals in an intensively used Navy training and testing area, which may also suggest a lack of long-term consequences as a result of exposure to Navy training and testing activities. More than eight years of passive acoustic monitoring on the Navy's instrumented range west of San Clemente Island documented no significant changes in annual and monthly beaked whale echolocation clicks, with the exception of repeated fall declines likely driven by natural beaked whale life history functions (DiMarzio *et al.,* 2018). Finally, results from passive acoustic monitoring estimated that regional Cuvier's beaked whale densities were higher than indicated by NMFS' broad scale visual surveys for the U.S. West Coast (Hildebrand and McDonald, 2009).

These beaked whale species are not listed as endangered or threatened species under the ESA, and there are no known biologically important areas identified for these species in the MITT Study Area. There have been no stock(s) specified for beaked whales found in the MITT Study Area and Transit Corridor, and there are no associated SARs. There is also no information on trends for these species within the MITT Study Area. All of the beaked whales species discussed in this section will benefit from the procedural mitigation measures described earlier in the *Mitigation Measures* section.

Regarding the magnitude of takes by Level B harassment (TTS and behavioral disturbance), the number of estimated instances of take compared to the abundance is 50 to 55 percent in the MITT Study Area and 24 to 54 percent in the MITT Study Area and transit corridor combined (Table 50). 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) and the received sound levels largely below 160 dB, though with beaked whales, which are considered somewhat more sensitive, this could mean that some individuals will leave preferred habitat for a day (*i.e.,* moderate level takes). However, while interrupted feeding bouts are a known response and concern for odontocetes, we also know that there are often viable alternative habitat options nearby. Regarding the severity of takes by TTS, they are expected to be low-level, of short duration, and mostly not in a frequency band that would be expected to interfere with beaked whale communication or other important low-frequency cues. Therefore, the associated lost opportunities and capabilities are not at a level that will impact reproduction or survival. As mentioned earlier in the odontocete overview, we anticipate more severe effects from takes when animals are exposed to higher received levels or sequential days of impacts.

Altogether, none of the four beaked whale species are listed under the ESA and there are no known population trends. Our analysis suggests that fewer than half of the individuals of each species in the MITT Study Area and Transit Corridor will be taken and disturbed at a low or moderate level, with those individuals likely not

disturbed on more than a few non-sequential days a year. No mortality or Level A harassment is anticipated or authorized. This low magnitude and low to moderate severity of harassment effects is not expected to result in impacts on individual reproduction or survival, 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 determined, in consideration of all of the effects of the Navy's activities combined, that the authorized take will have a negligible impact on these four beaked whale species.

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 51 below for dolphins and small whales, we indicate for each species the total annual numbers of take by Level A and Level B harassment, and a number indicating the instances of total take as a percentage of abundance in the MITT Study Area alone, as well as the MITT Study Area plus the Transit Corridor, which was calculated separately. While the density used to calculate take is the same for these two areas, the takes were calculated separately for the two areas for dolphins and small whales, because the activity levels are higher in the MITT Study Area and it is helpful to understand the comparative impacts in the two areas. Note also that for dolphins and small whales, the abundance within the MITT Study Area and Transit Corridor represents only a portion of the species abundance.

TABLE 51—ANNUAL ESTIMATED TAKES BY LEVEL B HARASSMENT AND LEVEL A HARASSMENT FOR DOLPHINS AND SMALL WHALES AND NUMBER INDICATING THE INSTANCES OF TOTAL TAKE AS A PERCENTAGE OF ABUNDANCE IN THE MITT STUDY AREA AND TRANSIT CORRIDOR

Species	Instances of indicated types of incidental take (not all takes represent separate individuals, especially for disturbance)					Abundance		Instances of total take as percentage of abundance	
	Level B harassment		Level A harassment	Total takes		MITT study area	MITT study area + transit corridor	MITT study area	MITT study area + transit corridor
	Behavioral disturbance	TTS	PTS	MITT study area	MITT study area + transit corridor				
Bottlenose dolphin	116	21	0	132	137	753	1,076	17	13
False killer whale	641	121	0	759	762	3,979	4,218	19	18
Fraser's dolphin	11,326	1,952	1	13,261	13,279	75,420	76,476	18	17
Killer whale	36	8	0	44	44	215	253	20	17
Melon-headed whale	2,306	509	0	2,798	2,815	15,432	16,551	18	17
Pantropical spotted dolphin	12,078	2,818	1	14,820	14,897	81,013	85,755	18	17
Pygmy killer whale	87	17	0	103	104	502	527	21	20
Risso's dolphin	2,650	520	0	3,166	3,170	16,991	17,184	19	18
Rough-toothed dolphin	161	36	0	185	197	1,040	1,815	18	11
Short-finned pilot whale	987	176	0	1,150	1,163	5,700	6,583	20	18
Spinner dolphin	1,185	229	1	1,404	1,415	4,449	5,232	32	27
Striped dolphin	3,256	751	0	3,956	4,007	22,081	24,528	18	16

Note: Abundance was calculated using the following formulas: (1) Density from the Technical Report in animals/km^2 x spatial extent of the MITT Study Area transit corridor = Abundance in the transit corridor and (2) Density from the Technical Report in animals/km^2 x spatial extent of the MITT Study Area = Abundance in the MITT Study. Note that the total annual takes described here may be off by a digit due to rounding. This occurred here as the Level B harassment takes are broken down further into Behavioral Disturbance and TTS compared to the Level B harassment takes presented as one number in the *Estimated Take of Marine Mammals* section.

As discussed above, the majority of takes by Level B harassment by behavioral disturbance of odontocetes, and thereby dolphins and small whales, from hull-mounted sonar (MFAS) in the MITT Study Area would result from received levels between 154 and 172 dB SPL. Therefore, the majority of takes by Level B harassment are expected to be in the form of low to occasionally moderate severity of a generally shorter duration. As mentioned 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 that have any effect on reproduction or survival. One Level A harassment is anticipated and authorized for three species (Fraser's dolphin, pantropical spotted dolphin, and spinner dolphin).

Research and observations show that if delphinids are exposed to sonar or other active acoustic sources they may react in a number of ways depending on their experience with the sound source and what activity they are engaged in at the time of the acoustic exposure. Delphinids may not react at all until the sound source is approaching within a few hundred meters to within a few kilometers depending on the environmental conditions and species. 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 dolphin), 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 procedural mitigation measures described earlier in the *Mitigation Measures* section. Additionally, the Agat Bay Nearshore Geographic Mitigation Area will provide protection for spinner dolphins as the Navy will not use in-water explosives or

MF1 ship hull-mounted mid-frequency active sonar in this area. High use areas for spinner dolphins including Agat Bay are where animals congregate during the day to rest (Amesbury *et al.,* 2001; Eldredge, 1991). Behavioral disruptions during resting periods can adversely impact health and energetic budgets by not allowing animals to get the needed rest and/or by creating the need to travel and expend additional energy to find other suitable resting areas. Avoiding sonar and explosives in this area reduces the likelihood of impacts that would affect reproduction and survival.

None of the small whale and dolphin species are listed as endangered or threatened species under the ESA. As noted above, an important resting area has been identified for spinner dolphins, and mitigation has been included to reduce impacts in the area. There have been no stock(s) specified for small whales and dolphins found in the MITT Study Area and Transit Corridor, and there are no associated SARs. There is also no information on trends for these species within the MITT Study Area.

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 32 percent for spinner dolphins and 17 to 21 percent for the remaining dolphins and small whales in the MITT Study Area. The number of estimated total instances of take compared to the abundance is 27 percent for spinner dolphins and 20 percent or less for the remaining dolphins and small whales in the MITT Study and transit corridor combined (Table 51).

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 minutes and hours (*i.e.,* relatively short) and the received sound levels largely below 172 dB (*i.e.,* of a lower, to occasionally moderate, level and less likely to evoke a severe response). Regarding the severity of takes by TTS, they are expected to be low-level, of short duration, and mostly not in a frequency band that would be expected to interfere with communication or other important low-frequency cues. The associated lost opportunities and capabilities are not at a level that will impact reproduction or survival. One individual each of three species (spinner dolphin, Fraser's dolphin, and pantropical spotted dolphin) is estimated to be taken by one PTS annually, of likely low 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 scale the estimated takes by Level A harassment by PTS for spinner dolphin, Fraser's dolphin, and pantropical spotted dolphin 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. Our analysis suggests that only a small portion of the individuals of any of these species in the MITT Study Area or Transit Corridor will be taken and disturbed at a low-moderate level, with those individuals likely disturbed no more than a few non-sequential days a year. One take by PTS for three dolphin species is anticipated and authorized, 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 and, therefore, the total take will not adversely affect these species through impacts on annual rates of recruitment or survival. For these reasons, we have 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 twelve of these species of small whales and dolphins.

Determination

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

Subsistence Harvest of Marine Mammals

There are no subsistence uses or harvest of marine mammals in the geographic area affected by the specified activities. Therefore, NMFS has determined that the total taking affecting species will not have an unmitigable adverse impact on the availability of the species for taking for subsistence purposes.

Classification

Endangered Species Act

There are five marine mammal species under NMFS jurisdiction that are listed as endangered or threatened under the ESA with confirmed or possible occurrence in the MITT Study Area: Blue whale, fin whale, humpback whale, sei whale, and sperm whale. There is no ESA-designated critical habitat for any species in the MITT Study Area. The Navy consulted with NMFS pursuant to section 7 of the ESA for MITT activities, and NMFS also consulted internally on the issuance of these regulations and LOA under section 101(a)(5)(A) of the MMPA. NMFS issued a Biological Opinion concluding that the issuance of the rule and subsequent LOA is not likely to jeopardize the continued existence of the threatened and endangered species under NMFS' jurisdiction and is not likely to result in the destruction or adverse modification of critical habitat in the MITT Study Area. The Biological Opinion for this action is available at *https://www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-military-readiness-activities.*

National Marine Sanctuaries Act

There are no national marine sanctuaries in the MITT Study Area. Therefore, no consultation under the National Marine Sanctuaries Act is required.

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 its proposed actions and alternatives with respect to potential impacts on the human environment. NMFS participated as a cooperating agency on the 2020 MITT FSEIS/OEIS, which was published on June 5, 2020, and is available at *http://www.MITT-eis.com.* In accordance with 40 CFR 1506.3, NMFS independently reviewed and evaluated the 2020 MITT FSEIS/OEIS and determined that it is adequate and sufficient to meet our responsibilities under NEPA for the issuance of this rule and associated LOA. NOAA therefore adopted the 2020 MITT FSEIS/OEIS. NMFS has prepared a separate Record of Decision. NMFS' Record of Decision for adoption of the 2020 MITT FSEIS/OEIS

and issuance of this final rule and subsequent LOA can be found at: *https://www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-military-readiness-activities.*

Executive Order 12866

The Office of Management and Budget has determined that this 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 certified to the Chief Counsel for Advocacy of the Small Business Administration during the proposed rule stage that this action would not have a significant economic impact on a substantial number of small entities. The factual basis for the certification was published in the proposed rule and is not repeated here. No comments were received regarding this certification. As a result, a regulatory flexibility analysis was not required and none was prepared.

Waiver of Delay in Effective Date

NMFS has determined that there is good cause under the Administrative Procedure Act (5 U.S.C. 553(d)(3)) to waive the 30-day delay in the effective date of this final rule. No individual or entity other than the Navy is affected by the provisions of these regulations. The Navy has requested that this final rule take effect on or before July 31, 2020, to accommodate the Navy's LOA expiring on August 3, 2020, so as to not cause a disruption in training and testing activities. NMFS was unable to accommodate the 30-day delay of effectiveness period due to the need to consider new information that became available in June 2020, as well as a revised humpback whale analysis that arose through the ESA section 7 consultation. The waiver of the 30-day delay of the effective date of the final rule will ensure that the MMPA final rule and LOA are in place by the time the previous authorizations expire. Any delay in finalizing the rule would result in either: (1) A suspension of planned naval training and testing, which would disrupt vital training and testing essential to national security; or (2) the Navy's procedural non-compliance with the MMPA (should the Navy conduct training and testing without an LOA), thereby resulting in the potential for unauthorized takes of marine mammals. Moreover, the Navy is ready to implement the regulations immediately. For these reasons, NMFS finds good cause to waive the 30-day delay in the effective date. In addition, the rule authorizes incidental take of marine mammals that would otherwise be prohibited under the statute. Therefore, by granting an exception to the Navy, the rule will relieve restrictions under the MMPA, which provides a separate basis for waiving the 30-day effective date for the rule.

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 15, 2020.

Samuel D. Rauch III,

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

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

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

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

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

■ 2. Revise subpart J to read as follows:

Subpart J—Taking and Importing Marine Mammals; U.S. Navy's Mariana Islands Training and Testing (MITT)

Sec.

218.90 Specified activity and geographical region.
218.91 Effective dates.
218.92 Permissible methods of taking.
218.93 Prohibitions.
218.94 Mitigation requirements.
218.95 Requirements for monitoring and reporting.
218.96 Letters of Authorization.
218.97 Renewals and modifications of Letters of Authorization.

Subpart J—Taking and Importing Marine Mammals; U.S. Navy's Mariana Islands Training and Testing (MITT)

§ 218.90 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 Mariana Islands Training and Testing (MITT) Study Area. The MITT Study Area is comprised of three components: The Mariana Islands Range Complex (MIRC), additional areas on the high seas, and a transit corridor between the MIRC and the Hawaii Range Complex (HRC). The MIRC includes the waters south of Guam to north of Pagan (Commonwealth of the Northern Mariana Islands (CNMI)), and from the Pacific Ocean east of the Mariana Islands to the Philippine Sea to the west, encompassing 501,873 square nautical miles (nmi^2) of open ocean. The additional areas of the high seas include the area to the north of the MIRC that is within the U.S. Exclusive Economic Zone (EEZ) of the CNMI and the areas to the west of the MIRC. The transit corridor is outside the geographic boundaries of the MIRC and represents a great circle route (*i.e.,* the shortest distance) across the high seas for Navy ships transiting between the MIRC and the HRC. Additionally, the MITT Study Area includes pierside locations in the Apra Harbor Naval Complex.

(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) Amphibious warfare;

(ii) Anti-submarine warfare;

(iii) Mine warfare;

(vi) Surface warfare; and

(vii) Other training activities.

(2) *Testing.* (i) Naval Air Systems Command Testing Activities;

(ii) Naval Sea Systems Command Testing Activities; and

(iii) Office of Naval Research Testing Activities.

§ 218.91 Effective dates.

Regulations in this subpart are effective from July 31, 2020, to July 30, 2027.

§ 218.92 Permissible methods of taking.

(a) Under an LOA issued pursuant to §§ 216.106 of this section and 218.96, the Holder of the LOA (hereinafter ''Navy'') may incidentally, but not intentionally, take marine mammals within the area described in § 218.90(b) by Level A harassment and Level B harassment associated with the use of active sonar and other acoustic sources and explosives, 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 § 218.90(c) is limited to the species listed in Table 1 of this section.

TABLE 1 TO § 218.92(b)

Species	Scientific name
Blue whale	*Balaenoptera musculus.*
Bryde's whale	*Balaenoptera edeni.*
Fin whale	*Balaenoptera physalus.*
Humpback whale	*Megaptera novaeangliae.*
Minke whale	*Balaenoptera acutorostrata.*
Omura's whale	*Balaenoptera omurai.*
Sei whale	*Balaenoptera borealis.*
Blainville's beaked whale.	*Mesoplodon densirostris.*
Common bottlenose dolphin.	*Tursiops truncatus.*
Cuvier's beaked whale.	*Ziphius cavirostris.*
Dwarf sperm whale	*Kogia sima.*
False killer whale	*Pseudorca crassidens.*
Fraser's dolphin	*Lagenodelphis hosei.*
Ginkgo-toothed beaked whale.	*Mesoplodon ginkgodens.*
Killer whale	*Orcinus orca.*
Longman's beaked whale.	*Indopacetus pacificus.*
Melon-headed whale	*Peponocephala electra.*
Pantropical spotted dolphin.	*Stenella attenuata.*
Pygmy killer whale	*Feresa attenuata.*
Pygmy sperm whale	*Kogia breviceps.*
Risso's dolphin	*Grampus griseus.*
Rough-toothed dolphin.	*Steno bredanensis.*
Short-finned pilot whale.	*Globicephala macrorhynchus.*
Sperm whale	*Physeter macrocephalus.*
Spinner dolphin	*Stenella longirostris.*
Striped dolphin	*Stenella coeruleoalba.*

§ 218.93 Prohibitions.

Notwithstanding incidental takings contemplated in § 218.92(a) and authorized by an LOA issued under §§ 216.106 of this section and 218.96, no person in connection with the activities listed in § 218.90(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 section and 218.96;

(b) Take any marine mammal not specified in § 218.92(b);

(c) Take any marine mammal specified in § 218.92(b) in any manner other than as specified in the LOA issued under §§ 216.106 of this chapter and 218.96; or

(d) Take a marine mammal specified in § 218.92(b) if NMFS determines such taking results in more than a negligible impact on the species of such marine mammal.

§ 218.94 Mitigation requirements.

When conducting the activities identified in § 218.90(c), the mitigation measures contained in any LOA issued under §§ 216.106 of this section and 218.96 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 MITT Study Area for each applicable activity category or stressor category and includes acoustic stressors (*i.e.,* active sonar and other transducers, weapons firing noise), explosive stressors (*i.e.,* sonobuoys, torpedoes, medium-caliber and large-caliber projectiles, missiles and rockets, bombs, sinking exercises, mines, anti-swimmer grenades), and 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 and mine shapes).

(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; U.S. Navy Protective Measures Assessment Protocol; and U.S. Navy Sonar Positional Reporting System and Marine Mammal Incident Reporting.

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

(i) *Number of Lookouts and observation platform*—(A) *Hull-mounted sources.* One Lookout must be positioned for platforms with space or manning restrictions while underway (at the forward part of a small boat or ship) and platforms using active sonar while moored or at anchor (including pierside); and two Lookouts must be positioned for platforms without space or manning restrictions while underway (at the forward part of the ship).

(B) *Sources that are not hull-mounted sources.* One Lookout must be positioned on the ship or aircraft conducting the activity.

(ii) *Mitigation zone and requirements.* The mitigation zones must be the zones as described in paragraphs (a)(2)(ii)(B) and (C) of this section.

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

(B) During the activity for low-frequency active sonar at or above 200 dB and hull-mounted mid-frequency active sonar, Navy personnel must observe the mitigation zone for marine mammals and power down active sonar transmission by 6 dB if marine mammals are observed within 1,000 yd of the sonar source; power down by an additional 4 dB (for a total of 10 dB) if marine mammals are observed within 500 yd of the sonar source; and cease transmission if marine mammals are observed within 200 yd of the sonar source.

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

(D) 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 or powering up active sonar transmission) 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 sonar source; the mitigation zone has been clear from any additional sightings for 10 minutes (min) for aircraft-deployed sonar sources or 30 min for vessel-deployed sonar sources; for mobile activities, the active sonar

source has transited a distance equal to double that of the mitigation zone size beyond the location of the last sighting; or for activities using hull-mounted sonar where a dolphin(s) is observed in the mitigation zone, the Lookout concludes that the dolphin(s) is deliberately closing in on the ship to ride the ship's bow wave, and is therefore out of the main transmission axis of the sonar (and there are no other marine mammal sightings within the mitigation zone).

(3) *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 ''Explosive medium-caliber and large-caliber projectiles'' or under ''Small-, medium-, and large-caliber non-explosive practice munitions'' in paragraphs (a)(6)(i) and (a)(15)(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 marine mammals; if 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 marine mammals; if 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 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.

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

(ii) *Mitigation zone and requirements.* (A) The mitigation zone must be 600 yd around an explosive sonobuoy.

(B) Prior to the initial start of the activity (*e.g.,* during deployment of a sonobuoy pattern, which typically lasts 20–30 min), Navy personnel must conduct passive acoustic monitoring for marine mammals and use information from detections to assist visual observations. Navy personnel also must visually observe the mitigation zone for marine mammals; if marine mammals are observed, Navy personnel must relocate or delay the start of sonobuoy or source/receiver pair detonations.

(C) During the activity, Navy personnel must observe the mitigation zone for marine mammals; if marine mammals are observed, Navy personnel must cease sonobuoy or source/receiver pair detonations.

(D) 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 detonations) 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 sonobuoy; or the mitigation zone has been clear from any additional sightings for 10 min when the activity involves aircraft that have fuel constraints (*e.g.,* helicopter), or 30 min when the activity involves aircraft that are not typically fuel constrained.

(E) 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), Navy personnel must 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.

(5) *Explosive torpedoes*—(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 mitigation zone for marine mammals and other applicable biological resources while performing their regular duties.

(ii) *Mitigation zone and requirements.* (A) The mitigation zone must be 2,100 yd around the intended impact location.

(B) Prior to the initial start of the activity (*e.g.,* during deployment of the target), Navy personnel must conduct passive acoustic monitoring for marine mammals and use the information from detections to assist visual observations. Navy personnel also must visually observe the mitigation zone for marine mammals; if marine mammals are observed, Navy personnel must relocate or delay the start of firing.

(C) During the activity, Navy personnel must observe the mitigation zone for marine mammals. If marine mammals are observed, Navy personnel must cease firing.

(D) 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.

(E) 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) *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)(3)(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 mitigation zone for marine mammals and other applicable biological resources while performing their regular duties.

(ii) *Mitigation zone and requirements.* (A) The mitigation zone must be 200 yd around the intended impact location for air-to-surface activities using explosive medium-caliber projectiles.

(B) The mitigation zone must be 600 yd around the intended impact location for surface-to-surface activities using explosive medium-caliber projectiles.

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

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

(E) During the activity, Navy personnel must observe the mitigation zone for marine mammals; if marine mammals are observed, Navy personnel must cease firing.

(F) 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.

(G) 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.

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

(i) *Number of Lookouts and observation platform.* One Lookout 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 mitigation zone for marine mammals and other applicable biological resources while performing their regular duties.

(ii) *Mitigation zone and requirements.* (A) The mitigation zone must be 900 yd around the intended impact location for missiles or rockets with 0.6–20 lb net explosive weight.

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

(C) 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 marine mammals; if marine mammals are observed, Navy personnel must relocate or delay the start of firing.

(D) During the activity, Navy personnel must observe the mitigation zone for marine mammals; if marine mammals are observed, Navy personnel must cease firing.

(E) 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.

(F) 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.

(8) *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 mitigation zone for marine mammals and other applicable biological resources while performing their regular duties.

(ii) *Mitigation zone and requirements.* (A) The mitigation zone must be 2,500 yd around the intended target.

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

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

(D) 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.

(E) 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.

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

(ii) *Mitigation zone and requirements.* (A) The mitigation zone must be 2.5 nmi around the target ship hulk.

(B) Prior to the initial start of the activity (90 min prior to the first firing), Navy personnel must conduct aerial observations of the mitigation zone for marine mammals; if marine mammals are observed, Navy personnel must delay the start of firing.

(C) During the activity, Navy personnel must conduct passive acoustic monitoring for marine mammals and use the information from detections to assist visual observations. Navy personnel must visually observe the mitigation zone for marine mammals from the vessel; if marine mammals are observed, Navy personnel must cease firing. Immediately after any planned or unplanned breaks in weapons firing of longer than two hours, Navy personnel must observe the mitigation zone for marine mammals from the aircraft and vessel; if marine mammals are observed, Navy personnel must delay recommencement of firing.

(D) 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 target ship hulk; or the mitigation zone has been clear from any additional sightings for 30 min.

(E) After completion of the activity (for two hours after sinking the vessel or until sunset, whichever comes first), Navy personnel must 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.

(10) *Explosive mine countermeasure and neutralization activities*—(i) *Number of Lookouts and observation platform.* (A) One Lookout must be positioned on a vessel or in an aircraft.

(B) If additional platforms are participating in the activity, Navy personnel positioned on those assets (*e.g.,* safety observers, evaluators) must support observing the mitigation zone for marine mammals and other applicable biological resources while performing their regular duties.

(ii) *Mitigation zone and requirements.* (A) The mitigation zone must be 600 yd around the detonation site.

(B) Prior to the initial start of the activity (*e.g.,* when maneuvering on station; typically 10 min when the activity involves aircraft that have fuel constraints, or 30 min when the activity involves aircraft that are not typically fuel constrained), Navy personnel must observe the mitigation zone for marine mammals; if marine mammals are observed, Navy personnel must relocate or delay the start of detonations.

(C) During the activity, Navy personnel must observe the mitigation zone for marine mammals; if marine mammals are observed, Navy personnel must cease detonations.

(D) 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 detonations) 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 detonation site; or the mitigation zone has been clear from any additional sightings for 10 min when the activity involves aircraft that have fuel constraints, or 30 min when the activity involves aircraft that are not typically fuel constrained.

(F) After completion of the activity (typically 10 min when the activity involves aircraft that have fuel constraints, or 30 min when the activity involves aircraft that are not typically fuel constrained), Navy personnel must 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.

(11) *Explosive mine neutralization activities involving Navy divers*—(i) *Number of Lookouts and observation platform.* (A) Two Lookouts (two small boats with one Lookout each, or one Lookout must be on a small boat and one must be in a rotary-wing aircraft) when implementing the smaller mitigation zone.

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

(C) All divers placing the charges on mines will support the Lookouts while performing their regular duties and will report applicable sightings to their supporting small boat or Range Safety Officer.

(D) If additional platforms are participating in the activity, Navy personnel positioned on those assets (*e.g.,* safety observers, evaluators) must support observing the mitigation zone for marine mammals and other applicable biological resources while performing their regular duties.

(ii) *Mitigation zone and requirements.* (A) For Lookouts on small boats or aircraft, the mitigation zone must be 500 yd around the detonation site under positive control.

(B) For Lookouts on small boats or aircraft, the mitigation zone must be 1,000 yd around the detonation site during all activities using time-delay fuses.

(C) For divers, the mitigation zone must be the underwater detonation

location, which is defined as the sea space within the divers' range of visibility but no further than the mitigation zone specified for Lookouts on small boats or aircraft (500 yd or 1,000 yd depending on the charge type).

(D) Prior to the initial start of the activity (when maneuvering on station for activities under positive control; 30 min for activities using time-delay firing devices), Navy Lookouts on small boats or aircraft, must observe the mitigation zone for marine mammals; if marine mammals are observed, Navy personnel must relocate or delay the start of detonations or fuse initiation.

(E) During the activity, Navy Lookouts on small boats or aircraft, must observe the mitigation zone for marine mammals; if marine mammals are observed, Navy personnel must cease detonations or fuse initiation. While performing their normal duties during the activity, divers must observe the underwater detonation location for marine mammals. Divers must notify their supporting small boat or Range Safety Officer of marine mammal sightings at the underwater detonation location; if observed, the Navy must cease detonations or fuse initiation. To the maximum extent practicable depending on mission requirements, safety, and environmental conditions, Navy personnel must position boats near the mid-point of the mitigation zone radius (but outside of the detonation plume and human safety zone), must position themselves on opposite sides of the detonation location (when two boats are used), and must travel in a circular pattern around the detonation location with one Lookout observing inward toward the detonation site and the other observing outward toward the perimeter of the mitigation zone. If used, Navy aircraft must travel in a circular pattern around the detonation location to the maximum extent practicable. Navy personnel must not set time-delay firing devices to exceed 10 min.

(F) Commencement/recommencement conditions after a marine mammal sighting before or during the activity. Navy personnel must allow a sighted marine mammal to leave the underwater detonation location or mitigation zone (as applicable) prior to the initial start of the activity (by delaying the start) or during the activity (by not recommencing detonations or fuse initiation) until one of the following conditions has been met: The animal is observed exiting the 500 yd or 1,000 yd mitigation zone; the animal is thought to have exited the 500 yd or 1,000 yd mitigation zone based on a determination of its course, speed, and movement relative to the detonation site; or the 500 yd or 1,000 yd mitigation zones (for Lookouts on small boats or aircraft) and the underwater detonation location (for divers) has been clear from any additional sightings for 10 min during activities under positive control with aircraft that have fuel constraints, or 30 min during activities under positive control with aircraft that are not typically fuel constrained and during activities using time-delay firing devices.

(G) After completion of an activity, the Navy must observe for marine mammals for 30 min. Navy personnel must 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.

(12) *Maritime security operations—anti-swimmer grenades*—(i) *Number of Lookouts and observation platform.* One Lookout must be positioned on the small boat 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 mitigation zone for marine mammals and other applicable biological resources while performing their regular duties.

(ii) *Mitigation zone and requirements.* (A) The mitigation zone must be 200 yd around the intended detonation location.

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

(C) During the activity, Navy personnel must observe the mitigation zone for marine mammals; if marine mammals are observed, Navy personnel must cease detonations.

(D) 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 detonations) 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 detonation location; the mitigation zone has been clear from any additional sightings for 30 min; or the intended detonation location has transited a distance equal to double that of the mitigation zone size beyond the location of the last sighting.

(E) 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.

(13) *Vessel movement.* The mitigation will not be applied if: The vessel's safety is threatened; the vessel is restricted in its ability to maneuver (*e.g.,* during launching and recovery of aircraft or landing craft, during towing activities, when mooring); 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.* (A) The mitigation zone must be 500 yd around whales.

(B) The mitigation zone must be 200 yd around all other marine mammals (except bow-riding dolphins).

(C) 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.

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

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

(i) *Number of Lookouts and observation platform.* One Lookout must be positioned on a manned towing platform.

(ii) *Mitigation zone and requirements.* (A) The mitigation zone must be 250 yd around marine mammals.

(B) During the activity (*i.e.,* when towing an in-water device), Navy personnel must observe the mitigation zone for marine mammals; if marine mammals are observed, Navy personnel must maneuver to maintain distance.

(15) *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)(3)(i) of this section.

(ii) *Mitigation zone and requirements.* (A) The mitigation zone must be 200 yd around the intended impact location.

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

(C) During the activity, Navy personnel must observe the mitigation zone for marine mammals; if marine mammals are observed, Navy personnel must cease firing.

(D) 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.

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

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

(ii) *Mitigation zone and requirements.* (A) The mitigation zone must be 900 yd around the intended impact location.

(B) 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 marine mammals; if marine mammals are observed, Navy personnel must relocate or delay the start of firing.

(C) During the activity, Navy personnel must observe the mitigation zone for marine mammals; if marine mammals are observed, Navy personnel must cease firing.

(D) 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.

(17) *Non-explosive bombs and mine shapes.* Non-explosive bombs and non-explosive mine shapes during mine laying activities.

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

(ii) *Mitigation zone and requirements.* (A) The mitigation zone must be 1,000 yd around the intended target.

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

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

(D) 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 or mine laying) 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.

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

(1) *Mitigation areas for marine mammals off Saipan in MITT Study Area for sonar, explosives, and vessel strikes*—(i) *Mitigation area requirements*—(A) *Marpi Reef and Chalan Kanoa Reef Geographic Mitigation Areas.* (*1*) Navy personnel will conduct a maximum combined total of 20 hours annually from December 1 through April 30 of surface ship hull-mounted MF1 mid-frequency active sonar during training and testing within the Marpi Reef and Chalan Kanoa Reef Geographic Mitigation Areas.

(*2*) Navy personnel will not use in-water explosives.

(*3*) Navy personnel must report the total hours of all active sonar use (all bins, by bin) from December 1 through April 30 in these geographic mitigation areas in the annual training and testing exercise report submitted to NMFS.

(*4*) Should national security present a requirement to conduct training or testing prohibited by the mitigation requirements in this paragraph (b)(1)(i)(A), Navy personnel must obtain permission from the appropriate designated Command authority prior to commencement of the activity. Navy personnel must provide NMFS with advance notification and include relevant information (*e.g.,* sonar hours, explosives use) in its annual activity reports submitted to NMFS.

(B) *Marpi Reef and Chalan Kanoa Reef Awareness Notification Message Area.* (*1*) Navy personnel must issue a seasonal awareness notification message to alert Navy ships and aircraft operating in the Marpi Reef and Chalan Kanoa Reef Geographic Mitigation Areas to the possible presence of increased concentrations of humpback whales from December 1 through April 30.

(*2*) 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 humpback whales that when concentrated seasonally, may become vulnerable to vessel strikes.

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

(ii) [Reserved]

(2) *Mitigation areas for marine mammals off Guam of the MITT Study Area for sonar and explosives*—(i) *Mitigation area requirements*—(A) *Agat Bay Nearshore Geographic Mitigation Area.* (*1*) Navy personnel will not conduct MF1 surface ship hull-mounted mid-frequency active sonar year-round.

(*2*) Navy personnel will not use in-water explosives year-round.

(*3*) Should national security require the use of MF1 surface ship hull-mounted mid-frequency active sonar or explosives within the Agat Bay Nearshore Geographic Mitigation Area, Navy personnel must obtain permission from the appropriate designated Command authority prior to commencement of the activity. Navy personnel must provide NMFS with advance notification and include the information (*e.g.,* sonar hours, explosives usage) in its annual activity reports submitted to NMFS.

(B) [Reserved]

§ 218.95 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 § 218.90 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, including abiding by the U.S. Navy's Marine Species Monitoring Program for the MITT Study Area. Details on program goals, objectives, project selection process, and current projects are available at *www.navymarinespeciesmonitoring.us.*

(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-mariana-islands-training-and-testing-mitt.*

(d) *Annual MITT Study Area marine species monitoring report.* The Navy must submit an annual report to NMFS of the MITT Study Area monitoring which will be included in a Pacific-wide monitoring report including results specific to the MITT Study Area describing the implementation and results from the previous calendar year. Data collection methods will be standardized across Pacific Range Complexes including the MITT, HSTT, NWTT, and Gulf of Alaska (GOA) Study Areas to the best extent practicable, to allow for comparison in different geographic locations. The report must be submitted to the Director, Office of Protected Resources, NMFS, either within three months after the end of the calendar year, or within three months after the conclusion of the monitoring year, to be determined by the Adaptive Management process. 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 submittal of the draft if NMFS does not provide comments on the draft report. Such a report will describe progress of knowledge made with respect to monitoring study questions across multiple Navy ranges associated with the ICMP. Similar study questions must be treated together so that progress on each topic can be summarized across multiple Navy ranges. The report need not include analyses and content that does not provide direct assessment of cumulative progress on the monitoring study question. This will continue to allow the Navy to provide a cohesive monitoring report covering multiple ranges (as per ICMP goals), rather than entirely separate reports for the MITT, Hawaii-Southern California, Gulf of Alaska, and Northwest Training and Testing Study Areas.

(e) *Annual MITT Study Area Training and Testing Exercise Report.* Each year, the Navy must submit a preliminary report (Quick Look Report) detailing the status of authorized sound sources within 21 days after the anniversary of the date of issuance of the LOA to the Director, Office of Protected Resources, NMFS. The Navy must also submit a detailed report (MITT Annual Training and Testing Exercise 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. The MITT Annual Training and Testing Exercise Report can be consolidated with other exercise reports from other range complexes in the Pacific Ocean for a single Pacific Exercise Report, if desired. 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 submittal of the draft if NMFS does not provide comments on the draft report. The annual will contain information on major training exercises (MTEs), Sinking Exercise (SINKEX) events, and a summary of all sound sources used (total hours or quantity of each bin of sonar or other non-impulsive source; total annual number of each type of explosive exercises; and total annual expended/detonated rounds (missiles, bombs, sonobuoys, etc.) for each explosive bin). The annual report will also contain information on sound sources used including within specific mitigation reporting areas as described in paragraph (e)(4) of this section. The annual report will also contain both the current year's data as well as cumulative sonar and explosive use quantity from previous years' reports. Additionally, if there were any changes to the sound source 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 2020 MITT FSEIS/OEIS and MMPA final rule. The annual report will also include the details regarding specific requirements associated with specific mitigation areas. 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) *MTEs.* This section of the report must contain the following information for MTEs conducted in the MITT Study Area.

(i) Exercise information for each MTE.

(A) Exercise designator.

(B) Date that exercise began and ended.

(C) Location.

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

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

(F) Number and types of vessels, aircraft, and other platforms participating in exercise.

(G) Total hours of all active sonar source operation.

(H) Total hours of each active sonar source bin.

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

(ii) Individual marine mammal sighting information for each sighting in each exercise where mitigation was implemented.

(A) Date/Time/Location of sighting.

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

(C) Number of individuals.

(D) Initial Detection Sensor (*e.g.,* sonar, Lookout).

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

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

(G) Sea state.

(H) Visibility.

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

(J) Indication of whether the animal was 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 from sonar source.

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

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

(M) 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.) and if any calves were present.

(iii) An evaluation (based on data gathered during all of the MTEs) of the effectiveness of mitigation measures designed to minimize the received level to which marine mammals may be exposed. This evaluation must identify the specific observations that support any conclusions the Navy reaches about the effectiveness of the mitigation.

(2) *SINKEXs.* This section of the report must include the following information for each SINKEX completed that year.

(i) Exercise information gathered for each SINKEX.

(A) Location.

(B) Date and time exercise began and ended.

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

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

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

(F) Total hours of passive acoustic search time.

(G) Number and types of vessels, aircraft, and other platforms, participating in exercise.

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

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

(ii) Individual marine mammal observation (by Navy Lookouts) information 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.

(3) *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 hours or quantity (per the LOA) of each bin of sonar or other transducers; and

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

(4) *Marpi Reef and Chalan Kanoa Reef Geographic Mitigation Areas.* The Navy must report any active sonar use (all bins, by bin) between December 1 and April 30 that occurred as specifically described in these areas. Information included in the classified annual reports may be used to inform future adaptive management within the MITT Study Area.

(5) *Geographic information presentation.* The reports must present an annual (and seasonal, where practical) depiction of training and testing bin usage geographically across the MITT Study Area.

(6) *Sonar exercise notification.* The Navy must submit to NMFS (contact as specified in the LOA) an electronic report within fifteen calendar days after the completion of any MTE indicating:

(i) Location of the exercise;

(ii) Beginning and end dates of the exercise; and

(iii) Type of exercise.

(f) *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.

§ 218.96 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 section.

(b) An LOA, unless suspended or revoked, may be effective for a period of time not to exceed July 30, 2027.

(c) If an LOA expires prior to July 30, 2027, 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 § 218.97(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 § 218.97.

(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 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.

§ 218.97 Renewals and modifications of Letters of Authorization.

(a) An LOA issued under §§ 216.106 of this section and 218.96 for the activity identified in § 218.90(c) may be renewed or modified upon request by the applicant, provided that:

(1) The planned 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 planned 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 section and 218.96 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 planned 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 section and 218.96, 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.

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