DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

50 CFR Part 218

[Docket No. 230817–0197]

RIN 0648–BL72

Taking and Importing Marine Mammals; Taking Marine Mammals Incidental to the U.S. Navy Training and Testing Activities in the Hawaii-Southern California Training and Testing Study Area

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

ACTION: Proposed rule; request for comments and information.

SUMMARY: NMFS has received a request from the U.S. Navy (Navy) to modify the regulations and Letters of Authorization (LOAs) authorizing the take of marine mammals incidental to Navy training and testing activities conducted in the Hawaii-Southern California Training and Testing (HSTT) Study Area between 2018 and 2025. In 2021, two separate U.S. Navy vessels struck unidentified large whales on two separate occasions, one whale in June 2021 and one whale in July 2021, in waters off Southern California. The takes by vessel strike of the two whales by the U.S. Navy were covered by the existing regulations and LOAs, which authorize the U.S. Navy to take up to three large whales by serious injury or mortality by vessel strike between 2018 and 2025. The Navy reanalyzed the potential of vessel strike in the HSTT Study Area, including the recent strikes and as a result, requested two additional takes of large whales by serious injury or mortality by vessel strike for the remainder of the current regulatory period. In May 2023, a U.S. Navy vessel struck a large whale in waters off Southern California. NMFS reanalyzed the potential for vessel strike following the May 2023 strike and proposes to authorize two additional takes of large whales by serious injury or mortality by vessel strike for the remainder of the current regulatory period (two takes in addition to the three takes authorized in the current regulations). Pursuant to the Marine Mammal Protection Act (MMPA), NMFS is requesting comments on the proposed promulgation of modified regulations and associated LOAs for the Navy governing this additional incidental taking of marine mammals. NMFS will consider public comments prior to issuing any final rule and making final decisions on the issuance of the requested LOAs. Agency responses to public comments will be provided in the notice of the final decision. The Navy's activities qualify as military readiness activities pursuant to the MMPA, as amended by the National Defense Authorization Act for Fiscal Year 2004 (2004 NDAA).

DATES: Comments and information must be received no later than November 17, 2023.

ADDRESSES: Submit all electronic public comments via the Federal e-Rulemaking Portal. Go to *https://www.regulations.gov* and enter NOAA–NMFS–2023–0102 in the Search box. Click on the ''Comment'' icon, complete the required fields, and enter or attach your comments.

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

A copy of the Navy's applications, NMFS' proposed and final rules and subsequent LOAs for the existing (2020) and previous (2018) 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: Leah Davis, Office of Protected Resources, NMFS, (301) 427–8401.

SUPPLEMENTARY INFORMATION:

Purpose of Regulatory Action

These proposed regulations, issued under the authority of the MMPA (16 U.S.C. 1361 *et seq.*), would modify the current regulations, which allow for the authorization of 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, in-water detonations, air guns, impact pile driving/vibratory extraction, and the movement of vessels throughout the HSTT Study Area (50 CFR part 218, subpart H; hereafter ''2020 HSTT regulations'').

NMFS received a request from the Navy to modify the existing regulations and LOAs to authorize two additional takes of large whales by serious injury or mortality by vessel strike over the remainder of the HSTT regulatory period. The current HSTT regulations and LOAs authorize the incidental take, by serious injury or mortality, of three large whales by vessel strike. Here, in consideration of the best available science, including updated information related to vessel strikes, NMFS analyzes and proposes to authorize the incidental serious injury or mortality by vessel strike of five large whales over the effective period of the regulations (December 2018–December 2025). The effective period remains unchanged from the existing regulations. Further, the Navy's proposed activities remain unchanged; however, this proposed rule includes two additional mitigation measures and revision of two existing mitigation measures to further reduce the probability of vessel strike. With the exception of these new mitigation measures and revisions to two existing mitigation measures, the required mitigation and monitoring measures remain unchanged.

Background

The MMPA prohibits the ''take'' of marine mammals, with certain exceptions. Sections 101(a)(5)(A) and (D) of the MMPA (16 U.S.C. 1361 *et seq.*) 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, the public is provided with notice of the proposed incidental take authorization and the opportunity to review and 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 stock(s) and will not have an unmitigable adverse impact on the availability of the species or stock(s) 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 rulemaking 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 Preliminary Analysis and Negligible Impact Determination section below discusses the definition of ''negligible impact.''

The 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.

The NDAA for Fiscal Year 2019 (2019 NDAA) (Pub. L. 115–232), amended the MMPA to allow incidental take rules for military readiness activities under section 101(a)(5)(A) to be issued for up to 7 years. Prior to this amendment, all incidental take rules under section 101(a)(5)(A) were limited to 5 years.

Under the MMPA implementing regulations, incidental take regulations may be modified, in whole or in part, as new information is developed and after notice and opportunity for public comment (50 CFR 216.105). An LOA must be withdrawn or suspended if, after notice and opportunity for public comment, NMFS determines that the regulations are not being substantially complied with, or the taking is having, or may have, more than a negligible impact on species or stock. *Id.* at 216.106(e). Note, in its application, Navy relied on §§ 218.76, and 218.77. These sections outline the process for modification of an LOA without modifying the applicable incidental take regulation. These sections do not apply here because the Navy requested modification of the 2020 HSTT regulations.

Summary of Request

On December 27, 2018, NMFS issued a 5-year final rule governing the taking of marine mammals incidental to Navy training and testing activities conducted in the HSTT Study Area (83 FR 66846; hereafter ''2018 HSTT final rule''). Previously, on August 13, 2018, and towards the end of the time period in which NMFS was processing the Navy's request for the 2018 regulations, the 2019 NDAA amended the MMPA for military readiness activities to allow incidental take regulations to be issued for up to 7 years instead of the previous 5 years. The Navy's training and testing activities conducted in the HSTT Study Area qualify as military readiness activities pursuant to the MMPA, as amended by the 2004 NDAA. On March 11, 2019, the Navy submitted an application requesting that NMFS extend the 2018 HSTT regulations and associated LOAs such that they would cover take incidental to 7 years of training and testing activities instead of 5, extending the expiration date from December 20, 2023 to December 20, 2025. On July 10, 2020, NOAA Fisheries issued regulations to govern the taking of marine mammals incidental to the training and testing activities conducted in the HSTT Study Area over the course of 7 years, effectively extending the effective period from December 20, 2023 to December 20, 2025.

On March 31, 2022, NMFS received an adequate and complete application (2022 Navy application) from the Navy requesting that NMFS modify the existing regulations and LOAs to authorize two additional takes of large whales by serious injury or mortality by vessel strike over the remainder of the HSTT authorization period. The 2020 HSTT regulations (50 CFR part 218, subpart H) and LOAs authorize the take of marine mammals from the Navy's training and testing activities in the HSTT Study Area through December 20, 2025. These regulations and LOAs authorize the take of three large whales by serious injury or mortality by vessel strike.

The Navy's 2022 request is based upon new information regarding U.S. Navy vessel strikes off the coast of Southern California. As described in the 2022 Navy application, in 2021, two separate U.S. Navy vessels struck unidentified large whales off the coast of Southern California on two separate occasions, one whale in June 2021 and one whale in July 2021. Separately, a foreign naval vessel struck two fin whales off the coast of Southern California in May 2021.

In the 2022 Navy application, the Navy proposes no changes to the nature of the specified activities covered by the 2020 HSTT final rule. The Navy states that the level of activity within and between years would be consistent with that previously analyzed in the 2020 HSTT final rule, and all activities would be conducted within the same boundaries of the HSTT Study Area identified in the 2020 HSTT final rule. The training and testing activities (*e.g.,* equipment and sources used, exercises conducted) are identical to those described and analyzed in the 2020 HSTT final rule, and the mitigation, monitoring, and reporting measures are similar to those described and analyzed in the 2020 HSTT final rule. The only changes included in the Navy's request are for additional take by serious injury or mortality by vessel strike.

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 ensures the readiness of the naval forces of the United States. The Navy executes this responsibility by establishing and executing training programs, including at-sea training and exercises, and ensuring naval forces have access to the ranges, operating areas (OPAREAs), and airspace needed to develop and maintain skills for conducting naval activities.

For a summary of the training and testing activities within the HSTT Study Area, see the Navy's previous rulemaking and LOA applications submitted for HSTT Phase III activities (October 13, 2017 initial rulemaking and LOA application (hereafter ''2017 Navy application'') and March 11, 2019 extension rulemaking and LOA application (hereafter ''2019 Navy application'')) and the 2020 HSTT regulations that were subsequently promulgated, which can be found at: *https://www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-military-readiness-activities.* These activities are deemed by the Navy necessary to accomplish military readiness requirements and are anticipated to continue into the reasonably foreseeable future. The 2022 Navy application and this proposed rule cover training and testing activities that would occur over the remainder of the effective period of the current regulations, valid from the

publication date of the final rule, if issued, through December 20, 2025.

Summary of the Proposed Regulations

NMFS is proposing to modify the incidental take regulations and associated LOAs to cover the same Navy activities covered by the 2020 HSTT regulations but authorize five takes of large whales by serious injury or mortality by vessel strike (two takes in addition to the three takes authorized in the current regulations). In its 2022 application, the Navy proposes no additional changes and explains that its training and testing activities, including the level of vessel use, remain unchanged. Nearly all mitigation, monitoring, and reporting measures remain unchanged with the exception of two additional mitigation measures, revision of two existing mitigation measures, and an additional reporting measure resulting from discussions between the Navy and NMFS.

In response to the Navy's request, we focus our analysis on the new information related to vessel strike. We also review any new information that may be pertinent to our analysis of the impacts from all other activities that comprise Navy's specified activity, and our analysis of mitigation, monitoring, and reporting. Where there is any new information pertinent to the descriptions, analyses, or findings required to authorize the incidental take for military readiness activities under MMPA section 101(a)(5)(A), that information is provided in the appropriate sections below. Where there is no new information or any new information does not change our previous analysis or findings, we indicate as such and refer the reader to the original analysis in the 2018 HSTT proposed and final rule, 2020 HSTT final rule or the 2019 HSTT Final Environmental Impact Statement (FEIS)/Overseas Environmental Impact Statement (OEIS).

After reviewing all new information and as discussed below, we largely find that our previous analyses and findings remain current and applicable. For vessel strike, we provide a new analysis and propose authorizing two additional takes of large whales, for a total of five takes by serious injury or mortality by vessel strike over the 7-year period. We consider authorizing these additional takes after analyzing the best available information and after considering the effects of the entire specified activity and the total taking as required by MMPA section 101(a)(5)(A). When setting forth the permissible methods of taking pursuant to the activity and other means of effecting the least practicable adverse impact on the species or stock, we propose requiring new and modified mitigation and also consider whether to require any new or modified mitigation for the entire specified activity.

The proposed regulatory language included at the end of this proposed rule, which would be published at 50 CFR part 218, subpart H, remains largely the same as that under the HSTT 2020 regulations, except for a small number of technical changes related to the Navy's 2022 request, new and revised mitigation measures, and a new reporting measure. Therefore, in this proposed rule, we refer the reader to complete analyses described in the 2018 HSTT final rule or an updated analysis in the 2020 HSTT final rule, where appropriate.

Below is a list of the regulatory documents referenced in this proposed rule. The list indicates the short name by which the document is referenced in this proposed rule as well as the full titles of the cited documents. All of the documents can be found at: *www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-military-readiness-activities* and *http://www.hstteis.com/.*

- NMFS June 26, 2018, Hawaii-Southern California Training and Testing (HSTT) proposed rule (83 FR 29872; 2018 HSTT proposed rule);
- NMFS December 27, 2018, Hawaii-Southern California Training and Testing (HSTT) final rule (83 FR 66846; 2018 HSTT final rule);
- NMFS September 13, 2019, Hawaii-Southern California Training and Testing (HSTT) proposed rule (84 FR 48388; 2019 HSTT proposed rule);
- NMFS July 10, 2020, Hawaii-Southern California Training and Testing (HSTT) final rule (85 FR 41780; 2020 HSTT final rule);
- Navy October 13, 2017, MMPA rulemaking and LOA application (2017 Navy application);
- Navy March 11, 2019, MMPA rulemaking and LOA extension application (2019 Navy application);
- Navy March 31, 2022, MMPA rulemaking and LOA revision application (2022 Navy application); and
- October 26, 2018, Hawaii-Southern California Training and Testing (HSTT) Final Environmental Impact Statement/Overseas Environmental Impact Statement (FEIS/OEIS) (2018 HSTT FEIS/OEIS).

Description of the Specified Activity

The Navy requests authorization to take marine mammals incidental to conducting training and testing activities. The Navy has determined that acoustic and explosives stressors are most likely to result in impacts on marine mammals that could rise to the level of harassment. In addition to take by harassment, the Navy has determined that vessel movement may result in serious injury or mortality to marine mammals. Detailed descriptions of these activities are provided in chapter 2 of the 2018 HSTT FEIS/OEIS and in the 2017 Navy application.

Overview of Training and Testing Activities

The Navy routinely trains in the HSTT Study Area in preparation for national defense missions. Training and testing activities and components covered in the 2022 Navy application are described in detail in the *Overview of Training and Testing Activities* sections of the 2018 HSTT proposed rule, the 2018 HSTT final rule, and chapter 2 (*Description of Proposed Action and Alternatives*) of the 2018 HSTT FEIS/OEIS (*http://www.hstteis.com/*). Each military training and testing activity described meets mandated Fleet requirements to deploy ready forces. The Navy proposes no changes to the specified activities described and analyzed in the 2018 HSTT final rule and subsequent 2020 HSTT final rule. The boundaries of the HSTT Study Area (see figure 2–1 of the 2019 Navy application); the dates and duration of the activities; and the training and testing activities (*e.g.,* equipment and sources used, exercises conducted) analyzed in this proposed rule are identical to those described and analyzed in the 2020 HSTT final rule and therefore, are not repeated herein. Please see the 2020 HSTT final rule for more information. The manner of vessel movement presented in this proposed rule is also identical to that analyzed in the 2020 HSTT final rule.

Vessel Strike

Vessel strikes are not specific to any particular training or testing activity but rather, a limited, sporadic, and incidental result of Navy vessel movement within the HSTT Study Area. Vessel strikes from commercial, recreational, and military vessels are known to seriously injure and occasionally kill cetaceans (Abramson *et al.* 2011; Berman-Kowalewski *et al.* 2010; Calambokidis, 2012; Douglas *et al.* 2008; Laggner, 2009; Lammers *et al.* 2003; Van der Hoop *et al.* 2012; Van der Hoop *et al.* 2013; Crum *et al.* 2019), although reviews of the literature on vessel strikes mainly involve collisions between commercial vessels and whales (Jensen and Silber, 2003; Laist *et al.* 2001). Vessel speed, size, and mass are

all important factors in determining both the potential likelihood and impacts of a vessel strike to marine mammals (Conn and Silber, 2013; Gende *et al.* 2011; Silber *et al.* 2010; Vanderlaan and Taggart, 2007; Wiley *et al.* 2016). For large vessels, speed and angle of approach can influence the severity of a strike.

Navy vessels transit at speeds that are optimal for fuel conservation or to meet training and testing requirements. Small craft (for purposes of this analysis, less than 18 m in length) have much more variable speeds (0–50+ knots (kn; 0–92.6 kilometers (km) per hour), dependent on the activity). Submarines generally operate at speeds in the range of 8–13 kn (14.8–24.1 km per hour), and the average speed of large Navy ships range between 10 and 15 kn (18.5 and 27.8 km per hour). While these speeds are considered averages and representative of most events, some vessels need to operate outside of these parameters for certain times or during certain activities. For example, to produce the required relative wind speed over the flight deck, an aircraft carrier engaged in flight operations must adjust its speed through the water accordingly. Also, there are other instances such as launch and recovery of a small rigid hull inflatable boat; vessel boarding, search, and seizure training events; or retrieval of a target when vessels would be dead in the water or moving slowly ahead to maintain steerage. There are a few specific events, including high-speed tests of newly constructed vessels, where vessels would operate at higher speeds. By comparison, this is slower than most commercial vessels where full speed for a container ship is typically 24 kn (44.4 km per hour; Bonney and Leach, 2010).

Large Navy vessels (greater than 18 m in length) within the offshore areas of range complexes and testing ranges operate differently from commercial vessels in ways that may reduce the probability of whale collisions. Surface ships operated by or for the Navy have multiple personnel assigned to stand watch at all times when a ship or surfaced submarine is moving through the water (underway). A primary duty of personnel standing watch on surface ships is to detect and report all objects and disturbances sighted in the water that may indicate a threat to the vessel and its crew, such as debris, a periscope, surfaced submarine, or surface disturbance. Per vessel safety requirements, personnel standing watch also report any marine mammals sighted in the path of the vessel as a standard collision avoidance procedure. All vessels proceed at a safe speed so they can take proper and effective action to avoid a collision with any sighted object or disturbance and can be stopped within a distance appropriate to the prevailing circumstances and conditions. As described in the *Standard Operating Procedures* section, the Navy utilizes Lookouts to avoid collisions, and Lookouts are also trained to spot marine mammals so that vessels may change course or take other appropriate action to avoid collisions. Should a vessel strike occur, we consider that it would likely result in incidental take in the form of serious injury and/or mortality and, accordingly, for the purposes of the analysis, we assume that any vessel strike would result in serious injury or mortality.

The Navy proposes no changes to the nature of the specified activities, the training and testing activities, the manner of vessel movement, the speeds at which vessels operate, the number of vessels that would be used during various activities, or the locations in which Navy vessel activity would be concentrated within the HSTT Study Area described in the 2018 HSTT final rule and referenced in the 2020 HSTT final rule.

Vessel Movement

Vessels used as part of the planned activities include ships, submarines, unmanned vessels, and boats ranging in size from small, 22 ft (7 m) rigid hull inflatable boats to aircraft carriers with lengths up to 1,092 ft (333 m). The average speed of large Navy ships ranges between 10 and 15 kn (18.5 and 27.8 km per hour) and submarines generally operate at speeds in the range of 8–13 kn (14.8–24.1 km per hour) while a few specialized vessels can travel at faster speeds. Small craft (for purposes of this analysis, less than 18 m in length) have much more variable speeds (0–50+ kn (0–92.6 km per hour), dependent on the activity) but generally range from 10 to 14 kn (18.5 to 25.9 km per hour). From unpublished Navy data, average median speed for large Navy ships in the HSTT Study Area from 2011–2015 varied from 5–10 kn (9.2–18.5 km per hour) with variations by ship class and location (*i.e.,* slower speeds close to the coast). While these speeds for large and small craft are representative of most events, some vessels need to temporarily operate outside of these parameters. Typical speed of Navy vessels in HSTT core high use areas from 2014–2018 were between 10 and 15 kn (18.5 and 27.8 km per hour; Starcovic and Mintz 2021). This core area is a region including the approaches to San Diego, and immediate offshore areas west of San Diego, centered north and south of San Clemente Island. A full description of Navy vessels that are used during training and testing activities can be found in the 2017 Navy application and chapter 2 (*Description of Proposed Action and Alternatives*) of the 2018 HSTT FEIS/OEIS.

The number of Navy vessels used in the HSTT Study Area varies based on military training and testing requirements, deployment schedules, annual budgets, and other dynamic factors. Most training and testing activities involve the use of vessels. These activities could be widely dispersed throughout the HSTT Study Area but would typically be conducted near naval ports, piers, and range areas. Navy vessel traffic would be especially concentrated near San Diego, California and Pearl Harbor, Hawaii. Based on historical data, we anticipate the annual number of at-sea hours by U.S. Navy vessels in the HSTT action area will be around 26,800 hours per year (Starcovic and Mintz 2021). We expect that about 25 percent of this vessel activity would occur within the Hawaii Range Complex (HRC) and 75 percent within the Southern California Range Complex (SOCAL; Mintz 2016). There is no seasonal differentiation in Navy vessel use because of continual operational requirements from Combatant Commanders. The majority of large vessel traffic occurs between the installations and the OPAREAs. The transit corridor, notionally defined by the great circle route (*e.g.,* shortest distance) from San Diego to the center of the HRC, as depicted in the 2018 HSTT FEIS/OEIS, is generally used by ships transiting between SOCAL and HRC. While in transit, ships and aircraft would, at times, conduct basic and routine unit-level activities such as gunnery, bombing, and sonar training and maintenance. Of note, support craft would be more concentrated in the coastal waters in the areas of naval installations, ports, and ranges. Activities involving vessel movements occur intermittently and are variable in duration, ranging from a few hours up to weeks. More information on Navy and non-Navy vessel traffic patterns in the HSTT Study Area may be found in several studies prepared by the Navy (Starcovic and Mintz 2021; Mintz, 2016; Mintz and Filadelfo, 2011; Mintz, 2012; Mintz and Parker, 2006).

Foreign Navies

In addition, we note that in some cases, foreign militaries may participate in U.S. Navy training or testing activities in the HSTT Study Area. The Navy does not consider these foreign

military activities as part of the ''specified activity'' under the MMPA, and NMFS defers to the applicant to describe the scope of its request for an authorization.

The participation of foreign navies varies from year to year, but overall is infrequent compared with Navy's total training and testing activities. The most significant joint training event is the Rim of the Pacific (RIMPAC), a multi-national training exercise held every-other-year primarily in the HRC. The participation level of foreign military vessels in U.S. Navy-led training or testing events within the HRC and within SOCAL differs greatly between RIMPAC and non-RIMPAC years. For example, in 2019 (a non-RIMPAC year), there were 0.1 foreign navy at-sea days (*i.e.,* 1 day = 24 hours) within HRC and 20 foreign navy at-sea days within SOCAL (Navy 2021). Out of 56 U.S.-led training events in 2019, 4 involved foreign navy vessels, with an average time per event of 8.7 hours. In 2020, a RIMPAC year, foreign vessels participating in U.S. Navy-led events accounted for 32 at-sea days in the HRC from August through September (some of this activity occurred after the RIMPAC exercise). During RIMPAC 2022, foreign vessels operated and/or transited through the HRC for 576 hours (24 days). Even in a RIMPAC year, the days at sea for foreign militaries engaged in a Navy-led training or testing activity accounts for a very small percentage compared to the U.S. Navy activities. For instance, the 2020 foreign military participation (a RIMPAC-year) was 1.5 percent of the U.S. Navy's average days at sea (32 days out of an estimated 2,056 days at sea).

According to the U.S. Navy, consistent with customary international law, when a foreign military vessel participates in a U.S. Navy exercise within the U.S. territorial sea (*i.e.,* 0 to 12 nmi (0 to 22.2 km) from shore), the U.S. Navy will request that the foreign vessel follow the U.S. Navy's mitigation measures for that particular event. When a foreign military vessel participates in a U.S. Navy exercise beyond the U.S. territorial sea but within the U.S. Exclusive Economic Zone, the U.S. Navy will encourage the foreign vessel to follow the U.S. Navy's mitigation measures for that particular event (Navy 2022a; Navy 2022b). In either scenario (*i.e.,* both within and beyond the territorial sea), U.S. Navy personnel will provide the foreign vessels participating with a description of the mitigation measures to follow. If a foreign military is not participating in a U.S. Navy training or testing exercise, foreign military vessels operating within the HSTT Study Area are expected to adhere to their own standard operating procedures and environmental mitigation measures.

According to the U.S. Navy, the May 2021 vessel strike of two fin whales by an Australian navy vessel did not occur while that vessel was participating in a U.S. Navy-led training exercise. The Royal Australian Navy vessel was adhering to its standard operating procedures at the time of the strike. The Royal Australian Navy provided a report of the incident, which is discussed below to inform our analysis.

NMFS analyzes the effects of these foreign military activities in two ways. First, effects of all past foreign military activities are captured in the baseline for the analysis, through marine mammal abundance estimates and population trends found in the SARs. Second, NMFS considers foreign military activities, including recent strikes, qualitatively in this proposed rule. For instance, in preparing this rulemaking, NMFS and the U.S. Navy discussed the nature, frequency, and control over joint or U.S. Navy-led training and testing activities with foreign entities to identify opportunities to encourage foreign militaries to adopt mitigation. NMFS and the U.S. Navy examined the Royal Australian Navy strike report for any lessons that could inform U.S. Navy strike mitigation. NMFS considered the Royal Australian Navy strikes along with other recent U.S. Navy strikes to determine whether these strikes indicate an increased risk of strike by the U.S. Navy in this region during the early summer months. NMFS also considered the species struck in this incident, fin whales, along with other literature, when considering the likelihood of certain species to be struck by the U.S. Navy. Finally, NMFS considered the fact that two fin whales were struck by the Royal Australian Navy qualitatively when considering other fin whale population and mortality trends, as well as the take proposed for authorization, as part of the negligible impact analysis.

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 a real-world situation and to their optimum capabilities. While standard operating procedures (SOPs) 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 proposed activities under NEPA and included them in the environmental analysis. We consider standard operating procedures as part of Navy's specified activity for the purposes of MMPA but also, where procedures are utilized (even in part) to reduce impacts to marine mammal species and Navy's commitment to follow the measures are practicable, certain SOPs may also be required as mitigation. Details on standard operating procedures were provided in the 2018 HSTT proposed rule; please see the 2018 HSTT proposed rule, the 2017 Navy application, and Chapter 2 (*Description of Proposed Action and Alternatives*) of the 2018 HSTT FEIS/OEIS for more information.

As stated in its 2022 application, in 2018, the Navy updated its SOPs related to vessel safety to incorporate revised procedures regarding Lookouts for certain ship classes as per the 2021 Surface Ship Navigation Department Organization and Regulations Manual (NAVDORM). The 2021 NAVDORM requires the use of three Lookouts on Navy cruisers and destroyers as compared to the previous requirement of one Lookout when a vessel was underway and not engaged in sonar training or testing. However, as discussed in the Proposed Mitigation Measures section below, the Navy informed NMFS that requiring the additional Lookouts as mitigation is not practicable because this SOP may change in response to manning issues and national security needs. Further, since submission of its 2022 application, the Navy has updated its Lookout Training Handbook and implemented other training improvements, as described in the Proposed Mitigation Measures section (September 2022).

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

Marine mammal species and their associated stocks that have the potential to occur in the HSTT Study Area are presented in table 1 along with the best/minimum abundance estimate and associated coefficient of variation value. Consistent with the 2018 HSTT final rule and 2020 HSTT final rule, the Navy anticipates the take of individuals from 38 marine mammal species by Level A harassment and Level B harassment incidental to training and testing activities from the use of sonar and other transducers, in-water detonations,

air guns, and impact pile driving/vibratory extraction activities. As described in detail later, serious injury or mortality of six species is also analyzed and proposed for authorization.

In the 2018 HSTT proposed rule and 2018 HSTT final rule, we presented a detailed discussion of marine mammals and their occurrence in the HSTT Study Area, inclusive of important marine mammal habitat (*e.g.,* ESA-designated critical habitat), biologically important areas (BIAs), national marine sanctuaries (NMSs), and unusual mortality events (UMEs). Please see these rules and the 2017 and 2019 Navy applications for additional information beyond what is provided herein. While there have been some minor changes described here, there have been no changes to important marine mammal habitat, NMSs, or ESA designated critical habitat since the issuance of the 2018 HSTT final rule that change our determination of which species or stocks have the potential to be affected by the Navy's activities or the information in the *Description of Marine Mammals and Their Habitat in the Area of the Specified Activities* section in the 2019 HSTT proposed rule and 2020 HSTT final rule. Therefore, the information presented in those sections of the 2019 HSTT proposed rule and 2020 HSTT final rule remains current and valid with the exception of the information about UMEs, BIAs, and revised humpback whale stock structures, discussed below.

On April 21, 2021, NMFS designated critical habitat for the endangered Western North Pacific Distinct Population Segment (DPS), the endangered Central America DPS, and the threatened Mexico DPS of humpback whales (86 FR 21082). Areas proposed as critical habitat include specific marine areas located off the coasts of California, Oregon, Washington, and Alaska. None of the designated critical habitat overlaps with the HSTT Study Area. One of the proposed areas, critical habitat Unit 19, would have overlapped with the SOCAL range in the HSTT Study Area but was excluded after consideration of potential national security and economic impacts of designation. NMFS, in the final rule designating critical habitat for humpback whales, identified prey species, primarily euphausiids and small pelagic schooling fishes of sufficient quality, abundance, and accessibility within humpback whale feeding areas to support feeding and population growth, as an essential habitat feature. NMFS, through a critical habitat review team (CHRT), also considered inclusion of migratory corridors and passage features, as well as sound and the soundscape, as essential habitat features. NMFS did not include either in the final critical habitat, however, as the CHRT concluded that the best available science did not allow for identification of any consistently used migratory corridors or definition of any physical, essential migratory or passage conditions for whales transiting between or within habitats of the three DPSs. The best available science also currently does not enable NMFS to identify particular sound levels or to describe a certain soundscape feature that is essential to the conservation of humpback whales. Regardless of whether critical habitat is designated for a particular area, NMFS has considered all applicable information regarding marine mammals and their habitat in the analysis supporting these proposed regulations.

NMFS has reviewed the 2022 final Stock Assessment Reports (SARs; Carretta *et al.* 2023, Young *et al.* 2023). For all species except humpback whale, NMFS determined that neither the SARs nor any other new information changes our determination of which species or stocks have the potential to be affected by the Navy's activities. For humpback whale, the 2022 final SARs include a revision to the humpback whale stock structure in the Pacific Ocean. In the 2020 HSTT final rule, NMFS authorized take of the CA/OR/WA stock and Central North Pacific stock of humpback whale. Given the revised stock structure, in this proposed rule, NMFS has reanalyzed the potential for take of each stock of humpback whale and determined that the Central America/Southern Mexico-CA/OR/WA, Mainland Mexico—CA/OR/WA stock, and Hawaii stocks are likely to be taken by the Navy's activities. Please refer to the 2022 Alaska and Pacific Ocean SARs for additional information about these new stocks.)

The species considered but not carried forward for analysis are two American Samoa stocks of spinner dolphins—(1) the Kure and Midway stock and (2) the Pearl and Hermes stock. There is no potential for overlap with any stressors from Navy activities and therefore there would be no incidental takes, in which case, these stocks are not considered further.

TABLE 1—MARINE MAMMAL OCCURRENCE WITHIN THE HSTT STUDY AREA

Common name	Scientific name	Stock	Status		Occurrence	Seasonal absence	Stock abundance (CV)/minimum population
			MMPA	ESA			
Blue whale	*Balaenoptera musculus*	Eastern North Pacific	Strategic, Depleted	Endangered	Southern California	—	1,898 (0.085)/1,767.
	Central North Pacific	Strategic, Depleted	Endangered	Hawaii	Summer	133 (1.09)/63.	
Bryde's whale	*Balaenoptera brydei/edeni.*	Eastern Tropical Pacific	—	—	Southern California	—	unknown.
		Hawaii	—	—	Hawaii	—	602 (0.22)/501.
Fin whale	*Balaenoptera physalus*	CA/OR/WA	Strategic, Depleted	Endangered	Southern California	—	11,065 (0.405)/7,970.
		Hawaii	Strategic, Depleted	Endangered	Hawaii	Summer	203 (0.99)/101.
Humpback whale	*Megaptera novaeangliae.*	Central America/Southern Mexico—CA/OR/WA.	Strategic	Endangered [1]	Southern California	Winter	1,496 (0.171)/1,284.
		Mainland Mexico—CA/OR/WA.	Strategic	Threatened [1]	Southern California	Winter	3,477 (0.101)/3,185.
		Hawai'i	—	—[1]	Hawaii	Summer	11,278 (0.56)/7,265.
Minke whale	*Balaenoptera acutorostrata.*	CA/OR/WA	—	—	Southern California	—	915 (0.792)/509.
		Hawaii	—	—	Hawaii	Summer	438 (1.05)/212.
Sei whale	*Balaenoptera borealis*	Eastern North Pacific	Strategic, Depleted	Endangered	Southern California	—	519 (0.40)/374.
		Hawaii	Strategic, Depleted	Endangered	Hawaii	Summer	391 (0.9)/204.

TABLE 1—MARINE MAMMAL OCCURRENCE WITHIN THE HSTT STUDY AREA—Continued

Common name	Scientific name	Stock	Status		Occurrence	Seasonal absence	Stock abundance (CV)/minimum population
			MMPA	ESA			
Gray whale	*Eschrichtius robustus*	Eastern North Pacific	—	—	Southern California	—	26,960 (0.05)/25,849.
		Western North Pacific	Strategic, Depleted	Endangered	Southern California	—	290 (NA)/271.
Sperm whale	*Physeter macrocephalus.*	CA/OR/WA	Strategic, Depleted	Endangered	Southern California	—	1,997 (0.57)/1,270.
		Hawaii	Strategic, Depleted	Endangered	Hawaii	—	5,707 (0.23)/4,486.
Pygmy sperm whale	*Kogia breviceps*	CA/OR/WA	—	—	Southern California	Winter and Fall	4,111 (1.12)/1,924.
		Hawaii	—	—	Hawaii	—	42,083 (0.64) 25,695.
Dwarf sperm whale	*Kogia sima*	CA/OR/WA	—	—	Southern California	—	unknown.
		Hawaii	—	—	Hawaii	—	unknown.
Baird's beaked whale	*Berardius bairdii*	CA/OR/WA	—	—	Southern California	—	1,363 (0.53)/894.
Blainville's beaked whale.	*Mesoplodon densirostris.*	Hawaii	—	—	Hawaii	—	1,132 (0.99)/564.
Cuvier's beaked whale	*Ziphius cavirostris*	CA/OR/WA	—	—	Southern California	—	5,454 (0.27)/4,214.
		Hawaii	—	—	Hawaii	—	4,431 0.41/3,180.
Longman's beaked whale.	*Indopacetus pacificus*	Hawaii	—	—	Hawaii	—	2,550 (0.67)/1,527.
Mesoplodont beaked whales.	*Mesoplodon spp*	CA/OR/WA	—	—	Southern California	—	3,044 (0.54)/1,967.
Common Bottlenose dolphin.	*Tursiops truncatus*	California Coastal	—	—	Southern California	—	453 (0.06)/346.
		CA/OR/WA Offshore	—	—	Southern California	—	3,477 (0.696)/2,048.
		Hawaii Pelagic	—	—	Hawaii	—	unknown.
		Kauai and Niihau	—	—	Hawaii	—	NA NA/97.
		Oahu	—	—	Hawaii	—	NA.
		4-Islands	—	—	Hawaii	—	NA.
		Hawaii Island	—	—	Hawaii	—	unknown.
False killer whale	*Pseudorca crassidens*	Main Hawaiian Islands Insular.	Strategic, Depleted	Endangered	Hawaii	—	167 (0.14)/149.
		Hawaii Pelagic	—	—	Hawaii	—	2,086 (0.35)/1,567.
		Northwestern Hawaiian Islands.	—	—	Hawaii	—	477 (1.71)/178.
Fraser's dolphin	*Lagenodelphis hosei*	Hawaii	—	—	Hawaii	—	40,960 (0.7)/24,068.
Killer whale	*Orcinus orca*	Eastern North Pacific Offshore.	—	—	Southern California	—	300 (0.1)/276.
		West Coast Transient	—	—	Southern California	—	349 (N/A)/349.
		Hawaii	—	—	Hawaii	—	161 (1.06)/78.
Long-beaked common dolphin.	*Delphinus capensis*	California	—	—	Southern California	—	83,379 (0.216)/69,636.
Melon-headed whale	*Peponocephala electra*	Hawaiian Islands	—	—	Hawaii	—	40,647 (0.74)/23,301.
		Kohala Resident	—	—	Hawaii	—	unknown.
Northern right whale dolphin.	*Lissodelphis borealis*	CA/OR/WA	—	—	Southern California	—	29,285 (0.72)/17,024.
Pacific white-sided dolphin.	*Lagenorhynchus obliquidens.*	CA/OR/WA	—	—	Southern California	—	34,999 (0.222)/29,090.
Pantropical spotted dolphin.	*Stenella attenuata*	Oahu	—	—	Hawaii	—	unknown.
		4-Islands	—	—	Hawaii	—	unknown.
		Hawaii Island	—	—	Hawaii	—	unknown.
		Hawaii Pelagic	—	—	Hawaii	—	39,768 (0.51)/25,548.
Pygmy killer whale	*Feresa attenuata*	Tropical	—	—	Southern California	Winter & Spring	unknown.
		Hawaii	—	—	Hawaii	—	10,328 (0.75)/5,885.
Risso's dolphins	*Grampus griseus*	CA/OR/WA	—	—	Southern	—	6,336 (0.32)/4,817.
		Hawaii	—	—	California Hawaii	—	7,385 (0.22)/6,150.
	Steno bredanensis	NSD[2]	—	—	Southern California	—	unknown.
Rough-toothed dolphin		Hawaii	—	—	Hawaii	—	76,357 (0.41)/54,804.
Short-beaked common dolphin.	*Delphinus delphis*	CA/OR/WA	—	—	Southern California	—	1,056,308 (0.21)/ 888,971.
Short-finned pilot whale	*Globicephala macrorhynchus.*	CA/OR/WA	—	—	Southern California	—	836 (0.79)/466.
		Hawaii	—	—	Hawaii	—	12,607 (0.18)/10,847.
Spinner dolphin	*Stenella longirostris*	Hawaii Pelagic	—	—	Hawaii	—	unknown.
		Hawaii Island	—	—	Hawaii	—	665 (0.09)/617.
		Oahu and 4-Islands	—	—	Hawaii	—	unknown.
		Kauai and Niihau	—	—	Hawaii	—	unknown.
		Kure and Midway	—	—	Hawaii	—	unknown.
		Pearl and Hermes	—	—	Hawaii	—	unknown.
Striped dolphin	*Stenella coeruleoalba*	CA/OR/WA	—	—	Southern California	—	29,988 (0.3)/23,448.

TABLE 1—MARINE MAMMAL OCCURRENCE WITHIN THE HSTT STUDY AREA—Continued

Common name	Scientific name	Stock	Status		Occurrence	Seasonal absence	Stock abundance (CV)/minimum population
			MMPA	ESA			
		Hawaii	—	—	Hawaii	—	35,179 (0.23)/29,058.
Dall's porpoise	*Phocoenoides dalli*	CA/OR/WA	—	—	Southern California	—	16,498 (0.61)/10,286.
Harbor seal	*Phoca vitulina*	California	—	—	Southern California	—	30,968 (NA)/27,348.
Hawaiian monk seal	*Neomonachus schauinslandi.*	Hawaii	Strategic, Depleted	Endangered	Hawaii	—	1,465[3] (0.03)/1,431.
Northern elephant seal	*Mirounga angustirostris*	California	—	—	Southern California	—	187,386 (NA)/85,369.
California sea lion	*Zalophus californianus*	U.S. Stock	—	—	Southern California	—	257,606 (NA)/233,515.
Guadalupe fur seal	*Arctocephalus townsendi.*	Mexico to California	Strategic, Depleted	Threatened	Southern California	—	34,187 (NA)/31,019.
Northern fur seal	*Callorhinus ursinus*	California	Depleted	—	Southern California	—	14,050 (NA)/7,524.

Note: A "—" indicates that this column does not apply.

[1] The Mainland Mexico-CA–OR–WA stock and the Mexico-North Pacific stock (which does not occur in the HSTT Study Area) of humpback whale comprise the Mexico DPS. The Hawai'i stock comprises the Hawai'i DPS. The Central America/Southern Mexico-CA–OR–WA stock comprises the Central America DPS.

[2] NSD—No stock designation. Rough-toothed dolphin has a range known to include the waters off Southern California, but there is no recognized stock or data available for the U.S. West Coast.

[3] The best official estimate of the total population size from the NMFS 2022 Stock Assessment Report (Carretta *et al.* 2023) is 1,465. This estimate is based on available data through 2020 data for Kure and Midway Atolls, Nihoa Island, and the MHI, and through 2019 for all other subpopulations. More recent survey data for 2021 and 2022 indicate an increasing trend in population size. NMFS estimates a total population size for 2022 of 1,605 (NOAA 2023).

Unusual Mortality Events

An UME is defined under section 410(6) of the MMPA as a stranding that is unexpected, involves a significant die-off of any marine mammal population, and demands immediate response. From 1991 to the present, there have been 17 formally recognized UMEs affecting marine mammals in California and Hawaii and involving species under NMFS' jurisdiction. There is one UME that is applicable to our evaluation of the Navy's activities in the HSTT Study Area. The gray whale UME along the west coast of North America is active and involves ongoing investigations. At the time of publication of the 2020 HSTT final rule, there was an active UME for Guadalupe fur seal, which NMFS fully considered in its analysis (85 FR 41780, July 10, 2020). This UME was closed on September 2, 2021, and therefore, it is not discussed further beyond the information provided here. The UME was closed because conditions under which the UME was declared are no longer occurring or have become persistent. Scientists documented a reduction in strandings compared to peak UME years. The team of scientists who investigated this UME determined the cause of the UME as being due to malnutrition in Guadalupe fur seal pups and yearlings from ecological factors (*e.g.,* warm water events) in the Pacific Ocean causing suboptimal prey conditions. Please see *https://www.fisheries.noaa.gov/national/marine-life-distress/unusual-mortality-event-2015-2021-guadalupe-fur-seal-and-2015* for additional information on this UME.

Gray Whale UME

Since January 1, 2019, elevated gray whale strandings have occurred along the west coast of North America, from Mexico to Canada. As of June 25, 2023, there have been a total of 674 strandings along the coasts of the U.S., Canada, and Mexico, with 333 of those strandings occurring along the U.S. coast. Of the strandings on the U.S. coast, 135 have occurred in Alaska, 83 in Washington, 22 in Oregon, and 93 in California. Full or partial necropsy examinations were conducted on a subset of the whales. Preliminary findings in several of the whales have shown evidence of emaciation. These findings are not consistent across all of the whales examined, so more research is needed. As part of the UME investigation process, NOAA has assembled an independent team of scientists to coordinate with the Working Group on Marine Mammal Unusual Mortality Events to review the data collected, sample stranded whales, consider possible causal-linkages between the mortality event and recent ocean and ecosystem perturbations, and determine the next steps for the investigation. Please refer to: *https://www.fisheries.noaa.gov/national/marine-life-distress/2019-2023-gray-whale-unusual-mortality-event-along-west-coast-and* for more information on this UME. See the Preliminary Analysis and Negligible Impact Determination section for additional information on how NMFS has considered this UME in this proposed rule.

Biologically Important Areas

Since publication of the 2020 HSTT final rule, Kratofil *et al.* (2023) identified updated BIAs in Hawaii. The HSTT Study Area overlaps the updated BIAs for small and resident populations of the following species in Hawaii: spinner dolphin, short-finned pilot whale, rough-toothed dolphin, pygmy killer whale, pantropical spotted dolphin, melon-headed whale, false killer whale, dwarf sperm whale, Cuvier's beaked whale, common bottlenose dolphin, and Blainville's beaked whale. Further, the HSTT Study Area overlaps updated BIAs for humpback whale reproduction in Hawaii. The updated BIAs overlap critical Navy training and testing areas within the HSTT Study Area, including most of the internal Navy operating areas. Please see Kratofil *et al.* (2023) for additional details about the BIAs.

Potential Effects of Specified Activities on Marine Mammals and Their Habitat

This section provides a discussion of the ways in which components of the specified activity may impact marine mammals and their habitat. The Estimated Take section later in this document includes a quantitative analysis of the number of individuals that are expected to be taken by this activity. The Negligible Impact Analysis and Determination section considers the content of this section, the Estimated Take section, and the Proposed Mitigation section, to draw conclusions regarding the likely impacts of these activities on the reproductive success or survivorship of individuals and whether those impacts are reasonably expected to, or reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or

survival. In the *Potential Effects of Specified Activities on Marine Mammals and Their Habitat* section of the 2018 HSTT proposed and final rules, and as updated by the 2020 HSTT final rule, NMFS provided a description of the ways marine mammals may be affected by the same activities that the Navy will be conducting during the 7-year period analyzed in this rulemaking in the form of serious injury or mortality, physical trauma, sensory impairment (permanent and temporary threshold shifts and acoustic masking), physiological responses (particularly stress responses), behavioral disturbance, or habitat effects. We do not repeat the information here, all of which remains current and applicable, and instead summarize any new relevant information from the scientific literature. For more information we refer the reader to those rules and the 2018 HSTT FEIS/OEIS (Chapter 3, Section 3.7 *Marine Mammals*), which NMFS participated in the development of via our cooperating agency status and adopted to meet our NEPA requirements.

In the *Potential Effects of Specified Activities on Marine Mammals and Their Habitat* section of the 2018 HSTT final rule, we stated that it has been speculated for some time that beaked whales might have unusual sensitivities to sonar sound due to their likelihood of stranding in conjunction with mid-frequency active sonar (MFAS) use, although few definitive causal relationships between MFAS use and strandings have been documented, and no such findings have been documented with Navy use in Hawaii and southern California. On March 25, 2022, a beaked whale (species unknown) stranded in Honaunau Bay, Hawaii. The animal was observed swimming into shore and over rocks. Bystanders intervened to turn the animal off of the rocks, and it swam back out of the Bay on its own. Locals reported hearing a siren or alarm type of sound underwater on the same day, and a Navy vessel was observed from shore on the following day. The Navy confirmed it used continuous active sonar (CAS) within 50 km (27 nmi) and 48 hours of the time of stranding, though the stranding has not been definitively linked to the Navy's CAS use.

An initial study of another deep diving odontocete, the sperm whale, found similar behavioral responses and reductions in foraging when whales were exposed to pulsed active sonar (PAS) and CAS at similar cumulative Sound Exposure Levels (SEL_{cum}), even though the CAS signal had a lower source level than the PAS signal. This may indicate that animals were, in this case, responding to the cumulative energy of a signal rather than the instantaneous amplitude (Cure *et al.* 2021, Isojunno *et al.* 2020). If a beaked whale were inshore of a Navy vessel using either PAS or CAS MFAS, and responded by moving away from the vessel, they could find themselves in shallow water and become disoriented, as may have happened in the case of Honaunau Bay. In addition, the animal was not seen after it returned to sea, so blood tissue samples could not be obtained. There has been a growing body of literature about the impacts of new pathogens on the health and stranding of marine mammals, including beaked whales in Hawaii and other locations in the Pacific (*e.g.,* Clifton *et al.* 2023 and West *et al.* 2013).

New Pertinent Science Since Publication of the 2020 HSTT Final Rule

NMFS has reviewed new relevant information from the scientific literature since publication of the 2020 HSTT final rule. Summaries of the new key scientific literature reviewed since publication of the 2020 HSTT final rule are presented below. The literature generally falls into the following topic areas: Vessel Strike; Aircraft Noise; Hearing, Vocalization, and Masking; Hearing Loss (Temporary Threshold Shift (TTS) and Permanent Threshold Shift (PTS)); Behavioral Reactions; Stranding; Population Consequences of Disturbance and Cumulative Stressors; Methodology for Assessing Acoustic Impacts.

Vessel Strike

Crum *et al.* (2019) analyzed a modeling framework using encounter theory to estimate the risk of lethal commercial vessel strike to North Atlantic right whales. Seasonal mortality rates of right whales decreased by 22 percent on average after a speed rule was implemented, indicating that the rule is effective at reducing lethal collisions. The rule's effect on risk was greatest where right whales were abundant and vessel traffic was heavy but varied considerably across time and space.

Keen *et al.* (2019) compared vessel traffic patterns in the Southern California Bight, San Francisco, and the Pacific Northwest and found fin whales had a higher risk of nighttime vessel strikes with the nighttime risk being double daytime risk. The authors concluded that the shipping lanes contained 14 percent of all traffic volume and contributed 13 percent of all strike risk similar to conclusions reached by Rockwood *et al.* (2017). However, the authors also point out that a California Current Ecosystem (CCE) wide shipping speed reductions would not be practicable. Instead, they proposed 24-hour speed restrictions around and within shipping lanes would be more effective and feasible than nighttime only speed restrictions elsewhere. Keen *et al.* (2019b) reported high fin whale habitat suitability throughout the Southern California Bight, in particular inshore in winter and in southern portions of the Bight, which include HSTT SOCAL Study Area.

Leaper (2019) estimated that a global 10 percent reduction in shipping speeds could result in a reduction of underwater sound associated with shipping by approximately 40 percent and vessel strike risk by around 50 percent by 2050. The vessel strike risk reduction done by the author is highly variable based solely on the relationship between ship speed and risk, qualitative in its findings, and speculative.

Redfern *et al.* (2019) compared risk of vessel strike to baleen whales around the Santa Barbara Channel based on 8 years of shipping data (2008–2015). Species evaluated include blue whales, fin whales, and humpback whales using available spatial habitat models and satellite tagging results. Spatial habitat modeling data included the years 1991, 1993, 1996, 2001, 2005, 2008, and 2009. The authors defined collision risk based on the co-occurrence of whales and ships for various management scenarios focused on adding shipping routes, expanding existing area to be avoided, and reducing shipping speed associated with these areas. Encounter rate theory was used to predict relative mortality resulting from vessel strikes by estimating (a) the encounter rate; (b) the number of encounters that result in a collision; and (c) the probability that a collision is lethal (Martin *et al.* 2016, Rockwood *et al.* 2017, Crum *et al.* 2019). The authors concluded that expanding the existing areas to be avoided and speed reductions within shipping lanes and their approaches would be the most effective solutions. Ship speeds declined in the Bight from 2008 to 2015 because California air pollution regulations and economic factors made slow-steaming strategies more favorable, therefore reduction in risk from slowing ships was greatest in 2008 and lowest in 2015.

Rockwood and Jahncke (2019) estimated that humpback whale mortality from January to April in Southern California alone was 6.5 whales (1.63/month), based upon modeling using updated abundance

estimates for humpback whales off Southern California. When added to the estimated mortality from July to November, the total estimated annual humpback mortality from vessel strikes in California alone was 23.4 deaths (16.9 + 6.5). This study did not include information for January to April for fin or blue whales and did not estimate humpback mortality in central or Northern California. Thus, even this updated study may underestimate whale mortality. The author's focus was exclusively on shipping approaches to San Francisco Bay (Northern California) and Los Angeles/Long Beach (Southern California) based on Rockwood *et al.* 2017 with new local fine scale analysis. The paper postulated potential mortality from models, not actual reported strikes. The model is used to predict whale mortality based on factors listed in Rockwood *et al.* 2017. In the model results, cargo vessels, especially container ships, accounted for more than half of the predicted mortality for all whale species in both Northern and Southern California with oil tankers accounting for the second highest mortality. The author's recommendation concludes with commercial industry-wide shipping speed reduction recommendations given the model is biased on mortality as a function of speed. In summary, Rockwood and Jahncke (2019) only addresses commercial shipping strike risk associated with major California commercial ports, and therefore, the paper may have limited applicability to how the Navy trains and tests in SOCAL.

Sèbe *et al.* (2019) assesses previous publications on whale vessel strike risk methodology and proposed a systematic approach to addressing the issue called the Formal Safety Assessment: (1) identification of hazards, (2) assessment of risks, (3) risk control options, (4) cost-benefit assessment, and (5) recommendations for decision-making. The authors provided a case study based on data from Rockwood *et al.* (2017). No new data analysis is presented in the paper. Caveats to Sèbe *et al.* (2019) are similar to those mentioned for Rockwood *et al.* (2017, 2019): older marine mammal data that may not be reflective of current or future distribution and focus on limited navigation within shipping approaches by commercial ships means that this study may have somewhat limited applicability to how the Navy trains and tests in SOCAL.

Szesciorka *et al.* (2019) concluded that while whales have some cues to avoid ships, this is true only at close range, under certain oceanographic conditions and if the whale is not otherwise distracted by feeding, breeding, or other behaviors. The paper is based on a single blue whale reaction observed in the Santa Barbara Channel, north of, and outside of, SOCAL. The blue whale was tagged as part of the U.S. Navy-funded Southern California Behavioral Response Study (SOCAL BRS) 2010–2015 and exposed to simulated MFAS when a closest point of approach of 93 m from a passing commercial container ship was noted. The whale was only tagged for a couple of hours before tag detachment. As other published papers report from the SOCAL BRS and as cited in the 2018 HSTT FEIS/OEIS, there can be significant individual variation in response to anthropogenic sources, which in this case would include vessel transit.

Blondin *et al.* (2020) estimated blue whale vessel strike risk in the Southern California Bight by combining predicted daily whale distributions with continuous vessel movement data for 4 years (2011, 2013, 2015, 2017). The study focuses on the northern Southern California Bight associated with the commercial vessel traffic separation zone through Santa Barbara Channel approaching the Port of Los Angeles/Long Beach. This area is north of and outside of SOCAL. The authors found that vessel traffic activity across years (2011, 2013, 2015, 2017) was variable and whale spatial probability was also variable based on inter-annual fluctuations in environmental conditions. Similar to previous monitoring efforts in Southern California, blue whales are typically in higher concentrations north of SOCAL from July-November (Mate *et al.* 2018), and Blondin *et al.* (2021) also picked up on this seasonal variability in their analysis. Oceanographic conditions favorable for krill development and concentration (*i.e.,* cool water periods) would lead to increased blue whale occurrence and higher strike risk as evidenced during the higher number of blue whale strikes in 2007 (Berman-Kowalewski *et al.* 2010). Finally, the coarse level of data analyzed by the authors does not account for short-term patchy prey conditions influencing blue whale occurrence and may result in overestimation of average risk.

Redfern *et al.* (2020) revised their 2019 assessments of vessel strike risk off California using interannual variability of risk across multiple years for blue whale, fin whale and humpback whale. The authors showed higher concentrations of both blue and fin whales along the Central California coast as compared to within SOCAL. Magnitude of vessel strike risk was influenced by the ship traffic scenario. In addition, interannual species variability (1991, 1993, 1996, 2001, 2005, 2008, and 2009) also influenced the magnitude of vessel strike risk, but did not change whether nearshore or offshore scenarios had higher risk. The author's conclusions were similar to Redfern *et al.* (2019). Figure 2 from Redfern *et al.* (2020) illustrates mean blue whale, fin whale, and humpback whale vessel strike risk for California based on data through 2009. Results from more recent NMFS surveys in 2014 and 2018 may or may not change this assessment in the future.

Rockwood *et al.* (2020b) calculated expected blue whale and humpback whale mortality for hypothetical compliance scenarios by imposing speed caps within and adjacent to vessel traffic lanes leading to the Port of San Francisco in Central California, 400 miles (643.7 km) north of SOCAL. Rookwood *et al.* (2020a) had already demonstrated this area off Central California had concentrated krill prey with associated higher distributions of blue whales and humpback whales. Rookwood *et al.* (2020b) used better temporal resolution density data than previous modeling efforts reported by Rookwood *et al.* (2017). Biological data analysis for Rookwood *et al.* (2020b) was based on regional monthly krill and whale surveys from 2004–2017. Rockwood *et al.'*s (2020b) overall modeling conclusions were that lower commercial ship speeds within the vessel traffic lanes could potentially reduce whale mortality from vessel strike. The authors acknowledge that local changes in whale abundance can have strong effects on both inter-annual and long-term patterns of ship-strike mortality.

Bernknopf *et al.* (2021) examined the socioeconomic benefits of using remotely-sensed information instead of in situ observations for determining blue whale occurrence in the eastern North Pacific Ocean. Their analysis used blue whale spatial distribution through 1991–2009 projects as representative of 2017 densities (Becker *et al.* 2012) combined with automatic identification system (AIS) derived measures of civilian commercial vessel traffic to predict blue whale vessel strike risk, called the Reference Case by the authors. The authors then compared estimated blue whale strike risk in a second analysis that, instead of using empirically measured blue whale observations converted into spatial habitat maps, used satellite tracking and environmental data to identify the spatial and temporal distribution of blue

whales, called the Counterfactual Case by the authors (Hazen *et al.* 2017). Estimated mean fatal strikes to blue whales for the Reference Case based on empirical density data from 1991–2009 ranged from 0.0490 to 2.5877 (max. values >1.000 between June to October) (see Table 2 in Bernknopf *et al.* 2021). Estimated mean fatal strikes to blue whales for the Counterfactual Case based on environmental estimates of blue whale density in 2017 ranged from 0.0286 to 2.1556 (max. values >1.000 between August to October). An important caveat to this research is that the two approaches result in different strike risks due to using different blue whale density estimates.

Barkaszi *et al.* (2021) designed a model to estimate risks to large whales from shipping associated with offshore wind development along the U.S. Atlantic Coast. A key caveat for the model is that it is based on civilian vessel types associated with wind energy construction (*e.g.,* tugs, service craft, *etc.*) with relatively fixed, direct routes to offshore wind sites. Therefore, while lower vessel speeds can reduce mortality, prediction and implementation of reduced speed zones are a far more complex challenge (Barkaszi *et al.* 2021). Vessel speed has less effect on strike risk over a fixed distance with fixed target density when there are no behavioral components considered (Yin *et al.* 2019). Vessel speed has a significant effect on strike risk only when behavioral components are considered, thus the ability for the user to input animal or vessel aversion is an important variable that can provide insights to the encounter risk based on vessel speeds.

Cusato (2021) discusses the merits of vessel traffic separation changes or mandatory commercial ship speed reductions in the Santa Barbara Channel to reduce the risk of vessel strikes to large whales. The author compares it to similar restrictions on the U.S. East Coast for North Atlantic right whales. The paper is a policy discussion rather than an analysis of current biological distribution of large whales and associated risk. Cusato (2021) focuses on reducing risk from commercial ships in the current vessel traffic separation scheme within the Santa Barbara Channel. Speed restrictions in the Channel would need to be implemented through either Federal regulations or Federal statute. The author also correctly points out legitimate concerns that operating large vessels at slow speeds in certain conditions could pose a safety risk because large vessels are more difficult to control and steer at slower speeds.

Hausner *et al.* (2021) examined tradeoffs of blue whale vessel strikes and speed reduction mitigation over a 17-year period from 2002 to 2018 in the Southern California Bight under two management scenarios verses a ''fixed strategy'' that implements speed reductions for a fixed time period each year. The two management strategies were (1) a ''daily strategy'' implementing speed reductions in response to whale habitat conditions on a daily basis, and (2) a ''seasonal strategy'' implementing speed reductions in response to whale habitat conditions on a seasonal basis. The period of the author's data analysis also covers the abnormal marine heat wave along the U.S. West Coast (2014–2016). The study's focus was exclusively with the traffic separation lanes leading from the Santa Barbara Channel to the Ports of Los Angeles and Long Beach, a narrow corridor north of and outside of SOCAL. The daily and seasonal management strategies were more effective in reducing blue whale strike risk in the Santa Barbara channel than the fixed strategy. The daily management strategy had the highest protective effect. This apparent difference in strategies also applied during and after the 2014–2016 marine heat wave where the daily strategy added even extra protection. The authors acknowledged that interannual variation on blue whale presence in the shipping lanes added some variability to their analysis. In addition, their study only considered blue whales sighted within the Traffic Separation Scheme, as opposed to the broader region where vessels transit through or a blue whale could occur.

Ransome *et al.* (2021) documented 40 vessel strikes to large whales in the Eastern Tropical Pacific Ocean between 1905 and 2017 off the coasts of 10 Central and South American countries (Mexico to Columbia). The authors concluded that vessel strikes to large whales are more prolific in this region than previously reported. For instance, the author's findings of 40 vessel strikes was over three times greater than previous reporting and still is likely under reporting total whale strikes. The majority of whale strikes occurred from the 1950s onward with the growth of modern shipping and whale watching. Humpback whales were the most commonly struck species (45 percent) although 30 percent of the species were not identified in their data.

Rockwood *et al.* (2021), similar to Rockwood *et al.* (2020b), calculated potential whale strike mortalities using AIS vessel data and whale density data to estimate mortality under several management scenarios within the commercial shipping lanes passing through Santa Barbara Channel and San Pedro Channel to and from the Ports of Los Angeles and Long Beach. While the Santa Barbara Channel is approximately 100 miles (160.9 km) north of SOCAL, Rockwood *et al.*'s study area also included the southern vessel traffic approach to Los Angeles and Long Beach which did extend into the northeast coastal portion of SOCAL. Recent whale surveys were not available for this effort, so the authors used long-term average blue, fin, and humpback whale densities from Becker *et al.* (2016). The author's model also predicted a higher level of whale vessel strikes from commercial ships than Rockwood *et al.* (2017), although the authors acknowledged that for the 2020 publication they included more vessel classes than for the 2017 publication.

Silber *et al.* (2021) examined the risk to gray whales from commercial shipping in the North Pacific. Vessel strike risk was highest for gray whales including the Western North Pacific Distinct Population Segment (WNP DPS) along most of the migratory routes. Highest risk to the WNP DPS of gray whales was outside of the SOCAL in the western Bering Sea, along the east coast of the Kamchatka peninsula (Russia), and coastlines of Japan. For both Eastern North Pacific and WNP DPSs of gray whales, the greatest vessel strike risk along the U.S. West Coast was from Washington to Central California.

Helm *et al.* (2023) looked at strike risk to foraging humpback whales surfacing around large cruise ships transiting Glacier Bay National Park, Alaska. The authors concluded that the probability of foraging humpback whales remaining near the surface after first sightings was relatively high. While this puts humpback whales at increased risk of ship strike, it also allows shipboard observers more time to spot whales in order to maneuver the ship to avoid a strike.

Lookout Effectiveness

A recent study by Oedekoven and Thomas (2022) was designed to evaluate the effectiveness of Navy Lookouts at detecting marine mammals before they entered a defined set of mitigation zones (*i.e.,* 200, 500, and 1,000 yd (182.9, 457.2, and 914.4 m)) during MFAS training activities. This study also compared Lookout effectiveness with that of trained marine mammal observers. Lookout teams were comprised of varying numbers of Lookouts depending on the type of ship and the training activity that was occurring (noting that the data was

collected prior to the Navy's change in its SOPs to require the use of three Lookouts on Navy cruisers and destroyers.) Marine mammal observer teams consisted of two dedicated observers. Results of this study indicate that Navy Lookout Teams, which include Lookouts and other crew members, have approximately an 80 percent chance of failing to detect a pod of large baleen whales (rorquals) before they come closer than a mitigation range of 200 yd (182.9 m), compared with a 49 percent chance for trained marine mammal observers. The probability of a pod remaining undetected by Lookouts was greater for larger mitigation zones (*i.e.,* 85 percent at 500 yd (457.2 m); 91 percent at 1,000 yd (914.4 m)). These values require some level of interpretation with regard to the numerical results. For instance, the study's statistical model assumed that Navy ships moved in a straight line at a set speed for the duration of the field trials, and that animals could not move in a direction perpendicular to a ship. Violation of this model assumption would underestimate Lookout effectiveness for some data points. The values for both Navy Lookouts and the Marine Mammal Observers include animals under the water that would not have been available for detection by a Lookout. This study suggests that detection of marine mammals is less certain than previously assumed at certain distances.

Hearing, Vocalization, and Masking

Branstetter *et al.* (2021) measured underwater, masked hearing thresholds for frequencies between 0.5 and 80 kilohertz (kHz) in two killer whales. Critical ratios computed from the threshold measurements ranged from 16 to 32 decibels (dB). For communication signals in the 1.5–15 kHz range, killer whales would require the signal to be up to 26 dB above background Gaussian noise to be detected. The authors noted that ambient background noise in the marine environment is not Gaussian, the tones used in this study do not contain as much frequency information as biologically relevant signals, and the temporal and spectral characteristics of actual signals and noise may result in some degree of release from masking. These results are consistent with critical ratio measurements from other odontocete species, despite differences in hearing ability and head size.

Fournet *et al.* (2021) measured call amplitudes from male bearded seals in the Beaufort Sea under different ambient noise conditions. The results showed that estimated source levels of seal calls increased with ambient noise up to approximately 100–105 dB root-mean-squared (rms), above which no further Lombard effect was observed. This suggests that masking of bearded seal mating calls may occur, resulting in reduced communication range, which could reduce the ability of bearded seals to detect one another, mate, and reproduce.

Mercado (2021) aimed to characterize how units within humpback whale songs were systematically varied using a large dataset of recordings from off the coast of Kona, Hawaii. The data showed that narrowband, reverberant units repeated at regular time intervals and dominated most song sessions, while broadband units were less predictable and occupied frequency bands that did not overlap with the narrowband units. The persistent production of narrowband units at regular time intervals resulted in consistent reverberation, which could either function to increase the range at which the song can be detected, or listen for fluctuations in echoes to indicate the presence of whale-sized targets.

Rey-Baquero *et al.* (2021) collected theodolite and passive acoustic data on humpback whales in a pristine environment along the Colombian Pacific for 2 months. When acoustic data (n=34 files) were analyzed for unit duration and inter-unit interval before and after boats passed, song unit lengths were shorter and more variable when boats were present. The second aim of this study was to model the whales' communication space during ambient noise or one to two boats traveling slowly. The most common peak frequency of this stock's song (350 Hz) was used in the model, and, along with a whale's location along the coast, informed calculations of transmission loss. However, the source level of ''typical whale-watching boats'' (145 dB re 1 uPa (decibels referenced to 1 micropascal) at 1 m; (Erbe *et al.* 2012)) and humpback whales (153 dB re 1 uPa at 1 m; (Au *et al.* 2006)) were taken from previous studies. Authors found that the infrequent addition of ecotour boat noise could temporarily reduce the ''very audible area'' (>10 dB SNR) in their song's commonly used peak frequency (350 Hz) by 63 percent.

Ruscher *et al.* (2021) measured aerial behavioral hearing thresholds in a Hawaiian monk seal (*Neomonachus schauinslandi*). The results showed a hearing range between 0.1 and 33 kHz with relatively poor sensitivity compared to Phocinae seals. The most sensitive thresholds were 40 dB re 20 µPa measured at 800 Hz and 3.2 kHz. The resulting audiogram was most similar to the northern elephant seal, which is the only other species of Monachinae seal with audiogram data (Reichmuth *et al.* 2013). This study suggested that hearing sensitivity of Monachinae seals is substantially reduced compared to other species within their functional hearing group (phocid carnivores in air; PCA); therefore, the use of the PCA weighting function to predict auditory impacts is likely conservative for Hawaiian monk seals.

Sills *et al.* (2021) measured underwater auditory detection thresholds in a male Hawaiian monk seal, and the range of most sensitive hearing was between 0.2 and 33 kHz. Peak hearing sensitivity of 73 dB re 1 µPa was observed at 1.6 kHz. The audiogram for this individual was similar but narrower and elevated compared to the hearing group (phocid carnivores in water; PCW) composite audiogram used to assess impacts to this species. Underwater vocalizations were also measured, and 6 call types were identified, which had peak energy between 55 and 400 Hz. The number of calls produced per minute fluctuated seasonally and peaked in the breeding season with the highest call rates recorded in December.

Sweeney *et al.* (2022) examined the difference between noise impact analyses using unweighted broadband sound pressure levels (SPLs) and analyses using auditory weighting functions. The recordings used to conduct parallel analyses in three marine mammal species groups were from a shipping route in Canada. Since shipping noise was predominantly in the low-frequency spectrum, bowhead whales perceived similar weighted and unweighted SPLs while narwhals and ringed seals experienced lower SPLs when auditory weighting functions were used. The data provide a real-world example to support the use of weighting functions based on hearing sensitivity when estimating audibility and potential impact of vessel noise on marine mammals.

A study by von Benda-Beckmann *et al.* (2021) modeled the effect of pulsed and continuous 1–2 kHz active sonar on sperm whale echolocation clicks and found that the presence of upper harmonics in the sonar signal increased masking of clicks produced in the search phase of foraging compared to buzz clicks produced during prey capture. Different levels of sonar caused intermittent to continuous masking (120 to 160 dB re 1 µPa2, respectively), but varied based on click level, whale orientation, and prey target strength. CAS resulted in a greater percentage of

time that echolocation clicks were masked compared to PAS.

Kastelein *et al.* (2021c) compared the ability of harbor porpoises to detect signals in constant-amplitude noise with amplitude-modulated noise. Underwater, behavioral hearing thresholds were measured from harbor porpoises at 4 kHz under three conditions: ambient noise (control), sinusoidally amplitude modulated (SAM) masking noise, and Gaussian (constant amplitude) masking noise. Both masker types were centered at 4 kHz with a one-third octave bandwidth and were tested at various SPLs. The SAM noise was also tested at modulation rates from 1–90 hertz (Hz). The 4 kHz hearing test signals were 0.5, 1, and 2 seconds in duration. The results showed that, compared to Gaussian noise, up to 14.5 dB of masking release (from ''dip listening'') was observed in lower-modulation rate (1–5 Hz) SAM noise. The effect of masking on communication space is often modeled using constant-amplitude noise, whereas most Navy sources contain gaps, more like amplitude-modulated noise. This study suggests that the signal duration, masker level, and masker modulation rate and depth should be considered when modeling the effect of noise on signal detection.

Isojunno *et al.* (2021) used data from 15 tagged sperm whales (Isojunno *et al.* 2020) to evaluate odontocete echolocation behavior as a function of received sonar exposures. Statistical analysis revealed small reductions in the number of buzzes and movement during sonar, but the most apparent change in echolocation behavior was a Lombard effect observed during higher sea states (increased surface noise). No behavioral changes in orientation relative to the sonar source were observed that would suggest an anti-masking strategy for spatial release from masking. Theoretical modeling of masking potential in terms of detection range revealed that search phase clicks would likely be masked during both PAS and CAS, but the buzz clicks would not. For regular search phase clicks to be continuously masked, SELs would have to be equal to or greater than 160 and 173 dB re 1 μPa^2s (dB referenced to 1 micropascal squared seconds) for PAS and CAS, respectively. Overall, the data showed more evidence for masking by increases in ambient noise (surface noise from higher sea states), than for sonar. This result could be due, in part, to the 1–2 kHz narrowband sonar masker, which is not comparable to broadband maskers such as ambient noise or shipping noise.

Matthews and Parks (2021) reviewed the existing literature on North Atlantic right whale acoustic behavior and summarize information on acoustic behavior of the Southern right whale, North Pacific right whale, and bowhead whale. The authors reviewed primary literature on whale vocalizations, anatomical modeling, and behavioral responses to playbacks to conclude that the North Atlantic right whale might have a hearing range of 20 Hz to 22 kHz. However, vocalization data cannot be used to directly estimate audible range since there are many examples of mammals (including marine mammals) that vocalize with energy below the frequency of best hearing, and calls can also contain high-frequency harmonics that are above the upper limit of hearing. The anatomical model developed by Ketten (1994) was used by Parks *et al.* (2007) to estimate a functional hearing range of 15 Hz to 18 kHz for this species.

Jacobson *et al.* (2022) modeled the probability of Blainville's beaked whale group vocal periods (GVPs) on the Pacific Missile Range Facility during periods of no naval activity, naval activity without hull-mounted MFAS, and naval activity with hull-mounted MFAS. Data were collected from bottom-mounted hydrophones on the range before, during, and after six Submarine Commanders Course (SCC) exercises. At an MFAS received level of 150 dB re 1 µPa rms (root mean square), the probability of GVP detection decreased by 77 percent (95 percent CI: 67 percent–84 percent) compared to periods when general training activity was ongoing and by 87 percent (95 percent CI: 81 percent–91 percent) compared to baseline conditions. This study found a greater reduction in p(GVP) with MFAS than observed in a prior study of Blainville's beaked whales at the Atlantic Undersea Test and Evaluation Center (AUTEC) (Moretti *et al.* 2014). The authors suggest that this may be due to the baseline period in the AUTEC study including naval activity without MFAS, potentially lowering the baseline p(GVP), or due to differences in the residency of the populations at each range.

Branstetter and Sills (2022) reviewed direct laboratory (*i.e.,* psychoacoustic) studies of marine mammal hearing in noise. Psychoacoustic studies of auditory masking in marine mammals were described in detail and categorized by the type of signal and masker (*e.g.,* tone in white noise), and specific conditions under which masking is reduced (*i.e.,* release from masking). Specifically, comodulation masking release, or the reduction in masking due to amplitude or frequency modulation differences between the signal and noise, and spatial release from masking, or the reduction in masking due to spatial separation between signal and noise and the directional hearing ability of the listener, are discussed. Finally, energetic masking, or the ability of the listener to detect a signal was compared to informational masking, or the ability of the listener to comprehend the signal was reviewed. The authors point out that while the body of scientific evidence thus far shows that processes of the ear result in energetic masking, more research on informational masking is needed to develop realistic communication space models. This is because current communication space models are based on 50 percent signal detection rather than some threshold of successful signal recognition or interpretation by the listener.

Hearing Loss (TTS and PTS)

Houser (2021) reviews existing literature on the relationship between auditory threshold shift and tissue destruction in mammals. According to small terrestrial mammal literature, TTSs of approximately 30–50 dB measured 24 hours after sound exposure induced progressive tissue damage despite the return of normal hearing thresholds. Although large TTSs allow for full recovery of hearing, pathological tissue destruction may occur; however, smaller-magnitude TTSs are unlikely to result in tissue damage. The author concludes that the current criteria of 40 dB of TTS measured within minutes of the noise exposure as the onset of injury is likely to encompass recoverable auditory threshold shift without tissue damage. This publication supports the use of current definitions of auditory injury in marine mammals.

Kastelein *et al.* (2022a) measured underwater behavioral hearing thresholds in two California sea lions at 0.6, 0.85, and 1.2 kHz before and after exposure to a one-sixth-octave noise band centered at 0.6 kHz for 60-minutes. Hearing tests were also conducted at 1, 1.4, and 2 kHz after exposure to a one-sixth-octave noise band centered at 1 kHz for 60-minutes. For the 0.6 kHz exposure, the maximum TTS was 7.5 dB (6.7 dB mean) for a 210 dB cumulative SEL (SEL_{cum}) exposure at the hearing test frequency one-half octave above the center frequency of the fatiguing stimulus (0.85 kHz), which recovered after approximately 12 minutes. For the 1 kHz exposure, the maximum TTS was 10.6 dB (9.6 dB mean) after a 195 dB SEL_{cum} exposure at the hearing test frequency one-half octave above the center frequency of the fatiguing

stimulus (1.4 kHz). Mean threshold shift (TS) greater than 6 dB (mean = 8.0 dB, min = 7.2 dB, max = 8.5 dB) was also observed after exposure to the 1 kHz fatiguing stimulus at 195 dB SEL_{cum} for the 1 kHz hearing test frequency. For this exposure frequency, hearing recovered within 24 minutes. The results of this study show individuals exhibiting onset of TTS in water at lower received levels than the otariid thresholds in ''Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis (Phase III)'' (Navy, 2017).

Kastelein *et al.* (2022b) measured underwater behavioral hearing thresholds in two California sea lions at 8, 11.3, and 16kHz before and after exposure to a one-sixth-octave noise band centered at 8 kHz for 60-minutes. Hearing tests were also conducted at 32 kHz after exposure to a one-sixth-octave noise band centered at 16 kHz for 60-minutes. For the 8kHz exposure, the maximum TTS was 20.2 dB (18 dB mean) for a 190 dB SEL_{cum} exposure at the hearing test frequency one-half octave above the center frequency of the fatiguing stimulus (11.3 kHz), which recovered after approximately 12 minutes. For the 16 kHz exposure, the maximum TTS was 19.7 dB (16.3 dB mean) after a 207 dB SEL_{cum} exposure at the hearing test frequency one-half octave above the center frequency of the fatiguing stimulus (22.4 kHz). For these exposure frequencies and scenarios, hearing recovered within 72 minutes or less. The results of this study show TTS onset in-water occurred at lower received levels than what the current otariid criteria in ''Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis (Phase III'') (Navy, 2017) suggest.

Kastelein *et al.* (2021a) measured underwater behavioral hearing thresholds at 0.5, 0.71, and 1 kHz in one harbor porpoise before and after exposure to one-sixth-octave band noise centered at 0.5 kHz. Maximum TTS was 8.9 dB (mean = 7.6 dB) at the 0.5 kHz hearing test frequency after a 205-dB SEL_{cum} exposure. For the 0.71 and 1 kHz hearing test frequencies, no mean TTS > 6 dB was observed. However, at 0.71 kHz, maximum TTS was 6.5 dB (mean = 5.8 dB) was observed after a 205-dB SEL_{cum} exposure. At 1 kHz, a maximum of 6.3 dB of TTS (mean = 5.7 dB) occurred after 206-dB SEL_{cum} exposures. All shifts < 5 dB recovered within 12 minutes and shifts > 6 dB recovered within 60 minutes. These results are consistent with the criteria and thresholds described in ''Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis (Phase III)'' (Navy, 2017).

Kastelein *et al.* (2021b) measured behavioral, underwater hearing thresholds at 2, 2.8, and 4.2 kHz in two sea lions before and after exposure to band-limited noise centered at 2 kHz. Sea lion hearing was also tested at 4.2, 5.6, 8 kHz before and after exposure to noise centered at 4 kHz. Maximum TTS was 24.1 dB (22.4 dB mean) at the 5.6 kHz test frequency after a 205-dB SEL_{cum} exposure centered at 4 kHz. Threshold shifts greater than or equal to 6 dB occurred at 187, 181, and 187 dB SEL_{cum} for 4.2, 5.6, and 8 kHz test frequencies respectively. After exposure to the 2-kHz noise, maximum TTS of 11.1 dB (10.5 dB mean) occurred for 203 dB SEL_{cum} at the 2 kHz test frequency. Threshold shifts greater than or equal to 6 dB occurred at SEL_{cum} of 192, 186, and 198 dB for test frequencies 2, 2.8, and 4.2 kHz respectively. These data suggest that one-half octave above the exposure frequency is the most sensitive to noise exposure. TTS between 6 and 10 dB recovered within 60 minutes, 10–15 dB of TTS recovered within 120 min, and TTS up to 24.1 dB recovered after 240 minutes. The results of this study show individuals exhibiting onset of TTS in-water at lower received levels than the current otariid criteria (''Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis (Phase III)'' (Navy, 2017)).

Kastelein *et al.* (2020a) measured underwater, behavioral hearing thresholds in one harbor porpoise before and after exposure to playbacks of one-sixth-octave band noise centered at 1.5 kHz and a 6.5 kHz continuous wave. Following exposure to the 1.5 kHz noise band at 201 dB SEL_{cum}, a maximum of a 7.8 dB, 9.8 dB, and 7 dB TTS was observed for 1.5, 2.1, and 3 kHz hearing frequencies respectively. After exposure to the 6.5 kHz continuous wave at 184 dB SEL_{cum}, a maximum of a 7.5, 16.7, and 11.8 dB TTS was observed for 6.5, 9.2, and 13 kHz hearing frequencies respectively. For the 6.5 kHz exposure, a mean TTS > 6 dB was observed for the 178 and 180 dB SEL_{cum} when the hearing test frequency was 9.2 kHz, and for the 180 dB SEL_{cum} when the hearing test frequency was 13 kHz. The results of this study show that the animal incurred onset of TTS at higher received levels than what the current HF cetacean criteria in ''Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis (Phase III)'' (Navy, 2017) indicate for both 1.5 and 6.5 kHz.

Kastelein *et al.* (2020b) measured underwater, behavioral hearing thresholds in two harbor seals before and after exposure to playbacks of one-sixth-octave band noise centered at 0.5, 1, and 2 kHz. Hearing tests were conducted at the center frequency, one-half octave above, and 1 octave above center frequency. No TTS > 6 dB was observed for any hearing frequency after 204, 210, or 211 dB SEL_{cum} exposures to the 0.5 kHz noise band. For the 1 kHz exposure frequency, max TTS of 7.4 dB (6.1 mean) was observed after a 207 dB SEL_{cum} exposure at a hearing frequency of 1.4 kHz. For this exposure frequency, no other test condition produced TTS > 6 dB; although, a 5.9 dB shift (at 1.4 kHz) occurred at 206 dB SEL_{cum}. For the 2 kHz noise band, after a 201 dB SEL_{cum} exposure, max TTS of 12 dB was measured one octave above the center frequency (4 kHz). For this exposure frequency, TTS > 6 dB was observed at SEL_{cum} > 201, 198, and 192 dB for hearing frequencies 2, 2.8, and 4 kHz respectively. All shifts recovered within 1 hour. These results of this study show that the animal incurred lower TTS (*i.e.,* smaller threshold shifts) at higher received levels than what the current phocid pinniped criteria in ''Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis (Phase III)'' (Navy, 2017) indicate.

Kastelein *et al.* (2020c) measured underwater, behavioral hearing thresholds in one harbor porpoise before and after exposure to playbacks of one-sixth-octave band noise centered at 88.4 kHz. Maximum TTS of 13.6 dB was observed at 197 dB SEL_{cum} for the 100 kHz hearing test frequency. No TTS > 6 dB was observed for any SEL_{cum} at the 88.4 kHz test frequency. For 125 kHz, shifts > 6 dB were observed for 191, 194, and 197 dB SEL_{cum} exposures, with a mean TTS of 5.4, 6.1, and 5.9 dB, respectively. The results of this study show that the animal incurred TTS at higher received levels than what the current HF cetacean criteria in ''Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis (Phase III)'' (Navy, 2017) suggest.

Kastelein *et al.* (2020d) measured underwater, behavioral hearing thresholds in one harbor porpoise before and after exposure to airgun impulses (''shots''). Exposure conditions varied with regard to number of airguns, number of shots, light cues, and position of the dolphin relative to the airguns. Hearing test frequencies were 2, 4, and 8 kHz, and no TTS > 6 dB was observed. The results of this study show that the animal would incur TTS onset at higher received levels than what the current HF cetacean criteria in ''Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis (Phase III)'' (Navy, 2017) suggest.

Kastelein *et al.* (2020e) measured underwater, behavioral hearing thresholds in two harbor seals before and after exposure to playbacks of one-sixth-octave band noise centered at 40 kHz. For the 50 kHz hearing test frequency, a maximum TTS of 30.7 dB was observed 12–16 minutes after the 189 dB $SEL_{cum,}$ and a mean TTS > 6 dB was observed for all SEL_{cum} 177 dB and above. The 30-dB shift recovered after 3 days. No TTS > 6 dB was observed for any SEL_{cum} at the 63 kHz test frequency for either seal. At 40 kHz, mean TTS of 9.2 dB was observed after a 189-dB SEL. The results of this study show that the animal incurred TTS at lower received levels than what the current phocid criteria in ''Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis (Phase III)'' (Navy, 2017) suggest.

Sills *et al.* (2020) exposed one bearded seal to multiple impulsive underwater noise exposures (seismic air gun ''shots''). Hearing tests were conducted at 100 Hz and 400 Hz after exposures to 2, 4, and 10 shots. After a 4-shot (191 dB SEL_{cum}) exposure, max TTS of 9.4 dB was observed, but no other TTS > 6 dB was demonstrated, despite four 10-shot (194–195 dB SEL_{cum}) exposures. It is possible that TTS recovered during the measurements, as quantified by a mean ''first miss'' of 7.5 dB for the 10-shot exposures (mean TTS was 2.2 dB). The results of this study show that the animal incurred TTS onset at lower received levels than what the current criteria in ''Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis (Phase III)'' (Navy, 2017) suggest. Behavioral responses were also scored and averaged across three observers. For most exposures, the seal exhibited mild/detectable responses, and all scores indicated that the seal did not move more than half his body and consistently participated in the study.

Tougaard *et al.* (2022) reviewed the most recent temporary TTS data from phocid seals and harbor porpoises and compared empirical data to the predictive exposure functions put forth by Southall *et al.* (2019), which were based on data collected prior to 2015. The authors concluded that more recent data supports the thresholds used for harbor porpoises (categorized as 'very high frequency', or VHF cetaceans), which over-estimated the hearing impact for sounds above 20 kHz in frequency. Similarly, the new data for phocid seals show TTS onset thresholds that are well-above the predicted levels for sounds below 5 kHz in frequency. However, phocid seals might be more sensitive to higher frequency sound exposures than predicted, as the TTS onset data for frequencies higher than 20 kHz was below the predicted levels.

von Benda-Beckmann *et al.* (2022) assessed whether correcting for kurtosis, a measure of sound impulsiveness, improved the ability to predict TTS in a marine mammal. Two different kurtosis correction factors were tested by applying them to frequency-weighted sound exposure levels (SEL_{cum}) and fitting (linear least squares) previously collected harbor porpoise TTS data to create dose-response functions, then comparing the resulting R^2 values to that of the standard function used to fit TTS growth data. TTS data from both continuous and intermittent sound exposures were used. For intermittent and continuous 1–2 kHz exposures combined, kurtosis-corrected fits were poorer (R^2 = 0.47, 0.68) than SEL_{cum}-based fits (R^2 = 0.73). For intermittent exposures of different types, one of the kurtosis-corrections resulted in a better fit (R^2 = 0.84) than SEL_{cum} (R^2 = 0.64), but only when a model fitting parameter denoting the relationship between SEL_{cum} and risk of permanent hearing loss was specifically derived from harbor porpoise TTS growth data. The conclusions from this study were that the kurtosis-corrected SELs did not explain differences in TTS between intermittent and continuous sound exposures, likely because silent intervals provided an opportunity for hearing recovery that could not be accounted for by these models. Kurtosis might still be useful for evaluating sound exposure criteria for different types of sounds having various degrees of impulsiveness.

Behavioral Reactions

In a study by Benti *et al.* (2021), vocalizations from Northeast Atlantic herring-feeding killer whales and Northeast Pacific mammal-eating killer whales were played back to humpback whales in Norwegian waters while their behavior was monitored through animal-borne tags and visual observations. In five of six cases the humpback whales approached the fish-eating killer whales, suggesting some attraction. The response to the mammal-eating killer whales varied with the behavioral context of the humpback whales. The results suggested that the calls of the fish-eating killer whales may have acted like a dinner-bell and initiated approach and foraging behavior in the humpback whales, while the unfamiliar sounds of the mammal-eating killer whales may have been perceived as a threat in offshore waters, but led to mixed behavior during inshore herring foraging by humpback whales. These results indicated that the humpback whales were able to discriminate between the different call types and respond with different behavioral strategies.

Boisseau *et al.* (2021) exposed foraging minke whales in Icelandic waters to an acoustic deterrent device that emitted 15 kHz pure tones with a source level of 198 dB rms. Pulse length and the number of pulses in a block were randomized but average pulse length was 752 millisecond (ms) with a 10 percent duty cycle. The source was deployed from a Zodiac boat 500 m away from an animal for the first two exposures, and 1000 m away in the remaining 8 exposures (max received level of 150 dB RMS at a minimum distance of 338 m). Video-range tracking was used to track animals before, during, and after the exposures and dive duration (sec), swim speed (km/h), reoxygenation rate (blows/min), and path predictability were also examined. During the exposure, animal speed and dive duration increased, measures of path predictability increased indicating straighter paths, and reoxygenation rate decreased. Path predictability had a strong relationship with received level whereas speed and dive duration did not, which suggested those two metrics were more influenced by the presence of the exposure signal than the received sound level.

Curé *et al.* (2021) conducted controlled exposure experiments using both PAS (5 percent duty cycle) and CAS (95 percent duty cycle) to measure and score tagged sperm whale behavioral responses. No sonar control exposures resulted in significantly fewer and less severe behavioral responses than sonar exposures. No significant differences were observed between sonar types, but the presence of killer whales or pilot whales did significantly increase the number of responses. The probability of observing low and medium severity responses increased with cumulative sound exposure level (SEL, dB re 1 µPa2 s), reaching a probability of 0.5 at approximately 173 dB SEL for low severity responses. Medium severity responses reached a probability of approximately 0.35 at cumulative SELs between 179 and 189 dB. This study suggested that both PAS and CAS exposure resulted in a greater number of behavioral changes in sperm whales as compared to the vessel (control) alone, and the types of behavioral responses might differ across sonar types.

Czapanskiy *et al.* (2021) modeled energetic costs associated with behavioral response to MFAS using

datasets from 11 cetaceans' feeding rates, prey characteristics, avoidance behavior, and metabolic rates. Authors found that the short-term energetic cost was influenced more by lost foraging opportunities than increased locomotor effort during avoidance. Additionally, the model found that mysticetes incurred more energetic cost than odontocetes, even during mild behavioral responses to sonar.

Durbach *et al.* (2021) analyzed acoustic tracks from minke whales detected on the Pacific Missile Range Facility (PMRF) in Hawaii in 3 years before, during, and after major Navy training exercises. These tracks were fit using a continuous-time correlated random walk at 5-minute interpolated locations. During sonar periods, fast movement became more northerly and more directed (less turning), with less movement south and east in the direction of the training activity, and this more northerly movement continued after sonar cessation. Specifically, whales to the north of the training activity were more likely to head north, while whales that were west of the activity were more likely to head west. Headings did not appear to change for slow, undirected movement during sonar. In addition, fast movement was more likely to occur during sonar than during any other period (70 percent during vs 35–41 percent in the other periods). Finally, whales were more likely to stop calling when in the fast state although not necessarily more during sonar than in other periods; in contrast, slow moving whales were more likely to stop calling during sonar than other periods. These results demonstrated that minke whales moved faster and movements were more directed during periods of active sonar. Minke whales also avoided the locations of the ships producing the sonar and were more likely to cease calling during sonar.

Fernandez-Betelu *et al.* (2021) used passive acoustic data recorded over a 10-year time period to assess the effects of impulsive noise produced during offshore activities on coastal bottlenose dolphin occurrence. Offshore activities included seismic surveys and pile driving from wind farm construction. Echolocation detections of dolphins were compared across years with and without offshore activity and also across days with and without impulsive noise. The effect of distance from the noise-producing activities on dolphin detections was also investigated by placing recorders (CPODs) at locations expected to be the most (impact areas) and least (reference areas) impacted by noise. No consistent relationship was found between annual dolphin occurrence and impulsive noise, but significantly more detections were observed on days with impulsive noise. The results showed that dolphins were not displaced by impulsive noise levels up to 141 dB re 1 µPa and as close as 20 km (10.8 nmi) from the impact area. These results suggest that the increase in dolphin detections during far-field noise was likely due to an increase in the number and/or amplitude of echolocation vocalizations.

Hastie *et al.* (2021) studied how the number and severity of avoidance events may be an outcome of marine mammal cognition and risk assessment. Five captive grey seals were given the option to forage in a high- or low-density prey patch while continuously exposed to silence, pile driving, or tidal turbine playbacks (source levels = 148 dB re 1 µPa at 1 m) for 1 hour. One prey patch was closer to the speaker, so had a higher received level in experimental exposures. Overall, seals avoided both anthropogenic noise playback conditions with higher received levels when the prey density was limited but would forage successfully and for as long as control conditions when the prey density was higher, demonstrating a classic cognitive approach utilized with predation risk and profit balancing.

In a study by Holt *et al.* (2021a), DTAGs (miniature sound and movement recording tags) were attached with suction cups to Southern Resident Killer Whales in the Salish Sea to investigate the relationship between probability of prey capture and vessel and sound variables. The predicted probability of prey capture was lower when vessels increased their speed. Received noise level did not significantly affect the probability of prey capture. The rate of descent during dives was slower when echosounders were on. The observed effects of echosounders suggest that whales prolonged their foraging efforts to successfully hunt, which could be caused by acoustic masking or increased attention to vessels. The rate of descent increased with increasing broadband noise levels and decreasing vessel distance. Decrease prey abundance also decreased the probability of predicted prey capture.

Holt *et al.* (2021b) attached DTAGs to 23 Southern Resident Killer Whales in the San Juan Islands over 3 field seasons in order to investigate the effects of vessel distance on underwater foraging behavior. When vessels were less than 366 m away, whales (n=13) decreased the number of dives associated with prey capture and the amount of time spent in these dives. Additionally, female killer whales were more likely to stop foraging, socializing, and prey-sharing and instead start traveling when vessels approached at this distance. At the same distance from vessels, male orcas were more likely to transition from close prey capture to socializing and prey-sharing, but would not stop general foraging behavior, such as searching for prey at deeper depths. Female orcas may therefore be at greater risk than males during close vessel interactions.

Kates Varghese *et al.* (2021) analyzed the effect of two separate surveys using a 12 kHz multibeam echosounder (*i.e.,* downward directed, unlike ASW sonar) over the Southern California Antisubmarine Warfare Range (SOAR) hydrophone array on Cuvier's beaked whale foraging. The authors conducted a spatial analysis, building off a temporal analysis of a previously presented dataset (Varghese *et al.* 2020). There were differences in spatial use of the SOAR for foraging between the 2 survey years. While no change in overall foraging effort was detected before, during, and after the surveys each year, some localized spatial shifts in foraging hot spots were detected during and after the survey in the second year. Because of the known heterogeneity of prey patches on SOAR, lack of evidence of avoidance of the sound source, and no observed change in overall foraging effort, the authors suggest that the observed spatial shifts were most likely due to prey dynamics.

Königson *et al.* (2021) tested the efficacy of Banana Pingers (300 ms, 59–130 kHz frequency modulated, 133–139 dB rms re 1 µPa at 1 m source level) as a deterrent for harbor porpoise in Sweden. As described previously, these pingers were designed to avoid potential pinniped responses. Authors used recorded echolocation clicks with C–PODs to measure the presence or absence of porpoise in the area. Porpoise were less likely to be detected at 0 m and within 100 m of an active pinger, but a pinger at 400 m appeared to have no effect.

In a study by Laborie *et al.* (2021), unmanned aerial vehicles (UAVs) were flown at three altitudes (25, 20, and 15 m) over Weddell seals, including adult males and females and females with pups. There was generally little response; 88 percent of the time the animals showed mild vigilance or no responses, and mothers rarely ended nursing. Agitation or escape responses only occurred in 12 percent of observations. The strongest response was in females with pups when wind speeds were lowest and therefore ambient noise levels were at their lowest. The probability of response

increased with lower altitude flights, so at altitudes over 25 m a low level of impact to Weddell seal behavior would be expected.

Manzano-Roth *et al.* (2022) found that cross seamount beaked whales reduced clusters of foraging pulses (Group Vocal Periods) during Submarine Command Course events and remained low for a minimum of 3 days after the MFA sonar activity.

An analysis subsequent to Varghese *et al.* (2020) suggested that the observed spatial shifts of Cuvier's beaked whales during multibeam echosounder activity on the Southern California Antisubmarine Warfare Range were most likely due to prey dynamics (Kates Varghese *et al.* 2021).

Ramesh *et al.* (2021) explored environmental drivers and the impact of shipping noise on fin whale vocalizations in Ireland. Approximately 3 months of passive acoustic fin whale call data from spring 2016 used in the habitat model found that fin whale calls increased at night, along with signs of higher prey availability. Fin whale calls were also less likely to be detected for every 1 dB re 1 µPa/minute increase in shipping noise levels (rms). However, these results should be used cautiously since the model was more likely to predict the absence of fin whale detections, rather than their presence.

Santos-Carvallo *et al.* (2021) monitored fin whale behavior before, during, and after the presence of whale watching vessels in Caleta Chañaral de Aceituno to determine if the whale watching activity was having any adverse impacts on the fin whales. Whale watching activities were only conducted by local artisanal fishers; 39 boats have permission but less than 20 conduct the whale watching activity. Land-based observations were conducted in January and February of 2015–2018 via binocular scans and focal follow tracking using a theodolite. Groups of whales were tracked through the area with continuous sampling of position, behavior, and presence of boats for every surfacing until they were no longer visible. Behavior was classified as traveling or resting, and the groups' swim speed, reorientation, and directness index, and these were modeled relative to the number of boats and whether the time period was before, during, or after the boats were present. Most observations occurred within the presence of at least one boat, but no more than three boats at one time. Travel swim speeds increased in the after period, while reorientation increased and directness decreased during and after the presence of boats. During rest behavior, reorientation increased during the presence of boats compared to before the boats were present, and directness decreased during the presence of boats. These results indicate that when whale watching vessels were present, the fin whales changed their direction of movement more frequently, with less linear movement than occurred before the boats arrived; this behavior may represent evasion or avoidance of the boats. The increase in travel swim speeds after the boats left the area may be related to the vessel's rapid speeds when leaving, sometimes in front of animals, leading to more avoidance behavior after the boats departed.

Arranz *et al.* (2021) conducted a noise exposure experiment which compared behavioral reactions of resting short-finned pilot whale mother-calf pairs during controlled approaches by a tour boat with two electric (136–140 dB) or petrol engines (139–150 dB). Approach speed (<4 kn (7.4 km per hour)), distance of passes (60 m (65.6 yd)), and vessel features other than engine noise remained the same between the two experimental conditions. Behavioral data was collected via unmanned aerial vehicle (UAV) and activity budgets were calculated from continuous focal follows. Mother pilot whales rested less, and calves nursed less, in response to both types of boat engines compared to control conditions (vessel >300 m (328 yd), stationary in neutral). However, they found no significant impact on whale behaviors when the boat approached with the quieter electric engine, while resting behavior decreased 29 percent and nursing decreased 81 percent when the louder petrol engine was installed in the same vessel.

Hiley *et al.* (2021) exposed groups of harbor porpoises to ''startle sounds'', which were 200-ms in duration and were band limited (5.5–20.5 kHz) with a peak frequency of 10.5 kHz and a source level of 176 dB re 1 µPa. There were 13 exposure sequences in which the startle sound was repeated for 15 minutes at a 0.6 percent duty cycle, and 11 control sequences in which vessels operated but no startle sounds were played. Despite a larger distance between porpoise groups and vessels during sound exposure trials (152 m) as compared to control trials (90 m), avoidance responses during exposures were significant whereas no avoidance was observed for controls. Porpoises avoided the area where sound exposures took place for approximately 30–60 minutes, and no long-term exclusion effect was observed.

Pellegrini *et al.* (2021) examined how boat presence impacts a unique subspecies of bottlenose dolphin (*Tursiops truncatus gephyreus,* Lahille's bottlenose) that vocalizes while foraging cooperatively with local fishermen who cast nets onto dolphin-herded fish while standing in coastal waters in Brazil. Dolphin vocalizations changed in response to the number, type, and speed of boats within 250 m. When more than one boat was present, dolphins produced fewer whistles and had a lower click rate and a longer whistle duration; initial and maximum frequency increased as well, especially when group size or calf presence increased. Whistles were longer duration when boat speed increased as well.

Martin *et al.* (2022) exposed a wild Cape fur seal breeding colony in Africa to playback recordings of boat noise and sea-side car traffic. Focal groups of at least six seals were approached by an experimenter who crawled within 6 m to avoid disturbing the seals. Seals were exposed to low (60–64 dB re 20 µPa rms SPL, broadcast at 6 m), medium (64–70 dB, broadcast at 3 m), or high (70–80 dB, broadcast at 1 m) levels, depending on the individual's distance to the speaker. No behavioral differences were found between low, medium, and high-level groups. Video recorded behavioral analysis demonstrated that mother-pup pairs spent less time nursing (15–31 percent) and more time awake (13–26 percent), vigilant (7–31 percent), and mobile (2–4 percent) during boat noise conditions compared to control conditions. Mothers were more vigilant (26 percent) than pups (7 percent) to medium levels of boat noise.

Jones-Todd *et al.* (2021) analyzed the movement of seven Blainville's beaked whales tagged at (AUTEC) relative to MFAS use during the SCC training event. Data from these tags was previously reported by Joyce *et al.* (2019). A continuous time correlated random walk movement model accounted for location accuracy by modeling 100 track imputations for each tag and arranged samples in equal time intervals. The probability of whale presence within the boundary of the instrumented range (on range), and outside the boundary of the instrumented range (off range) was modeled relative to the time since the last MFAS transmission. Results show there was a higher probability that whales on the range would go off range when there were MFAS transmissions, and that whales off the range would stay off the range when there were MFAS transmissions. These results indicate a response to MFAS that lasted for 3 days since transition rates on-off and off-on the range returned to baseline levels

after that amount of time. There was also variability in transition rates and time spent on/off range between individuals, which highlights the need to analyze a larger sample size of whales.

Durban *et al.* (2022) tested new methods of observing behavioral responses of groups of small delphinids to sonar, where the use of tags is challenging, and the response of the group is more salient than that of the individual. They tested the use of a land-based observation platform coupled with a drone and multiple acoustic recorders to observe the vocal behavior, group cohesion, group size, and group behavior before, during, and after a simulated sonar exposure. In a group of short-beaked common dolphins, the authors found the number of whistles and sub-groups to increase during the exposure period, but the directivity of the tracked subgroup did not change much.

Königson *et al.* (2022) tested the efficacy of Banana Pingers (300 ms, 59–130 kHz frequency modulated, 133–139 dB_{rms} re 1 µPa at 1 m source level) as a deterrent for harbor porpoise in Sweden. As described previously, these pingers were designed to avoid potential pinniped responses. Authors used recorded echolocation clicks with C–PODs to measure the presence or absence of porpoise in the area. Porpoise were less likely to be detected at 0 m and within 100 m of an active pinger, but a pinger 400 m appeared to have no effect.

Miller *et al.* (2022) investigated the risk disturbance hypothesis that an animal's response decision is a trade-off between perceived risk and the cost of a missed opportunity (the reward of foraging). The authors predicted that species that are more vulnerable to predation would be more likely to respond to both predator sounds and anthropogenic stressors. Using data collected from 2008 to 2017 during the 3S project in Norway, changes in foraging duration during killer whale playbacks and changes in foraging duration during mid-frequency sonar were positively correlated across the four species examined (listed in order of increasing sensitivity to foraging disruption: sperm whales, long-finned pilot whales, humpback whales, and northern bottlenose whales). This suggests that tolerance of predation risk may play a role in sensitivity to sonar disturbance.

Paitach *et al.* (2022) tested the efficacy of Banana Pingers (300 ms, 50–120 kHz frequency modulated, 145 dB +/− 3 dB at 1 m source level) as a deterrent and entanglement mitigation for Franciscana dolphins in Brazil. These pingers were designed to emit sound outside of the best hearing range for pinnipeds and were therefore less likely to incite a ''dinner bell'' effect. Authors used recorded echolocation clicks with C–PODs to measure the presence or absence of dolphins in the area. Dolphins were 19 percent and 15 percent less likely to be detected nearby and within 100 m of an active pinger respectively, but dolphins 400 m from the pinger did not appear to avoid it. While a reduction in vocalizations does not always equate to a reduction in presence, this species has been previously seen departing from areas with active pingers. Authors did not witness any habituation to the pinger during the length of the experiment (64 days), and although they recorded fewer dolphins in the area over time, they believe this was due to seasonality rather than habitat displacement.

Siegal *et al.* (2022) used Dtag data from 15 northern bottlenose whales tagged during 3S efforts off Norway (2013–2016) to estimate body density (to represent body condition by lipid energy stores) using hydrodynamic models and obtain foraging and anti-predator indicators based on vocal behavior and dive metrics. The authors compared relative anti-predator/foraging indices to body condition and found that relative anti-predator to foraging indices typically did not depend on body condition. This finding is inconsistent with the needs/assets hypothesis; an individual in poor condition would accept more risk (*i.e.,* engage in less anti-predator behavior) for foraging opportunities, whereas healthy animals can afford to be more risk averse (*i.e.,* have a relatively higher anti-predator to foraging index ratio). The authors suggest that this result may be due to an insufficient range of body conditions in the data set to determine a relationship, or a selection of bolder individuals in the tagging effort. The authors also suggest that animals in good condition may take greater predation risks because they may successfully flee. Three of the 15 whales were exposed to sonar (presented in prior 3S publications). The authors compared foraging and anti-predator metrics pre- and post-exposure, showing that all three animals increased their anti-predator index and reduced their foraging index.

Stanistreet *et al.* (2022) used passive acoustic recordings during a multinational navy activity to assess marine mammal acoustic presence and behavioral response to especially long bouts of sonar lasting up to 13 consecutive hours, occurring repeatedly over 8 days (median and maximum SPL = 120 dB and 164 dB). Cuvier's beaked whales and sperm whales substantially reduced how often they produced clicks during sonar, indicating a decrease or cessation in foraging behavior. Few previous studies have shown sustained changes in foraging or displacement of sperm whales, but there was an absence of sperm whale clicks for 6 consecutive days of sonar activity. Sperm whales returned to baseline levels of clicks within days after the activity, but beaked whale detection rates remained low even 7 days after the exercise. In addition, there were no detections from a Mesoplodon beaked whale species within the area during and at least 7 days after the sonar activity. Clicks from northern bottlenose whales and Sowerby's beaked whales were also detected but were not frequent enough at the recording site used to compare clicks between baseline and sonar conditions.

Benhemma-Le Gall *et al.* (2021) compared harbor porpoise presence and foraging activity between periods of baseline and construction at two Scottish offshore windfarms with arrays of echolocation click detectors (C–PODs). Noise levels were measured with calibrated noise recorders, and vessel presence was tracked with AIS data. Authors found an 8–17 percent decline in porpoise presence compared to baseline, with more porpoises (more buzzing) further from vessels, construction sites, and related higher levels of noise. The probability of porpoise occurrence by source vessels decreased by 9–23 percent without piling activity, and by 40–54 percent during pile driving. Porpoises were displaced up to 12 km (6.5 nmi) from pile driving and 4 km (2.2 nmi) from construction vessels. At an average vessel distance of 2 km (1.1 nmi), porpoise occurrence decreased by up to 35 percent. Outside piling hours, porpoise detection decreased by 17 percent (0.26), and foraging (buzzes) decreased by up to 41.5 percent (0.03) with increasing noise levels (159 and 155 dB re 1 µPa, respectively). During piling activities, porpoise occurrence began lower (0.16, 102 dB) but occurrence still decreased by 9 percent (0.07), and foraging (buzzes, beginning at 0.76, 104 dB) also decreased by 61.8 percent (0.15) with increasing noise levels (161 and 155 dB re 1 µPa, respectively).

Kastelein *et al.* (2022c) recorded pile driving sounds 100 m from construction for an offshore windfarm turbine, and six versions of the sound were created with varying frequency content using low-pass filters at 44.1, 6.3, 3.2, 1.5, 1.0,

and 0.5 kHz, at levels of 135 dB re 1 μPa²s. When authors played these impulsive sounds back to a single harbor porpoise in a pool, she increased swim speed, respiration rate, distance from the transducer, and occasionally jumped in response to the sounds with higher frequencies present (*i.e.,* the sounds with a wider bandwidth, especially sounds low-pass filtered at 44.1 and 6.3 kHz). However, the porpoise still moved away from the three most narrowband sounds, just not as far. Results indicate that frequency weighting of SEL may improve prediction of harbor porpoise behavioral responses, and authors present the argument that weighted SELs should be used for reporting behavioral response threshold levels for criteria.

Todd *et al.* (2022) detected harbor porpoises with C–PODS before, during, and after pile driving for an oil and gas platform from 2015–2020. Pile driving single strike SEL at 750 m was 160–164 dB re 1 μPa²s. Porpoise detections significantly decreased at the beginning of the construction project, but detections appeared to return to baseline levels within 5 months. According to the authors, the lack of significant trend over years indicated that porpoises returned to the area and did not experience habitat displacement for the entire 5-year period.

Physiological Responses and Stress

Elmegaard *et al.* (2021) exposed two captive harbor porpoises to sonar sweeps (6–9 kHz, 500 msec duration, 50–100 msec rise time, varying received levels (RL)) and pulsed sounds (50 msec duration, peak frequency 40 kHz, half power bandwidth of ~5 kHz, rise time < 5 msec, varying RL) to investigate startle reflex and changes in heart rate. The sonar exposures did not elicit startle responses; the initial two to three exposures induced bradycardia (a slow heart rate), with subsequent habituation. This habituation was conserved after a 3-year pause in exposures. The authors suggest that the initial bradycardia allows ''a prolonged breath-hold to assess the nature of a novel stimuli or flee in crypsis if needed;'' in naïve wild cetaceans, the reduced peripheral perfusion caused by this response may reduce N_2 diffusion from supersaturated tissues during dive ascents, increasing risk of decompression sickness. Startle responses to the pulse exposures were directly correlated to RL. The 50 percent motor-startle probability threshold was around 130 dB re 1 μPa (rms50). This is ~85 dB above hearing threshold and is similar to that observed in bottlenose dolphins (~90 dB over hearing threshold) (Gotz *et al.* 2020). No significant change in heart rate was observed. The authors suggest that the parasympathetic cardiac dive response may override any transient sympathetic response, or that diving mammals may not have the cardiac startle response seen in terrestrial mammals in order to maintain volitional cardiovascular control at depth.

Fahlman *et al.* (2021) reviews decompression theory and the mechanisms dolphins have evolved to prevent high N2 levels and gas emboli (*i.e.,* bends-like symptoms) in normal conditions. However, in times of high stress, the selective gas exchange hypothesis states that this mechanism can break down. In addition, circulating microparticles may be useful biomarkers for decompression stress in cetaceans.

Yang *et al.* (2021) measured cortisol concentrations in blood samples of two captive bottlenose dolphins and found significantly higher levels after exposure to high sound level (140 dB re 1 μPa) impulsive noise playbacks, compared to control and low sound levels (0 and 120 dB re 1 μPa, respectively). Six cytokine gene transcriptions were also measured in blood samples and two (IL–10 and IFN-γ) showed significant changes at high sound level exposure, compared to control and low sound levels. Results suggest that repeated exposures or sustained stress response to impulsive sounds may increase an affected individual's susceptibility to pathogens, affect growth and reproduction, *etc.* In addition, no avoidance behavior was observed during the trials, indicating that stress-induced physiological changes could be present despite the absence of behavioral changes.

Williams *et al.* (2022) measured physiological and behavioral responses in narwhals in the Arctic during seismic airgun impulse exposure compared to control conditions. Responses were measured using heart rate-accelerometer-depth recorders and changes in locomotor, cardiovascular, and respiratory responses were observed following exposure. Airgun SELs, as received at 10 m depth during sound source verifications, were approximately 152 dB re 1 μPa²s at 1 km (0.5 nmi) range and decreased to approximately 120 dB re 1 μPa²s at 10 km (5.4 nmi) dives. The response to seismic and vessel noise was a reduction in gliding descents and prolonged periods of high intensity activity associated with periods of elevated stroke frequencies. Noise exposure also resulted in periods of prolonged and intense bradycardia (*i.e.,* slowed heart rate). An increase in post-dive respiratory rates occurred during recovery from noise-exposed dives compared to control dives.

Stranding

Danil *et al.* (2021) document the findings of NOAA's investigation of the strandings of three coastal bottlenose dolphins in 2015 at Silver Strand Training Complex in NOAA Technical Memorandum NMFS–SWFSC–641. On October 21, 2015, two dolphins were found stranded dead near each other on the beach. Because a Navy major training exercise (MTE) was underway, these strandings met the criteria of an Uncommon Stranding Event in accordance with the Southern California Stranding Response Plan in the Navy's Phase 2 LOA for HSTT. A third decomposed dolphin was found in the same area 10 days later. Examination of the dolphins resulted in findings indicative of severe acute trauma, including lower jaw subcutaneous hemorrhage, emphysema, and cervical blubber hemorrhage. Additional signs of injury to the cerebrum and heart, or lipids in the lungs were also discovered. No hemorrhage was found near the ears. At least two of the dolphins showed signs of feeding before stranding, and all were in robust condition. There were no external signs of strike or entanglement. These observations and lack of others did not clearly determine the cause of the acute trauma. Based on previous case studies, the investigators determined that underwater detonation, peracute underwater entrapment (*i.e.,* fisheries interaction), or sonar were the most plausible causes. The Navy notes that sonar has not been associated with these kinds of symptoms before, nor has there ever been any association between dolphin mortality and sonar. No anti-submarine (ASW) sonar or explosive use was associated with the Navy MTE; however, unit level training with MF1 sonar occurred on October 19 (for 35 minutes) and October 20 (62 minutes in total), with sonar use as close as 6 nmi (11.1 km) to the stranding location. No known squid or bait fishing efforts within U.S. waters occurred in the vicinity preceding the strandings. The Navy notes that it is unknown what fishing efforts occurred in Mexican territorial waters immediately south of the stranding location.

Wang *et al.* (2021) conducted an auditory-evoked potential (AEP) hearing test on a single stranded 19-year-old male melon-headed whale in the 9.5—181 kHz frequency range. Tone pip trains were presented underwater at a depth of 0.3 m and 1 m distance from the whale, and AEPs were recorded by suction cup electrodes on the skin surface. Hearing was measured in this

individual after it had been stranded and during attempted rehabilitation in a concrete pool. Eighteen frequencies were measured once, and eight frequencies were measured twice, yielding an audiogram that showed elevated hearing thresholds (compared to the pygmy killer whale) between 10 and 100 kHz. There are no data from normal-hearing individuals of the melon-headed whale species to which this study's data can be compared.

Population Consequences of Disturbance and Cumulative Stressors

Southall *et al.* (2021) provided updated guidance and methods to assess the severity of behavioral responses by marine mammals to several types of anthropogenic noise sources. The criteria developed in the 2007 effort were updated by explicitly distinguishing between captive and field studies, decoupling their respective severity scales, and splitting the severity scale into three categories of foraging, survival, and reproduction. In addition, the updated guidance changed the categorization of noise sources and began to consider long term consequences of exposures rather than just immediate responses. Additional and consistent metrics to be reported in behavioral response studies are recommended, including subject-specific metrics (*e.g.,* functional hearing group, age class, sex, behavioral state, presence of calf), exposure context metrics (*e.g.,* exposure type, range to source, source and animal depth, presence of other species or other noise sources), and noise exposure metrics (*e.g.* exposure duration, rise time, number of exposures, SPL [rms and p-p], SEL, SNR). The authors then applied the severity scale to acute exposure studies using sonar sources, continuous (industrial) sources, pile driving sources, and airgun sources. For the long-term exposure analysis, a set of factors developed by Bejder and Samuels (2003) were applied to long-term studies on whale-watching and other long-term exposure or multi-exposure datasets. These factors included metrics of short-term impacts and long-term survival measures, characteristics of the studies, and sources of anthropogenic disturbance. The applied examples of scoring both acute and long-term studies of behavioral response provide a framework for other researchers to apply the same metrics to their own studies.

Migrating humpback whale mother-calf pairs' responses to seismic surveys were modeled by Dunlop *et al.* (2021) using both a forwards and backward approach. While a typical forwards approach can determine if a stressor would have population-level consequences, authors demonstrated that working backwards through a population consequences of disturbance (PCoD) model can be used to assess the ''worst case'' scenario for an interaction of a target species and stressor. Assumptions for the extreme scenario were likely exaggerated (*e.g.,* in area for > 48 hours, exposed to > 3 air gun events) but lack data to inform humpback nursing behavior and calf survivability during acoustic stressors. The results demonstrated that migrating whales would not likely experience enough of a delay as a result of disturbance to result in population consequences, but whales disturbed in breeding or resting areas would be more vulnerable to consequences of disturbance.

Greenfield *et al.* (2020) demonstrated that bottlenose dolphins who had been injured from boat strike or entanglement experienced a decline in their social network's preferred associations, and as a result were more vulnerable to predation and less fecund.

Hin *et al.* (2021) used a previously published energy budget model for pilot whales (Hin *et al.* 2019) to examine how lost foraging days affect individuals in a population at carrying capacity. In this model, depletion of prey is dependent on whale density, and prey density limits the energy available for growth, reproduction, and survival. The authors assumed extreme disturbance events for this study: consecutive days of no foraging affecting all individuals in a population. The undisturbed whale population was regulated through the effect of prey availability on calf survival and pregnancy rates and on age at first reproduction of females. During a disturbance event, population decline was generally attributed to loss of lactating females and calves due to reduced body condition. The subsequent increase in prey density and per capita prey availability, however, resulted in improved body condition in the population overall and decreased age at first calf. As disturbance duration was increased (~40 days of no foraging), the population would enter extreme decline towards extinction.

Murray *et al.* (2021) conducted a cumulative effects assessment on Northern and Southern Resident killer whales, which involved both a Pathways of Effects conceptual model and a Population Viability Analysis quantitative simulation model. Authors found that both populations were highly sensitive to prey abundance and were also impacted by the interaction of low prey abundance with vessel strike, vessel noise, and polychlorinated biphenyls contaminants. However, more research is needed to validate the mechanisms of vessel disturbance and environmental contaminants.

Pirotta *et al.* (2020) reformulated their previous dynamic energy budget model (Pirotta *et al.* 2018) to investigate the state-dependent life history strategies of female long-finned pilot whales and trade-offs between their body condition (*i.e.,* ability to offset starvation during pregnancy and provide milk), prey availability, and decision to reproduce in situations with and without disturbance. Many whales in this model attempted to reproduce young, and while that had no cost in situations without disturbance, young mothers would starve and die when foraging was prevented by some disturbance event or because resources were low (winter). Whale reproductive strategies resulted in lower lifetime reproductive output, compared to the model used in Hin *et al.* (2019).

Pirotta *et al.* (2021) integrated different sources of data (*e.g.,* controlled exposure data, activity monitoring, telemetry tracking, and prey sampling) into a bioenergetic model, which was used to predict effects from sonar on a blue whale's daily energy intake. Approximately half of the simulated whales had no change in daily net energy intake because they either had no response or were not exposed. However, the other half experienced a decrease in net energy intake. A portion (11 percent) of those simulated whales had negative net energy even after brief (*e.g.,* 6–30 min) or weak (*e.g.,* 160–180 dB re 1 µPa source level) events, which indicated that they would not be able to cover that day's energetic cost. This dichotomy in results was due to the variation in activity budgets, lunging rates and ranging patterns between tagged whales. This evidence suggests that context can influence the predicted costs of disturbance even more than body size or prey density distribution on a daily scale (although prey availability and abundance affected behavioral patterns).

Pirotta *et al.* (2022) evaluated potential long-term effects of changing environmental conditions and military sonar by modeling vital rates of Eastern North Pacific blue whales. Previous work from Pirotta *et al.* (2021) was used as a foundation for incorporating the most recent best available science into the vital rate model presented in this study. Using data and underlying models of behavioral patterns, energy budgets, body condition, contextual responses to noise, and prey resources, the model predicted female vital rates

including survival (age at death), and reproductive success (number of female calves). The model simulation results showed that ''[e]nvironmental changes were predicted to severely affect vital rates, while the current regime of sonar activities was not.'' The case study used an annual sonar regime in SOCAL based on the description of the action in the Navy's 2018 HSTT FEIS/OEIS. Additional military sonar scenarios were modeled, and a ten-fold increase in sonar activity combined with a shift in geographical location to overlap with main feeding areas of blue whales resulted in a moderate decrease in lifetime reproductive success (Cohen's d = 0.47). However, there was no effect on survival (Cohen's d = 0.05).

Pirotta (2022) covered the development of bioenergetic models [''any mechanistic model where the principles of metabolic ecology are used to describe how an individual animal acquires energy from food resources (*i.e.,* energy intake) and allocates assimilated energy to various life history functions (*i.e.,* energy costs, including maintenance and survival, growth and reproduction)''] with a focus on applications to marine mammals. This article provided a thorough overview of the history of marine mammal bioenergetic models, defined relevant terminology, and explained the differences between general types of models.

McHuron *et al.* (2021) developed a state-dependent behavioral and life history model to predict the probability of Western gray whale mother-calf pair survival with and without acoustic disturbance and with or without adequate prey availability on their summer foraging grounds. Pregnant mother movement, feeding behavior, fat mass and fetal length were input data for the model. Since prey availability was co-dependent on whales having access to high-density offshore areas by mid-July, nearshore seismic surveys had no impact on population fecundity or mother-calf survival. This model overcomes a key challenge in PCoD literature by providing a link between behavioral responses and vital rates; authors recommend focusing on species that are data rich to accurately characterize the biology of the focal species, metrics of fitness, and key qualities of their environment.

Joy *et al.* (2022) presented a hypothetical case study for fin whales off Southern California exposed to stationary single-ship 53C sonar events over the course of a year, using the Navy's Phase 3 behavioral response function (BRF). Two model runs were compared: using $\alpha = 0.05$ (average 20-minute movement disruption) and $\alpha = 0.99$ (average 3 days movement disruption). When animals returned to baseline behavior after a short disturbance ($\alpha = 0.05$), there was less regional displacement and thus more instances of behavioral disturbance over the course of a year. When animals returned to baseline behavior after a longer period ($\alpha = 0.99$), there were fewer instances of behavioral disturbances over the course of a year due to cumulative displacement from habitat near the sonar source.

Keen *et al.* (2021) reviewed 15+ years of PCoD modeling and identified the most critical factors for determining long-term impacts to populations. Critical factors include life-history traits, disturbance source characteristics, and environmental conditions. No specific model or quantitative assessment was proposed.

Methodology for Assessing Acoustic Impacts

Palmer *et al.* (2022) recorded North Atlantic right whale upcalls using 10 Marine Autonomous Recording Units deployed in Cape Cod Bay from February to May 2009. A modified equation was provided for determining the effective survey area, including a Lombard coefficient, for single sensor applications. The authors state manual annotation or verification is nearly always used to confirm automated detector outputs prior to near-real-time conservation measures due to limitations in automatic detector capabilities.

Aircraft Noise

Kuehne *et al.* (2020) measured in-air and underwater sound from low-altitude EA–18G Growler flights in the immediate vicinity of Ault Field at Naval Air Station Whidbey Island (NASWI). Data were collected by two in-air recorders and one hydrophone placed just off the runway at a depth of 30 meters. The underwater 10-flight average sound measurement was 134 ± 3 dB re 1 µPa rms in the highest 1-second window. The results showed that the peak frequency range of the Growler overflight noise both in air and underwater was between 50 and 1,000 Hz, which is typically a frequency range with high background noise underwater, particularly in areas with large amounts of vessel traffic (Erbe *et al.* 2012). The study did not include behavioral observations of wildlife, and the authors' conclusions about potential impacts to wildlife were unsupported by data from the study. In a separate effort, Kuehne and Olden (2020) relied on volunteers to identify military aircraft noise in recordings taken on land on the Olympic Peninsula. This study also did not examine impacts to or responses by wildlife to aircraft.

We reiterate that NMFS reviewed the Navy's analysis and conclusions that aircraft noise will not result in incidental take of marine mammals, and finds the analysis and conclusions complete and supportable, as stated in the 2018 HSTT final rule. Please see section 3.7 (Marine Mammals) of the 2018 HSTT FEIS/OEIS for additional information.

Conclusion for New Pertinent Science Since Publication of the 2020 HSTT Final Rule

Having considered the best scientific information available, specifically new relevant information published since the 2020 HSTT final rule, we have preliminarily determined that there is no new information that substantively affects our analysis of impacts on marine mammals and their habitat that appeared in the 2020 HSTT final rule, all of which remains applicable and valid for our assessment of the effects of the Navy's activities during the 7-year period of this rulemaking.

Estimated Take of Marine Mammals

This section indicates the number of takes that NMFS is proposing for authorization, which are based on the amount of take that NMFS anticipates could occur or is likely to occur, depending on the type of take and the methods used to estimate it, as described below. NMFS coordinated closely with the Navy in the development of their incidental take application and preliminarily agrees that the methods the Navy has put forth described herein, in the 2019 HSTT proposed rule, 2020 HSTT final rule, and in the 2018 HSTT proposed and final rules 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, with the exception of that of humpback whales, discussed further below. The number and type of incidental takes that could occur or are likely to occur annually remain identical to those authorized in the 2018 HSTT regulations and 2020 HSTT regulations, with the exception of proposed takes by serious injury or mortality by vessel strike and harassment takes of humpback whale stocks in Southern California (due to the new stock structure).

Takes are predominantly in the form of harassment, but a small number of serious injuries or mortalities could

occur. 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).

Proposed authorized takes would primarily be in the form of Level B harassment, as use of the acoustic and explosive sources (*i.e.,* sonar, air guns, pile driving, explosives) and is more likely to result in the disruption of natural behavior patterns to a point where they are abandoned or significantly altered (as defined specifically at the beginning of this section but referred to generally as behavioral disturbance) or TTS for marine mammals. There is also the potential for Level A harassment 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. Additionally, serious injuries or mortalities of mysticetes (except for sei whales, minke whales, Bryde's whales, Central North Pacific stock of blue whales, Hawaii stock of fin whales, Western North Pacific stock of gray whales, and sperm whales) could occur through vessel strike. Proposed mitigation and monitoring measures are expected to minimize the severity of the taking to the extent practicable.

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 would experience behavioral disturbance 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) and the number of days of activities or events.

Acoustic Thresholds

Using the best available science, NMFS, in coordination with the Navy, has established acoustic thresholds that identify the most appropriate received level of underwater sound above which marine mammals exposed to these sound sources could be reasonably expected to 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 permanent threshold shift (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.

We described the acoustic thresholds and the methods used to determine thresholds, none of which have changed, in detail in the *Acoustic Thresholds* section of the 2018 HSTT final rule; please see the 2018 HSTT final rule for detailed information. Further, in the 2020 HSTT final rule, we described new relevant information from the scientific literature since publication of the 2018 HSTT final rule. Since publication of the 2020 HSTT final rule, a number of additional studies have published, including several associated with TTS in harbor porpoises and seals (*e.g.,* Kastelein *et al.* 2020d; Kastelein *et al.* 2021a and 2021b; Sills *et al.* 2020). NMFS is aware of these recent papers, summarized above in the *New Pertinent Science Since Publication of the 2020 HSTT Final Rule* section. NMFS is currently working with the Navy to update NMFS' Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing Version 2.0 (Acoustic Technical Guidance; NMFS 2018) to reflect relevant papers that have been published since the 2018 update on our 3–5 year update schedule in the Acoustic Technical Guidance. First, we note that the recent peer-reviewed updated marine mammal noise exposure criteria by Southall *et al.* (2019) provide identical PTS and TTS thresholds and weighting functions to those provided in NMFS' Acoustic Technical Guidance.

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 or updates may be appropriate. However, any such revisions must undergo peer and public review before being adopted, as described in the Acoustic Technical Guidance methodology. While some of the relevant data may potentially suggest changes to TTS/PTS thresholds for some species, any such changes would not be expected to change the predicted take estimates in a manner that would change the necessary determinations supporting the issuance of these regulations, and the data and values used in this proposed rule reflect the best available science.

Navy's Acoustic Effects Model

The Navy proposes no changes to the Acoustic Effects Model as described in the 2018 HSTT final rule (and incorporated by reference in the 2020 HSTT final rule), and there is no new information that would affect the applicability or validity of the model. Please see the 2018 HSTT final and proposed rules and Appendix E of the 2018 HSTT FEIS/OEIS for detailed information.

Range to Effects

The Navy proposes no changes from the 2018 HSTT final rule (and subsequent 2020 HSTT final rule) to the type and nature of the specified activities to be conducted during the 7-year period analyzed in this proposed rule, including equipment and sources used and exercises conducted. NMFS has reviewed and 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. However, any such revisions must undergo peer and public review before being adopted, as described in the Acoustic Guidance methodology. While some of the relevant data may potentially suggest changes to TTS/PTS thresholds for some species (*e.g.,* Kastelein *et al.* (2020a) shows onset of TTS incurred by a harbor porpoise at higher received levels than would have been anticipated based on the existing criteria, while Kastelein *et al.* (2022a) shows onset of TTS in otariids in water at lower received levels than the existing criteria), our assessment suggests that any such changes would not be expected to change the predicted take estimates in a manner that would change the necessary determinations supporting the issuance of these regulations, and the data and values used in the 2018 HSTT final rule, 2020 HSTT final rule, and this proposed rule reflect the best available science. Therefore, the ranges to effects in this proposed rule are identical to those described and analyzed in the 2018 HSTT final rule and 2020 HSTT final rule, including received sound levels that may cause onset of significant behavioral response and TTS and PTS in hearing for each source type or explosives that may cause non-auditory injury. Please see the *Range to Effects* section and tables 24 through 40 of the 2018 HSTT final rule for detailed information.

Marine Mammal Density

The Navy proposes no changes to the methods used to estimate marine mammal density described in the 2018 HSTT final rule, and there is no new information that would affect the applicability or validity of these methods or change the results in a manner that would change the necessary determinations supporting the issuance of these regulations. The Navy's estimate of marine mammal density as described in the 2018 HSTT final rule remains valid, though, as described herein, NMFS has incorporated new information regarding humpback whale stock structure into its analysis. Please see the 2018 HSTT final rule, and below, for detailed information.

As noted above, NMFS regularly updates SARs, and in this rulemaking considers the 2022 final SARs (Carretta *et al.* 2023, Young *et al.* 2023). While these SARs contain updated information, the Navy's estimate of marine mammal density as described in the 2018 HSTT final rule remains valid for the following reasons. The Navy uses its Marine Species Density Database (NMSDD) for its analysis, which is derived from multiple sources, including but not limited to SARs. In contrast, for most cetacean species, the SAR 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 abundance value for each species across broad geographic areas, but it does not provide information on the species density or concentrations within that area, and it does not estimate density for other timeframes or seasons that were not surveyed. A change in a stock's abundance indicated in a SAR does not necessarily indicate a change in that stock's density in any given area. Therefore, stocks in the HSTT Study Area with higher abundance estimates in the most recent SARs in comparison to the abundance estimates at the time that marine mammal densities were derived for the HSTT Study Area do not necessarily now occur in higher densities in the HSTT Study Area. For humpback whale, while the stock structure in the Pacific Ocean was revised in the 2022 final SARs, the discussion above remains true regarding density of humpback whales in the HSTT Study Area across all stocks.

Take Requests

As in the 2018 HSTT final rule and 2020 HSTT final rule, the Navy determined that the three stressors below could result in the incidental taking of marine mammals. NMFS has reviewed the Navy's data and analysis and determined that it is complete and accurate, and NMFS agrees that the following stressors have the potential to result in takes of marine mammals from the Navy's planned activities:

- Acoustics (sonar and other transducers; air guns; pile driving/extraction);
- Explosives (explosive shock wave and sound, assumed to encompass the risk due to fragmentation); and
- Physical Disturbance and Strike (vessel strike).

NMFS reviewed and agrees with the Navy's conclusion that acoustic and explosive sources have the potential to result in incidental takes of marine mammals by harassment, serious injury, or mortality. NMFS carefully reviewed the Navy's analysis and conducted its own analysis of vessel strikes, determining that the likelihood of any particular species of large whale being struck is quite low. However, as noted previously, in 2021, two separate U.S. Navy vessels struck unidentified large whales on two separate occasions, one whale in June 2021 and one whale in July 2021. In May 2023, the U.S. Navy struck a large whale, which based on available photos and video, NMFS and the Navy have determined was either a fin whale or sei whale. NMFS agrees that vessel strikes have the potential to result in incidental take from serious injury or mortality for certain species of large whales, and the Navy has specifically requested coverage for these species. Therefore, the likelihood of vessel strikes, and later the effects of the incidental take that is being proposed to be authorized, has been fully analyzed and is described below.

Regarding the quantification of expected takes from acoustic and explosive sources (by Level A and Level B harassment, as well as mortality resulting from exposure to explosives), the number of takes are based directly on the level of activities (days, hours, counts, *etc.,* of different activities and events) in a given year. In the 2020 HSTT final rule, take estimates across the 7 years were based on the Navy conducting 4 years of a representative level of activity and 3 years of maximum level of activity. As in the 2020 HSTT final rule, the Navy proposes to use the maximum annual level to calculate annual takes (which would remain identical to what was determined in the 2020 HSTT final rule, with the exception of attribution of takes to humpback whale stocks), and the sum of all years (4 representative and 3 maximum) to calculate the 7-year totals for this rulemaking.

The quantitative analysis process used for the 2018 HSTT FEIS/OEIS and the 2017 and 2019 Navy applications 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 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. Where the analysis indicates mitigation would effectively reduce risk, the model-estimated PTS 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 mitigation, see the 2017 Navy application and the *Take Requests* section of the 2018 HSTT final rule. The extent to which the mitigation areas reduce impacts on the affected species and stocks is addressed separately in the *Preliminary Analysis and Negligible Impact Determination* section.

No changes have been made to the quantitative analysis process to estimate potential exposures to marine mammals resulting from acoustic and explosive stressors and calculate take estimates, with the exception of take of humpback whales to account for the change in stock structure. Please see the documents described in the paragraph above, the 2018 HSTT proposed rule, the 2018 HSTT final rule, and below for detailed descriptions of these analyses. While Oedekoven and Thomas (2022) suggest that detection of marine mammals is less certain than previously assumed at certain distances, NMFS has independently evaluated the Navy's method for application of mitigation effectiveness in estimating take 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, including after consideration of Oedekoven and Thomas (2022). In summary, we believe the Navy's methods, including the method for incorporating mitigation and avoidance, are the most appropriate methods for predicting 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 PTS, TTS, or behavioral disturbance.

Summary of Requested 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 7-year period in its 2019 rulemaking/LOA application. With the exception of changes to humpback whale take, described below, annual takes (based on the maximum number of activities that could occur per 12-month period) from the use of acoustic and explosive sources are identical to those presented in tables 41 and 42 and in the *Explosives* subsection of the *Take Requests* section of the 2018 HSTT final rule. The 2022 Navy application includes the Navy's updated take estimate and request for take by vessel strike due to vessel movement in the HSTT Study Area. NMFS reviewed the Navy's data, methodology, and analysis and determined that it was complete, but NMFS has reanalyzed the potential for vessel strike following the May 2023 strike, as described in the Estimated Take from Vessel Strikes and Explosives by Serious Injury or Mortality section. NMFS agrees that the estimates for incidental takes by harassment from all sources as well as the incidental takes by serious injury or mortality from explosives requested for authorization are the maximum number of instances in which marine mammals are reasonably expected to be taken at the time of Navy's request, and continues to be for all stocks other than humpback whales, for which changes are described below. NMFS also agrees that the takes by serious injury or mortality as a result of vessel strikes could occur. Note that, consistent with the 2020 HSTT final rule, the total amount of estimated incidental take from acoustic and explosive sources over the total 7-year period covered by the 2019 Navy application is less than the annual total multiplied by seven. Although the annual estimates are based on the maximum number of activities per year and therefore, the maximum possible estimated takes, the 7-year total take estimates are based on the sum of 3 maximum years and 4 representative years, with the exception of humpback whale stocks that occur in SOCAL for which 7-year total take is conservatively estimated as the annual total multiplied by seven. Not all activities occur every year. Some activities would occur multiple times within a year, and some activities would occur only a few times over the course of the 7-year period. Using 7 years of the maximum number of activities each year would vastly overestimate the amount of incidental take that would occur over the 7-year period where the Navy knows that it will not conduct the maximum number of activities each and every year for the 7 years.

As described above in the Description of Marine Mammals and Their Habitat in the Area of the Specified Activities section, the 2022 final SARs include a revision to the humpback whale stock structure in the Pacific Ocean. In the 2020 HSTT final rule, NMFS authorized take of the CA/OR/WA stock and Central North Pacific stock of humpback whale. Given the revised stock structure, in this proposed rule, NMFS has reanalyzed the potential for take of each stock of humpback whale and determined that the Central America/Southern Mexico-CA/OR/WA, Mainland Mexico—CA/OR/WA stock, and Hawaii stocks are likely to be taken by the Navy's activities.

Under the new stock structure, the Hawaii stock (Hawaii DPS) is the only stock that would occur in Hawaii. Therefore, the Hawaii stock of humpback whale is the only humpback whale stock anticipated to be taken by the Navy's activities in the HRC, and all takes of the Central North Pacific stock of humpback whale that were authorized in the 2020 HSTT final rule are anticipated to be of individuals from the new Hawaii stock. In SOCAL, the takes of individuals from the former CA/OR/WA stock that were authorized in the 2020 HSTT final rule are anticipated to be of individuals from the new Central America/Southern Mexico-CA/OR/WA and Mainland Mexico-CA/OR/WA stock.

Please see the Estimated Harassment Take from Testing Activities and Estimated Harassment Take from Training Activities sections below for the estimated annual and 7-year total number and type of Level A harassment and Level B harassment for each humpback whale stock.

Estimated Harassment Take From Training Activities

For training activities, table 11 of the 2020 HSTT final rule summarizes the Navy's take estimate and request in the 2019 Navy application and the maximum amount and type of Level A harassment and Level B harassment that NMFS concurred is reasonably expected to occur by species or stock and authorized in the 2020 HSTT LOA. In the 2022 Navy application, the Navy requested no change to this authorized take, though as described above, NMFS has since published the 2022 final SARs, which include a revision to humpback whale stock structure. For the estimated 7-year total amount and type of Level A harassment and Level B harassment, see table 11 of the 2020 HSTT final rule for all species other than humpback whale. For the estimated amount and type of Level A harassment and Level B harassment annually, see table 41 in the 2018 HSTT final rule for all species other than humpback whale. Note that take by Level B harassment includes both behavioral disturbance and TTS. Navy Figures 6–12 through 6–50 in Section 6 of the 2017 Navy application illustrate 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 disturbance in the model, it was recorded as a TTS.

TABLE 2—HUMPBACK WHALE TAKE FROM ACOUSTIC AND EXPLOSIVE EFFECTS FOR ALL TRAINING ACTIVITIES IN THE HSTT STUDY AREA

Species	Stock	Annual		7-Year total	
		Level B harassment	Level A harassment	Level B harassment	Level A harassment
Humpback whale [a]	Hawaii	5,604	1	34,437	12
	Central America/Southern Mexico-CA/OR/WA (Central America DPS).	585	0	[b] 4,095	0
	Mainland Mexico—CA/OR/WA (Mexico DPS).	669	1	[b] 4,683	7

[a] Combined, takes from the Central America/Southern Mexico- CA/OR/WA stock and the Mainland Mexico CA/OR/WA stock are equal to takes of the CA/OR/WA stock authorized in the 2020 HSTT final rule.
[b] Unlike other species and stocks, for the Central America/Southern Mexico-CA/OR/WA stock and Mainland Mexico-CA/OR/WA stock, NMFS estimated the 7-year take by Level B harassment by multiplying the annual estimated take by seven. However, between the two stocks, NMFS does not anticipate that the total number of takes by Level B harassment across all 7 years would exceed the 7,962 takes by Level B harassment from training activities that were authorized for the CA/OR/WA stock of humpback whales in the 2020 HSTT final rule.

Estimated Harassment Take From Testing Activities

For testing activities, table 12 of the 2020 HSTT final rule summarizes the Navy's take estimate and request in the 2019 Navy application and the maximum amount and type of Level A harassment and Level B harassment that NMFS concurred is reasonably expected to occur by species or stock and authorized in the 2020 HSTT LOA. In the 2022 Navy application, the Navy requested no change to this authorized take. For the estimated 7-year total amount and type of Level A harassment and Level B harassment, see table 12 of the 2020 HSTT final rule. For the estimated amount and type of Level A harassment and Level B harassment annually, see table 42 in the 2018 HSTT final rule. Note that take by Level B harassment includes both behavioral disturbance and TTS. Navy Figures 6–12 through 6–50 in section 6 of the 2017 Navy application illustrate 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 disturbance in the model, it was recorded as a TTS.

TABLE 3—HUMPBACK WHALE TAKE FROM ACOUSTIC AND EXPLOSIVE EFFECTS FOR ALL TESTING ACTIVITIES IN THE HSTT STUDY AREA

Species	Stock	Annual		7-Year total	
		Level B harassment	Level A harassment	Level B harassment	Level A harassment
Humpback whale [a]	Hawaii	3,522	2	23,750	19
	Central America/Southern Mexico—CA/OR/WA.	291	0	[b] 2,037	0
	Mainland Mexico—CA/OR/WA	449	0	[b] 3,143	0

[a] Combined, takes from the Central America/Southern Mexico-CA/OR/WA stock and the Mainland Mexico CA/OR/WA stock are equal to takes of the CA/OR/WA stock authorized in the 2020 HSTT final rule.
[b] Unlike other species and stocks, for the Central America/Southern Mexico-CA/OR/WA stock and Mainland Mexico-CA/OR/WA stock, NMFS estimated the 7-year take by Level B harassment by multiplying the annual estimated take by seven. However, between the two stocks, NMFS does not anticipate that the total number of takes by Level B harassment across all 7 years would exceed the 4,961 takes by Level B harassment from testing activities that were authorized for the CA/OR/WA stock of humpback whales in the 2020 HSTT final rule.

Estimated Take From Vessel Strikes and Explosives by Serious Injury or Mortality
Vessel Strike

Vessel strikes from commercial, recreational, and military vessels are known to affect large whales and have resulted in serious injury and fatalities to cetaceans (Abramson *et al.* 2011; Berman-Kowalewski *et al.* 2010; Calambokidis, 2012; Douglas *et al.* 2008; Laggner, 2009; Lammers *et al.* 2003; Van der Hoop *et al.* 2012; Van der Hoop *et al.* 2013; Crum *et al.* 2019). Records of collisions date back to the early 17th century, and the worldwide number of collisions appears to have increased steadily during recent decades (Laist *et al.* 2001; Ritter 2012) due to increases in the number and speed of large vessels, increased reporting of strikes, and increased abundance of some large whales (Ransome *et al.* 2021), among other factors.

Numerous studies of interactions between surface vessels and marine mammals have demonstrated that free-ranging marine mammals often, but not always (*e.g.,* McKenna *et al.* 2015; Smultea *et al.* 2022; Szesciorka *et al.* 2019), engage in avoidance behavior when surface vessels move toward them. It is not clear whether these responses are caused by the physical presence of a surface vessel, the underwater noise generated by the vessel, or an interaction between the two (Amaral and Carlson, 2005; Au and Green, 2000; Bain *et al.* 2006; Bauer 1986; Bejder *et al.* 1999; Bejder and Lusseau, 2008; Bejder *et al.* 2009; Bryant *et al.* 1984; Corkeron, 1995; Erbe, 2002; Félix, 2001; Goodwin and Cotton, 2004; Lemon *et al.* 2006; Lusseau, 2003; Lusseau, 2006; Magalhaes *et al.* 2002; Nowacek *et al.* 2001; Richter *et al.* 2003; Scheidat *et al.* 2004; Simmonds, 2005; Watkins, 1986; Williams *et al.* 2002; Wursig *et al.* 1998). Several authors suggest that the noise generated during vessel movement is probably an important factor (Blane and Jaakson, 1994; Evans *et al.* 1992; Evans *et al.* 1994). Water disturbance may also be a factor. These studies suggest that the behavioral responses of marine mammals to surface vessels are similar to their behavioral responses to

predators. Avoidance behavior is expected to be even stronger in the subset of instances during which the Navy is conducting training or testing activities using active sonar or explosives.

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

Some researchers have suggested the relative risk of a vessel strike can be assessed as a function of animal density and the magnitude of vessel traffic (*e.g.,* Fonnesbeck *et al.* 2008; Vanderlaan *et al.* 2008). Differences among vessel types also influence the probability of a vessel strike. The ability of any ship to detect a marine mammal and avoid a collision depends on a variety of factors, including environmental conditions, ship design, size, speed, and ability and number of personnel observing, as well as the behavior of the animal. Vessel speed, size, and mass are all important factors in determining if injury or death of a marine mammal is likely due to a vessel strike. For large vessels, speed and angle of approach can influence the severity of a strike. For example, Vanderlaan and Taggart (2007) found that between vessel speeds of 8.6 and 15 kn (15.9 and 27.8 km per hour), the probability that a vessel strike is lethal increases from 0.21 to 0.79. Large whales also do not have to be at the water's surface to be struck. Silber *et al.* (2010) found when a whale is below the surface (about one to two times the vessel draft), there is likely to be a pronounced propeller suction effect. This suction effect may draw the whale into the hull of the ship, increasing the probability of propeller strikes.

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

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

Vessel strike to marine mammals is not associated with any specific training or testing activity but is rather a limited and sporadic, but possible, accidental result of Navy vessel movement within the HSTT Study Area or while in transit.

In 2009, the Navy began implementing additional mitigation measures to further reduce the likelihood of vessel strikes. Prior to the recent strikes in 2021 and 2023, there were two recorded U.S. Navy vessel strikes of large whales in the HSTT Study Area between 2009 and April 2021, a period of approximately 12 years.

Since 2021 there have been five documented strikes of large whales in SOCAL by naval vessels, three by the U.S. Navy and two by the Royal Australian Navy. As stated previously, the U.S. Navy struck a large whale in waters off Southern California in May 2023. Based on available photos and video, NMFS and the Navy have determined this whale was either a fin whale or sei whale. The U.S. Navy struck two unidentified large whales during the months of June and July 2021, and prior to that, on May 7, 2021, the Royal Australian Navy HMAS Sydney, a 147.5 m (161.3 yd) Hobart Class Destroyer, struck and killed two fin whales (a mother and her calf) while operating within SOCAL. In the case of the Royal Australian Navy strike, the carcasses were first sighted under the bow of the vessel while it was approaching the Naval Base in San Diego. The whales had been pinned to a sonar dome in the front of the vessel due to the force of water as the ship was underway. Based on interviews with HMAS Sydney personnel, the most likely time of impact with the two whales would have been around 6:25 a.m. when the vessel was located near Cortes Bank, and visibility was poor. The reported vessel speed at the estimated time of strike was 9 kn (16.7 km per hour). One minute before the estimated strike time a lookout reported whales off the starboard bow. The officer on-watch verbally acknowledged the report, slowed speed, and visually tracked the whales passing clear down the starboard side until they were clear of the ship. The morning of the strike, the HMAS Sydney was getting into position to participate in a U.S. Navy-led exercise later that day. Of note, throughout the remainder of the day visibility was poor and the vessel had implemented mitigation measures in multiple instances due to whale occurrence. In addition to being the only documented occurrence of a foreign military vessel strike of a large whale within the HSTT Study Area, the HMAS Sydney vessel strike was also somewhat unique, as compared to other reported military vessel strikes, in that two whales were apparently struck at one time, and both remained pinned to the front of the vessel until the vessel approached the port.

On June 29, 2021, a U.S. Navy cruiser struck an unknown whale species approximately 95 nmi west of San Diego. The ship was returning from Hawaii, heading to a rendezvous with a fuel replenishment vessel (oiler) for an Underway Replenishment. Off-duty sailors noticed a group of whales approaching the ship from the port quarter (*i.e.,* left rear of the ship), an area unique to cruisers with some equipment structures blocking close aboard sight. The first indication of a whale within the 500-yd mitigation zone immediately prior to the strike was when an off-duty sailor on the flight deck witnessed the whale briefly surface on the aft port quarter before diving. Shortly after this occurred blood was noticed in the wake, and a floating whale body was eventually observed behind the ship. The ship's speed was 25 kn (46.3 km per hour) at the estimated time the strike occurred. The Navy also noted that, on the morning before the strike occurred, the ship had maneuvered several times to avoid whale blows beyond the 500-yd (457.2 m) mitigation zone, closer to 1,000 yd (914.4 m).

On July 11, 2021, a U.S. Navy cruiser struck an unknown whale species

approximately 90 nmi (166.7 km) south-southwest of San Diego. The vessel was a participant in a MTE (Large Integrated Anti-Submarine Warfare—Composite Unit Training Exercise) within the SOCAL portion of the action area. The vessel was maneuvering for pending flight operations to receive an inbound helicopter. At 2:27 p.m., the starboard lookout sighted what they believed to be a whale crossing immediately under the vessel's bow. The conning officer attempted to maneuver the vessel by turning to port but internal watchstanders subsequently felt the ship shudder aft. The vessel's combat center observed a red slick 600 yd (548.6 m) astern on a flight deck camera and a brief surfacing of the whale itself, but no carcass was observed. There had not been any sightings of large whales off the bow leading up to the incident. Although the ship was traveling at 25–30 kn (46.3–55.6 km per hour) one hour before the estimated strike time, at ten minutes before, the vessel changed course and reduced its speed to 17 kn (31.5 km per hour). These 2021 incidents were the first known U.S. Navy vessel strikes in the HSTT Study Area since 2009.

On May 20, 2023, a U.S. Navy aircraft carrier was at sea conducting independent, unit-level flight training for the embarked airwing approximately 70 nmi west of San Diego. Training exercises concluded for the day at approximately 7:44 p.m. local time. Navy personnel discovered a whale impinged on the bow of the vessel at approximately 8:00 p.m. local time. The vessel was traveling at approximately 5 kn and had recently made a turn to reset position for the evening when the Navy personnel discovered the whale. Navy personnel captured video and photos of the carcass, and based on those images, NMFS and the Navy have determined this whale was either a fin whale or sei whale; the two species are very similar morphologically and are difficult to distinguish from one another at sea. Navy personnel stopped the vessel to allow lack of momentum to dislodge the carcass from the bow, and based on lack of further observations after the carcass dislodged, it is believed to have sunk around 9:30 p.m. local time. Navy personnel on board the vessel reported that they did not feel an impact from striking the whale. Prior to the strike, between 6:45 p.m. and 7:45 p.m., the forward Lookouts on the vessel observed two whales crossing the vessel's bow but did not provide a distance between the vessel and the whales. One Lookout reported seeing the blow and the other reported seeing 'humps' (presumably the dorsal of the animal). Both whales were sighted past the ship's course to the northwest. Within the same time window, one of the aft Lookouts observed a single whale swimming parallel to the ship and soon passed astern of the ship. During the same time, independent of the sightings and for general movement reasons, the ship changed speed from 17 knots to 10 knots at 7:22 p.m.

For the same reasons listed above describing why the likelihood of a military vessel striking a whale is lower than that of some other vessels striking whales, it is also highly unlikely that a Navy vessel would strike a whale, dolphin, porpoise, or pinniped without detecting it. Specifically, Navy ships have Lookouts, including on the forward part of the ship that can visually detect a hit animal in the event ship personnel do not feel the strike (which has occurred). Accordingly, NMFS is confident that the Navy's reported strikes are accurate and appropriate for use in the analysis. Navy's strict internal procedures and mitigation requirements 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.

As noted above, the 2021 Royal Australian Navy vessel strikes were first observed when the vessel came to port at Naval Base San Diego. However, such a scenario is unlikely on a U.S. Navy vessel. While U.S. Navy cannot speculate on the configurations of other ships bows and even sonar dome specifications (that may be at the bow), the Navy believes it would be implausible for a marine mammal to become lodged on the sonar dome of a U.S. Navy ship and remain undetected due to a technological standard operating procedure. Sonar domes on U.S. Navy ships have a pressurized rubber window that maintains 150 pound-force per square inch (PSI) through the ship's fire main. If anything affects the pressure, an alarm sounds in the sonar control room. In the event of a whale strike in that location, this alarm would alert personnel that something hit the sonar dome. Further, the shape, hydrodynamic design, construction using a non-abrasive material, and regular hull cleaning procedures to remove barnacles and other growth on U.S. Navy ships also make it unlikely that a whale would become lodged and remain undetected on a U.S. Navy ship's bow or even sonar dome. While in the case of the May 2023 strike, described above, a whale also became lodged on the ship's bow, the aircraft carrier that struck the whale does not have active or passive sonar capabilities (*i.e.,* no sonar dome), nor does it have a bulbous bow, and the whale was more quickly discovered by Navy personnel.

In order to better account for the accidental nature of vessel strikes to large whales in general and the potential risk from U.S. Navy vessel movement within the HSTT Study Area during the remaining period of the HSTT rule in particular, the Navy requested the HSTT rule be modified to authorize additional incidental takes by vessel strike based on probabilities derived from a Poisson distribution using vessel strike data between 2009–2021 in the HSTT Study Area (the time period from when current mitigations were instituted until the Navy conducted the analysis for the 2022 Navy application), as well as historical at-sea days in the HSTT Study Area from 2009–2015 and estimated at-sea days for the period from 2016 to 2025 covered by the current regulations. This distribution predicted the probabilities of a specific number of strikes (n=0, 1, 2, *etc.*) over the remaining period of the regulations at the time of the Navy's analysis (2022–2025).

The Navy used the two fin whale strikes (2009) and two unidentified large whale strikes (2021) in their calculations to determine the number of strikes likely to result from its activities over the remaining 3 years of the rule (2023–2025, although worldwide strike information from all Navy activities and other sources was used to inform the species that may be struck). The Navy evaluated data beginning in 2009 as that was the start of the Navy's Marine Species Awareness Training and adoption of additional mitigation measures to address vessel strike, which will remain in place along with additional and modified mitigation measures during the 7 years of this rulemaking. From this analysis, the Navy concluded that there was a 27 percent chance that zero whales would be struck by Navy vessels over the remaining period of the rule (which, at the time that the application was submitted, was 4 years), and a 35, 23, and 10 percent chance that one, two, or three whales, respectively, would be struck over the remaining 4 years of the rule. Therefore, the Navy estimated that there was some probability that the Navy could strike, and take by serious injury or mortality, up to three large whales incidental to training and testing

activities within the HSTT Study Area over what would have been the remaining 4 years of the current authorization, and the Navy requested authorization of two additional takes of large whales by serious injury or mortality by vessel strike, beyond the three takes authorized by the 2020 HSTT final rule (85 FR 41780, July 10, 2020).

NMFS has since updated this analysis to reflect that an additional strike of an unidentified large whale occurred in May 2023 (either a fin whale or sei whale, as stated above) and that additional time has passed since the Navy submitted the 2022 Navy application. Based on further discussions with the Navy, NMFS has also updated the way it calculated at-sea days. This is a different manner of calculating at-sea days for the purposes of the strike analysis rather than a change in Navy's activity levels. For 2010–2015, the at-sea days used in NMFS' calculation reflected historic at-sea days in the HSTT action area based on positional vessel data records (Mintz, 2016). While the actual annual at-sea days from 2016-present are currently classified, NMFS' updated calculation reflects an extrapolation of the 2010–2015 at-sea days (using the formula $y = -64x + 131555$) to estimate the number of at-sea days in 2016 (Navy, 2022). The number of at-sea days derived for 2016 was 2,056 at-sea days, which reflects the downward trend in HSTT vessel activity from 2010–2015. Since we do not have sufficient information to say whether or not this downward trend continued for the years 2017–2022, we conservatively estimate the average over these years was the same as the 2016 extrapolated value of 2,056 at-sea days. This analysis only included at-sea days for Navy warships greater than 65 feet (*i.e.,* destroyers are the smallest ship class included). Navy vessels smaller than 65 feet have never reported a whale strike in the Pacific, and therefore, we consider it unlikely that this would occur in the remaining 2.5 years of the regulations.

TABLE 4—HSTT 2009 THROUGH MID-2023 AT-SEA DAYS USED FOR THE VESSEL STRIKE PROBABILITY CALCULATION

Year	At-sea days	Derivation
2009	4,233	Estimated average based on 2010–2015 data.
2010	5,207	Based on positional vessel data.
2011	4,483	Based on positional vessel data.
2012	4,081	Based on positional vessel data.
2013	4,041	Based on positional vessel data.
2014	4,272	Based on positional vessel data.
2015	3,311	Based on positional vessel data.
2016	2,056	Extrapolated from 2010–2015 regression.
2017	2,056	Extrapolated from 2010–2015 regression.
2018	2,056	Extrapolated from 2010–2015 regression.
2019	2,056	Extrapolated from 2010–2015 regression.
2020	2,056	Extrapolated from 2010–2015 regression.
2021	2,056	Extrapolated from 2010–2015 regression.
2022	2,056	Extrapolated from 2010–2015 regression.
2023 (first half of year)	1,028	Extrapolated from 2010–2015 regression, then reduced by half.
2009–Mid-2023 total	45,048	

NMFS then used the number of past Navy vessel strikes and the at-sea days to calculate a vessel strike rate for 2009 through mid-2023. The estimated total number of Navy at-sea days (for vessels greater than 65 feet) for 2009 through mid-2023 was 45,048 days. Dividing the five known strikes during that period by the at-sea days (*i.e.,* 5 strikes/45,048 at-sea days) results in a strike rate of 0.000111 strikes per day.

As described above, NMFS conservatively assumed that the average number of at-sea days from mid-2023 through 2025 (the remaining period of the regulations) will be the same as the 2016 extrapolated value of 2,056. Therefore, the estimated at-sea days within the action area for the period from mid-2023 through 2025 is 5,140 days. NMFS multiplied the historic daily strike rate by the estimated at-sea days from mid-2023 through 2025 (0.000111 strikes per day × 5,140 days) to estimate the number of whale strikes anticipated during that period. This calculation predicts an estimated 0.57 strikes over the remaining 2.5 years of the regulations (mid-2023 through 2025).

As explained above, according to the U.S. Navy, the May 2021 vessel strike of two fin whales by a Royal Australian Navy vessel did not occur while that vessel was participating in a U.S. Navy-led training exercise, and the strike of those two fin whales is not included in the estimated take by vessel strike calculation. Instead, as noted below, NMFS considered the 2021 vessel strike by the Royal Australian Navy along with other strike information when determining which species could be among the estimated large whales struck.

NMFS used a Poisson distribution to derive the probabilities of a specific number of strikes (n=0, 1, 2, *etc.*) from mid-2023 through 2025, given the estimated 0.57 strikes during that period. NMFS' probability analysis concluded that there is a 57 percent chance that zero whales would be struck by U.S. Navy vessels over the remaining period of the rule (mid-2023 through 2025), and a 32, 9, and 2 percent chance that one, two, or three whales, respectively, would be struck over the remaining 2.5 years of the regulations. Further, there is an estimated 11 percent chance that the Navy would strike more than one large whale over the remaining period of the rule (mid-2023 through 2025). We have assessed these probabilities and determined that the strike up to two large whales could occur over the remaining duration of the regulations, for a total of five takes by serious injury or mortality of large whales by vessel strike total over the 7-year duration of the regulations (three takes authorized in the 2020 HSTT final rule (85 FR 41780, July 10, 2020) which have occurred, plus two additional takes).

In addition to the reasons listed above that make it unlikely that the Navy will hit a large whale (more maneuverable ships, larger crew, *etc.*), vessel strike of dolphins, small whales, porpoises, and pinnipeds is considered very unlikely. Dating back more than 20 years and for as long as it has kept records, the Navy has no records of any small whales or

pinnipeds being struck by a vessel as a result of Navy activities. Over the same time period, NMFS and the Navy have only one record of a dolphin being struck by a vessel as a result of Navy activities. The dolphin was accidentally struck by a Navy small boat in fall 2021 in Saint Andrew's Pass, Florida. The smaller size and maneuverability of dolphins, small whales, and pinnipeds generally make such strikes very unlikely. Other than this one reported strike of a dolphin in 2021, NMFS has never received any reports from other LOA or Incidental Harassment Authorization holders indicating that these species have been struck by vessels. In addition, worldwide vessel strike records show little evidence of strikes of these groups from the shipping sector and larger vessels, and the majority of the Navy's activities involving faster-moving vessels (that could be considered more likely to hit a marine mammal) are located in offshore areas where smaller delphinid, porpoise, and pinniped densities are lower. Based on this information, NMFS concurs with the Navy's assessment and recognizes the potential for (and is proposing for authorization) incidental take by vessel strike of large whales only (*i.e.,* no dolphins, small whales, porpoises, or pinnipeds) over the course of the 7-year regulations from training and testing activities as discussed below.

Next, after determining that take of up to five large whales could occur, NMFS considered which species could be among the five large whales struck. As noted in the 2018 HSTT proposed and final rules, the 2019 HSTT proposed rule, and 2020 HSTT final rule, in the 2017 Navy rulemaking/LOA application, the Navy initially considered a weight of evidence approach that considered relative abundance, historical strike data over many years, and the overlap of Navy activities with the stock distribution in their request. NMFS updated this analysis to consider several factors, in addition to the overlap of Navy activities with stock distribution: (1) The relative likelihood of striking one stock versus another based on available strike data from all vessel types as denoted in the Carretta *et al.* (2021; referenced in the Pacific SARs), the Pacific and Alaska SARs (Carretta *et al.* 2023 and Young *et al.* 2023), and unpublished NMFS vessel strike data for 2019–2021; and (2) whether the Navy has ever struck an individual from a particular species or stock in the HSTT Study Area, and if so, how many times. NMFS did not consider relative abundance, as was considered in previous analyses, given that the relative abundance of a stock does not necessarily inform its occurrence in a specific area. Further, NMFS did not consider the historical strike data from older years (prior to 2015), given that more recent data is more relevant to determining occurrence of, and strike risk to, various stocks. NMFS updated the analysis with NMFS' vessel strike probability analysis for the remaining 2.5 years of the rule and included new/updated vessel strike data from the SARs and NMFS records for California and Hawaii.

To address number (1) above, for SOCAL, NMFS compiled information from Carretta *et al.* (2021) and unpublished NMFS vessel strike data for 2020–2021 for California on known annual rates of large whale serious injury or mortality from vessel collisions (this data includes the strike of 2 fin whales by the Royal Australian Navy in 2021, but does not include Navy strikes in 2021 and 2023 because the species struck is not known). Use of Carretta *et al.* (2021) rather than the Pacific SAR allows NMFS to separate strikes that occurred in California from strikes to the same stocks that occurred in other locations. For the HRC, NMFS compiled information from the Pacific and Alaska SARs and unpublished NMFS vessel strike data for 2019–2021 for Hawaii on known annual rates of large whale serious injury or mortality from vessel collisions. The annual rates of large whale serious injury or mortality from vessel collisions from those sources help inform the relative susceptibility of large whale species to vessel strike in SOCAL and the HRC; therefore, we considered only reported strikes where the species struck was identified with sufficient certainty (*i.e.,* ''known strikes''). Additionally, the M/SI in the 2022 SAR considers modeled takes for some, but not most species and stocks (*i.e.,* M/SI for humpback whale includes modeled takes from Rockwood *et al.* (2017)). Using known strike data for all species and stocks allows us to consider-like metrics for this comparative analysis. (Note we rely on the M/SI estimates from the 2022 SAR in our Negligible Impact Analysis. We also consider modeled takes of species from Rockwood *et al.* (2017) in table 7). We summed the annual rates of serious injury or mortality from vessel collisions in California and Hawaii as calculated above and then divided each species' annual rate by this sum to get the proportion of strikes for each species/stock (table 5).

TABLE 5—ANNUAL RATES OF SERIOUS INJURY AND MORTALITY FROM VESSEL STRIKE AND PERCENTAGE OF TOTAL STRIKES BY SPECIES IN SOCAL AND THE HRC

ESA status	Species	Stock	SOCAL annual known strikes (2015–2021)	HRC annual known strikes (2015–2021)	Percentage of total annual strikes
Listed	Blue whale	Central North Pacific		0	0.0
		Eastern North Pacific	0.57		6.5
	Fin whale [a]	California, Oregon, & Washington	1.57		17.8
		Hawaiian		0	0.0
	Humpback whale	Central America/Southern Mexico-CA/OR/WA (Central America DPS).	[b] 1		11.3
		Mainland Mexico-CA/OR/WA (Mexico DPS).			
	Sei whale	Eastern North Pacific	0.14		1.6
		Hawaiian		0	0.0
	Gray whale	Western North Pacific	0		0.0
	Sperm whale	California, Oregon, & Washington	0		0.0
		Hawaiian		0	0.0
Not listed	Gray whale	Eastern North Pacific	2.14		24.3
	Bryde's whale	ETP stock	0		0.0
		Hawaiian		0	0.0
	Minke whale	CA/OR/WA	0		0.0

TABLE 5—ANNUAL RATES OF SERIOUS INJURY AND MORTALITY FROM VESSEL STRIKE AND PERCENTAGE OF TOTAL STRIKES BY SPECIES IN SOCAL AND THE HRC—Continued

ESA status	Species	Stock	SOCAL annual known strikes (2015–2021)	HRC annual known strikes (2015–2021)	Percentage of total annual strikes
		Hawaiian	.....	0	0.0
	Humpback whale	Hawaii (Hawaii DPS)	.....	3.4	38.5
Total	.....	.....	8.82		.....

[a] This includes the two fin whales struck by the Royal Australian Navy in May 2021.
[b] This strike occurred to an individual of the CA/OR/WA stock under the previous stock structure. As such, in its analysis, NMFS assumed that this strike could have been of either stock.

To inform the likelihood of striking a particular species of large whale, we multiplied the percent of total annual strikes for a given species in table 5, by the total percent likelihood of striking at least one whale during the remaining period of the rule (2023–2025; *i.e.,* 43 percent, as described by the probability analysis above). We also calculated the percent likelihood of striking a particular species of large whale twice during the remaining period of the rule by squaring the value estimated for the probability of striking a particular species of whale once (*i.e.,* to calculate the probability of an event occurring twice, multiply the probability of the first event by the second). The results of these calculations are reflected in the last two columns of table 6. We note that these probabilities vary from year to year as the average annual mortality changes depending on the specific range of time considered; however, over the years and through updated data in the SARs and unpublished NMFS records, stocks tend to consistently maintain a relatively higher or relatively lower likelihood of being struck.

TABLE 6—PERCENT LIKELIHOOD OF STRIKING EACH STOCK ONE OR TWO TIMES OVER 2.5 YEARS AND TOTAL KNOWN U.S. NAVY STRIKES IN THE HSTT STUDY AREA

Species	Stock	Total known U.S. Navy strikes in HSTT study area	Percent likelihood of 1 strike over 2.5 years	Percent likelihood of 2 strikes over 2.5 years
Blue whale	Central North Pacific	0	0.00	0.00
	Eastern North Pacific	1 in SOCAL (2004)	2.81	0.08
Fin whale	CA/OR/WA	3 in SOCAL (2009, 2023[a])	[b] 7.74	[b] 0.60
	Hawaiian	0	0.00	0.00
Humpback whale	Central America/Southern Mexico-CA/OR/WA (Central America DPS).	0	4.93	0.24
	Mainland Mexico-CA/OR/WA (Mexico DPS).			
Sei whale	Eastern North Pacific	1 in SOCAL (2023[a])	0.69	0.00
	Hawaiian	0	0.00	0.00
Gray whale	Western North Pacific	0	0.00	0.00
Sperm whale	CA/OR/WA	0.00	0.00	
	Hawaiian	1 in HRC (2007)	0.00	0.00
Gray whale	Eastern North Pacific	3 in SOCAL (1993, 1998)	10.55	1.11
Bryde's whale	ETP stock	0	0.00	0.00
	Hawaiian	0	0.00	0.00
Minke whale	CA/OR/WA	0	0.00	0.00
	Hawaii	0	0.00	0.00
Humpback whale	Hawaii (Hawaii DPS)	2 in HRC (2003)	16.76	2.81

[a] Based on available photos and video, NMFS and the Navy have determined the May 2023 strike was of either a fin whale or sei whale. In the analysis herein, NMFS has assumed that this strike could have been of either species, and has therefore, accounted for it in both the fin whale and sei whale strike totals. Given that we are unable to identify the species of the whales struck by the U.S. Navy in 2021, NMFS did not include the two 2021 strikes in this part of the analysis.
[b] This includes the two fin whales struck by the Royal Australian Navy in May 2021.

The percent likelihood calculated as described above are then considered in combination with the information indicating the known species that the Navy has hit in the HSTT Study Area since 1991 (since they started tracking consistently; table 6). We note that for the lethal take of species specifically denoted in table 7 below, 47 percent of those struck by the Navy (8 of 17 in the Pacific) remained unidentified (including the May 2023 strike, which as stated above, NMFS and the Navy have determined was of either a fin whale or sei whale). However, given the information on known stocks struck, the analysis below remains appropriate. We also note that Rockwood *et al.* (2017) modeled the likelihood of vessel strike of blue whales, fin whales, and humpback whales on the U.S. West Coast (discussed in more detail in the *Serious Injury or Mortality* subsection of the *Preliminary Analysis and Negligible Impact Determination* section), and those numbers help inform the relative likelihood that the Navy could hit those stocks.

For each indicated stock, table 7 includes the percent likelihood of

striking an individual whale from a particular stock during the remaining 2.5 years of the rule once based on SAR data, Carretta *et al.* (2021), and unpublished NMFS vessel strike data from 2019–2021 for Hawaii; total strikes from Navy vessels in the HSTT Study Area, and modeled vessel strikes from Rockwood *et al.* (2017). The last column indicates the annual mortality proposed to be authorized.

TABLE 7—SUMMARY OF FACTORS CONSIDERED IN DETERMINING THE NUMBER OF INDIVIDUALS IN EACH STOCK POTENTIALLY STRUCK BY A VESSEL

ESA status	Species	Stock	Percent likelihood of one strike over 2.5 years	Total known U.S. Navy strikes in HSTT study area (1993–2009)	Rockwood *et al.* 2017 modeled vessel strikes [1]	Annual authorized take from 2020 HSTT final rule	Proposed annual authorized take
Listed	Blue whale	Central North Pacific	0.00	0			0
		Eastern North Pacific	2.81	1 in SOCAL (2004)	18	0.14	0.14
	Fin whale	CA/OR/WA	[2] 7.74	3 in SOCAL (2009, 2023 [3])	43	0.29	0.57
		Hawaii	0.00	0			0
	Humpback whale [4]	Central America/Southern Mexico-CA/OR/WA (Central America DPS).	4.93	0	22	0.14	0
		Mainland Mexico-CA/OR/WA (Mexico DPS).					0.14
	Sei whale	Eastern North Pacific	0.69	1 in SOCAL(2023) [3]			0.14
		Hawaii	0.00	0			0
	Gray whale	Western North Pacific	0.00	0			0
	Sperm whale	CA/OR/WA	0.00	0			0
		Hawaii	0.00	1 in HRC (2007)		0.14	0
Not listed	Gray whale	Eastern North Pacific	10.55	3 in SOCAL (1993, 1998)		0.29	0.57
	Bryde's whale	Eastern Tropical Pacific	0.00	0			0
		Hawaii	0.00	0			0
	Minke whale	CA/OR/WA	0.00	0			0
		Hawaii	0.00	0			0
	Humpback whale	Hawaii (Hawaii DPS) [5]	16.76	2 in HRC (2003)		0.29	0.29

[1] Rockwood *et al.* modeled likely annual vessel strikes off the West Coast for these three species only.
[2] This includes the two fin whales struck by the Royal Australian Navy in May 2021.
[3] Based on available photos and video, NMFS and the Navy have determined the May 2023 strike was of either a fin whale or sei whale. In the analysis herein, NMFS has assumed that this strike could have been of either species, and has therefore, accounted for it in both the fin whale and sei whale strike totals.
[4] In the 2020 HSTT final rule, take of humpback whale by serious injury and mortality by vessel strike in Southern California was attributed to the former CA/OR/WA stock and the Mexico DPS. Text explains why takes in SOCAL come from the Mexico DPS, and therefore the Mainland Mexico-CA/OR/WA stock.
[5] The 2022 final SAR reports vessel strike data for the Hawaii stock of humpback whales in Alaska, Washington, and Hawaii. Only vessel strike data from Hawaii was incorporated into our analysis as Alaska and Washington are outside of the HSTT Study Area.

Accordingly, stocks that have no record of ever having been struck by any vessel are considered to have a zero percent likelihood of being struck by the Navy in the 7-year period of the rule. Stocks that have never been struck by the Navy, have rarely been struck by other vessels, and have a low percent likelihood based on the historical vessel strike calculation are also considered to have a zero percent likelihood to be struck by the Navy during the 7-year rule. We note that while vessel strike records have not differentiated between Eastern North Pacific and Western North Pacific gray whales, given their small population size and the comparative rarity with which individuals from the Western North Pacific stock are detected off the U.S. West Coast, it is highly unlikely that they would be encountered, much less struck. This rules out all but seven stocks. Further, it is unlikely that the Hawaii stock of sperm whale would be struck given the zero percent likelihood of striking a sperm whale as indicated by the quantitative analysis above, the fact that the last U.S. Navy strike of a Hawaii stock sperm whale was in 2007, before the mitigation updates discussed above, and that, with the exception of humpback whales, vessel strikes (both military and non-military) of other large whale species in the HRC are extremely rare events (Carretta 2021b; Carretta 2022). (The 2020 HSTT final rule authorized 1 take (0.14 annual take) by mortality of the Hawaii stock of sperm whale.)

As stated previously, based on available photos and video of the whale struck by the U.S. Navy in Southern California in 2023, NMFS and the Navy have determined this whale was either a fin whale or sei whale. While the species of the two whales struck by the U.S. Navy in 2021 are unknown, given the following factors, NMFS expects these strikes may have been CA/OR/WA fin whales or Eastern North Pacific (ENP) gray whales, or some combination of these two stocks. These species have the highest annual rates of mortality/serious injury (M/SI) from vessel collision in California (1.57, 2.14, respectively, as noted above; which is approximately one and a half to two times higher than the species with the next highest strike rate, humpback whale, and approximately two to four times higher than the strike rate of blue whale). Additionally, gray whale and fin whale have the most recorded vessel strike incidents by military vessels in SOCAL and are the only stocks known to have been hit more than one time by naval vessels in the SOCAL portion of the HSTT Study Area (3 gray whale strikes by the U.S. Navy (1993, 1998), 2 or 3 fin whale strikes by the U.S. Navy (2009, potentially 2023), and 2 fin whale strikes by the Royal Australian Navy (2021)). Further, accounting for undocumented vessel strikes, Rockwood *et al.* (2021) estimated that in their study area off Southern California from 2012–2018, on average 8.9 blue, 4.6 humpback, and 9.7 fin whales were killed by civilian vessel strikes from June to November each year. In addition, they estimated that, on average, 5.7 humpback whales were killed by civilian vessel strike from January–April per year (Rockwood *et al.* 2021). For fin whales in particular, model-predicted densities of large whales in the Southern California Bight from May to July 2021 (the time period during which the 2021 strikes of two unidentified whales by the U.S. Navy occurred) estimated fin whale abundance as being nearly an order of magnitude higher than either blue or humpback whale abundance during this time period (Becker *et al.* 2020; Zickel

et al. 2021). Ship-whale encounter models for the U.S. West Coast Exclusive Economic Zone also indicated that vessel strike mortality estimates for fin whales were significantly higher than for blue whales and humpback whales (Rockwood *et al.* 2017). The comparatively higher modeled vessel strike rates for fin whales result from both the larger population as well as the more offshore distribution that overlaps significantly with several major shipping routes for a much greater spatial extent (Rockwood *et al.* 2017). Based on 1,243 visual boat-based sightings of 2,638 fin whales from 1991–2011, Calambokidis *et al.* (2015) found fin whale concentration areas included the San Clemente Basin where the 2021 Navy vessel strikes occurred (Tanner and Cortez Banks area and the shelf edge west of San Nicolas Island were also reported as fin whale concentration areas). There are two different populations of fin whales that occur in the Southern California Bight: a seasonal population, and a population that occurs year-round with offshore/inshore movements (Campbell *et al.* 2015; Falcone *et al.* 2022). This would likely make fin whales more susceptible to vessel strike year-round, as compared to other large whale species that may occur seasonally within SOCAL. Based on all of these factors, there is a reasonable likelihood that the CA/OR/WA stock of fin whales or ENP stock of gray whales could be struck twice during the remaining 2.5 years of the rule. Therefore, we propose that, of the five total takes by serious injury or mortality by vessel strike of large whales proposed to be authorized, up to four of those takes could be of the CA/OR/WA stock of fin whale or the ENP stock of gray whale given that the two strikes of unidentified large whales in 2021 could have been of either stock. Further, consistent with the 2020 HSTT final rule, we propose that, of the five total takes by serious injury or mortality by vessel strike of large whales proposed to be authorized, up to two of those takes could occur in Hawaii, and therefore be of individuals of the Hawaii stock of humpback whale.

Based on the information summarized in table 7 and the fact that there is the potential for up to two large whales to be struck over the remaining 2.5 years of the rule (five strikes over the full 7-year rule period), one individual from the Eastern North Pacific stock of blue whale, Mainland Mexico-CA/OR/WA stock of humpback whale, or Eastern North Pacific stock of sei whale could be among the two whales struck during the remaining effective period of the regulations (2023–2025). The total strikes of Eastern North Pacific blue whales and the percent likelihood of striking one based on the historic strike calculation above can both be considered moderate compared to other stocks, and the Navy struck a blue whale in 2004 (based on the historic strike calculation, the likelihood of striking two blue whales is well below one percent (table 6)). Therefore, we consider it reasonably likely that the Navy could strike one individual over the course of the 7-year rule, and given that we do not expect that the 2023 strike nor either of the 2021 U.S. Navy strikes of unidentified large whales were blue whales, we expect that this strike could occur during the remaining 2.5 years of the rule. The total strikes of Eastern North Pacific sei whales are low compared to other stocks, but NMFS and the Navy think it is possible that the Navy may have struck a sei whale in SOCAL in 2023. Therefore, we consider it reasonably likely that the Navy could strike a sei whale over the remaining 2.5 years of the rule. The Navy has not hit a humpback whale in the SOCAL portion of the HSTT Study Area. However, in 2016 a U.S. Coast Guard vessel participating in a Navy event struck a humpback whale in Hood Canal, and as a species, humpbacks have a moderate to high number of total strikes and percent likelihood of being struck. Although the likelihood of Central America/Southern Mexico-CA/OR/WA (Central America DPS) or Mainland Mexico-CA/OR/WA (Mexico DPS) humpback whales being struck by any vessel type is moderate to high relative to other stocks, the distribution of the Mexico DPS versus the Central America DPS, as well as the distribution of overall vessel strikes inside versus outside of the SOCAL area (the majority are outside), supports the reasonable likelihood that the Navy could strike one individual humpback whale from the Mainland Mexico-CA/OR/WA stock (Mexico DPS) over the 7-year duration of the rule, as described below.

Regarding the likelihood of striking a humpback whale from a particular DPS, we evaluated the relative abundance of each of these DPS in California waters. Curtis *et al.* (2022) estimated the abundance of the Central America DPS to be 1,496 whales. From Wade *et al.* (2017), about 93 percent (or 1,391 whales) of these humpbacks that winter in Central America will move to Oregon/California in the summer months. While there is currently no abundance estimate for the Mexico DPS, an estimated 3,477 whales from the Mexico DPS feed off the U.S. West Coast (Calambokidis and Barlow 2020; Curtis 2022). Based on this information, we estimate that approximately 30 percent of the humpback whales off the coast of California may be from the Central America DPS with the remaining 70 percent are expected to be from the Mexico DPS. Therefore, we anticipate that if a Navy vessel strike of a humpback whale were to occur within SOCAL, it would likely be from the Mexico DPS. Last, Rockwood *et al.* (2017) supports a relative likelihood of 1:1:2 for striking blue whales, humpback whales, and fin whales off the U.S West Coast (though as noted above, more recent data suggests that the relative likelihood of striking a fin whale is higher and suggests that the two 2021 U.S. Navy vessel strikes of unidentified large whales may have been fin whales), which, in consideration of more recent data also supports the proposed authorized take included in this rule, which is 1, 1, and 4, respectively over the 7-year period. For these reasons, one lethal take of a Mainland Mexico-CA/OR/WA humpback whale (Mexico DPS) could occur and is proposed for authorization.

For Hawaii stocks, given that all known vessel strikes between 2015 and 2021 were of humpback whales, we anticipate that any vessel strike of a large whale in Hawaii would be of the Hawaii stock of humpback whale. Given that this stock has the highest percentage of total annual strikes (38.5 percent) and a 2.81 percent chance of being struck twice over the remaining 2.5 years (more than twice that of the species with the next highest percentage, gray whale), NMFS proposes to authorize two lethal takes of Hawaii humpback whales.

As described above, the Navy's analysis suggests and NMFS' analysis concurs that the likelihood of vessel strikes to the stocks below is discountable due to the stocks' relatively low occurrence in the HSTT Study Area, particularly in core HSTT training and testing subareas, and the fact that the stocks have not been struck by the Navy and are rarely, if ever, recorded struck by other vessels. Therefore, NMFS is not proposing to authorize lethal take for the following stocks: Blue whale (Central North Pacific stock), Bryde's whale (Eastern Tropical Pacific stock and Hawaii stock), fin whale (Hawaii stock), gray whale (Western North Pacific stock), humpback whale (Central America/Southern Mexico-CA/OR/WA stock, Central America DPS), minke whale (CA/OR/WA stock and Hawaii stock), sei whale (Hawaii stock), and sperm

whale (CA/OR/WA stock and Hawaii stock).

Also of note, while information on past Navy vessel strikes can serve as a reasonable indicator of future vessel strike risk, future conditions may differ from the past in ways that could influence the likelihood of a large whale vessel strike occurring. In general, the magnitude of vessel strike risk may be increasing over time as many whale populations are gradually recovering from centuries of commercial whaling (Redfern *et al.* 2020). Increased vessel strike risk off California in recent decades has been associated with increases in the abundance of fin and humpback whale populations in the North Pacific (Redfern *et al.* 2020). It has also been suggested that the blue whale population in the Eastern North Pacific, inclusive of the SOCAL portion of the action area, is at carrying capacity and recovered to pre-whaling levels (Monnahan *et al.* 2014). In addition, the magnitude of risk may also be affected by shifts in whale distributions over time in response to environmental factors including climate change, marine heatwaves, and associated changes in prey distribution.

Historically, military vessel strikes of large whales within the HSTT Study Area have been rare events with only seven such strikes occurring over the past 14 years, five U.S. Navy strikes, and two Royal Australian Navy strikes. However, the fact that four of these strikes occurred within a 3-month period (May–July) in 2021, and two occurred within a 4-month period (February–May) in 2009, suggests that military vessel strikes in SOCAL can be both highly episodic and clustered. The four large whale strikes in 2021 (two strikes of unidentified large whales by the U.S. Navy and two fin whale strikes by the Royal Australian Navy) appear to be outliers in the time series of military vessel strikes in SOCAL for that period. However, particularly in consideration of the 2023 U.S. Navy strike, these strikes could also represent an early indicator of an increased military vessel strike risk within SOCAL based on the factors discussed above. Results from a survey of whale watching vessel operators and crew in Southern California, combined with remote sensing data in the area, suggest that the number of large whales may have been greater in May through July of 2021 compared with previous years in certain high military vessel traffic and ''core'' use HSTT areas off southern California, particularly farther offshore as well as closer to shore off San Diego Bay (Zickel MJ *et al.* 2021).

In conclusion, while take by vessel strike across any given year is sporadic, based on the information and analysis above, including consideration of the 2021 and 2023 strikes by the U.S. Navy, NMFS anticipates no more than five takes of large whales by M/SI could occur over the 7-year period of the rule. Of those five whales over the 7-years, no more than four may come from the following stocks: gray whale (Eastern North Pacific stock) and fin whale (CA/OR/WA stock). No more than two may come from the Hawaii stock of humpback whales. No more than one may come from the following stocks: blue whale (Eastern North Pacific stock), sei whale (Eastern North Pacific), and humpback whale (Mexico-North Pacific stock or Mainland Mexico-CA/OR/WA, Mexico DPS). Accordingly, NMFS has evaluated under the negligible impact standard the M/SI of 0.14, 0.29, or 0.57 whales annually from each of these species or stocks (*i.e.,* 1, 2, or 4 takes, respectively, divided by 7 years to get the annual number), along with the expected incidental takes by harassment.

Explosives

The Navy's model and quantitative analysis process used for the 2018 HSTT FEIS/OEIS and in the Navy's 2017 and 2019 applications to estimate potential exposures of marine mammals to explosive stressors is detailed in the technical report titled *Quantifying Acoustic Impacts on Marine Mammals and Sea Turtles: Methods and Analytical Approach for Phase III Training and Testing report* (U.S. Department of the Navy, 2018). Specifically, over the course of a modeled maximum year of training and testing, the Navy's model and quantitative analysis process estimates M/SI of two short-beaked common dolphin and one California sea lion as a result of exposure to explosive training and testing activities (please see section 6 of the 2017 Navy application where it is explained how maximum annual estimates are calculated). Over the 7-year period of the 2020 HSTT regulations, M/SI of 8 short-beaked common dolphins and 5 California sea lions (13 marine mammals in total) is estimated as a result of exposure to explosive training and testing activities. NMFS proposes no changes to the authorization of take by M/SI as a result of explosive use as the Navy proposes no changes to its activities from that described in the 2018 HSTT final rule, and after reviewing all new information, we find that our previous analyses remain applicable. Please refer to the 2018 HSTT final rule and 2020 HSTT final rule for additional information.

Proposed Mitigation Measures

Under section 101(a)(5)(A) of the MMPA, NMFS must set forth the permissible methods of taking pursuant to the activity, and other means of effecting the least practicable adverse impact on the species or stock(s) and its habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of the species or stock(s) 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. For the full discussion of how NMFS interprets least practicable adverse impact, including how it relates to the negligible-impact standard, see the *Mitigation Measures* section in the 2018 HSTT final rule.

Section 101(a)(5)(A)(i)(II) requires NMFS to issue, in conjunction with its authorization, binding—and 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.[1] 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

[1] 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).

describe below. This proposed rule includes all mitigation measures required by the 2020 HSTT final rule (though two have been modified in this proposed rule), and our discussion in that rule remains complete and accurate (including reference to the 2018 HSTT final rule), except as described below.

Implementation of Least Practicable Adverse Impact Standard

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 measure(s) 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 lower value (*e.g.,* decreased disturbance in an area of high productivity but of less firmly established biological importance). Regarding practicability, a measure might involve restrictions in an area or time that impede the Navy's ability to certify a strike group (higher impact on mission effectiveness), 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. 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 will be carefully considered to determine the types of mitigation that are appropriate under the least practicable adverse impact standard. For more detail on how we apply these factors, see the discussion in the *Mitigation Measures* section of the 2018 HSTT final rule.

Assessment of Mitigation Measures for HSTT Rule

NMFS fully reviewed the Navy's specified activities and the mitigation measures for the 2020 HSTT final rule and determined, with the addition of the new and modified measures discussed herein, and after consideration of the new information and studies described above, that the proposed mitigation measures would result in the least practicable adverse impact on marine mammals (see the 2019 Navy application and the 2018 HSTT final rule for detailed information on the Navy's mitigation measures, with the exception of the new and modified measures described herein). NMFS worked with the Navy in the development of the Navy's mitigation 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 Chapter 5 (*Mitigation*) of the 2018 HSTT FEIS/OEIS. The process described in Chapter 5 (*Mitigation*) of the 2018 HSTT FEIS/OEIS robustly supports NMFS' independent evaluation of whether the mitigation measures would meet the least practicable adverse impact standard. The Navy has implemented the mitigation measures under the 2020 HSTT regulations and would be required to continue implementation of the mitigation measures identified in this rulemaking for the full 7 years it covers to avoid or reduce potential impacts from acoustic, explosive, and physical disturbance and vessel strike stressors.

The Navy also evaluated numerous measures in the 2018 HSTT FEIS/OEIS that were not included in the 2017 Navy application, and NMFS independently reviewed and considered all new information, and continues to concur with Navy's analysis that their inclusion

was not appropriate under the least practicable adverse impact standard. The Navy considered these additional potential mitigation measures in two groups. First, Chapter 5 (*Mitigation*) of the 2018 HSTT FEIS/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 NGOs or the public, through scoping or public comment on environmental compliance documents. Appendix K (Geographic Mitigation Assessment) of the 2018 HSTT FEIS/OEIS includes an in-depth analysis of time/area restrictions that have been recommended over time or previously implemented as a result of litigation.

Below, we summarize the mitigation measures (organized into procedural measures and mitigation areas) that NMFS has determined will ensure the least practicable adverse impact on all affected species and stocks and their habitat, including the specific considerations for military readiness activities, and including several measures that are new or modified since publication of the 2020 HSTT final rule.

In its 2022 application, the Navy proposed no changes to the procedural or geographic mitigation measures in the 2020 HSTT final rule. NMFS reviewed new information potentially pertinent to mitigation of the Navy's training and testing activities. While Lookouts are essential to detecting the potential for and potentially avoiding a vessel strike of a marine mammal, NMFS and the Navy have always acknowledged that Lookouts cannot prevent all vessel strikes. The recent U.S. Navy and Royal Australian Navy vessel strikes appear to confirm this, as these strikes occurred when Lookouts were posted. As acknowledged above, these recent incidents may represent an early indicator of an increased military vessel strike risk within SOCAL. Recent reports appear to reflect the sporadic, episodic, or clustered nature of vessel strike or may reflect a trend of increased large whale presence in this area in the early summer months. NMFS and Navy have discussed the circumstances of each of the recent strikes, including the Royal Australian Navy strike, and discussed ways of improving strike mitigation. In these further conversations, NMFS and the Navy developed several new and modified mitigation measures in comparison to those included in the 2020 HSTT final rule.

For vessel movement, the 2020 HSTT final rule required that ''When underway Navy personnel must observe the mitigation zone for marine mammals; if marine mammals are observed, Navy personnel must maneuver to maintain distance.'' This measure has been updated to state that reducing speed may be an appropriate way to maneuver. The revised measure states that ''When underway, Navy personnel must observe the mitigation zone for marine mammals; if marine mammals are observed, Navy personnel must maneuver (which may include reducing speed as the mission or circumstances allow) to maintain distance.'' Of note, between 2009 and 2021 (the most recent year for which data is available), U.S. Navy vessels in the SOCAL portion of the HSTT Study Area maneuvered 316 times to avoid large whales during MTEs. The years 2017 and 2021 had the highest number of maneuvers (n=64 and n=82, respectively). In all years for which data is available (2009 to 2021), Navy cruisers and destroyers account for 51 to 100 percent of maneuvers during MTEs. With this modified measure, NMFS is emphasizing that Navy personnel should consider reducing speed (as mission or circumstances allow) when maneuvering to avoid marine mammals, though this modified measure does not require reduction of vessel speed for reasons explained in Chapter 5 (*Mitigation*) of the 2018 HSTT FEIS/OEIS, in the Measures Considered but Eliminated section (*i.e.,* requirements to reduce vessel speeds would have significant direct negative effects on mission effectiveness).

This proposed rule also requires that Navy personnel must send alerts to Navy vessels of increased risk of strike following any reported Navy vessel strike in the HSTT Study Area.

Further, the 2020 HSTT final rule included a requirement for Navy personnel to issue seasonal awareness notification messages to alert ships and aircraft to the possible presence of blue whales (June–October), humpback whales (November–April), gray whales (November–March), or fin whales (November–May). These messages assist in maintaining safety of navigation and in avoiding interactions with large whales during transits. Platforms must 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. This proposed rule requires the Navy to re-title the spring blue whale message (released in June) to a large whale awareness message inclusive of typical spring-summer large whales in southern California (mainly blue, fin, and humpback whales). Furthermore, rather than tying the message release to a specific month, the message would be for a period based on predicted oceanographic conditions for a given year (*e.g.,* May–November, April–November, *etc.*). The Navy will also evaluate information obtained from NMFS' Southwest Fisheries Science Center scientists, soon to be promulgated revised West Coast BIAs, and other oceanographic or predictive models for guiding message text descriptions of whale occurrence in Southern California. The improvement will emphasize that when a marine mammal is spotted, this may be an indicator that additional marine mammals are present and nearby, and increased vigilance and awareness of Navy personnel is warranted.

The proposed rule also contains a new mitigation measure in which Navy personnel would issue real-time notifications to Navy vessels of large whale aggregations (four or more whales) within 1 nmi (1.9 km) of a Navy vessel in a select area of SOCAL (Of note, the four whales do not have to be the same species and do not have to be part of the same group (*e.g.,* two whales of one species sighted at a distance off the port side at 500 yd (457.2 m) and two more whales of another species sighted off the starboard side at 500 yd (457.2 m) would be considered an aggregation under this measure)). This measure would apply to the area between 32–33 degrees North and 117.2–119.5 degrees West, which includes the locations where recent (2009, 2021, 2023) strikes occurred, and historic locations where strikes occurred when precise latitude and longitude were known.

Of note, in order to improve mitigation effectiveness, in fall 2022 the Navy made several changes to its Lookout training. The Navy revised its basic Lookout training materials to improve marine mammal awareness and spotting techniques through updates to the Marine Mammal chapter of the Navy's September 2022 Lookout Training Handbook. Further, the Navy integrated improved Lookout training into a new generation of a shipboard simulator at its recruit training center in the Great Lakes. This simulator enhances new sailor knowledge and skill under realistic training scenarios. Last, the Navy will evaluate future revisions to online or DVD Marine Species Awareness Training video training to emphasize that when a protected species is spotted, this may be an indicator that additional marine mammals are present and nearby, and the vessel should take this into consideration when transiting.

In addition to Lookouts required under this proposed rule, the Navy mandates the number of Lookouts on underway vessels per internal policy documents, including the Surface Ship NAVDORM. As described in the *Standard Operating Procedures* section, in 2021, NAVDORM policy changed to require three Lookouts on most classes of surface ship, including destroyers and cruisers. However, the Navy asserts that always including three Lookouts on these vessels in the future as a required mitigation measure is not practicable because lookout numbers are subject to change based on national security needs, including manning and staffing requirements. As such, although the Navy describes these additional Lookouts in its application under the mitigation section, NMFS has not considered the potential presence of two additional lookouts when considering Navy's mitigation effectiveness. Please see the Proposed Reporting section for additional detail on this proposed requirement.

With the exception of Oedekoven and Thomas (2022) described above, there is no new information that affects NMFS' assessment of the applicability or effectiveness of the measures included in the 2018 HSTT final rule over the remainder of the 7-year period. As stated above in the Potential Effects of Specified Activities on Marine Mammals and Their Habitat section, while (Oedekoven and Thomas, 2022) suggests that detection of marine mammals is less certain than previously assumed at certain distances, model assumptions may still underestimate Lookout effectiveness in some cases. Additionally, maneuvering data summarized above demonstrates that Navy vessels are successfully maneuvering to avoid striking sighted marine mammals in most cases, despite the Oedekoven and Thomas (2022) results. Further, as described above, Navy and NMFS have developed modified or new mitigation in this proposed rule which are anticipated to further reduce the risk of vessel strike of large whales.

In summary, and as described in more detail above regarding vessel strike, 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 or explosives, vessel strike, and impacts to marine mammal habitat. Specifically, the Navy will use a combination of delayed starts, powerdowns, and shutdowns to minimize or avoid M/SI and minimize the likelihood or severity of PTS or other injury, and reduce instances of TTS or more severe behavioral disturbance caused by acoustic sources or explosives. The Navy will also implement multiple time/area restrictions (several of which were added in the 2018 HSTT final rule since the previous HSTT MMPA incidental take rule) that would reduce take of marine mammals in areas or at times where they are known to engage in important behaviors, such as feeding or 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. Table 8 provides the Navy's required procedural mitigation measures for environmental awareness and education and vessel movement as well as summaries of the Navy's procedural mitigation measures for other activities. Table 9 provides summaries of mitigation areas for the HSTT Study Area.

NMFS and the Navy considered mitigation areas to protect marine mammals, including odontocetes with small or resident populations in the HSTT Study Area. This included consideration of new mitigation areas based on newly identified BIAs in Hawaii (Kratofil *et al.* 2023). Including additional mitigation areas beyond that included in the 2020 HSTT final rule is impracticable given overlap with critical Navy training areas in the HRC. However, many of the BIAs identified in Kratofil *et al.* 2023 partially or fully overlap the mitigation areas included in the 2020 HSTT final rule and proposed herein.

TABLE 8—SUMMARY OF PROCEDURAL MITIGATION

Stressor or activity	Mitigation zone sizes and other requirements
Environmental Awareness and Education	• This mitigation applies to 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 specific activities must complete one or more modules of the U.S. Navy Afloat Environmental Compliance Training Series, as identified in their career path training plan. Modules include: ▪ Introduction to the U.S. Navy Afloat Environmental Compliance Training Series. The introductory module provides information on environmental laws (e.g., ESA, MMPA) and the corresponding responsibilities 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.
Active Sonar	Depending on sonar source:

TABLE 8—SUMMARY OF PROCEDURAL MITIGATION—Continued

Stressor or activity	Mitigation zone sizes and other requirements
	• 1,000 yd (914.4 m) power down, 500 yd (457.2 m) power down, and 200 yd (182.9 m) shut down • 200 yd (182.9 m) shut down.
Air Guns	• 150 yd (137.2 m).
Pile Driving	• 100 yd (91.4 m).
Weapons Firing Noise	• 30 degrees on either side of the firing line out to 70 yd (64 m).
Explosive Sonobuoys	• 600 yd (548.6 m).
Explosive Torpedoes	• 2,100 yd (1,920.2 m).
Explosive Medium-Caliber and Large-Caliber Projectiles	• 1,000 yd (914.4 m; large-caliber projectiles). • 600 yd (548.6 m; medium-caliber projectiles during surface-to-surface activities). • 200 yd (182.9 m; medium-caliber projectiles during air-to-surface activities).
Explosive Missiles and Rockets	• 2,000 yd (1,828.8 m; 21–500 lb. net explosive weight). • 900 yd (823 m; 0.6–20 lb. net explosive weight).
Explosive Bombs	• 2,500 yd (2,286 m).
Sinking Exercises	• 2.5 nmi (4.6 km).
Explosive Mine Countermeasure and Neutralization Activities	• 2,100 yd (1,929.2 m; 6–650 lb net explosive weight). • 600 yd (548.6 m; 0.1–5 lb net explosive weight).
Explosive Mine Neutralization Activities Involving Navy Divers	• 1,000 yd (914.4 m; 21–60 lb net explosive weight for positive control charges and charges using time-delay fuses). • 500 yd (457.2 m; 0.1–20 lb net explosive weight for positive control charges).
Underwater Demolition Multiple Charge—Mat Weave and Obstacle Loading	• 700 yd (640.1 m).
Maritime Security Operations—Anti-Swimmer Grenades	• 200 yd (182.9 m).
Vessel Movement	• The mitigation must 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), (3) the vessel is operated autonomously, or (4) when impractical based on mission requirements (e.g., during Amphibious Assault—Battalion Landing exercises). • Number of Lookouts and Observation Platform: ○ 1 Lookout must be on the vessel that is underway.[1] • Mitigation Requirements: ○ Mitigation zones:—500 yd (457.2 m) around whales.—200 yd (182.9 m) around other marine mammals (except bow-riding dolphins and pinnipeds hauled out on man-made navigational structures, port structures, and vessels). ○ During the activity:—When underway, Navy personnel must observe the mitigation zone for marine mammals; if marine mammals are observed, Navy personnel must maneuver (which may include reducing speed as the mission or circumstances allow) to maintain distance. • Additional requirements: ○ If a marine mammal vessel strike occurs, Navy personnel must follow the established incident reporting procedures. Navy personnel must also send alerts to Navy vessels of increased risk of strike following any reported Navy vessel strike in the HSTT Study Area. ○ Navy personnel must issue real-time notifications to Navy vessels of large whale aggregations (four or more whales) within 1 nmi (1.9 km) of a Navy vessel in the area between 32–33 degrees North and 117.2–119.5 degrees West.
Towed In-Water Devices	• 250 yd (228.6 m; marine mammals).
Small-, Medium-, and Large-Caliber Non-Explosive Practice Munitions	• 200 yd (182.9 m).
Non-Explosive Missiles and Rockets	• 900 yd (823 m).
Non-Explosive Bombs and Mine Shapes	• 1,000 yd (914.4 m).

Note: lb: pounds; nmi: nautical miles; yd: yards; m: meters.

[1] Underway vessels will maintain at least one Lookout. For ship classes required to maintain more than one Lookout, the specific requirement is subject to change over time in accordance with Navy navigation instruction (*e.g.,* the Surface Ship NAVDORM). Navy personnel will notify NMFS as soon as practicable should its Lookout policies change, including in the NAVDORM.

TABLE 9—SUMMARY OF MITIGATION AREAS FOR MARINE MAMMALS

Summary of mitigation area requirements
Hawaii Island Mitigation Area (year-round): • Navy personnel must not conduct more than 300 hours of MF1 surface ship hull-mounted mid-frequency active sonar or 20 hours of MF4 dipping sonar, or use explosives that could potentially result in takes of marine mammals during training and testing.[1]
4-Islands Region Mitigation Area (November 15–April 15 for active sonar; year-round for explosives): • Navy personnel must not use MF1 surface ship hull-mounted mid-frequency active sonar or explosives that could potentially result in takes of marine mammals during training and testing.[1]
Humpback Whale Special Reporting Areas (December 15–April 15): • Navy personnel must report the total hours of surface ship hull-mounted mid-frequency active sonar used in the special reporting areas in its annual training and testing activity reports submitted to NMFS.
San Diego Arc, San Nicolas Island, and Santa Monica/Long Beach Mitigation Areas (June 1–October 31): • Navy personnel must not conduct more than a total of 200 hours of MF1 surface ship hull-mounted mid-frequency active sonar in the combined areas, excluding normal maintenance and systems checks, during training and testing.[1] • Within the San Diego Arc Mitigation Area, Navy personnel must not use explosives that could potentially result in the take of marine mammals during large-caliber gunnery, torpedo, bombing, and missile (including 2.75″ rockets) activities during training and testing.[1] • Within the San Nicolas Island Mitigation Area, Navy personnel must not use explosives that could potentially result in the take of marine mammals during mine warfare, large-caliber gunnery, torpedo, bombing, and missile (including 2.75″ rockets) activities during training.[1] • Within the Santa Monica/Long Beach Mitigation Area, Navy personnel must not use explosives that could potentially result in the take of marine mammals during mine warfare, large-caliber gunnery, torpedo, bombing, and missile (including 2.75″ rockets) activities during training and testing.[1]
Santa Barbara Island Mitigation Area (year-round):

TABLE 9—SUMMARY OF MITIGATION AREAS FOR MARINE MAMMALS—Continued

Summary of mitigation area requirements
• Navy personnel must not use MF1 surface ship hull-mounted mid-frequency active sonar during training and testing, or explosives that could potentially result in the take of marine mammals during medium-caliber or large-caliber gunnery, torpedo, bombing, and missile (including 2.75″ rockets) activities during training.[1]
Awareness Notification Message Areas (seasonal according to species):
• Navy personnel must issue awareness notification messages to alert ships and aircraft to the possible presence of large whales during a period based on predicted oceanographic conditions for a given year. The message must emphasize that when a marine mammal is spotted, this may be an indicator that additional marine mammals are present and nearby, and increased vigilance and awareness of Navy personnel is warranted. Navy personnel must also issue awareness notification messages to alert ships and aircraft to the possible presence of gray whales (November–March) and fin whales (November–May).

[1] If Naval units need to conduct more than the specified amount of training or testing, they will obtain permission from the appropriate designated Command authority prior to commencement of the activity. The Navy will provide NMFS with advance notification and include the information in its annual activity reports submitted to NMFS.

Mitigation Conclusions

NMFS has carefully evaluated the Navy's mitigation measures from the 2020 rule—many of which were developed with NMFS' input during the previous phases of Navy training and testing authorizations and none of which have changed since our evaluation during the 2018 HSTT rulemaking, with the exception of the changes described herein—and considered a broad range of other measures (*i.e.,* the measures considered but eliminated in the 2018 HSTT FEIS/OEIS, which reflect many of the comments that have arisen via NMFS or public input in past years) in the context of ensuring that NMFS prescribes the means of effecting the least practicable adverse impact on the affected marine mammal species and stocks and their habitat. Our evaluation of potential measures included consideration of the following factors in relation to one another: the manner in which, and the degree to which, the successful implementation of the mitigation measures is expected to reduce the likelihood and/or magnitude of adverse impacts to marine mammal species and stocks and their habitat; the proven or likely efficacy of the measures; and the practicability of the measures for applicant implementation, including consideration of personnel safety, practicality of implementation, and impact on the effectiveness of the military readiness activity. After considering all new information, including consideration of new information regarding vessel strike, NMFS proposes two additional mitigation measures and revision of two existing mitigation measures as described above.

Based on our evaluation of the Navy's current mitigation measures (which are being implemented under the 2020 HSTT regulations), as well as modified and new measures described above, NMFS has preliminarily determined that the proposed mitigation measures are appropriate means of effecting the least practicable adverse impact on marine mammal species or stocks 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, as described in more detail below, the 2020 HSTT final rule includes an adaptive management provision, which the Navy proposes to extend, which ensures that mitigation is regularly assessed and provides a mechanism to improve the mitigation, based on the factors above, through modification as appropriate.

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

Proposed Monitoring

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

In its 2022 application, the Navy proposes no changes to the monitoring described in the 2018 HSTT final rule and 2020 HSTT final rule. They would continue implementation of the robust Integrated Comprehensive Monitoring Program and Strategic Planning Process described in the 2018 HSTT final rule. The Navy's monitoring strategy, currently required by the 2018 HSTT regulations, is well-designed to work across Navy ranges to help better understand the impacts of the Navy's activities on marine mammals and their habitat by focusing on learning more about marine mammal occurrence in different areas and exposure to Navy stressors, marine mammal responses to different sound sources, and the consequences of those exposures and responses on marine mammal populations. Similarly, these proposed modified regulations would include identical adaptive management provisions and reporting requirements as the 2018 HSTT regulations. There is no new information that would indicate that the monitoring measures put in place under the 2018 HSTT final rule would not remain applicable and appropriate for the 7-year period of this proposed rule. See the *Monitoring* section of the 2018 HSTT final rule for more details on the monitoring program that would be required under this rule. In addition, please see the 2019 Navy application, which references Chapter 13 of the 2017 Navy application for full details on the monitoring and reporting proposed by the Navy.

Within the SOCAL portion of HSTT, the Navy has been primarily focused on beaked whale monitoring since 2018 through two separate ongoing projects that are expected to continue until 2025. These projects use passive acoustic devices, visual surveys, satellite tagging, genetic analysis, photoID, and response to anthropogenic sounds to refine population status of beaked whales in SOCAL. There is also one concurrent project with fin whales using visual surveys, satellite tagging, and photoID to gather additional data on fin whale

populations in Southern California. Finally, the Navy continues to fund marine mammal sighting data collected during California Cooperative Oceanic Fisheries Investigations (CALCOFI) *https://calcofi.org/*. These data are collected on a much more frequent basis than NMFS' West Coast visual survey which typically occur once every 5 years in the summer. CALCOFI surveys occur quarterly every year to include winter and spring seasons NMFS does not survey. Sufficient marine mammal sightings have been accumulated since the Navy started funding in 2004 for the data to be incorporated into ongoing NMFS spatial habitat models, including new models for select species. The Navy also annually funds continued NMFS spatial habitat model improvements as new data and techniques become available. These models benefit the Navy and other Federal partners such as the Bureau of Ocean Energy Management and NMFS, for use in future regional marine mammal density derivation. For additional information, please see the Navy's Marine Species Monitoring program website, *https://www.navymarinespeciesmonitoring.us/regions/pacific/current-projects/*.

Adaptive Management

The 2020 HSTT regulations governing the take of marine mammals incidental to Navy training and testing activities in the HSTT 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 7-year regulations. The 2022 Navy application proposes no changes to the adaptive management component included in the 2020 HSTT final rule.

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 would 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) compiled results of Navy funded R&D studies; (3) results from specific stranding investigations; (4) results from general marine mammal and sound research; and (5) any information which reveals that marine mammals may have been taken in a manner, extent, or number not authorized by these regulations or subsequent LOAs. The results from monitoring reports and other studies may be viewed at *https://www.navymarinespeciesmonitoring.us*.

Proposed Reporting

In order to issue incidental take authorization for an activity, section 101(a)(5)(A) of the MMPA states that NMFS must set forth requirements pertaining to the monitoring and reporting of such taking. Effective reporting is critical both to compliance as well as ensuring that the most value is obtained from the required monitoring. Reports from individual monitoring events, results of analyses, publications, and periodic progress reports for specific monitoring projects will be posted to the Navy's Marine Species Monitoring web portal: *http://www.navymarinespeciesmonitoring.us*. The 2019 Navy application and 2022 Navy application proposed no changes to the reporting requirements, though as noted above, the Navy has since proposed to report changes to Lookout SOPs to NMFS. Except as discussed below, reporting requirements would remain identical to those described in the 2018 HSTT final rule and 2020 HSTT final rule, and there is no new information that would indicate that the reporting requirements put in place under the 2020 HSTT final rule would not remain applicable and appropriate for the remaining duration of the 7-year period of this proposed rule. See the *Reporting* section of the 2018 HSTT final rule for more details on the reporting that would be required under this rulemaking. In addition, the 2018 HSTT proposed and final rules unintentionally failed to include the requirement for the Navy to submit a final activity ''close out'' report at the end of the regulatory period. That oversight was corrected through the 2020 HSTT final rule. Please see the 2020 HSTT final rule for the detailed requirements for that report.

In addition to the reporting requirements included in the 2020 HSTT final rule, the Navy must report changes in its Lookout policies to NMFS as soon as practicable after a change is made.

Preliminary Analysis and Negligible Impact Determination

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). While this proposed rule consists of a modification of take by M/SI by vessel strike, NMFS considers the impacts of the entire specified activity and the total taking in the negligible impact determination. An estimate of the number of takes alone is not enough information on which to base an impact determination. In addition to considering estimates of the number of marine mammals that might be taken through mortality, serious injury, and Level A or Level B harassment (as presented in tables 11 and 12 of the 2020 HSTT final rule), 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 (including foreign military activities) are incorporated into this analysis via their impacts on the environmental baseline (*e.g.,* as reflected in the regulatory status of the species, population size and growth rate where known, other ongoing sources of human-caused mortality, ambient noise levels, and specific consideration of take by Level A harassment or M/SI previously authorized for other NMFS activities).

In the *Estimated Take of Marine Mammals* sections of this proposed rule and the 2020 HSTT final rule (where the activities, species and stocks, potential effects, and mitigation measures are the same as for this rulemaking), we

identified the subset of potential effects that would be expected to rise to the level of takes both annually and over the 7-year period covered by this rulemaking and then identified the number of each of those mortality takes that we believe could occur or 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 is dependent on many case-specific factors that need to be considered in the negligible impact analysis (*e.g.,* the context of behavioral exposures such as duration or intensity of a disturbance, the health of impacted animals, the status of a species that incurs fitness-level impacts to individuals, *etc.*). For this proposed rule, we evaluated the likely impacts of the enumerated maximum number of harassment takes that are reasonably expected to occur and proposed for authorization, in the context of the specific circumstances surrounding these predicted takes. We also assessed M/SI takes that could occur, as well as considering the traits and statuses of the affected species and stocks. 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 stock or species. Because all of the Navy's specified activities would occur within the ranges of the marine mammal stocks identified in the rule, all negligible impact analyses and determinations are at the stock level (*i.e.,* additional species-level determinations are not needed).

The Navy proposes no changes to the nature or level of the specified activities or the boundaries of the HSTT Study Area, and therefore, the training and testing activities (*e.g.,* equipment and sources used, exercises conducted) are the same as those analyzed in the 2020 HSTT final rule. In addition, the mitigation, monitoring, and nearly all reporting measures are identical to those described and analyzed in the 2018 HSTT final rule with the exception of changes to mitigation measures described previously and the additional reporting requirement for Navy to report changes in its Lookout policies to NMFS as soon as practicable after a change is made. There is no new information since the publication of the 2020 HSTT final rule regarding the impacts of the specified activities on marine mammals, the status and distribution of any of the affected marine mammal species or stocks, or the effectiveness of the mitigation and monitoring measures that would change the content of our analyses, with the exception of that described below. First, naval vessel strikes have occurred in the HSTT and Atlantic Fleet Training and Testing (AFTT) Study Areas since publication of the 2020 HSTT final rule (one fin or sei whale struck by the U.S. Navy in the HSTT Study Area (2023), two unidentified large whales struck by the U.S. Navy in the HSTT Study Area (2021), two fin whales struck by a foreign navy in the HSTT Study Area (2021), and one dolphin struck by the U.S. Navy in the AFTT Study Area (2021)). Second, for gray whales, we have considered the latest effects of the UME on the west coast of North America along with the effects of the Navy's activities in the negligible impact analysis. Third, a new study suggests that Lookout detection of marine mammals is less certain than previously assumed (Oedekoven and Thomas, 2022). Fourth, stock assessments have been updated for multiple stocks in the 2022 Pacific and Alaska SARs (Carretta *et al.* 2023; Young *et al.* 2023).

As described above and in the 2022 Navy application, a number of additional studies have been published, including several studies associated with TTS in harbor porpoises and seals (*e.g.,* Kastelein *et al.* 2020d; Kastelein *et al.* 2021a and 2021b; Sills *et al.* 2020). NMFS is aware of these recent papers and is currently working with the Navy to update NMFS' Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing Version 2.0 (Acoustic Technical Guidance; NMFS 2018) to reflect relevant papers that have been published since the 2018 update on our 3–5 year update schedule in the Acoustic Technical Guidance. We note that the recent peer-reviewed, updated marine mammal noise exposure criteria by Southall *et al.* (2019) provide identical PTS and TTS thresholds and weighting functions to those provided in NMFS' Acoustic Technical Guidance. 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. However, any such revisions must undergo peer and public review before being adopted, as described in the Acoustic Guidance methodology. While some of the relevant data may potentially suggest changes to TTS/PTS thresholds for some species, any such changes would not be expected to change the predicted take estimates in a manner that would change the necessary determinations supporting the issuance of these regulations, and the data and values used in this rulemaking reflect the best available science.

Harassment

As described in the *Estimated Takes of Marine Mammals* section, the annual number of takes proposed for authorization and reasonably expected to occur by Level A harassment and Level B harassment (based on the maximum number of activities per 12-month period) are identical to those presented in tables 41 and 42 in the *Take Requests* section of the 2018 HSTT final rule, with the exception of humpback whale, which are presented in tables 2 and 3 herein. As such, the negligible impact analyses and determinations of the effects of the estimated Level A harassment and Level B harassment takes on annual rates of recruitment or survival for each species and stock are nearly identical to and substantively unchanged from those presented in the 2020 HSTT final rule. The differences in the analysis is our removal of consideration of California Sea Lion UME, which has been closed since publication of the 2020 HSTT final rule, and incorporation of the revised stock structure for humpback whales. This does not affect the results of the analyses or our determinations. For detailed discussion of the impacts that affected individuals may experience given the specific characteristics of the specified activities and required mitigation (*e.g.,* from behavioral disruption, masking, and temporary or permanent threshold shift), along with the effects of the expected Level A harassment and Level B harassment take on reproduction and survival, see the applicable subsections in the *Analysis and Negligible Impact Determination* section of the 2018 HSTT final rule (83 FR 66977–67018; also incorporated by reference in the 2020 HSTT final rule).

Serious Injury or Mortality

Based on the information and methods discussed in the *Estimated Take of Marine Mammals* section (which are identical to those used in the 2018 HSTT final rule for explosives and revised for vessel strike), NMFS is proposing to authorize five mortalities of large whales due to vessel strike over the 7-year period of this rulemaking, two more strikes than what was authorized in the 2018 HSTT final rule and 2020 HSTT final rule. Across the 7-year duration of the rule, take of an annual average of 0.57 gray whales (Eastern North Pacific stock) and fin

whales (CA/OR/WA stock), an annual average of 0.29 humpback whales (Hawaii stock) and an annual average of 0.14 blue whales (Eastern North Pacific stock), sei whales (Eastern North Pacific stock) and humpback whales (Mainland Mexico-CA/OR/WA stock, Mexico DPS), as described in table 8 (*i.e.,* one, two, or four take(s) over 7 years divided by seven to get the annual number) could occur and are proposed for authorization.

TABLE 10—SUMMARY INFORMATION RELATED TO MORTALITIES REQUESTED FOR VESSEL STRIKE
[2018–2025]

Species (stock)	Stock abundance (Nbest) *	Annual authorized take by serious injury or mortality [1]	Total annual M/SI * [2]	Fisheries interactions (Y/N); annual rate of M/SI from fisheries interactions *	Annual rate of M/SI from vessel collision *	Potential biological removal (PBR) *	Residual PBR (PBR minus annual M/SI) [3]	Stock trend * [4]	Recent UME (Y/N); number and year (since 2007)
Fin whale (CA/OR/WA stock).	11,065	0.57	≥43.6	Y; ≥0.64	Y, 43	80	36.4	↑	N.
Gray whale (Eastern North Pacific stock).	26,960	0.57	131	Y, 9.3	Y, 1.8	801	670	[5] ↑	Y; 674; 2019 (as of June 25, 2023).
Humpback whale (Mainland Mexico-CA/OR/WA stock, Mexico DPS).	3,477	0.14	22	Y; 11.4	Y, 10.15	65	[6] 43	Unknown	N.
Humpback whale (Hawaii stock).	11,278	0.29	27.09	Y; 8.39	[7] Y, 10.59	127	99.91	Unknown	Y; 2015; 52.]
Blue whale (Eastern North Pacific Stock).	1,898	0.14	≥19.5	Y; ≥1.54	Y, 0.8	4.1	-15.4	Unknown	Y; 3, 2007.
Sei whale (Eastern North Pacific Stock).	519	0.14	≥0.2	N; 0	Y, 0.2	0.75	0.55	Unknown	N.

* Presented in the 2022 final SARs.
[1] This column represents the annual take by serious injury or mortality (M/SI) by vessel collision and was calculated by the number of mortalities proposed for authorization divided by 7 years (the length of the rule and LOAs).
[2] This column represents the total number of incidents of M/SI that could potentially accrue to the specified species or stock. This number comes from the SAR, but deducts the takes accrued from either Navy strikes or NMFS' Southwest Fisheries Science Center (SWFSC) takes in the SARs to ensure not double-counted against PBR. However, for these species, there were no takes from either other Navy activities or SWFSC in the SARs to deduct that would be considered double-counting.
[3] This value represents the calculated PBR less the average annual estimate of ongoing anthropogenic mortalities (*i.e.,* total annual human-caused M/SI, which is presented in the SARs).
[4] See relevant SARs for more information regarding stock status and trends.
[5] The Pacific 2022 SAR indicates that the stock trend is increasing. However, recent (2021–2022) surveys conducted by NMFS' Southwest Fisheries Science Center estimated that the population has declined to 16,650 whales, though the authors note that this stock has historically shown a pattern of population growth and decline that has not impacted the population in the long term (Eguchi et al. 2022).
[6] Vessel strike of the Mainland Mexico-CA/OR/WA stock was calculated by applying a prorated portion of humpback whale strikes modeled by Rockwood et al. (2017) to this stock.
[7] For this stock, PBR is currently set at 43 for U.S. waters and 65 for the stock's entire range. As the HSTT Study Area extends beyond U.S. waters and activities have the potential to impact the entire stock, we present the analysis using the PBR for the stock's entire range.
[8] Annual vessel strike for this stock reported in the 2022 final SAR was calculated by summing vessel strike data from Hawaii, Alaska, and Washington. All observed strikes in Hawaii were assigned to the Hawaii stock, and a portion of observed strikes in Alaska were assigned to the Hawaii stock. Vessel strike of the Hawaii stock in Washington waters was calculated by applying a prorated portion of humpback whale strikes modeled by Rockwood et al. (2017) to the Hawaii stock.

The Navy also requested a small number of takes by M/SI from explosives in the 2017 Navy application. To calculate the annual average of mortalities for explosives in table 11, we used the same method as described for vessel strikes. The annual average is the total number of takes over 7 years divided by seven. Specifically, NMFS is proposing to authorize the following M/SI takes from explosives: five California sea lions and eight short-beaked common dolphins over the 7-year period (therefore 0.71 mortalities annually for California sea lions and 1.14 mortalities annually for short-beaked common dolphin), as described in table 11. As this annual number is the same as that analyzed and authorized in the 2020 HSTT final rule, and no other relevant information about the status, abundance, or effects of mortality on each species or stock has changed, the analysis of the effects of explosives is identical to that presented in the 2020 HSTT final rule.

TABLE 11—SUMMARY INFORMATION RELATED TO MORTALITIES FROM EXPLOSIVES
[2018–2025]

Species (stock)	Stock abundance (Nbest) *	Annual authorized take by serious injury or mortality [1]	Total annual M/SI * [2]	Fisheries interactions (Y/N); annual rate of M/SI from fisheries interactions *	PBR *	SWFSC authorized take (annual) [3]	Residual PBR—PBR minus annual M/SI and SWFSC [4]	Stock trend * [5]	UME (Y/N); number and year
California sea lion (U.S. stock)	257,606	0.71	≥321	Y; ≥197	14,011	6	13,684	↑	N
Short-beaked common dolphin (CA/OR/WA stock).	1,056,308	1.14	≥30.5	Y; ≥30.5	8,889	2.8	8,855.7	?	N

* Presented in the 2022 draft SARs or most recent SAR.
[1] This column represents the annual take by serious injury or mortality (M/SI) during explosive detonations and was calculated by the number of mortalities planned for authorization divided by 7 years (the length of the rule and LOAs).
[2] This column represents the total number of incidents of M/SI that could potentially accrue to the specified species or stock. This number comes from the SAR.
[3] This column represents annual take authorized through NMFS' SWFSC rulemaking/LOAs (86 FR 3840; January 15, 2021).
[4] This value represents the calculated PBR less the average annual estimate of ongoing anthropogenic mortalities (*i.e.,* total annual human-caused M/SI column and the annual authorized take from the SWFSC column. In the case of California sea lion the M/SI column (321) and the annual authorized take from the SWFSC (6) were subtracted from the calculated PBR of 14,011. In the case of short-beaked common dolphin the M/SI column (30.5) and the annual authorized take from the SWFSC (2.8) were subtracted from the calculated PBR of 8,889.
[5] See relevant SARs for more information regarding stock status and trends.

See the *Serious Injury or Mortality* subsection in the *Analysis and Negligible Impact Determination* section of the 2018 HSTT final rule (83 FR 66985–66993) for detailed discussions of the impacts of M/SI, including a description of how the agency uses the PBR metric and other factors to inform our analysis and an analysis of the impacts on each species and stock for which M/SI is proposed for authorization, including the relationship of potential mortality for each species to the insignificance threshold and residual PBR, except as updated below.

Stocks With M/SI Below the Insignificance Threshold

As noted in the *Serious Injury or Mortality* subsection of the *Negligible Impact Analysis and Determination* section in the 2018 HSTT final rule and 2020 HSTT final rule, for a species or stock with incidental M/SI less than 10 percent of residual PBR, we consider M/SI from the specified activities to represent an insignificant incremental increase in ongoing anthropogenic M/SI that alone (*i.e.,* in the absence of any other take and barring any other unusual circumstances) will clearly not adversely affect annual rates of recruitment and survival. In this case, as shown in table 10 and table 11, the following species or stocks have potential or estimated M/SI from vessel strike and explosive takes, respectively, and proposed for authorization below their insignificance threshold: fin whale (CA/OR/WA stock), gray whale (Eastern North Pacific stock), humpback whale (Hawaii stock and Mainland Mexico-CA/OR/WA stock), California sea lion (U.S stock), and short-beaked common dolphin (CA/OR/WA stock). While the proposed authorized M/SI of gray whales (Eastern North Pacific stock) is below the insignificance threshold, because of the recent UME, we further address how the proposed authorized M/SI and the UME inform the negligible impact determination immediately below. For the other four stocks with proposed authorized M/SI below the insignificance threshold, there are no other known factors, information, or unusual circumstances that indicate anticipated M/SI below the insignificance threshold could have adverse effects on annual rates of recruitment or survival and they are not discussed further. For the remaining stocks with anticipated potential M/SI above the insignificance threshold, how that M/SI compares to residual PBR, as well as additional factors, as appropriate, are discussed below as well.

Gray Whales (Eastern North Pacific Stock)

Since January 2019, gray whale strandings along the west coast of North America have been significantly higher than the previous 18-year averages. Preliminary findings from necropsies have shown evidence of emaciation. These findings are not consistent across all of the whales examined, so more research is needed. The seasonal pattern of elevated strandings in the spring and summer months is similar to that of the previous gray whale UME in 1999–2000. If strandings continue to follow a similar pattern, we would anticipate a decrease in strandings in late summer and fall. However, combined with other annual human-caused mortalities and viewed through the PBR lens (for human-caused mortalities), total human-caused mortality would still fall below residual PBR. Given the small number of takes by serious injury or mortality proposed for authorization, the proposed takes are not anticipated to exacerbate the ongoing UME.

Stocks With M/SI Above the Insignificance Threshold

Blue Whale (Eastern North Pacific Stock)

For blue whales (Eastern North Pacific stock), PBR is currently set at 4.1 and the total annual M/SI is estimated at greater than or equal to 19.5, yielding a residual PBR of −15.4. This is slightly higher than the 2020 HSTT final rule (was −16.7). NMFS proposes to authorize one M/SI for the Navy over the 7-year duration of the rule (indicated as 0.14 annually for the purposes of comparing to PBR and evaluating overall effects on annual rates of recruitment and survival), which means that residual PBR is exceeded by 15.54. However, as described in the 2018 and 2020 rules, given that the negligible impact determination is based on the assessment of take of the activity being analyzed, when total annual mortality from human activities is higher, but the impacts from the specific activity being analyzed are very small, NMFS may still find the impact of the proposed authorized take from a specified activity to be negligible even if total human-caused mortality exceeds PBR if the proposed authorized mortality is less than 10 percent of PBR and management measures are being taken to address serious injuries and mortalities from the other activities causing mortality (*i.e.,* other than the specified activities covered by the incidental take authorization in consideration). When those considerations are applied here, the authorized lethal take (0.14 annually) of blue whales from the Eastern North Pacific stock is less than 10 percent of PBR (which is 4.1), and there are management measures in place to address M/SI from activities other than those the Navy is conducting (as discussed below). Perhaps more importantly, the available data suggests that the current number of vessel strikes is not likely to have an adverse impact on the population, despite the fact that it exceeds PBR, with the Navy's minimal additional mortality of one whale in the 7 years not creating the likelihood of adverse impact. Immediately below, we explain the information that supports our finding that the Navy's proposed authorized M/SI is not expected to result in more than a negligible impact on this stock. As described previously, NMFS must also ensure that impacts by the applicant on the species or stock from other types of take (*i.e.,* harassment) do not combine with the impacts from mortality to adversely affect the species or stock via impacts on annual rates of recruitment or survival, which occurs further below in the stock-specific conclusion sections.

As discussed in the 2018 HSTT final rule and the 2020 HSTT final rule, the 2018 draft SAR and the more recent SARs rely on a new method to estimate annual deaths by vessel strike utilizing an encounter theory model that combined species distribution models of whale density, vessel traffic characteristics, and whale movement patterns obtained from satellite-tagged animals in the region to estimate encounters that would result in mortality (Rockwood *et al.* 2017). The model predicts 18 annual mortalities of blue whales from vessel strikes, which, with the additional M/SI of 1.54 from fisheries interactions, results in the current estimate of residual PBR being −15.4. Although NMFS' Permits and Conservation Division in the Office of Protected Resources has independently reviewed the vessel strike model and its results and agrees that it is appropriate for estimating blue whale mortality by vessel strike on the U.S. West Coast, for analytical purposes we also note that if the historical method were used to predict vessel strike (*i.e.,* using observed mortality by vessel strike, or 0.8, instead of 18), then total human-caused mortality including the Navy's potential take would not exceed PBR. We further note that the authors (Rockwood *et al.* 2017) do not suggest that vessel strike suddenly increased to 18 recently. In fact, the model is not specific to a year, but rather offers a generalized

prediction of vessel strike off the U.S. West Coast. Therefore, if the Rockwood *et al.* (2017) model is an accurate representation of vessel strike, then similar levels of vessel strike have been occurring in past years as well. Put another way, if the model is correct, for some number of years total-human-caused mortality has been significantly underestimated and PBR has been similarly exceeded by a notable amount, and yet, the Eastern North Pacific stock of blue whales remains stable nevertheless.

NMFS' 2022 final SAR states that the current population trend is unknown, though there may be evidence of a population size increase since the 1990s. The SAR further cites to Monnahan *et al.* (2015), which used a population dynamics model to estimate that the Eastern North Pacific blue whale population was at 97 percent of carrying capacity in 2013 and to suggest that the observed lack of a population increase since the early 1990s was explained by density dependence, not impacts from vessel strike. This would mean that this stock of blue whales shows signs of stability and is not increasing in population size because the population size is at or nearing carrying capacity for its available habitat. In fact, we note that this population has maintained this status throughout the years that the Navy has consistently tested and trained at similar levels (with similar vessel traffic) in areas that overlap with blue whale occurrence, which would be another indicator of population stability.

Monnahan *et al.* (2015) modeled vessel numbers, vessel strikes, and the population of the Eastern North Pacific blue whale population from 1905 out to 2050 using a Bayesian framework to incorporate informative biological information and assign probability distributions to parameters and derived quantities of interest. The authors tested multiple scenarios with differing assumptions, incorporated uncertainty, and further tested the sensitivity of multiple variables. Their results indicated that there is no immediate threat (*i.e.,* through 2050) to the population from any of the scenarios tested, which included models with 10 and 35 strike mortalities per year. Broadly, the authors concluded that, unlike other blue whale stocks, the Eastern North Pacific blue whales have recovered from 70 years of whaling and are in no immediate threat from vessel strikes. They further noted that their conclusion conflicts with the depleted and strategic designation under the MMPA as well as PBR specifically.

As discussed, we also take into consideration management measures in place to address M/SI caused by other activities. The Channel Islands NMS staff coordinates, collects, and monitors whale sightings in and around the Vessel Speed Reduction (VSR) zones and the Channel Islands NMS region. Redfern *et al.* (2013) note that the most risky area for blue whales is the Santa Barbara Channel, where shipping lanes intersect with common feeding areas. The seasonally established Southern California VSR zone spans from Point Arguello to Dana Point, including the Traffic Separation Schemes in the Santa Barbara Channel and San Pedro Channel. Vessels transiting the area from May 1 through December 15, 2023 are recommended to exercise caution and voluntarily reduce speed to 10 kn (18.5 km per hour) or less for blue, humpback, and fin whales. (Note this is an expanded timeframe from the Whale Advisory Zone discussed in the 2020 HSTT final rule, which spanned June through November, though the effective period could change in future years.) Channel Island NMS observers collect information from aerial surveys conducted by NOAA, the U.S. Coast Guard, California Department of Fish and Game, and U.S. Navy chartered aircraft. Information on seasonal presence, movement, and general distribution patterns of large whales is shared with mariners, NMFS Office of Protected Resources, U.S. Coast Guard, California Department of Fish and Game, the Santa Barbara Museum of Natural History, the Marine Exchange of Southern California, and whale scientists. Real time and historical whale observation data collected from multiple sources can be viewed on the Point Blue Whale Database.

In this case, 0.14 M/SI means one mortality in 1 of the 7 years and zero mortalities in 6 of those 7 years. Therefore, the Navy would not be contributing to the total human-caused mortality at all in 6 of the 7, or 85.7 percent, of the years covered by this rulemaking. That means that even if a blue whale were to be struck, in 6 of the 7 years there could be no effect on annual rates of recruitment or survival from Navy-caused M/SI. Additionally, the loss of a male would have far less, if any, effect on population rates and absent any information suggesting that one sex is more likely to be struck than another, we can reasonably assume that there is a 50 percent chance that the single strike authorized by this rulemaking would be a male, thereby further decreasing the likelihood of impacts on the population rate. In situations like this where potential M/SI is fractional, consideration must be given to the lessened impacts anticipated due to the absence of M/SI in 6 of the 7 years and the fact that the single strike could be a male. Lastly, we reiterate that PBR is a conservative metric and also not sufficiently precise to serve as an absolute predictor of population effects upon which mortality caps would appropriately be based. This is especially important given the minor difference between zero and one across the 7-year period covered by this rulemaking, which is the smallest distinction possible when considering mortality. As noted above, Wade *et al.* (1998), authors of the paper from which the current PBR equation is derived, note that ''Estimating incidental mortality in 1 year to be greater than the PBR calculated from a single abundance survey does not prove the mortality will lead to depletion; it identifies a population worthy of careful future monitoring and possibly indicates that mortality-mitigation efforts should be initiated.'' The information included here indicates that the current population trend of this blue whale stock is unknown but likely approaching carrying capacity and has leveled off because of density-dependence, not human-caused mortality, in spite of what might be otherwise indicated from the calculated PBR. Further, potential (and proposed for authorization) M/SI is below 10 percent of PBR and management actions are in place to minimize vessel strike from other vessel activity in one of the highest-risk areas for strikes. Based on the presence of the factors described above, we do not expect lethal take from Navy activities, alone, to adversely affect Eastern North Pacific blue whales through effects on annual rates of recruitment or survival. Nonetheless, the fact that total human-caused mortality exceeds PBR necessitates close attention to the remainder of the impacts (*i.e.,* harassment) on the Eastern North Pacific stock of blue whales from the Navy's activities to ensure that the total authorized takes have a negligible impact on the species or stock. Therefore, this information will be considered in combination with our assessment of the impacts of proposed harassment takes in the *Group and Species-Specific Analyses* section that follows.

Sei Whale (Eastern North Pacific Stock)

For sei whales (Eastern North Pacific stock), PBR is currently set at 0.75. The total annual M/SI is estimated at greater than or equal to 0.2 in the 2022 final SAR, which reflects one strike over 5

years, yielding a residual PBR of 0.55. However, more recent information suggests that the total annual M/SI reflected in the SAR may be overestimated because the one mortality considered in the calculation may not have been caused by a vessel strike. Carretta *et al.* (2021) elected to omit this strike from its report summarizing sources of human-related injury and mortality for U.S. Pacific west coast marine mammal stock assessments after reviewing the stranding narrative. The narrative indicated that the strike likely occurred post-mortem, evidenced by a lack of hemorrhaging in the whale's tissues. NMFS proposes to authorize one M/SI for the Navy over the 7-year duration of the rule (indicated as 0.14 annually for the purposes of comparing to PBR and evaluating overall effects on annual rates of recruitment and survival), which means that residual PBR is 0.41 with the conservative inclusion of the likely post-mortem strike discussed above.

We acknowledge that the 2023 vessel strike by the U.S. Navy could have been of a sei whale or a CA/OR/WA fin whale, and this strike is not quantitatively included in this PBR analysis (nor is it quantitatively included in the PBR analysis for CA/OR/WA fin whale if both of the 2021 U.S. Navy strikes were fin whales) which rely on the 2022 final SARs. However, consideration of the 2023 strike would not change the total M/SI which NMFS compares to PBR, as the single strike from 2012–2016 used to calculate the vessel strike rate in the 2022 final SAR occurred in 2015 (which, as noted above, likely occurred post-mortem, and therefore, inclusion of this strike in the annual total M/SI is inherently conservative), and the 2023 U.S. Navy strike occurred outside of the 2012–2016 time period. Therefore, while we acknowledge the 2023 U.S. Navy strike, in the quantitative analysis it is treated the same as other non-U.S. Navy strikes that occurred outside of the timeframe reflected in the total M/SI (2012–2016).

Immediately below, we explain the information that supports our finding that the Navy's proposed authorized M/SI is not expected to result in more than a negligible impact on this stock. As described previously, NMFS must also ensure that impacts by the applicant on the species or stock from other types of take (*i.e.,* harassment) do not combine with the impacts from mortality to adversely affect the species or stock via impacts on annual rates of recruitment or survival, which occurs further below in the stock-specific conclusion sections.

Of note, management measures are in place to address M/SI caused by other activities. The Channel Islands NMS staff coordinates, collects, and monitors whale sightings in and around the Vessel Speed Reduction (VSR) zones and the Channel Islands NMS region. The seasonally established Southern California VSR zone spans from Point Arguello to Dana Point, including the Traffic Separation Schemes in the Santa Barbara Channel and San Pedro Channel. Vessels transiting the area from May 1 through December 15, 2023 are recommended to exercise caution and voluntarily reduce speed to 10 kn (18.5 km per hour) or less. While the VSR zone is aimed at reducing risk of fatal vessel strike of blue, humpback, and fin whales, this measure is also anticipated to reduce risk to sei whales (note, this is an expanded timeframe from the Whale Advisory Zone discussed in the 2020 HSTT final rule, which spanned June through November, though the effective period could change in future years). Channel Island NMS observers collect information from aerial surveys conducted by NOAA, the U.S. Coast Guard, California Department of Fish and Game, and U.S. Navy chartered aircraft. Information on seasonal presence, movement, and general distribution patterns of large whales is shared with mariners, NMFS Office of Protected Resources, U.S. Coast Guard, California Department of Fish and Game, the Santa Barbara Museum of Natural History, the Marine Exchange of Southern California, and whale scientists. Real time and historical whale observation data collected from multiple sources can be viewed on the Point Blue Whale Database.

Further, as stated in the 2022 final SAR, the California swordfish drift gillnet fishery is the most likely U.S. fishery to interact with Eastern North Pacific sei whales, though there are zero estimated annual takes from this fishery given no observed entanglements from 1990–2016 across 8,845 monitored fishing sets (Carretta *et al.* (2018b)). NMFS established the Pacific Offshore Cetacean Take Reduction Team in 1996 and prepared an associated Plan (PCTRP) to reduce the risk of M/SI via fisheries interactions. In 1997, NMFS published final regulations formalizing the requirements of the PCTRP, including the use of pingers following several specific provisions and the employment of Skipper education workshops.

In this case, 0.14 M/SI means one authorized mortality in 1 of the 7 years and zero authorized mortalities in 6 of those 7 years. Therefore, the Navy's authorized take would not be contributing to the total human-caused mortality at all in 6 of the 7, or 85.7 percent, of the years covered by this rulemaking. That means that even if a sei whale were to be struck, in 6 of the 7 years there could be no effect on annual rates of recruitment or survival from Navy-caused M/SI. Additionally, the loss of a male would have far less, if any, effect on population rates and absent any information suggesting that one sex is more likely to be struck than another, we can reasonably assume that there is a 50 percent chance that the single strike authorized by this rulemaking would be a male, thereby further decreasing the likelihood of impacts on the population rate. In situations like this where potential M/SI is fractional, consideration must be given to the lessened impacts anticipated due to the absence of M/SI in 6 of the 7 years and the fact that the single strike could be a male.

Lastly, we reiterate that PBR is a conservative metric and also not sufficiently precise to serve as an absolute predictor of population effects upon which mortality caps would appropriately be based. This is especially important given the minor difference between zero and one across the 7-year period covered by this rulemaking, which is the smallest distinction possible when considering mortality. As noted above, Wade *et al.* (1998), authors of the paper from which the current PBR equation is derived, note that ''Estimating incidental mortality in 1 year to be greater than the PBR calculated from a single abundance survey does not prove the mortality will lead to depletion; it identifies a population worthy of careful future monitoring and possibly indicates that mortality-mitigation efforts should be initiated.'' Even after qualitatively considering the possibility that the whale struck by Navy in 2023 was a sei whale, and based on the presence of the factors described above, we do not expect one authorized lethal take from Navy activities, alone, to adversely affect Eastern North Pacific sei whales through effects on annual rates of recruitment or survival. This information will be considered in combination with our assessment of the impacts of proposed harassment takes in the *Group and Species-Specific Analyses* section that follows.

Group and Species-Specific Analyses

In addition to broader analyses of the impacts of the Navy's activities on mysticetes, odontocetes, and pinnipeds, the 2018 HSTT final rule contained detailed analyses of the effects of the

Navy's activities in the HSTT Study Area on each affected species and stock and was updated, as appropriate, in the 2020 HSTT final rule. All of that information and analyses remain applicable and valid for our analyses of the effects of the same Navy activities on the same species and stocks, with the exception of humpback whale, for which the stock structure has been revised, and NMFS has updated its analyses accordingly for this proposed rule. See the *Group and Species-Specific Analyses* subsection in the *Analysis and Negligible Impact Determination* section of the 2018 HSTT final rule (83 FR 66993–67018). In addition, apart from the additional proposed incidental take by vessel strike of two large whales, the resulting changes to the average annual mortality estimates discussed above, and the revised humpback whale stock structure, no new information has been received since the publication of the 2020 HSTT final rule that significantly changes the analyses of the effects of the Navy's activities on each species and stock presented in the 2020 HSTT final rule (new information regarding vessel strike, the potential impact of the new gray whale UME, and the revised humpback whale stock structure were discussed earlier in the rule).

In the discussions below, the estimated Level B harassment takes represent instances of take, not the number of individuals taken (the much lower and less frequent Level A harassment takes are far more likely to be associated with separate individuals), and in many cases, some individuals are expected to be taken more than one time while in other cases, a portion of individuals will not be taken at all. Below, we compare the total take numbers (including PTS, TTS, and behavioral disturbance) for species or stocks to their associated abundance estimates to evaluate the magnitude of impacts across the species or stock and to individuals. Specifically, when an abundance percentage comparison is below 100, it means that percentage or less of the individuals in the stock will be affected (*i.e.,* some individuals will not be taken at all), that the average for those taken is 1 day per year, and that we would not expect any individuals to be taken more than a few times in a year. When it is more than 100 percent, it means there will definitely be some number of repeated takes of individuals. For example, if the percentage is 300, the average would be each individual is taken on 3 days in a year if all were taken, but it is more likely that some number of individuals will be taken more than three times and some number of individuals fewer times or not at all. While it is not possible to know the maximum number of days across which individuals of a stock might be taken, in acknowledgement of the fact that it is more than the average, for the purposes of this analysis, we assume a number approaching twice the average. For example, if the percentage of take compared to the abundance is 800, we estimate that some individuals might be taken as many as 16 times. Those comparisons are included in the sections below. For some stocks, these numbers have been adjusted slightly (with these adjustments being in the single digits) so as to more consistently apply this approach, but these minor changes did not change the analysis or findings.

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 in the *Harassment* subsection of the *Analysis and Negligible Impact Determination* section of the 2018 HSTT final rule, 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 accrues PTS or TTS and is also subjected 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 (as discussed below in the stock-specific summaries). Accordingly, in analyzing the number of takes and the likelihood of repeated and sequential takes (which could result in reproductive impacts), we consider the total takes, not just the Level B harassment takes by behavioral disturbance, so that individuals potentially exposed to both threshold shift and behavioral disturbance are appropriately considered. We note that the same reasoning applies with the potential addition of behavioral disturbance to tissue damage from explosives, the difference being that we do already consider the likelihood of reproductive impacts whenever tissue damage occurs. Further, the number of Level A harassment takes by either PTS or tissue damage are so low compared to abundance numbers that it is considered highly unlikely that any individual would be taken at those levels more than once.

Having considered all of the information and analyses previously presented in the 2018 HSTT final rule, including the *Group and Species-Specific Analyses* discussions organized by the different groups and species, below we present tables showing instances of total take as a percentage of stock abundance for each group, updated with the new vessel strike calculations and humpback stock structure. We then summarize the information for each species or stock, considering the analysis from the 2018 HSTT final rule, 2020 HSTT final rule, and any new analysis. 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 and pinnipeds in water), 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 or stock. In addition, animals belonging to each stock within a species typically have the same hearing capabilities and behaviorally respond in the same manner as animals in other stocks within the species.

Mysticetes

In table 12 and table 13 below for mysticetes, we indicate the total annual mortality, Level A harassment, and Level B harassment, and a number indicating the instances of total take as a percentage of abundance. Table 12 and table 13 have been updated from tables 18 and 19 in the 2020 HSTT final rule, as appropriate, with the 2022 final SARs and updated information on mortality, as discussed above. For additional information and analysis supporting the negligible-impact analysis, see the *Mysticetes* discussion in the *Group and Species-Specific Analyses* section of the 2018 HSTT final rule, all of which remains applicable to this proposed rule unless specifically noted.

TABLE 12—ANNUAL ESTIMATED TAKES BY LEVEL B HARASSMENT, LEVEL A HARASSMENT, AND MORTALITY FOR MYSTICETES IN THE HRC PORTION OF THE HSTT STUDY AREA AND NUMBER INDICATING THE INSTANCES OF TOTAL TAKE AS A PERCENTAGE OF STOCK ABUNDANCE

Species	Stock	Instances of indicated types of incidental take (not all takes represent separate individuals, especially for disturbance)					Total takes [a]		Abundance		Instance of total take as percent of abundance	
		Level B harassment		Level A harassment		Mortality [b]	Total takes (entire study area)	Takes (within Navy EEZ)	Total Navy abundance inside and outside of EEZ (HRC)	Within EEZ Navy abundance (HRC)	Total take as percentage of total Navy abundance (HRC)	EEZ take as percentage of Navy EEZ abundance (HRC)
		Behavioral disturbance	TTS (may also include disturbance)	PTS	Tissue damage							
Blue whale	Central North Pacific.	15	33	0	0	0	48	40	43	33	112	121
Bryde's whale.	Hawaii	40	106	0	0	0	146	123	108	89	135	138
Fin whale	Hawaii	21	27	0	0	0	48	41	52	40	92	103
Humpback whale.	Hawaii	2,837	6,289	3	0	0.29	9,129	7,389	5,078	4,595	180	161
Minke whale.	Hawaii	1,233	3,697	2	0	0	4,932	4,030	3,652	2,835	135	142
Sei whale	Hawaii	46	121	0	0	0	167	135	138	107	121	126

Note: For the Hawaii take estimates, we compare predicted takes to abundance estimates generated from the same underlying density estimates (as described in the *Estimated Take of Marine Mammals* section of the 2018 HSTT final rule), both in and outside of the U.S. EEZ. Because the portion of the Navy's study area inside the U.S. EEZ is generally concomitant with the area used to generate the abundance estimates in the SARs, and the abundance predicted by the same underlying density estimates is the preferred abundance to use, there is no need to separately compare the take to the SARs abundance estimate.

[a] Total takes inside and outside U.S. EEZ represent the sum of annual Level A and Level B harassment from training and testing activities.

[b] The annual mortality of 0.29 is the result of no more than two mortalities over the course of 7 years from vessel strikes as described above in the *Estimated Take of Marine Mammals* section.

TABLE 13—ANNUAL ESTIMATED TAKES BY LEVEL B HARASSMENT, LEVEL A HARASSMENT, AND MORTALITY FOR MYSTICETES IN THE SOCAL PORTION OF THE HSTT STUDY AREA AND NUMBER INDICATING THE INSTANCES OF TOTAL TAKE AS A PERCENTAGE OF STOCK ABUNDANCE

Species	Stock	Instances of indicated types of incidental take (not all takes represent separate individuals, especially for disturbance)					Total takes [a]	Abundance		Instance of total take as percent of abundance	
		Level B harassment		Level A harassment		Mortality [b]	Total takes (entire study Area)	Navy abundance in action area (SOCAL)	NMFS SARS abundance	Total take as percentage of total Navy abundance in action area	Total take as percentage of total SAR abundance
		Behavioral disturbance	TTS (may also include disturbance)	PTS	Tissue damage						
Blue whale	Eastern North Pacific.	792	1,196	1	0	0.14	1,989	785	1,898	253	105
Bryde's whale	Eastern Tropical Pacific.	14	27	0	0	0	41	1.3	unknown	3,154	unknown
Fin whale	CA/OR/WA	835	1,390	1	0	0.57	2,227	363	11,065	613	20
Humpback whale	Central America/ Southern Mexico-CA/OR/WA.	282	594	0	0	0	876	[c] 74	1,496	1,184	59
	Mainland Mexico- CA/ OR/WA.	198	920	1	0	0.14	1,119	[c] 173	3,477	647	32
Minke whale	CA/OR/WA	259	666	1	0	0	926	163	915	568	101
Sei whale	Eastern North Pacific.	27	52	0	0	0.14	79	3	519	2,633	15
Gray whale	Eastern North Pacific.	1,316	3,355	7	0	0.57	4,679	193	26,960	2,424	17
Gray whale	Western North Pacific.	2	4	0	0	0	6	0	290	0	2

Note: For the SOCAL take estimates, because of the manner in which the Navy study area overlaps the ranges of many MMPA stocks (*i.e.,* a stock may range far north to Washington state and beyond and abundance may only be predicted within the U.S. EEZ, while the Navy study area is limited to Southern California and northern Mexico, but extends beyond the U.S. EEZ), we compare predicted takes to both the abundance estimates for the study area, as well as the SARs (as described in the *Estimated Take of Marine Mammals* section of the 2018 HSTT final rule).

[a] Total takes inside and outside U.S. EEZ represent the sum of annual Level A and Level B harassment from training and testing activities.

[b] The annual mortality of 0.14 is the result of no more than one mortality over the course of 7 years from vessel strikes as described above in the *Estimated Take of Marine Mammals* section. The annual mortality of 0.57 is the result of no more than four mortalities over the course of 7 years from vessel strikes.

[c] In the 2020 HSTT final rule, NMFS reported a Navy abundance in Action Area (SOCAL) of 247 CA/OR/WA humpback whales. As explained in more detail in the Estimated Take from Vessel Strikes and Explosives by Serious Injury or Mortality, NMFS estimates that approximately 30 percent of the humpback whales off the coast of California may be from the Central America DPS with the remaining 70 percent are expected to be from the Mexico DPS. Therefore, of the estimated 247 humpback whales in SOCAL, NMFS anticipates that 74 would be of the Central America/Southern Mexico-CA/OR/WA stock (Central America DPS), and 173 would be of the Mainland Mexico-CA/OR/WA stock (Mexico DPS).

Below we compile and summarize the information that supports our preliminary determination that the Navy's activities would not adversely affect any species or stocks through effects on annual rates of recruitment or survival for any of the affected mysticete species and stocks.

Blue Whale (Eastern North Pacific Stock)

Blue whales are listed as endangered under the ESA, and the current population trend for the Eastern North Pacific stock is unknown. We further note that this stock was originally listed under the ESA as a result of the impacts from commercial whaling, which is no longer affecting the species. NMFS proposes to authorize one mortality over the 7 years covered by this rulemaking or 0.14 mortality annually. With the addition of this 0.14 annual mortality, residual PBR is exceeded, resulting in the total human-caused mortality exceeding PBR by 15.54. However, as described in more detail in the *Serious Injury or Mortality* section above, when total human-caused mortality exceeds PBR, we consider whether the incremental addition of a small amount of authorized mortality from the specified activity may still result in a negligible impact, in part by identifying whether it is less than 10 percent of PBR. In this case, the authorized mortality is well below 10 percent of PBR, management measures are in place to reduce mortality from other sources, and the incremental addition of a single mortality over the course of the 7-year Navy rule is not expected to, alone, lead to adverse impacts on the stock through effects on annual rates of recruitment or survival.

Regarding the magnitude of Level B harassment takes (TTS and behavioral disturbance), the number of estimated total instances of take compared to the abundance (measured against both the Navy-estimated abundance and the SAR) is 253 and 105 percent, respectively (table 13). Given the range of blue whales, this information suggests that only some portion of individuals in the stock are likely impacted, but that there will likely be some repeat exposure (maybe 5 or 6 days within a year) of some subset of individuals that spend extended time within SOCAL. Regarding the severity of those individual Level B harassment takes by behavioral disturbance, 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). Additionally, the Navy implements time/area mitigation in SOCAL in the majority of the BIAs, which will reduce the severity of impacts to blue whales by reducing interference in feeding that could result in lost feeding opportunities or necessitate additional energy expenditure to find other good opportunities. Regarding the severity of TTS takes, we have explained in the 2018 HSTT final rule that they are expected to be low-level, of short duration, and mostly not in a frequency band that would be expected to interfere with blue whale communication or other important low-frequency cues—and that the associated lost opportunities and capabilities are not at a level that would impact reproduction or survival. For similar reasons (as described in the 2018 HSTT final rule) the single estimated Level A harassment take by PTS for this stock is unlikely to have any effect on the reproduction or survival of that one individual, even if it were to be experienced by an animal that also experiences one or more Level B harassment takes by behavioral disturbance.

Altogether, only a small portion of the stock is anticipated to be impacted and any individual blue whale is likely to be disturbed at a low-moderate level, with likely many animals exposed only once or twice and a subset potentially disturbed across 5 or 6 days but minimized in biologically important areas. 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, when combined with the proposed authorized mortality (which our earlier analysis indicated would not, alone, have more than a negligible impact on this stock of blue whales), the total take is not expected to adversely affect this stock through impacts on annual rates of recruitment or survival. For these reasons, we have preliminarily determined, in consideration of all of the effects of the Navy's activities combined, that the authorized take proposed would have a negligible impact on the Eastern North Pacific stock of blue whales.

Bryde's Whale (Eastern Tropical Pacific Stock)

Little is known about this stock or its status, and it is not listed under the ESA. No mortality or Level A harassment is anticipated or proposed to be authorized. Regarding the magnitude of Level B harassment takes (TTS and behavioral disturbance), the number of estimated total instances of take compared to the abundance is 3,154 percent; however, the abundance upon which this percentage is based (1.3 whales from the Navy estimate, which is extrapolated from density estimates based on very few sightings) is clearly erroneous and the SAR does not include an abundance estimate because all of the survey data is outdated (table 13). However, the abundance in the early 1980s was estimated as 22,000 to 24,000, a portion of the stock was estimated at 13,000 in 1993, and the minimum number in the Gulf of California was estimated at 160 in 1990. Given this information and the fact that 41 total takes of Bryde's whales were estimated, this information suggests that only a small portion of the individuals in the stock are likely impacted, and few, if any, are likely taken over more than 1 day. Regarding the severity of those individual Level B harassment takes by behavioral disturbance, 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 Bryde's whale communication or other important low-frequency cues. Any associated lost opportunities and capabilities are not at a level that would impact reproduction or survival.

Altogether, only a small portion of the stock is anticipated to be impacted and any individual Bryde's whale is likely to be disturbed at a low-moderate level, with few, if any, individuals exposed over more than 1 day in the year. This low magnitude and severity of harassment effects is not expected to result in impacts on individual reproduction or survival, much less annual rates of recruitment or survival. For these reasons, we have preliminarily determined, in consideration of all of the effects of the Navy's activities combined, that the authorized take proposed would have a negligible impact on the Eastern Tropical Pacific stock of Bryde's whales.

Fin Whale (CA/OR/WA Stock)

The SAR identifies this stock as ''increasing,'' even though the larger species is listed as endangered under the ESA. NMFS proposes to authorize four mortalities over the 7 years covered by this rulemaking, or 0.57 mortality annually. The addition of this 0.57 annual mortality still leaves the total human-caused mortality well under residual PBR.

We acknowledge the 2021 vessel strike of two fin whales by the Royal Australian Navy, and that the 2021 and 2023 vessel strikes by the U.S. Navy could have been CA/OR/WA fin whales. While the Royal Australian Navy strikes are not quantitatively included in the estimated take by vessel strike, even if they were, and if we presumed that the 2021 and 2023 U.S. Navy strikes were all fin whales, M/SI of this stock would still fall well below PBR (80).

Regarding the magnitude of Level B harassment takes (TTS and behavioral disturbance), the number of estimated total instances of take compared to the abundance (measured against both the Navy-estimated abundance and the SAR) is 613 and 20 percent, respectively (table 13). This information suggests that only some portion (less than 25 percent) of individuals in the stock are likely impacted but that there is likely some repeat exposure (perhaps up to 12 days within a year) of some subset of individuals that spend extended time within the SOCAL complex. Some of these takes could occur on a few sequential days for some small number of individuals, for example, if they resulted from a multi-day exercise on a range while individuals were in the area for multiple days feeding. Regarding the severity of those individual Level B harassment takes by behavioral disturbance, 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). Additionally, while there are no known BIAs for fin whales in the SOCAL range, the Navy implements time/area mitigation in SOCAL in blue whale BIAs, and fin whales are known to sometimes feed in some of the same areas, which means they could potentially accrue some benefits from the mitigation. 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 fin whale communication or other important low-frequency cues—and that the associated lost opportunities and capabilities are not at a level that would impact reproduction or survival. For similar reasons (as described in the 2018 HSTT final rule) the single estimated Level A harassment take by PTS for this stock is unlikely to have any effects on the reproduction or survival of that one individual.

Altogether, this population is increasing, only a small portion of the stock is anticipated to be impacted, and any individual fin whale is likely to be disturbed at a low-moderate level, with the taken individuals likely exposed between 1 and 12 days, with a few individuals potentially taken on a few sequential days. This low magnitude and severity of harassment effects is not expected to result in impacts on individual reproduction or survival, and therefore, when combined with the proposed authorized mortality (which our earlier analysis indicated would not, alone, have more than a negligible impact on this stock of fin whales), the total take is not expected to adversely affect this stock through impacts on annual rates of recruitment or survival. For these reasons, we have preliminarily determined, in consideration of all of the effects of the Navy's activities combined, that the authorized take proposed would have a negligible impact on the CA/OR/WA stock of fin whales.

Humpback Whale (Central America/ Southern Mexico-CA/OR/WA Stock)

The SAR identifies this stock as increasing, though the growth rate is uncertain. Animals in this stock are of the Central America DPS which is designated as endangered under the ESA.

Regarding the magnitude of Level B harassment takes (TTS and behavioral disturbance), the number of estimated total instances of take compared to the abundance (measured against both the Navy-estimated abundance and the SAR) is 1,184 and 59 percent, respectively (table 11). Given the range of humpback whales, this information suggests that only some portion of individuals in the stock are likely impacted but that there is likely some repeat exposure (perhaps up to 23 days within a year) of some subset of individuals that spend extended time within the SOCAL complex. Regarding the severity of those individual Level B harassment takes by behavioral disturbance, 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). Some of these takes could occur on several sequential days for some small number of individuals, for example, if they resulted from a multi-day exercise on a range while individuals were in the area for multiple days feeding. However, in these amounts, it would still not be expected to adversely impact reproduction or survival of any individuals.

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 humpback whale communication or other important low-frequency cues—and that the associated lost opportunities and capabilities are not at a level that would impact reproduction or survival. Altogether, only a small portion of the stock is anticipated to be impacted and any individual humpback whale is likely to be disturbed at a low-moderate level, with likely many animals exposed only once or twice and a subset potentially disturbed up to 23 days, but with no reason to think that more than a few of those days would be sequential. 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 is not expected to adversely affect this stock through impacts on annual rates of recruitment or survival. For these reasons, we have preliminarily determined, in consideration of all of the effects of the Navy's activities combined, that the authorized take proposed would have a negligible impact on the Central America/Southern Mexico-CA/OR/WA stock of humpback whales.

Humpback Whale (Mainland Mexico-CA/OR/WA Stock)

The status of this stock is unknown. Animals in this stock are of the Mexico DPS which is designated as threatened under the ESA. NMFS proposes to authorize one mortality over the 7 years covered by this rulemaking, or 0.14 mortality annually. The addition of this 0.14 annual mortality still leaves the total human-caused mortality well under residual PBR.

Regarding the magnitude of Level B harassment takes (TTS and behavioral disturbance), the number of estimated total instances of take compared to the abundance (measured against both the Navy-estimated abundance and the SAR) is 647 and 32 percent, respectively (table 13). Given the range of humpback whales, this information suggests that only some portion of individuals in the stock are likely impacted but that there is likely some repeat exposure (perhaps up to 13 days within a year) of some subset of individuals that spend extended time within the SOCAL complex. Regarding the severity of those individual Level B harassment takes by behavioral disturbance, 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). Some of these takes could occur on several sequential days for some small number of individuals, for example, if they resulted from a multi-day exercise on a range while individuals were in the area for multiple days feeding. However, in these amounts, it would still not be expected to adversely impact reproduction or survival of any individuals.

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 humpback whale communication or other important low-frequency cues—and that the associated lost opportunities and capabilities are not at a level that would impact reproduction or survival. For similar reasons (as described in the 2018 HSTT final rule) the single estimated Level A harassment take by PTS for this stock is unlikely to have any effects on the reproduction or survival of that one individual.

Altogether, only a small portion of the stock is anticipated to be impacted and any individual humpback whale is likely to be disturbed at a low-moderate level, with likely many animals exposed only once or twice and a subset potentially disturbed up to 13 days, but with no reason to think that more than a few of those days would be sequential. 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, when combined with the proposed authorized mortality (which our earlier analysis indicated would not, alone, have more than a negligible impact on this stock of humpback whales), the total take is not expected to adversely affect this stock through impacts on annual rates of recruitment or survival. For these reasons, we have preliminarily determined, in consideration of all of the effects of the Navy's activities combined, that the authorized take proposed would have a negligible impact on the CA/OR/WA stock of humpback whales.

Minke Whale (CA/OR/WA Stock)

The status of this stock is unknown and it is not listed under the ESA. No mortality from vessel strike or tissue damage from explosive exposure is anticipated or proposed for authorization for this species. Regarding the magnitude of Level B harassment takes (TTS and behavioral disturbance), the number of estimated total instances of take compared to the abundance (measured against both the Navy-estimated abundance and the SAR) is 568 and 101 percent, respectively (table 11). Based on the behaviors of minke whales, which often occur along continental shelves and sometimes establish home ranges along the West Coast, this information suggests that only a portion of individuals in the stock are likely impacted but that there is likely some repeat exposure (perhaps up to 11 days within a year) of some subset of individuals that spend extended time within the SOCAL complex. Some of these takes could occur on a few sequential days for some small number of individuals, for example, if they resulted from a multi-day exercise on a range while individuals were in the area for multiple days feeding. Regarding the severity of those individual Level B harassment takes by behavioral disturbance, 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 minke whale communication or other important low-frequency cues—and that the associated lost opportunities and capabilities are not at a level that would impact reproduction or survival. For similar reasons (as described in the 2018 HSTT final rule) the single estimated Level A harassment take by PTS for this stock is unlikely to have any effects on the reproduction or survival of that individual.

Altogether, only a portion of the stock is anticipated to be impacted and any individual minke whale is likely to be disturbed at a low-moderate level, with the taken individuals likely exposed between 1 and 11 days, with a few individuals potentially taken on a few sequential days. This low magnitude and severity of harassment effects is not expected to result in impacts on individual reproduction or survival, much less annual rates of recruitment or survival. For these reasons, we have preliminarily determined, in consideration of all of the effects of the Navy's activities combined, that the authorized take proposed would have a negligible impact on the CA/OR/WA stock of minke whales.

Sei Whale (Eastern North Pacific Stock)

The status of this stock is unknown, and sei whales are listed under the ESA. NMFS proposes to authorize one mortality over the 7 years covered by this rulemaking or 0.14 mortality annually. The addition of this 0.14 annual mortality still leaves the total human-caused mortality under residual PBR. After additionally considering several qualitative factors described above, including that the 2023 strike could have been a sei whale (or fin whale), we do not expect one authorized lethal take from Navy activities, alone, to adversely affect Eastern North Pacific sei whales through effects on annual rates of recruitment or survival. No Level A harassment is anticipated or proposed for authorization.

Regarding the magnitude of Level B harassment takes (TTS and behavioral disturbance), the number of estimated total instances of take compared to the abundance (measured against both the Navy-estimated abundance and the SAR) is 2,633 and 15 percent, respectively (table 13), however, the abundance upon which the Navy percentage is based (3 from the Navy estimate, which is extrapolated from density estimates based on very few sightings) is likely an underestimate of the number of individuals in the HSTT study Area, resulting in an overestimated percentage. Given this information and the large range of sei whales, and the fact that only 79 total Level B harassment takes of sei whales were estimated, it is likely that some very small number of sei whales would be taken repeatedly, potentially up to 15 days in a year (typically 2,633 percent would lead to the estimate of 52 days/year, however, given that there are only 79 sei whale total takes, we used the conservative assumption that five individuals might be taken up to 15 times, with the few remaining takes distributed among other individuals). Regarding the severity of those individual Level B harassment takes by behavioral disturbance, 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). Some of these takes could occur on a few sequential days for some small number of individuals, for example, if they resulted from a multi-day exercise on a range while individuals were in the area for multiple days feeding, however, in these amounts it would still not be expected to adversely impact reproduction or survival of any individuals. 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 sei whale

communication or other important low-frequency cues—and that the associated lost opportunities and capabilities are not at a level that would impact reproduction or survival.

Altogether, only a small portion of the stock is anticipated to be impacted and any individual sei whale is likely to be disturbed at a low-moderate level, with only a few individuals exposed over one to 15 days in a year, with no more than a few sequential days. This low magnitude and severity of harassment effects is not expected to result in impacts on individual reproduction or survival, and therefore, when combined with the proposed authorized mortality (which our earlier analysis indicated would not, alone, have more than a negligible impact on this stock of sei whales), the total take is not expected to adversely affect this stock through impacts on annual rates of recruitment or survival. For these reasons, we have preliminarily determined, in consideration of all of the effects of the Navy's activities combined, that the authorized take proposed would have a negligible impact on the Eastern North Pacific stock of sei whales.

Gray Whale (Eastern North Pacific Stock)

The Eastern North Pacific stock of gray whale is not ESA-listed and the SAR indicates that the stock is increasing. However, recent (2021–2022) surveys conducted by NMFS' Southwest Fisheries Science Center estimated that the population has declined to 16,650 whales, though the authors note that this stock has historically shown a pattern of population growth and decline that has not impacted the population in the long term (Eguchi *et al.* 2022). NMFS is proposing to authorize four mortalities over the 7 years covered by this rulemaking, or 0.57 mortality annually. The addition of this 0.57 annual mortality still leaves the total human-caused mortality well under the insignificance threshold of residual PBR (670). On May 31, 2019, NMFS declared the unusual spike in strandings of gray whales along the west coast of North America since January 1, 2019 an UME. As of June 25, 2023, 674 gray whales have stranded along the west coast of North America (in the U.S., Canada, and Mexico) under this UME. Given the small number of takes by serious injury or mortality proposed for authorization, the proposed takes are not anticipated to exacerbate the ongoing UME.

Regarding the magnitude of Level B harassment takes (TTS and behavioral disturbance), the number of estimated total instances of take compared to the abundance (measured against both the Navy-estimated abundance and the SAR) is 2,424 and 16 percent, respectively (table 13). (Note that in comparison to the recent Eguchi *et al.* 2022 abundance estimate, the number of estimated total instances of take compared to the abundance would be 28 percent.) This information suggests that only some small portion of individuals in the stock are likely impacted (less than 17 percent) but that there is likely some level of repeat exposure of some subset of individuals that spend extended time within the SOCAL complex. Typically 2,424 percent would lead to the estimate of 48 days/year, however, given that a large number of gray whales are known to migrate through the SOCAL complex and the fact that there are 4,679 total takes, we believe that it is more likely that a larger number of individuals would be taken one to a few times, while a small number staying in an area to feed for several days may be taken on 5–10 days. Regarding the severity of those individual Level B harassment takes by behavioral disturbance, 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). Some of these takes could occur on a couple of sequential days for some small number of individuals; however, in these amounts it would still not be expected to adversely impact reproduction or survival of any individuals.

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 gray whale communication or other important low-frequency cues and that the associated lost opportunities and capabilities are not at a level that would impact reproduction or survival. For these same reasons (low level and frequency band), while a small permanent loss of hearing sensitivity may include some degree of energetic costs for compensating or may mean some small loss of opportunities or detection capabilities, at the expected scale the seven estimated Level A harassment takes by PTS for gray whales would be unlikely to impact behaviors, opportunities, or detection capabilities to a degree that would interfere with reproductive success or survival of any individuals.

Altogether, we have considered the impacts of the gray whale UME, the Eastern North Pacific stock of gray whales is not endangered or threatened under the ESA. The SAR indicates that the stock is increasing. However, recent (2021–2022) surveys conducted by NMFS' Southwest Fisheries Science Center estimated that the population has declined (Eguchi *et al.* 2022). Only a small portion of the stock is anticipated to be impacted and any individual gray whale is likely to be disturbed at a low-moderate level, with likely many animals exposed only once or twice and a subset potentially disturbed across 5 to 10 days. This low magnitude and severity of harassment effects is not expected to result in impacts to reproduction or survival for any individuals and, therefore, when combined with the proposed authorized mortality of four whales over the 7 year period (which our earlier analysis indicated would not, alone, have more than a negligible impact on this stock of gray whales), the total take is not expected to adversely affect this stock through impacts on annual rates of recruitment or survival. For these reasons, we have preliminarily determined, in consideration of all of the effects of the Navy's activities combined, that the authorized take proposed would have a negligible impact on the Eastern North Pacific stock of gray whales.

Gray Whale (Western North Pacific stock)

The Western North Pacific stock of gray whales is reported as increasing in the 2022 final SAR but is listed as endangered under the ESA. No mortality or Level A harassment is anticipated or proposed for authorization. This stock is expected to incur the very small number of 6 Level B harassment takes (2 behavioral disruption and 4 TTS) to a stock with a SAR-estimated abundance of 290 (table 11). These takes will likely accrue to different individuals, the behavioral disturbances will be of a low-moderate level, and the TTS instances will be at a low level and short duration. This low magnitude and severity of harassment effects is not expected to result in impacts on individual reproduction or survival, much less to adversely affect this stock through impacts on annual rates of recruitment or survival. For these reasons, we have preliminarily determined, in consideration of all of the effects of the Navy's activities combined, that the authorized take proposed would have a negligible impact on the Western North Pacific stock of gray whales.

Humpback Whale (Hawaii Stock)

The status of this stock is unknown. Animals in this stock are of the Hawaii

DPS which is not listed under the ESA. No Level A harassment by tissue damage is proposed for authorization. NMFS proposes to authorize two mortalities over the 7 years covered by this rulemaking, or 0.29 mortalities annually. The addition of this 0.29 annual mortality still leaves the total human-caused mortality well under the insignificance threshold for residual PBR.

Regarding the magnitude of Level B harassment takes (TTS and behavioral disturbance), the number of estimated instances of take compared to the abundance, both throughout the HSTT Study Area and within the U.S. EEZ, respectively, is 180 and 161 percent (table 12). This information and the complicated far-ranging nature of the stock structure suggests that some portion of the stock (but not all) are likely impacted, over 1 to several days per year, with little likelihood of take across sequential days. Regarding the severity of those individual Level B harassment takes by behavioral disturbance, 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). Additionally, as noted above, there are two mitigation areas implemented by the Navy that span a large area of the important humpback reproductive area (BIA) and minimize impacts by limiting the use of MF1 active sonar and explosives, thereby reducing both the number and severity of takes of humpback whales. 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 humpback whale communication or other important low-frequency cues, and that the associated lost opportunities and capabilities are not at a level that would impact reproduction or survival. For these same reasons (low level and frequency band), while a small permanent loss of hearing sensitivity may include some degree of energetic costs for compensating or may mean some small loss of opportunities or detection capabilities, at the expected scale the 3 estimated Level A harassment takes by PTS for humpback whales would be unlikely to impact behaviors, opportunities, or detection capabilities to a degree that would interfere with reproductive success or survival of any individuals.

Altogether, this stock's status is unknown and the DPS is not listed as endangered or threatened under the ESA. Only a small portion of the stock is anticipated to be impacted and any individual humpback whale is likely to be disturbed at a low-moderate level, with the taken individuals likely exposed between 1 to several days per year, with little likelihood of take across sequential days. This low magnitude and severity of harassment effects is not expected to result in impacts on individual reproduction or survival, and therefore, when combined with the proposed authorized mortality (which our earlier analysis indicated would not, alone, have more than a negligible impact on this stock of humpback whales), the total take is not expected to adversely affect this stock through effects on annual rates of recruitment or survival. For these reasons, we have preliminarily determined, in consideration of all of the effects of the Navy's activities combined, that the authorized take proposed would have a negligible impact on the Hawaii stock of humpback whales.

Blue Whale (Central North Pacific Stock) and the Hawaii Stocks of Bryde's Whale, Fin Whale, Minke Whale, and Sei Whale

The status of these stocks are not identified in the SARs. Blue whale (Central North Pacific stock) and the Hawaii stocks of fin whale and sei whale are listed as endangered under the ESA; the Hawaii stocks of minke whales and Bryde's whales are not listed under the ESA. No mortality or Level A harassment by tissue damage is anticipated or proposed for authorization for any of these stocks.

Regarding the magnitude of Level B harassment takes (TTS and behavioral disturbance), the number of estimated instances of take compared to the abundance, both throughout the HSTT Study Area and within the U.S. EEZ, respectively, is 92–135 and 103–142 percent (table 12). This information suggests that some portion of the stocks (but not all) are likely impacted, over 1 to several days per year, with little likelihood of take across sequential days. Regarding the severity of those individual Level B harassment takes by behavioral disturbance, 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 mysticete communication or other important low-frequency cues—and that the associated lost opportunities and capabilities are not at a level that would impact reproduction or survival. For similar reasons (as described in the 2018 HSTT final rule) the two estimated Level A harassment takes by PTS for the Hawaii stock of minke whales are unlikely to have any effects on the reproduction or survival of any individuals.

Altogether, only a portion of these stocks are anticipated to be impacted and any individuals of these stocks are likely to be disturbed at a low-moderate level, with the taken individuals likely exposed between 1 and several days, with little chance that any are taken across sequential days. This low magnitude and severity of harassment effects is not expected to result in impacts on individual reproduction or survival, much less have impacts on annual rates of recruitment or survival. For these reasons, we have preliminarily determined, in consideration of all of the effects of the Navy's activities combined, that the authorized take proposed would have a negligible impact on these stocks.

Odontocetes

Sperm Whale, Dwarf Sperm Whale, and Pygmy Sperm Whale

In table 14 and table 15 below for sperm whale, dwarf sperm whale, and pygmy sperm whale, we indicate the total annual mortality (0 for all stocks; the 2020 HSTT final rule included 0.14 annual takes by mortality of the Hawaii stock of sperm whale), Level A and Level B harassment, and a number indicating the instances of total take as a percentage of abundance. Table 14 and table 15 are unchanged from tables 20 and 21 in the 2020 HSTT final rule, except for updated information on mortality for the Hawaii stock of sperm whales, as discussed above. For additional information and analysis supporting the negligible-impact analysis, see the *Odontocetes* discussion as well as the *Sperm Whales, Dwarf Sperm Whales, and Pygmy Sperm Whales* discussion in the *Group and Species-Specific Analyses* section of the 2018 HSTT final rule, all of which remains applicable to this proposed rule unless specifically noted.

TABLE 14—ANNUAL ESTIMATED TAKES BY LEVEL B HARASSMENT, LEVEL A HARASSMENT, AND MORTALITY FOR SPERM WHALES, DWARF SPERM WHALES, AND PYGMY SPERM WHALES IN THE HRC PORTION OF THE HSTT STUDY AREA AND NUMBER INDICATING THE INSTANCES OF TOTAL TAKE AS A PERCENTAGE OF STOCK ABUNDANCE

Species	Stock	Instances of indicated types of incidental take (not all takes represent separate individuals, especially for disturbance)				Total takes			Abundance		Instances of total take as percent of abundance	
		Level B harassment		Level A harassment		Mortality	Total takes (entire study area)	Takes (within NAVY EEZ)	Total Navy abundance inside and outside EEZ (HRC)	Within EEZ Navy abundance (HRC)	Total take as percentage of total Navy abundance (HRC)	EEZ take as percentage of EEZ abundance (HRC)
		Behavioral disturbance	TTS (may also include disturbance)	PTS	Tissue damage							
Dwarf sperm whale.	Hawaii	5,870	14,550	64	0	0	20,484	15,310	8,218	6,379	249	240
Pygmy sperm whale.	Hawaii	2,329	5,822	29	0	0	8,180	6,098	3,349	2,600	244	235
Sperm whale.	Hawaii	2,466	30	0	0	0	2,496	1,317	1,656	1,317	151	147

Note: For the Hawaii take estimates, we compare predicted takes to abundance estimates generated from the same underlying density estimates (as described in the *Estimated Take of Marine Mammals* section of the 2018 HSTT final rule), both in and outside of the U.S. EEZ. Because the portion of the Navy's study area inside the U.S. EEZ is generally concomitant with the area used to generate the abundance estimates in the SARs, and the abundance predicted by the same underlying density estimates is the preferred abundance to use, there is no need to separately compare the take to the SARs abundance estimate.
Total takes inside and outside U.S. EEZ represent the sum of annual Level A and Level B harassment from training and testing activities.

TABLE 15—ANNUAL ESTIMATED TAKES BY LEVEL B HARASSMENT, LEVEL A HARASSMENT, AND MORTALITY FOR SPERM WHALES, DWARF SPERM WHALES, AND PYGMY SPERM WHALES IN THE SOCAL PORTION OF THE HSTT STUDY AREA AND NUMBER INDICATING THE INSTANCES OF TOTAL TAKE AS A PERCENTAGE OF STOCK ABUNDANCE

Species	Stock	Instances of indicated types of incidental take (not all takes represent separate individuals, especially for disturbance)				Total takes		Abundance		Instances of total take as percent of abundance	
		Level B harassment		Level A harassment		Mortality	Total takes (entire study area)	Navy abundance in action area	NMFS SARS abundance	Total take as percentage of total Navy abundance in Action Area	Total take as percentage of total SAR abundance
		Behavioral disturbance	TTS (may also include disturbance)	PTS	Tissue damage						
Kogia whales ...	CA/OR/WA	2,779	6,353	38	0	0	9,170	757	4,111	1,211	223
Sperm whale ...	CA/OR/WA	2,437	56	0	0	0	2,493	273	1,997	913	125

Note: For the SOCAL take estimates, because of the manner in which the Navy study area overlaps the ranges of many MMPA stocks (*i.e.,* a stock may range far north to Washington state and beyond and abundance may only be predicted within the U.S. EEZ, while the Navy study area is limited to Southern California and northern Mexico, but extends beyond the U.S. EEZ), we compare predicted takes to both the abundance estimates for the study area, as well as the SARs (as described in the *Estimated Take of Marine Mammals* section of the 2018 HSTT final rule).
Total takes inside and outside U.S. EEZ represent the sum of annual Level A and Level B harassment from training and testing activities.

Below we compile and summarize the information that supports our preliminary determination that the Navy's activities would not adversely affect any species or stocks through effects on annual rates of recruitment or survival for any of the affected species and stocks addressed in this section.

Sperm Whale, Dwarf Sperm Whale, and Pygmy Sperm Whale (CA/OR/WA Stocks)

The SAR identifies the CA/OR/WA stock of sperm whales as ''stable'', and the species is listed as endangered under the ESA. The status of the CA/OR/WA stocks of pygmy and dwarf sperm whales is unknown and neither are listed under the ESA. Neither mortality nor Level A harassment by tissue damage from exposure to explosives is expected or proposed for authorization for any of these three stocks.

Due to their pelagic distribution, small size, and cryptic behavior, pygmy sperm whales and dwarf sperm whales are rarely sighted during at-sea surveys and are difficult to distinguish between when visually observed in the field. Many of the relatively few observations of *Kogia* spp. off the U.S. West Coast were not identified to species. All at-sea sightings of *Kogia* spp. have been identified as pygmy sperm whales or *Kogia* spp. Stranded dwarf sperm and pygmy sperm whales have been found on the U.S. West Coast, however dwarf sperm whale strandings are rare. NMFS SARs suggest that the majority of *Kogia* sighted off the U.S. West Coast were likely pygmy sperm whales. As such, the stock estimate in the NMFS SAR for pygmy sperm whales is the estimate derived for all *Kogia* spp. in the region (Barlow, 2016), and no separate abundance estimate can be determined for dwarf sperm whales, though some low number likely reside in the U.S. EEZ. Due to the lack of abundance estimate, it is not possible to predict the take of dwarf sperm whales and take estimates are identified as *Kogia* spp. (including both pygmy and dwarf sperm whales). We assume only a small portion of those takes are likely to be dwarf sperm whales as the density and abundance in the U.S. EEZ is thought to be low.

Regarding the magnitude of Level B harassment takes (TTS and behavioral disturbance), the number of estimated total instances of take compared to the abundance (measured against both the Navy-estimated abundance and the SAR) is, respectively, 913 and 125 for sperm whales and 1,211 and 223 for *Kogia* spp., with a large proportion of

these anticipated to be pygmy sperm whales due to the low abundance and density of dwarf sperm whales in the HSTT Study Area. (Table 15). Given the range of these stocks (which extends the entire length of the West Coast, as well as beyond the U.S. EEZ boundary), this information suggests that some portion of the individuals in these stocks will not be impacted but that there is likely some repeat exposure (perhaps up to 24 days within a year for *Kogia* spp. and 18 days a year for sperm whales) of some small subset of individuals that spend extended time within the SOCAL Range. Additionally, while interrupted feeding bouts are a known response and concern for odontocetes, we also know that there are often viable alternative habitat options in the relative vicinity. Regarding the severity of those individual Level B harassment takes by behavioral disturbance, 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). However, some of these takes could occur on a fair number of sequential days for some number of individuals.

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 sperm whale communication or other important low-frequency cues, and that the associated lost opportunities and capabilities are not at a level that would impact reproduction or survival. For these same reasons (low level and frequency band), while 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, at the expected scale the estimated Level A harassment takes by PTS for the dwarf and pygmy sperm whale stocks would be unlikely to impact behaviors, opportunities, or detection capabilities to a degree that would interfere with reproductive success or survival of any individuals. Thus, the 38 total Level A harassment takes by PTS for these two stocks would be unlikely to affect rates of recruitment and survival for the stocks.

Altogether, most members of the stocks will likely be taken by Level B harassment (at a low to occasionally moderate level) over several days a year, and some smaller portion of the stocks are expected to be taken on a relatively moderate to high number of days (up to 18 or 24) across the year, some of which could be sequential days. Though the majority of impacts are expected to be of a lower to sometimes moderate severity, the larger number of takes for a subset of individuals makes it more likely that a small number of individuals could be interrupted during foraging in a manner and amount such that impacts to the energy budgets of females (from either losing feeding opportunities or expending considerable energy to find alternative feeding options) could cause them to forego reproduction for a year. Energetic impacts to males are generally meaningless to population rates unless they cause death, and it takes extreme energy deficits beyond what would ever be likely to result from these activities to cause the death of an adult marine mammal. As discussed in the 2020 HSTT final rule, however, foregone reproduction (especially for 1 year, which is the maximum predicted because the small number anticipated in any 1 year makes the probability that any individual would be impacted in this way twice in 7 years very low) has far less of an impact on population rates than mortality and a small number of instances of foregone reproduction would not be expected to adversely affect these stocks through effects on annual rates of recruitment or survival. We also note that residual PBR is 19 for pygmy sperm whales and 1.9 for sperm whales. Both the abundance and PBR are unknown for dwarf sperm whales, however, we know that take of this stock is likely significantly lower in magnitude and severity (*i.e.,* lower number of total takes and repeated takes any individual) than pygmy sperm whales. For these reasons, in consideration of all of the effects of the Navy's activities combined, we have preliminarily determined that the authorized take proposed would have a negligible impact on the CA/OR/WA stocks of sperm whales and pygmy and dwarf sperm whales.

Sperm Whale (Hawaii Stock)

The SAR does not identify a trend for this stock and the species is listed as endangered under the ESA. No mortality or Level A harassment by PTS or tissue damage is expected or proposed for authorization.

Regarding the magnitude of Level B harassment takes (TTS and behavioral disturbance), the number of estimated instances of take compared to the abundance, both throughout the HSTT Study Area and within the U.S. EEZ, respectively, is 151 and 147 percent (table 14). This information and the sperm whale stock range suggest that likely only a smaller portion of the stock would be impacted, over 1 to several days per year, with little likelihood of take across sequential days. Regarding the severity of those individual Level B harassment takes by behavioral disturbance, 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 sperm whale communication or other important low-frequency cues, and that the associated lost opportunities and capabilities are not at a level that would impact reproduction or survival.

Altogether, a relatively small portion of this stock is anticipated to be impacted and any individuals are likely to be disturbed at a low-moderate level, with the taken individuals likely exposed between 1 and several days, with little chance that any are taken across sequential days. This low magnitude and severity of harassment effects is not expected to result in impacts on individual reproduction or survival, much less annual rates of recruitment or survival. For these reasons, we have preliminarily determined, in consideration of all of the effects of the Navy's activities combined, that the authorized take proposed would have a negligible impact on the Hawaii stock of sperm whales.

Pygmy and Dwarf Sperm Whales (Hawaii Stocks)

The SAR does not identify a trend for these stocks and the species are not listed under the ESA. No Level A harassment by tissue damage is anticipated or proposed for authorization. Regarding the magnitude of Level B harassment takes (TTS and behavioral disturbance), the number of estimated instances of take compared to the abundance, both throughout the HSTT Study Area and within the U.S. EEZ, respectively, is 244–249 and 235–240 percent (table 12). This information and the pygmy and dwarf sperm whale stock ranges (at least throughout the U.S. EEZ around the entire Hawaiian Islands) suggest that likely a fair portion of each stock is not impacted, but that a subset of individuals may be taken over one to perhaps 5 days per year, with little likelihood of take across sequential days. Regarding the severity of those individual Level B harassment takes by behavioral disturbance, 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). Additionally, as discussed earlier, within the Hawaii Island Mitigation Area, explosives are not used and the use of MF1 and MF4 active sonar is limited, greatly reducing the severity of impacts within the small and resident population BIA for dwarf sperm whales (Kratofil *et al.,* 2023), which is entirely contained within this mitigation area.

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 sperm whale communication or other important low-frequency cues—and that the associated lost opportunities and capabilities are not at a level that would impact reproduction or survival. For these same reasons (low level and frequency band), while a small permanent loss of hearing sensitivity may include some degree of energetic costs for compensating or may mean some small loss of opportunities or detection capabilities, at the expected scale, estimated Level A harassment takes by PTS for dwarf and pygmy sperm whales would be unlikely to impact behaviors, opportunities, or detection capabilities to a degree that would interfere with reproductive success or survival of any individuals, even if it were to be experienced by an animal that also experiences one or more instances of Level B harassment by behavioral disturbance. Thus the 29 and 64 total Level A harassment takes by PTS for dwarf and pygmy sperm whales, respectively, would be unlikely to affect rates of recruitment and survival for these stocks.

Altogether, a portion of these stocks are likely to be impacted and any individuals are likely to be disturbed at a low-moderate level, with the taken individuals likely exposed between 1 and 5 days, with little chance that any are taken across sequential days. This low magnitude and severity of Level A and Level B harassment effects is not expected to result in impacts on individual reproduction or survival, much less impacts on annual rates of recruitment or survival. For these reasons, we have preliminarily determined, in consideration of all of the effects of the Navy's activities combined, that the expected and authorized take proposed would have a negligible impact on the Hawaii stocks of pygmy and dwarf sperm whales.

Beaked Whales

In table 16 and table 17 below for beaked whales, we indicate the total annual mortality, Level A and Level B harassment, and a number indicating the instances of total take as a percentage of abundance. Table 16 and table 17 are unchanged from table 22 and table 23 in the 2020 HSTT final rule, with the exception of a correction to a rounding error as noted. For additional information and analysis supporting the negligible-impact analysis, see the *Odontocetes* discussion as well as the *Beaked Whales* discussion in the *Group and Species-Specific Analyses* section of the 2018 HSTT final rule, all of which remains applicable to this proposed rule unless specifically noted.

TABLE 16—ANNUAL ESTIMATED TAKES BY LEVEL B HARASSMENT, LEVEL A HARASSMENT, AND MORTALITY FOR BEAKED WHALES IN THE HRC PORTION OF THE HSTT STUDY AREA AND NUMBER INDICATING THE INSTANCES OF TOTAL TAKE AS A PERCENTAGE OF STOCK ABUNDANCE

Species	Stock	Instances of indicated types of incidental take (not all takes represent separate individuals, especially for disturbance)					Total takes		Abundance		Instances of total take as percent of abundance	
		Level B harassment		Level A harassment			Total Takes (entire Study Area)	Takes (within Navy EEZ)	Total Navy abundance inside and outside EEZ (HRC)	Within EEZ Navy abundance (HRC)	Total take as percentage of total Navy abundance (HRC)	EEZ take as percentage of EEZ abundance (HRC)
		Behavioral disturbance	TTS (may also include disturbance)	PTS	Tissue damage	Mortality						
Blainville's beaked whale.	Hawaii	5,369	16	0	0	0	5,385	4,140	989	768	[a] 544	539
Cuvier's beaked whale.	Hawaii	1,792	4	0	0	0	1,796	1,377	345	268	521	514
Longman's beaked whale.	Hawaii	19,152	81	0	0	0	19,233	14,585	3,568	2,770	539	527

Note: For the Hawaii take estimates, we compare predicted takes to abundance estimates generated from the same underlying density estimates (as described in the *Estimated Take of Marine Mammals* section of the 2018 HSTT final rule), both in and outside of the U.S. EEZ. Because the portion of the Navy's study area inside the U.S. EEZ is generally concomitant with the area used to generate the abundance estimates in the SARs, and the abundance predicted by the same underlying density estimates is the preferred abundance to use, there is no need to separately compare the take to the SARs abundance estimate.

Total takes inside and outside U.S. EEZ represent the sum of annual Level A and Level B harassment from training and testing activities.

[a] The 2020 final rule unintentionally presented this percentage as 545. The correct value is provided here. This error does not affect the conclusions in the 2020 HSTT final rule.

TABLE 17—ANNUAL ESTIMATED TAKES BY LEVEL B HARASSMENT, LEVEL A HARASSMENT, AND MORTALITY FOR BEAKED WHALES IN THE SOCAL PORTION OF THE HSTT STUDY AREA AND NUMBER INDICATING THE INSTANCES OF TOTAL TAKE AS A PERCENTAGE OF STOCK ABUNDANCE

Species	Stock	Instances of indicated types of incidental take (not all takes represent separate individuals, especially for disturbance)				Total takes		Abundance		Instances of total take as percent of abundance	
		Level B harassment		Level A harassment		Mortality	Total Takes (entire study area)	Navy abundance in action area	NMFS SARS abundance	Total take as percentage of total Navy abundance in action area	Total take as percentage of total SAR abundance
		Behavioral disturbance	TTS (may also include disturbance)	PTS	Tissue damage						
Baird's beaked whale.	CA/OR/WA	2,030	14	0	0	0	2,044	74	1,363	2,762	150
Cuvier's beaked whale.	CA/OR/WA	11,373	127	1	0	0	11,501	520	5,454	2,212	211
Mesoplodon species.	CA/OR/WA	6,125	68	1	0	0	6,194	89	3,044	6,960	203

Note: For the SOCAL take estimates, because of the manner in which the Navy study area overlaps the ranges of many MMPA stocks (*i.e.,* a stock may range far north to Washington state and beyond and abundance may only be predicted within the U.S. EEZ, while the Navy study area is limited to Southern California and northern Mexico, but extends beyond the U.S. EEZ), we compare predicted takes to both the abundance estimates for the study area, as well as the SARs (as described in the *Estimated Take of Marine Mammals* section of the 2018 HSTT final rule).
Total takes inside and outside U.S. EEZ represent the sum of annual Level A and Level B harassment from training and testing activities.

Below we compile and summarize the information that supports our determination that the Navy's activities would not adversely affect any species or stocks through effects on annual rates of recruitment or survival for any of the affected species or stocks addressed in this section.

Blainville's, Cuvier's, and Longman's Beaked Whales (Hawaii Stocks)

The SAR does not identify a trend for these stocks and the species are not listed under the ESA. No mortality or Level A harassment are expected or proposed for authorization for any of these three stocks. Regarding the magnitude of Level B harassment takes (TTS and behavioral disturbance), the number of estimated instances of take compared to the abundance, both throughout the HSTT Study Area and within the U.S. EEZ, respectively, is 521–544 and 514–539 percent (table 16). This information and the stock ranges (at least of the small, resident island associated stocks around Hawaii) suggest that likely a fair portion of the stocks (but not all) will be impacted, over 1 to perhaps 11 days per year, with little likelihood of much take across sequential days. Regarding the severity of those individual Level B harassment takes by behavioral disturbance, 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 or 2 (*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. Additionally, as noted earlier, within the Hawaii Island mitigation area (which overlaps a large portion of the BIAs for Cuvier's and Blainville's beaked whales), explosives are not used and the use of MF1 and MF4 active sonar is limited, greatly reducing the severity of impacts within these two small resident populations.

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 beaked whale communication or other important low-frequency cues, and that the associated lost opportunities and capabilities are not at a level that would impact reproduction or survival.

Altogether, a fair portion of these stocks are anticipated to be impacted and any individuals are likely to be disturbed at a moderate level, with the taken individuals likely exposed between 1 and 11 days, with little chance that individuals are taken across more than a few sequential days. This low, to occasionally moderate, magnitude and severity of harassment effects is not expected to result in impacts on individual reproduction or survival, much less have impacts on annual rates of recruitment or survival. For these reasons, we have preliminarily determined, in consideration of all of the effects of the Navy's activities combined, that the authorized take proposed would have a negligible impact on the Hawaii stocks of beaked whales.

Baird's and Cuvier's Beaked Whales and *Mesoplodon* Species (All CA/OR/WA Stocks)

The species are not listed under the ESA and their populations have been identified as ''increasing,'' ''decreasing,'' and ''increasing,'' respectively. No mortality is expected or proposed for authorization for any of these three stocks and only two takes by Level A harassment (PTS) are proposed for authorization.

No methods are available to distinguish between the six species of *Mesoplodon* beaked whale CA/OR/WA stocks (Blainville's beaked whale (*M. densirostris*), Perrin's beaked whale (*M. perrini*), Lesser beaked whale (*M. peruvianus*), Stejneger's beaked whale (*M. stejnegeri*), Gingko-toothed beaked whale (*M. gingkodens*), and Hubbs' beaked whale (*M. carlhubbsi*)) when observed during at-sea surveys (Carretta *et al.* 2018a). Bycatch and stranding records from the region indicate that the Hubbs' beaked whale is most commonly encountered (Carretta *et al.* 2008, Moore and Barlow, 2013). As indicated in the SAR, no species-specific abundance estimates are available, the abundance estimate includes all CA/OR/WA *Mesoplodon* spp, and the six species are managed as one unit. Due to the lack of species-specific abundance estimates, it is not possible to predict the take of individual species and take estimates are identified as *Mesoplodon* spp.

Regarding the magnitude of Level B harassment takes (TTS and behavioral disturbance), the number of estimated total instances of take compared to the abundance for these stocks is 2,762, 2,212, and 6,960 percent (measured against Navy-estimated abundance) and

150, 211, and 203 percent (measured against the SAR) for Baird's beaked whales, Cuvier's beaked whales, and *Mesoplodon* spp., respectively (table 15). Given the ranges of these stocks, this information suggests that some smaller portion of the individuals of these stocks will be taken, and that some subset of individuals within the stock will be taken repeatedly within the year (perhaps up to 20–25 days, and potentially more for Cuvier's)—potentially over a fair number of sequential days, especially where individuals spend extensive time in the SOCAL Range. Note that we predict lower days of repeated exposure for these stocks than their percentages might have suggested because of the number of overall takes—*i.e.,* using the higher percentage would suggest that an unlikely portion of the takes are taken up by a small portion of the stock incurring a very large number of repeat takes, with little room for take resulting from few or moderate numbers of repeats, which is unlikely. While interrupted feeding bouts are a known response and concern for odontocetes, we also know that there are often viable alternative habitat options in the relative vicinity. Regarding the severity of those individual Level B harassment takes 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 or 2 (*i.e.,* of a moderate level). In addition, as noted, some of these takes could occur on a fair number of sequential days for these stocks.

The severity of TTS takes is expected to be low-level, of short duration, and mostly not in a frequency band that would be expected to interfere significantly with conspecific communication, echolocation, or other important low-frequency cues. Therefore, the associated lost opportunities and capabilities would not be expected to impact reproduction or survival. For similar reasons (as described in the 2020 HSTT final rule) the single estimated Level A harassment take by PTS for this stock is unlikely to have any effects on the reproduction or survival of any individuals.

Altogether, a portion of these stocks will likely be taken (at a moderate or sometimes low level) over several days a year, and some smaller portion of the stock is expected to be taken on a relatively moderate to high number of days across the year, some of which could be sequential days. Though the majority of impacts are expected to be of a moderate severity, the repeated takes over a potentially fair number of sequential days for some individuals makes it more likely that a small number of individuals could be interrupted during foraging in a manner and amount such that impacts to the energy budgets of females (from either losing feeding opportunities or expending considerable energy to find alternative feeding options) could cause them to forego reproduction for a year. Energetic impacts to males are generally meaningless to population rates unless they cause death, and it takes extreme energy deficits beyond what would ever be likely to result from these activities to cause the death of an adult marine mammal. As noted previously, however, foregone reproduction (especially for 1 year, which is the maximum predicted because the small number anticipated in any 1 year makes the probability that any individual would be impacted in this way twice in 7 years very low) has far less of an impact on population rates than mortality and a small number of instances of foregone reproduction would not be expected to adversely affect these stocks through effects on annual rates of recruitment or survival, especially given the residual PBR of these three beaked whale stocks (8.7, 41.9, and 19.9, respectively).

Further, Navy activities have been conducted in SOCAL for many years at similar levels and the SAR considers *Mesoplodon* spp. and Baird's beaked whales as increasing. While NMFS' SAR indicates that Cuvier's beaked whales on the U.S. West Coast are declining based on a Bayesian trend analysis of NMFS' survey data collected from 1991 through 2014, results from passive acoustic monitoring and other research have estimated regional Cuvier's beaked whale densities that were higher than indicated by NMFS' broad-scale visual surveys for the U.S. West Coast (Debich *et al.* 2015a; Debich *et al.* 2015b; Falcone and Schorr, 2012, 2014; Hildebrand *et al.* 2009; Moretti, 2016; Širović *et al.* 2016; Smultea and Jefferson, 2014). Research also indicates higher than expected residency in the Navy's instrumented Southern California Anti-Submarine Warfare Range in particular (Falcone and Schorr, 2012) and photo identification studies in the SOCAL have identified approximately 100 individual Cuvier's beaked whale individuals with 40 percent having been seen in one or more prior years, with re-sightings up to 7 years apart (Falcone and Schorr, 2014). The documented residency by many Cuvier's beaked whales over multiple years suggests that a stable population may exist in that small portion of the stock's overall range (Falcone *et al.* 2009; Falcone and Schorr, 2014; Schorr *et al.* 2017).

For these reasons, in consideration of all of the effects of the Navy's activities combined, we have preliminarily determined that the authorized take proposed would have a negligible impact on the CA/OR/WA stocks of Baird's and Cuvier's beaked whales, as well as all six species included within the *Mesoplodon* spp.

Small Whales and Dolphins

In table 18 and table 19 below for dolphins and small whales, we indicate the total annual mortality, Level A and Level B harassment, and a number indicating the instances of total take as a percentage of abundance. Table 18 and table 19 are updated from tables 24 and 25 in the 2020 HSTT final rule as appropriate with the 2022 final SARs. For additional information and analysis supporting the negligible-impact analysis, see the *Odontocetes* discussion as well as the *Small Whales and Dolphins* discussion in the *Group and Species-Specific Analyses* section of the 2018 HSTT final rule, all of which remains applicable to this proposed rule unless specifically noted.

TABLE 18—ANNUAL ESTIMATED TAKES BY LEVEL B HARASSMENT, LEVEL A HARASSMENT, AND MORTALITY FOR DOLPHINS AND SMALL WHALES IN THE HRC PORTION OF THE HSTT STUDY AREA AND NUMBER INDICATING THE INSTANCES OF TOTAL TAKE AS A PERCENTAGE OF STOCK ABUNDANCE

Species	Stock	Instances of indicated types of incidental take (not all takes represent separate individuals, especially for disturbance)					Total takes		Abundance		Instance of total take as percent of abundance	
		Level B harassment		Level A harassment		Mortality	Total takes (entire study area)	Takes (within Navy EEZ)	Total Navy abundance inside and outside of EEZ (HRC)	Within EEZ Navy abundance (HRC)	Total take as percentage of total Navy abundance (HRC)	EEZ take as percentage of Navy EEZ abundance (HRC)
		Behavioral disturbance	TTS (may also include disturbance)	PTS	Tissue damage							
Bottlenose dolphin.	Hawaii Pelagic.	3,196	132	0	0	0	3,328	2,481	1,528	1,442	218	172
Bottlenose dolphin.	Kauai & Niihau.	534	31	0	0	0	565	264	184	184	307	143
Bottlenose dolphin.	Oahu	8,600	61	1	0	0	8,662	8,376	743	743	[a] 1,166	[a] 1,127
Bottlenose dolphin.	4-Island ..	349	10	0	0	0	359	316	189	189	190	167
Bottlenose dolphin.	Hawaii	74	6	0	0	0	80	42	131	131	61	32
False killer whale.	Hawaii Pelagic.	999	42	0	0	0	1,041	766	645	507	161	151
False killer whale.	Main Hawaiian Islands Insular.	572	17	0	0	0	589	476	147	147	[b] 401	324
False killer whale.	Northwestern Hawaiian Islands.	365	16	0	0	0	381	280	215	169	177	166
Fraser's dolphin.	Hawaii	39,784	1,289	2	0	0	41,075	31,120	5,408	18,763	760	166
Killer whale.	Hawaii	118	6	0	0	0	124	93	69	54	180	172
Melon-headed whale.	Hawaii Islands.	3,261	231	0	0	0	3,492	2,557	1,782	1,782	196	143
Melon-headed whale.	Kohala Resident.	341	9	0	0	0	350	182	447	447	78	41
Pantropical spotted dolphin.	Hawaii Island.	3,767	227	0	0	0	3,994	2,576	2,405	2,405	166	107
Pantropical spotted dolphin.	Hawaii Pelagic.	9,973	476	0	0	0	10,449	7,600	5,462	4,637	191	164
Pantropical spotted dolphin.	Oahu	4,284	45	0	0	0	4,329	4,194	372	372	1,164	1,127
Pantropical spotted dolphin.	4-Island ..	701	17	0	0	0	718	634	657	657	109	96
Pygmy killer whale.	Hawaii	8,122	402	0	0	0	8,524	6,538	4,928	3,931	173	166
Pygmy killer whale.	Tropical ..	710	50	0	0	0	760	490	159	23	478	2,130
Risso's dolphin.	Hawaii	8,950	448	0	0	0	9,398	7,318	1,210	4,199	777	174
Rough-toothed dolphin.	Hawaii	6,112	373	0	0	0	6,485	4,859	3,054	2,808	212	173
Short-finned pilot whale.	Hawaii	12,499	433	0	0	0	12,932	9,946	6,433	5,784	201	172
Spinner dolphin.	Hawaii Island.	279	12	0	0	0	291	89	629	629	46	14
Spinner dolphin.	Hawaii Pelagic.	4,332	202	0	0	0	4,534	3,491	2,885	2,229	157	157
Spinner dolphin.	Kauai & Niihau.	1,683	63	0	0	0	1,746	812	604	604	289	134

TABLE 18—ANNUAL ESTIMATED TAKES BY LEVEL B HARASSMENT, LEVEL A HARASSMENT, AND MORTALITY FOR DOLPHINS AND SMALL WHALES IN THE HRC PORTION OF THE HSTT STUDY AREA AND NUMBER INDICATING THE INSTANCES OF TOTAL TAKE AS A PERCENTAGE OF STOCK ABUNDANCE—Continued

Species	Stock	Instances of indicated types of incidental take (not all takes represent separate individuals, especially for disturbance)					Total takes		Abundance		Instance of total take as percent of abundance	
		Level B harassment		Level A harassment		Mortality	Total takes (entire study area)	Takes (within Navy EEZ)	Total Navy abundance inside and outside of EEZ (HRC)	Within EEZ Navy abundance (HRC)	Total take as percentage of total Navy abundance (HRC)	EEZ take as percentage of Navy EEZ abundance (HRC)
		Behavioral disturbance	TTS (may also include disturbance)	PTS	Tissue damage							
Spinner dolphin.	Oahu & 4-Island.	1,790	34	1	0	0	1,825	1,708	354	354	516	482
Striped dolphin.	Hawaii	7,379	405	0	0	0	7,784	6,034	4,779	3,646	163	165

Note: For the Hawaii take estimates, we compare predicted takes to abundance estimates generated from the same underlying density estimates (as described in the *Estimated Take of Marine Mammals* section of the 2018 HSTT final rule), both in and outside of the U.S. EEZ. Because the portion of the Navy's study area inside the U.S. EEZ is generally concomitant with the area used to generate the abundance estimates in the SARs, and the abundance predicted by the same underlying density estimates is the preferred abundance to use, there is no need to separately compare the take to the SARs abundance estimate.

Total takes inside and outside U.S. EEZ represent the sum of annual Level A and Level B harassment from training and testing activities.

[a] The 2020 final rule unintentionally presented these percentages as 1,169 and 1,130. The correct values are provided here. These errors do not affect the conclusions in the 2020 HSTT final rule.

[b] The 2020 final rule unintentionally presented this percentage as 400. The correct value is provided here. This rounding error does not affect the conclusions in the 2020 HSTT final rule.

TABLE 19—ANNUAL ESTIMATED TAKES BY LEVEL B HARASSMENT, LEVEL A HARASSMENT, AND MORTALITY FOR DOLPHINS AND SMALL WHALES IN THE SOCAL PORTION OF THE HSTT STUDY AREA AND NUMBER INDICATING THE INSTANCES OF TOTAL TAKE AS A PERCENTAGE OF STOCK ABUNDANCE

Species	Stock	Instances of indicated types of incidental take (not all takes represent separate individuals, especially for disturbance)					Total takes	Abundance		Instance of total take as percent of abundance	
		Level B harassment		Level A harassment		Mortality	Total takes (entire study area)	Navy abundance in action area (SOCAL)	NMFS SARS abundance	Total take as percentage of total Navy abundance in action area	Total take as percentage of total SAR abundance
		Behavioral disturbance	TTS (may also include disturbance)	PTS	Tissue damage						
Bottlenose dolphin.	California Coastal.	1,771	38	0	0	0	1,809	238	453	760	399
Bottlenose dolphin.	CA/OR/WA Offshore.	51,727	3,695	3	0	0	55,425	5,946	3,477	932	1,594
Killer whale	ENP Offshore	96	11	0	0	0	107	4	300	2,675	36
Killer whale	ENP Transient/West Coast Transient.	179	20	0	0	0	199	30	349	663	57
Long-beaked common dolphin.	California	233,485	13,787	18	2	0	247,292	10,258	83,379	2,411	297
Northern right whale dolphin.	CA/OR/WA	90,052	8,047	10	1	0	98,110	7,705	29,285	1,273	335
Pacific white-sided dolphin.	CA/OR/WA	69,245	6,093	5	0	0	75,343	6,626	34,999	1,137	215
Risso's dolphin	CA/OR/WA	116,143	10,118	9	0	0	126,270	7,784	6,336	1,622	1,993
Short-beaked common dolphin.	CA/OR/WA	1,374,048	118,525	79	10	1.14	1,492,664	261,438	1,056,308	571	141
Short-finned pilot whale.	CA/OR/WA	1,789	124	1	0	0	1,914	208	836	920	229
Striped dolphin	CA/OR/WA	163,640	11,614	3	0	0	175,257	39,862	29,988	440	584

Note: For the SOCAL take estimates, because of the manner in which the Navy study area overlaps the ranges of many MMPA stocks (*i.e.*, a stock may range far north to Washington state and beyond and abundance may only be predicted within the U.S. EEZ, while the Navy study area is limited to Southern California and northern Mexico, but extends beyond the U.S. EEZ), we compare predicted takes to both the abundance estimates for the study area, as well as the SARs (as described in the *Estimated Take of Marine Mammals* section of the 2018 HSTT final rule).

Total takes inside and outside U.S. EEZ represent the sum of annual Level A and Level B harassment from training and testing activities.

For mortality takes there is an annual average of 1.14 short-beaked common dolphins (*i.e.,* where eight takes could potentially occur divided by 7 years to get the annual number of mortalities/serious injuries).

Below we compile and summarize the information that supports our determination that the Navy's activities would not adversely affect any species or stocks through effects on annual rates of recruitment or survival for any of the affected species or stocks addressed in this section.

Long-Beaked Common Dolphin (California Stock), Northern Right Whale Dolphin (CA/OR/WA Stock), and Short-Beaked Common Dolphin (CA/OR/WA Stock)

None of these stocks are listed under the ESA and their stock statuses are considered ''increasing,'' ''unknown,'' and ''increasing,'' respectively. Eight mortalities or serious injuries of short-beaked common dolphins are proposed for authorization over the 7-year rule, or 1.14 M/SI annually. The addition of this 1.14 annual mortality still leaves the total human-caused mortality well under the insignificance threshold for residual PBR. The three stocks are expected to accrue 2, 1, and 10 Level A harassment takes from tissue damage resulting from exposure to explosives, respectively. As described in detail in the 2018 HSTT final rule, the impacts of a Level A harassment take by tissue damage could range in impact from minor to something just less than M/SI that could seriously impact fitness. However, given the Navy's procedural mitigation, exposure closer to the source and more severe end of the spectrum is less likely and we cautiously assume some moderate impact for these takes that could lower the affected individual's fitness within the year such that a female (assuming a 50 percent chance of it being a female) might forego reproduction for 1 year. As noted previously, foregone reproduction has less of an impact on population rates than death (especially for only 1 year in 7, which is the maximum predicted because the small number anticipated in any 1 year makes the probability that any individual would be impacted in this way twice in 7 years very low), and 1 to 10 instances would not be expected to impact annual rates of recruitment or survival for these stocks.

Regarding the magnitude of Level B harassment takes (TTS and behavioral disturbance), the number of estimated total instances of take compared to the abundance (measured against both the Navy-estimated abundance and the SAR) is 2,411, 1,273, and 571 percent (respective to the stocks listed in the heading) and 297, 335, and 141 percent (respective to the stocks listed in the heading) (table 19). Given the range of these stocks, this information suggests that likely some portion (but not all or even the majority) of the individuals in the northern right whale dolphin and short-beaked common dolphin stocks are likely impacted while it is entirely possible that most or all of the range-limited long-beaked common dolphin is taken. All three stocks likely will experience some repeat Level B harassment exposure (perhaps up to 48, 25, or 11 days within a year, respective to the stocks listed in the heading) of some subset of individuals that spend extended time within the SOCAL range complex. While interrupted feeding bouts are a known response and concern for odontocetes, we also know that there are often viable alternative habitat options in the relative vicinity. Regarding the severity of those individual Level B harassment takes by behavioral disturbance, 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). However, some of these takes could occur on a fair number of sequential days for long-beaked common dolphins or northern right whale dolphins, or even some number of short-beaked common dolphins, given the high number of total takes (*i.e.,* the probability that some number of individuals get taken on a higher number of sequential days is higher, because the total take number is relatively high, even though the percentage is not that high).

The severity of TTS takes is expected to be low-level, of short duration, and mostly not in a frequency band that would be expected to interfere significantly with conspecific communication, echolocation, or other important low-frequency cues, and the associated lost opportunities and capabilities would not be expected to impact reproduction or survival. For these same reasons (low level and frequency band), while a small permanent loss of hearing sensitivity may include some degree of energetic costs for compensating or may mean some small loss of opportunities or detection capabilities, as discussed in the 2020 HSTT final rule, it would be unlikely to impact behaviors, opportunities, or detection capabilities to a degree that would interfere with reproductive success or survival of any individuals.

Altogether and as described in more detail above, 1.14 annual lethal takes of short-beaked common dolphins are proposed for authorization, all three stocks may experience a very small number of takes by tissue damage or PTS (relative to the stock abundance and PBR), and a moderate to large portion of all three stocks will likely be taken (at a low to occasionally moderate level) over several days a year, and some smaller portion of these stocks is expected to be taken on a relatively moderate to high number of days across the year, some of which could be sequential days. Though the majority of impacts are expected to be of a lower to sometimes moderate severity, the larger number of takes (in total and for certain individuals) makes it more likely (probabilistically) that a small number of individuals could be interrupted during foraging in a manner and amount such that impacts to the energy budgets of females (from either losing feeding opportunities or expending considerable energy to find alternative feeding options) could cause them to forego reproduction for a year. Energetic impacts to males are generally meaningless to population rates unless they cause death, and it takes extreme energy deficits beyond what would ever be likely to result from these activities to cause the death of an adult marine mammal. As noted previously, however, foregone reproduction (especially for only 1 year out of 7, which is the maximum predicted because the small number anticipated in any 1 year makes the probability that any individual would be impacted in this way twice in 7 years very low) has far less of an impact on population rates than mortality and a small number of instances of foregone reproduction (including in combination with that which might result from the small number of tissue damage takes) would not be expected to adversely affect the stocks through effects on annual rates of recruitment or survival, especially given the very high residual PBRs of these stocks (638.3, 156.4, and 8,858.5, respectively). For these reasons, in consideration of all of the effects of the Navy's activities combined (mortality, Level A harassment, and Level B harassment), we have preliminarily determined that the authorized take proposed would have a negligible impact on these three stocks of dolphins.

All Other SOCAL Dolphin Stocks (Except Long-Beaked Common Dolphin, Northern Right Whale Dolphin, and Short-Beaked Common Dolphin)

None of these stocks are listed under the ESA and their stock statuses are considered ''unknown,'' except for the bottlenose dolphin (California coastal stock) and killer whale (Eastern North Pacific stock), which are considered ''stable.'' No M/SI or Level A harassment via tissue damage from exposure to explosives is expected or proposed for authorization for these stocks.

Regarding the magnitude of Level B harassment takes (TTS and behavioral disturbance), the number of estimated total instances of take compared to the

abundance (measured against both the Navy-estimated abundance and the SAR) is from 440 to 2,675 percent and 36 to 1,993 percent, respectively (table 19). Given the range of these stocks (along the entire U.S. West Coast, or even beyond, with some also extending seaward of the HSTT Study Area boundaries), this information suggests that some portion (but not all or even the majority) of the individuals of any of these stocks will be taken, with the exception that most or all of the individuals of the more range-limited California coastal stock of bottlenose dolphin may be taken. It is also likely that some subset of individuals within most of these stocks will be taken repeatedly within the year (perhaps up to 10–15 days within a year) but with no more than several potentially sequential days, although the CA/OR/WA stocks of bottlenose dolphins, Pacific white-sided dolphins, and Risso's dolphins may include individuals that are taken repeatedly within the year over a higher number of days (up to 57, 22, and 40 days, respectively) and potentially over a fair number of sequential days, especially where individuals spend extensive time in the SOCAL range complex. Note that though percentages are high for the Eastern North Pacific stock of killer whales and short-finned pilot whales, given the low overall number of takes, it is highly unlikely that any individuals would be taken across the number of days their percentages would suggest. While interrupted feeding bouts are a known response and concern for odontocetes, we also know that there are often viable alternative habitat options in the relative vicinity. Regarding the severity of those individual Level B harassment takes 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, or sometimes moderate level, less likely to evoke a severe response). However, as noted, some of these takes could occur on a fair number of sequential days for the three stocks listed earlier.

The severity of TTS takes is expected to be low-level, of short duration, and mostly not in a frequency band that would be expected to interfere significantly with conspecific communication, echolocation, or other important low-frequency cues. For these same reasons (low level and frequency band), while a small permanent loss of hearing sensitivity may include some degree of energetic costs for compensating or may mean some small loss of opportunities or detection capabilities, it would be unlikely to impact behaviors, opportunities, or detection capabilities to a degree that would interfere with reproductive success or survival of any individuals.

Altogether, a portion of all of these stocks will likely be taken (at a low to occasionally moderate level) over several days a year, and some smaller portion of CA/OR/WA stocks of bottlenose dolphins, Pacific white-sided dolphins, and Risso's dolphins, specifically, are expected to be taken on a relatively moderate to high number of days across the year, some of which could be sequential days. Though the majority of impacts are expected to be of a lower to sometimes moderate severity, the larger number of takes (in total and for certain individuals) for the CA/OR/WA stocks of bottlenose dolphins, Pacific white-sided dolphins, and Risso's dolphins makes it more likely (probabilistically) that a small number of individuals could be interrupted during foraging in a manner and amount such that impacts to the energy budgets of females (from either losing feeding opportunities or expending considerable energy to find alternative feeding options) could cause them to forego reproduction for a year. Energetic impacts to males are generally meaningless to population rates unless they cause death, and it takes extreme energy deficits beyond what would ever be likely to result from these activities to cause the death of an adult marine mammal. As noted previously, however, foregone reproduction (especially for only 1 year in 7, which is the maximum predicted because the small number anticipated in any 1 year makes the probability that any individual would be impacted in this way twice in 7 years very low) has far less of an impact on population rates than mortality and a small number of instances of foregone reproduction would not be expected to adversely affect the stocks through effects on annual rates of recruitment or survival, especially given the residual PBRs of the CA/OR/WA stocks of bottlenose dolphins, Pacific white-sided dolphins, and Risso's dolphins (18.9, 272, and 42.3, respectively). For these reasons, in consideration of all of the effects of the Navy's activities combined, we have preliminarily determined that the authorized take proposed would have a negligible impact on these stocks of dolphins.

All HRC Dolphin Stocks

With the exception of the Main Hawaiian Island stock of false killer whales (listed as endangered under the ESA, with the MMPA stock identified as ''decreasing''), none of these stocks are listed under the ESA and their stock statuses are considered ''unknown.'' No M/SI or Level A harassment via tissue damage from exposure to explosives is expected or proposed for authorization for these stocks.

Regarding the magnitude of Level B harassment takes (TTS and behavioral disturbance), the number of estimated total instances of take compared to the abundance (measured against both the Navy-estimated abundance and the SAR) is from 46 to 1,166 percent and 14 to 2,130 percent, respectively (table 16). Given the ranges of these stocks (many of them are small, resident, island-associated stocks), this information suggests that a fairly large portion of the individuals of many of these stocks will be taken but that most individuals will only be impacted across a smaller to moderate number of days within the year (1–15), and with no more than several potentially sequential days, although two stocks (the Oahu stocks of bottlenose dolphin and pantropical spotted dolphin) have a slightly higher percentage, suggesting they could be taken up to 23 days within a year, with perhaps a few more of those days being sequential. We note that although the percentage is higher for the tropical stock of pygmy killer whale within the U.S. EEZ (2,130), given (1) the low overall number of takes (760) and (2) the fact that the small within-U.S. EEZ abundance is not a static set of individuals, but rather individuals moving in and out of the U.S. EEZ making it more appropriate to use the percentage comparison for the total takes versus total abundance—it is highly unlikely that any individuals would be taken across the number of days the within-U.S. EEZ percentage suggests (42). While interrupted feeding bouts are a known response and concern for odontocetes, we also know that there are often viable alternative habitat options in the relative vicinity. Regarding the severity of those individual Level B harassment takes by behavioral disturbance, 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, or sometimes moderate level, less likely to evoke a severe response). However, as noted, some of these takes could occur on a fair number of sequential days for the Oahu stocks of bottlenose dolphin and pantropical spotted dolphins.

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 significantly with conspecific communication, echolocation, or other important low-frequency cues. For these same reasons (low level and frequency band), while a small permanent loss of hearing sensitivity may include some degree of energetic costs for compensating or may mean some small loss of opportunities or detection capabilities, they would be unlikely to impact behaviors, opportunities, or detection capabilities to a degree that would interfere with reproductive success or survival of any individuals, even if accrued to individuals that are also taken by behavioral harassment at the same time.

Altogether, most of these stocks (all but the Oahu stocks of bottlenose dolphin and pantropical spotted dolphins) will likely be taken (at a low to occasionally moderate level) over several days a year, with some smaller portion of the stock potentially taken on a more moderate number of days across the year (perhaps up to 15 days for Fraser's dolphin, though others notably less), some of which could be across a few sequential days, which is not expected to affect the reproductive success or survival of individuals. For the Oahu stocks of bottlenose dolphin and pantropical spotted dolphins, some subset of individuals could be taken up to 23 days in a year, with some small number being taken across several sequential days, such that a small number of individuals could be interrupted during foraging in a manner and amount such that impacts to the energy budgets of females (from either losing feeding opportunities or expending considerable energy to find alternative feeding options) could cause them to forego reproduction for a year. Energetic impacts to males are generally meaningless to population rates unless they cause death, and it takes extreme energy deficits beyond what would ever be likely to result from these activities to cause the death of an adult marine mammal. As noted previously, however, foregone reproduction (especially for 1 year, which is the maximum predicted because the small number anticipated in any 1 year makes the probability that any individual would be impacted in this way twice in 7 years very low) has far less of an impact on population rates than mortality and a small number of instances of foregone reproduction would not be expected to adversely affect these two stocks through effects on annual rates of recruitment or survival. For these reasons, in consideration of all of the effects of the Navy's activities combined, we have preliminarily determined that the authorized take proposed would have a negligible impact on all of the stocks of dolphins found in the vicinity of the HRC.

Dall's Porpoise

In table 20 below for porpoises, we indicate the total annual mortality, Level A harassment and Level B harassment, and a number indicating the instances of total take as a percentage of abundance. Table 20 is updated from table 26 in the 2020 HSTT final rule with the 2022 final SARs. For additional information and analysis supporting the negligible-impact analysis, see the *Odontocetes* discussion as well as the *Dall's Porpoise* discussion in the *Group and Species-Specific Analyses* section of the 2018 HTT final rule, all of which remains applicable to this proposed rule unless specifically noted.

TABLE 20—ANNUAL ESTIMATED TAKES BY LEVEL B HARASSMENT, LEVEL A HARASSMENT, AND MORTALITY FOR PORPOISES IN THE HSTT STUDY AREA AND NUMBER INDICATING THE INSTANCES OF TOTAL TAKE AS A PERCENTAGE OF STOCK ABUNDANCE

Species	Stock	Instances of indicated types of incidental take (not all takes represent separate individuals, especially for disturbance)					Total takes	Abundance		Instances of total take as percent of abundance	
		Level B harassment		Level A harassment		Mortality	Total takes (entire study area)	Navy abundance in action area	NMFS SARS abundance	Total take as percentage of total Navy abundance in action area	Total take as percentage of total SAR abundance
		Behavioral disturbance	TTS (may also include disturbance)	PTS	Tissue damage						
Dall's porpoise	CA/OR/WA	14,482	29,891	209	0	0	44,582	2,054	16,498	2,170	270

Note: For the SOCAL take estimates, because of the manner in which the Navy study area overlaps the ranges of many MMPA stocks (*i.e.,* a stock may range far north to Washington state and beyond and abundance may only be predicted within the U.S. EEZ, while the Navy study area is limited to Southern California and northern Mexico, but extends beyond the U.S. EEZ), we compare predicted takes to both the abundance estimates for the study area, as well as the SARs (as described in the *Estimated Take of Marine Mammals* section of the 2018 HSTT final rule).

Total takes inside and outside U.S. EEZ represent the sum of annual Level A and Level B harassment from training and testing activities.

Below we compile and summarize the information that supports our determination that the Navy's activities would not adversely affect Dall's porpoises through effects on annual rates of recruitment or survival.

Dall's porpoise is not listed under the ESA and the stock status is considered ''unknown.'' No M/SI or Level A harassment via tissue damage from exposure to explosives is expected or proposed for authorization for this stock.

Most Level B harassments to Dall's porpoise from hull-mounted sonar (MF1) in the HSTT Study Area would result from received levels between 154 and 166 dB SPL (85 percent). While harbor porpoises have been observed to be especially sensitive to human activity, the same types of responses have not been observed in Dall's porpoises. Dall's porpoises are typically notably longer than and weigh more than twice as much as harbor porpoises making them generally less likely to be preyed upon and likely differentiating their behavioral repertoire somewhat from harbor porpoises. Further, they are typically seen in large groups and feeding aggregations or exhibiting bow-riding behaviors, which is very different from the group dynamics observed in the more typically solitary, cryptic harbor porpoises, which are not often seen bow-riding. For these reasons, Dall's porpoises are not treated as especially sensitive species (as compared to harbor porpoises, which have a lower threshold for Level B harassment by behavioral disturbance and more distant cutoff) but, rather, are analyzed similarly to other odontocetes. Therefore, the majority of Level B harassment takes are expected to be in the form of milder responses compared to higher level exposures. As discussed more fully in the 2018 HSTT final rule, we anticipate more severe effects from takes when animals are exposed to higher received levels.

Regarding the magnitude of Level B harassment takes (TTS and behavioral disturbance), the number of estimated total instances of take compared to the abundance (measured against both the Navy-estimated abundance and the SAR) is 2,170 and 270 percent, respectively (table 20). Given the range of this stock (up the U.S. West Coast through Washington and sometimes beyond the U.S. EEZ), this information suggests that some smaller portion of the individuals of this stock will be taken, and that some subset of individuals within the stock will be taken repeatedly within the year (perhaps up to 42 days)—potentially over a fair number of sequential days, especially where individuals spend extensive time in the SOCAL range complex. While interrupted feeding bouts are a known response and concern for odontocetes, we also know that there are often viable alternative habitat options in the relative vicinity. Regarding the severity of those individual Level B harassment takes by behavioral disturbance, 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, or sometimes moderate level, less likely to evoke a severe response). However, as noted, some of these takes could occur on a fair number of sequential days for this stock.

The severity of TTS takes is expected to be low-level, of short duration, and mostly not in a frequency band that would be expected to interfere significantly with conspecific communication, echolocation, or other important low-frequency cues. Therefore, the associated lost opportunities and capabilities would not be expected to impact reproduction or survival. For these same reasons (low level and the likely frequency band), while a small permanent loss of hearing sensitivity may include some degree of energetic costs for compensating or may mean some small loss of opportunities or detection capabilities, the estimated 209 takes by Level A harassment by PTS for Dall's porpoise would be unlikely to impact behaviors, opportunities, or detection capabilities to a degree that would interfere with reproductive success or survival for most individuals. Because of the high number of PTS takes, however, we acknowledge that a few animals could potentially incur permanent hearing loss of a higher degree that could potentially interfere with their successful reproduction and growth. Given the status of the stock, even if this occurred, it would not adversely impact rates of recruitment or survival.

Altogether, a portion of this stock will likely be taken (at a low to occasionally moderate level) over several days a year, and some smaller portion of the stock is expected to be taken on a relatively moderate to high number of days across the year, some of which could be sequential days. Though the majority of impacts are expected to be of a lower to sometimes moderate severity, the larger number of takes (in total and for certain individuals) for the Dall's porpoise makes it more likely (probabilistically) that a small number of individuals could be interrupted during foraging in a manner and amount such that impacts to the energy budgets of females (from either losing feeding opportunities or expending considerable energy to find alternative feeding options) could cause them to forego reproduction for a year. Energetic impacts to males are generally meaningless to population rates unless they cause death, and it takes extreme energy deficits beyond what would ever be likely to result from these activities to cause the death of an adult marine mammal. Similarly, we acknowledge the potential for this to occur to a few individuals out of the 209 total that might incur a higher degree of PTS. As noted previously, however, foregone reproduction (especially for only 1 year in 7, which is the maximum predicted because the small number anticipated in any 1 year makes the probability that any individual would be impacted in this way twice in 7 years very low) has far less of an impact on population rates than mortality. Further, the small number of instances of foregone reproduction that could potentially result from PTS and/or the few repeated, more severe Level B harassment takes by behavioral disturbance would not be expected to adversely affect the stock through effects on annual rates of recruitment or survival, especially given the status of the species (not endangered or threatened; minimum population of 10,286 just within the U.S. EEZ) and residual PBR of Dall's porpoise (98.3). For these reasons, in consideration of all of the effects of the Navy's activities combined, we have preliminarily determined that the authorized take proposed would have a negligible impact on Dall's porpoise.

Pinnipeds

In table 21 and table 22 below for pinnipeds, we indicate the total annual mortality, Level A harassment and Level B harassment, and a number indicating the instances of total take as a percentage of abundance. Table 21 and table 22 have been updated from tables 27 and 28 in the 2020 HSTT final rule with the 2022 final SARs, as appropriate. For additional information and analysis supporting the negligible-impact analysis, see the *Pinnipeds* discussion in the *Group and Species-Specific Analyses* section of the 2018 HSTT final rule, all of which remains applicable to this proposed rule unless specifically noted.

TABLE 21—ANNUAL ESTIMATED TAKES BY LEVEL B HARASSMENT, LEVEL A HARASSMENT, AND MORTALITY FOR PINNIPEDS IN THE HRC PORTION OF THE HSTT STUDY AREA AND NUMBER INDICATING THE INSTANCES OF TOTAL TAKE AS A PERCENTAGE OF STOCK ABUNDANCE

Species	Instances of indicated types of incidental take (not all takes represent separate individuals, especially for disturbance)					Total takes		Abundance		Instance of total take as percent of abundance	
	Level B harassment		Level A harassment		Mortality	Total takes (entire study area)	Takes (within Navy EEZ)	Total Navy abundance inside and outside of EEZ (HRC)	Within EEZ Navy abundance (HRC)	Total take as percentage of total Navy abundance (HRC)	EEZ take as percentage of Navy EEZ abundance (HRC)
	Behavioral disturbance	TTS (may also include disturbance)	PTS	Tissue damage							
Hawaiian monk seal	143	62	1	0	0	206	195	169	169	122	115

Note: For the Hawaii take estimates, we compare predicted takes to abundance estimates generated from the same underlying density estimates (as described in the *Estimated Take of Marine Mammals* section of the 2018 HSTT final rule), both in and outside of the U.S. EEZ. Because the portion of the Navy's study area inside the U.S. EEZ is generally concomitant with the area used to generate the abundance estimates in the SARs, and the abundance predicted by the same underlying density estimates is the preferred abundance to use, there is no need to separately compare the take to the SARs abundance estimate.

Total takes inside and outside U.S. EEZ represent the sum of annual Level A and Level B harassment from training and testing activities.

TABLE 22—ANNUAL ESTIMATED TAKES BY LEVEL B HARASSMENT, LEVEL A HARASSMENT, AND MORTALITY FOR PINNIPEDS IN THE SOCAL PORTION OF THE HSTT STUDY AREA AND NUMBER INDICATING THE INSTANCES OF TOTAL TAKE AS A PERCENTAGE OF STOCK ABUNDANCE

Species	Stock	Instances of indicated types of incidental take (not all takes represent separate individuals, especially for disturbance)					Total takes	Abundance		Instance of total take as percent of abundance	
		Level B harassment		Level A harassment		Mortality	Total takes (entire study area)	Navy abundance in action area (SOCAL)	NMFS SARS abundance	Total take as percentage of total Navy abundance in action area	Total take as percentage of total SAR abundance
		Behavioral disturbance	TTS (may also include disturbance)	PTS	Tissue damage						
California sea lion.	U.S	113,419	4,789	87	9	0.71	118,305	4,085	257,606	2,896	46
Guadalupe fur seal.	Mexico	1,442	15	0	0	0	1,457	1,171	34,187	124	4
Northern fur seal.	California	15,167	124	1	0	0	15,292	886	14,050	1,726	109
Harbor seal	California	2,450	2,994	8	0	0	5,452	321	30,968	1,698	18
Northern elephant seal.	California	42,916	17,955	97	2	0	60,970	4,108	187,386	1,484	33

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

For mortality takes there is an annual average of 0.71 California sea lions (*i.e.,* where five takes could potentially occur divided by 7 years to get the annual number of mortalities/serious injuries).

Below we compile and summarize the information that supports our determination that the Navy's activities would not adversely affect any pinnipeds through effects on annual rates of recruitment or survival for any of the affected species or stocks addressed in this section.

Five M/SI takes of California sea lions are proposed for authorization and when this mortality is combined with the other human-caused mortality from other sources, it still falls well below the insignificance threshold for residual PBR (13,684). A small number of Level A harassment takes by tissue damage are also proposed for authorization (nine and two for California sea lions and northern elephant seals, respectively), which, as discussed in the 2020 HSTT final rule, could range in impact from minor to something just less than M/SI that could seriously impact fitness. However, given the Navy's mitigation, exposure at the closer to the source and more severe end of the spectrum is less likely. Nevertheless, we cautiously assume some moderate impact on the individuals that experience these small numbers of take that could lower the individual's fitness within the year such that a female (assuming a 50 percent chance of it being a female) might forego reproduction for 1 year. As noted previously, foregone reproduction has less of an impact on population rates than death (especially for only one within 7 years, which is the maximum predicted because the small number anticipated in any 1 year makes the probability that any individual would be impacted in this way twice in 7 years very low) and these low numbers of instances (especially assuming the likelihood that only 50 percent of the takes would affect females) would not be expected to impact annual rates of recruitment or survival, especially given the population sizes of these species.

Regarding the magnitude of Level B harassment takes (TTS and behavioral disturbance), for Hawaiian monk seals and Guadalupe fur seals, the two species listed under the ESA, the estimated instances of takes as compared to the stock abundance does not exceed 124 percent, which suggests that some portion of these two stocks would be taken on 1 to a few days per year. For the remaining stocks, the number of estimated total instances of take compared to the abundance (measured against both the Navy-estimated abundance and the SAR) for these stocks is 1,484 to 2,896 percent and 18 to 46 percent, respectively (table 21). Given the ranges of these stocks (*i.e.,* very large ranges, but with individuals often staying in the vicinity of haulouts), this information suggests that some very small portion of the individuals of these stocks will be taken, but that some subset of individuals within the stock will be taken repeatedly within the year (perhaps up to 58 days)—potentially over a fair number of sequential days. Regarding the severity of those individual Level B harassment takes by behavioral disturbance, 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, which is considered a relatively low to occasionally moderate level for pinnipeds. However, as noted, some of these takes could occur on a fair number of sequential days for this stock.

As described in the 2018 HSTT final rule and 2020 HSTT final rule, the Hawaii and 4-Islands mitigation areas protect (by not using explosives and limiting MFAS within) a significant portion of the designated critical habitat for Hawaiian monk seals in the Main Hawaiian Islands, including all of it around the islands of Hawaii and Lanai, most around Maui, and good portions around Molokai and Kaho'olawe. As discussed, this protection reduces the overall number of takes and further reduces the severity of effects by minimizing impacts near pupping beaches and in important foraging habitat.

The severity of TTS takes are expected to be low-level, of short duration, and mostly not in a frequency band that would be expected to interfere significantly with conspecific communication, echolocation, or other important low-frequency cues that would affect the individual's reproduction or survival. For these same reasons (low level and frequency band), while a small permanent loss of hearing sensitivity may include some degree of energetic costs for compensating or may mean some small loss of opportunities or detection capabilities, the one to eight estimated Level A harassment takes by PTS for monk seals, northern fur seals, and harbor seals would be unlikely to impact behaviors, opportunities, or detection capabilities to a degree that would interfere with

reproductive success or survival of any individuals. Because of the high number of PTS takes for California sea lions and northern elephant seals (87 and 97, respectively), we acknowledge that a few animals could potentially incur permanent hearing loss of a higher degree that could potentially interfere with their successful reproduction and growth. Given the status of the stocks, even if this occurred, it would not adversely impact rates of recruitment or survival (residual PBR of 13,684 and 5,108, respectively).

Altogether, an individual Hawaiian monk seal and Guadalupe fur seal would be taken no more than a few days in any year with none of the expected take anticipated to affect individual reproduction or survival, let alone annual rates of recruitment and survival. With all other stocks, only a very small portion of the stock will be taken in any manner. Of those taken, some individuals will be taken by Level B harassment (at a moderate or sometimes low level) over several days a year, and some smaller portion of those taken will be on a relatively moderate to high number of days across the year (up to 58), a fair number of which would likely be sequential days. Though the majority of impacts are expected to be of a lower to sometimes moderate severity, the repeated takes over a potentially fair number of sequential days for some individuals makes it more likely that some number of individuals could be interrupted during foraging in a manner and amount such that impacts to the energy budgets of females (from either losing feeding opportunities or expending considerable energy to find alternative feeding options) could cause them to forego reproduction for a year (energetic impacts to males are generally meaningless to population rates unless they cause death, and it takes extreme energy deficits beyond what would ever be likely to result from these activities to cause the death of an adult marine mammal). As noted previously, however, foregone reproduction (especially for only 1 year within 7, which is the maximum predicted because the small number anticipated in any 1 year makes the probability that any individual would be impacted in this way twice in 7 years very low) has far less of an impact on population rates than mortality and a relatively small number of instances of foregone reproduction (as compared to the stock abundance and residual PBR) would not be expected to adversely affect the stock through effects on annual rates of recruitment or survival, especially given the status of these stocks. Accordingly, we do not anticipate the relatively small number of individual northern fur seals or harbor seals that might be taken over repeated days within the year in a manner that results in 1 year of foregone reproduction to adversely affect the stocks through effects on rates of recruitment or survival, given the status of the stocks, which are respectively increasing and stable with abundances and residual PBRs of 14,050/30,968 and 449/1,598.

For California sea lions, given the very high abundance and residual PBR (257,606 and 13,684, respectively), as well as the increasing status of the stock in the presence of similar levels of Navy activities over past years—the impacts of 0.71 annual mortalities, potential foregone reproduction for up to nine individuals in a year taken by tissue damage, and some relatively small number of individuals taken as a result of repeated behavioral harassment over a fair number of sequential days are not expected to adversely affect the stock through effects on annual rates of recruitment or survival. Similarly, for northern elephant seals, given the very high abundance and residual PBR (187,386 and 5,108, respectively), as well as the increasing status of the stock in the presence of similar levels of Navy activities over past years, the impacts of potential foregone reproduction for up to two individuals in a year taken by tissue damage and some relatively small number of individuals taken as a result of repeated behavioral harassment over a fair number of sequential days are not expected to adversely affect the stock through effects on annual rates of recruitment or survival. For these reasons, in consideration of all of the effects of the Navy's activities combined (M/SI, Level A harassment, and Level B harassment), we have preliminarily determined that the authorized take proposed would have a negligible impact on all pinniped species and stocks.

Preliminary Determination

The 2018 HSTT final rule included a detailed discussion of all of the anticipated impacts on the affected species and stocks from serious injury or mortality, Level A harassment, and Level B harassment; impacts on habitat; and how the Navy's mitigation and monitoring measures reduce the number and/or severity of adverse effects. We have evaluated how these impacts as well as an additional proposed take of two large whales by serious injury or mortality by vessel strike, and the proposed mitigation measures are expected to combine, annually, to affect individuals of each species and stock. Those effects were then evaluated in the context of whether they are reasonably likely to impact reproductive success or survivorship of individuals and then, if so, further analyzed to determine whether there would be effects on annual rates of recruitment or survival that would adversely affect the species or stock.

As described above, the basis for the negligible impact determination is the assessment of effects on annual rates of recruitment and survival. Accordingly, the analysis included in the 2018 HSTT final rule and 2020 HSTT final rule used annual activity levels, the best available science, and approved methods to predict the annual impacts to marine mammals, which were then analyzed in the context of whether each species or stock would incur more than a negligible impact based on anticipated adverse impacts to annual rates of recruitment or survival. As we have described above, none of the factors upon which the conclusions in the 2020 HSTT final rule were based have changed, with the exception of estimated take by vessel strike. Therefore, even though this proposed rule includes two additional takes by vessel strike, little has changed that would change our 2018 HSTT final rule and subsequent 2020 HSTT final rule analyses, and it is appropriate to rely on those analyses, as well as the new information and analysis discussed above, for this proposed rule.

Based on the applicable information and analysis from the 2018 HSTT final rule and 2020 HSTT final rule, as updated with the information and analysis contained herein on the potential and likely effects of the specified activities on the affected marine mammals and their habitat, and taking into consideration the implementation of the monitoring and mitigation measures, NMFS preliminarily finds that the incidental take from the specified activities will have a negligible impact on all affected marine mammal species and stocks.

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 preliminarily determined that the total taking affecting species or stocks would not have an unmitigable adverse impact on the availability of such species or stocks for taking for subsistence purposes.

Classification

Endangered Species Act

There are nine marine mammal species under NMFS jurisdiction that are listed as endangered or threatened under the ESA with confirmed or possible occurrence in the HSTT Study Area: blue whale (Eastern and Central North Pacific stocks), fin whale (CA/OR/WA and Hawaii stocks), gray whale (Western North Pacific stock), humpback whale (Mexico and Central America DPSs), sei whale (Eastern North Pacific and Hawaii stocks), sperm whale (CA/OR/WA and Hawaii stocks), false killer whale (Main Hawaiian Islands Insular), Hawaiian monk seal (Hawaii stock), and Guadalupe fur seal (Mexico to California). There is also ESA-designated critical habitat for Hawaiian monk seals and Main Hawaiian Islands Insular false killer whales. The Navy consulted with NMFS pursuant to section 7 of the ESA for HSTT activities. NMFS also consulted internally on the issuance of the 2018 HSTT regulations and LOAs under section 101(a)(5)(A) of the MMPA.

NMFS issued a Biological Opinion on December 10, 2018 concluding that the issuance of the 2018 HSTT final rule and subsequent LOAs are not likely to jeopardize the continued existence of the threatened and endangered species under NMFS' jurisdiction and are not likely to result in the destruction or adverse modification of critical habitat in the HSTT Study Area. The 2018 Biological Opinion included specified conditions under which NMFS would be required to reinitiate section 7 consultation. NMFS reviewed these specified conditions for the 2020 HSTT rulemaking and determined that reinitiation of consultation was not warranted. The incidental take statement that accompanied the 2018 Biological Opinion was amended to cover the 7-year period of the 2020 HSTT rule. The 2018 Biological Opinion for this action is available at *https://www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-military-readiness-activities*.

The 2018 Biological Opinion reinitiation clause (2), states that formal consultation should be reinitiated if ''new information reveals effects of the agency action that may affect ESA-listed species or critical habitat in a manner or to an extent not previously considered.'' Given the new information regarding the recent occurrence of large whale strikes by naval vessels in the southern California portion of the HSTT Study Area, as described herein, the Navy has reinitiated consultation with NMFS pursuant to section 7 of the ESA for HSTT Study Area activities, and NMFS has also reinitiated consultation internally on the issuance of these proposed, revised regulations and LOAs under section 101(a)(5)(A) of the MMPA.

National Marine Sanctuaries Act

Federal agency actions that are likely to injure national marine sanctuary resources are subject to consultation with the Office of National Marine Sanctuaries (ONMS) under section 304(d) of the National Marine Sanctuaries Act (NMSA). There are two national marine sanctuaries in the HSTT Study Area, the Hawaiian Islands Humpback Whale National Marine Sanctuary and the Channel Islands National Marine Sanctuary. NMFS will work with NOAA's ONMS to fulfill our responsibilities under the NMSA as warranted and will complete any NMSA requirements prior to a determination on the issuance of the final rule and LOAs.

National Environmental Policy Act

To comply with the National Environmental Policy Act of 1969 (NEPA; 42 U.S.C. 4321 *et seq.*) and NOAA Administrative Order (NAO) 216–6A, NMFS must evaluate our proposed actions and alternatives with respect to potential impacts on the human environment. NMFS participated as a cooperating agency on the 2018 HSTT FEIS/OEIS (published on October 26, 2018, *http://www.hstteis.com*) which evaluated impacts from Navy training and testing activities in the HSTT Study Area for the reasonably foreseeable future (including through 2025). In accordance with 40 CFR 1506.3, NMFS independently reviewed and evaluated the 2018 HSTT FEIS/OEIS and determined that it was adequate and sufficient to meet our responsibilities under NEPA for the issuance of the 2018 HSTT final rule and associated LOAs. NMFS therefore adopted the 2018 HSTT FEIS/OEIS.

In accordance with 40 CFR 1502.9 and the information and analysis contained in this proposed rule, the Navy and NMFS as a cooperating agency have made a preliminary determination that this proposed rule and any subsequent LOAs would not result in significant impacts that were not fully considered in the 2018 HSTT FEIS/OEIS. As indicated in this proposed rule, the Navy has made no substantial changes to the activities nor are there significant new circumstances or information relevant to environmental concerns or their impacts. NMFS will make a final NEPA determination prior to a decision whether to issue a final rule.

Regulatory Flexibility Act

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

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

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: September 26, 2023.

Samuel D. Rauch III,

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

For reasons set forth in the preamble, NMFS proposes to amend 50 CFR part 218 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.*

■ 2. Revise subpart H to read as follows:

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

Sec.

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

§ 218.70 Specified activity and geographical region.

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

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

(1) *Training.* (i) Amphibious warfare;

(ii) Anti-submarine warfare;

(iii) Electronic warfare;

(iv) Expeditionary warfare;

(v) Mine warfare;

(vi) Surface warfare; and

(vii) Pile driving.

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

(ii) Naval Sea System Command Testing Activities;

(iii) Office of Naval Research Testing Activities; and

(iv) Naval Information Warfare Systems Command.

§ 218.71 Effective dates.

Regulations in this subpart are effective from [date of publication of a final rule in the **Federal Register**] through December 20, 2025.

§ 218.72 Permissible methods of taking.

(a) Under LOAs issued pursuant to §§ 216.106 of this chapter and 218.76, the Holder of the LOAs (hereinafter ''Navy'') may incidentally, but not intentionally, take marine mammals within the area described in § 218.70(b) by Level A harassment and Level B harassment associated with the use of active sonar and other acoustic sources and explosives as well as serious injury or mortality associated with vessel strikes and explosives, provided the activity is in compliance with all terms, conditions, and requirements of these regulations in this subpart and the applicable LOAs.

(b) The incidental take of marine mammals by the activities listed in § 218.70(c) is limited to the following species:

TABLE 1 TO PARAGRAPH (b)

Species	Stock
Blue whale	Central North Pacific.
Blue whale	Eastern North Pacific.
Bryde's whale	Eastern Tropical Pacific.
Bryde's whale	Hawaii.
Fin whale	CA/OR/WA.
Fin whale	Hawaii.
Humpback whale	Central America/Southern Mexico—CA/OR/WA.
Humpback whale	Mainland Mexico—CA/OR/WA.
Humpback whale	Hawaii.
Minke whale	CA/OR/WA.
Minke whale	Hawaii.
Sei whale	Eastern North Pacific.
Sei whale	Hawaii.
Gray whale	Eastern North Pacific.
Gray whale	Western North Pacific.
Sperm whale	CA/OR/WA.
Sperm whale	Hawaii.
Dwarf sperm whale	Hawaii.
Pygmy sperm whale	Hawaii.
Kogia whales	CA/OR/WA.
Baird's beaked whale	CA/OR/WA.
Blainville's beaked whale	Hawaii.
Cuvier's beaked whale	CA/OR/WA.
Cuvier's beaked whale	Hawaii.
Longman's beaked whale	Hawaii.
Mesoplodon spp	CA/OR/WA.
Bottlenose dolphin	California Coastal.
Bottlenose dolphin	CA/OR/WA Offshore.
Bottlenose dolphin	Hawaii Pelagic.
Bottlenose dolphin	Kauai & Niihau.
Bottlenose dolphin	Oahu.
Bottlenose dolphin	4-Island.

TABLE 1 TO PARAGRAPH (b)—Continued

Species	Stock
Bottlenose dolphin	Hawaii.
False killer whale	Hawaii Pelagic.
False killer whale	Main Hawaiian Islands Insular.
False killer whale	Northwestern Hawaiian Islands.
Fraser's dolphin	Hawaii.
Killer whale	Eastern North Pacific (ENP) Offshore.
Killer whale	ENP Transient/West Coast Transient.
Killer whale	Hawaii.
Long-beaked common dolphin	California.
Melon-headed whale	Hawaiian Islands.
Melon-headed whale	Kohala Resident.
Northern right whale dolphin	CA/OR/WA.
Pacific white-sided dolphin	CA/OR/WA.
Pantropical spotted dolphin	Hawaii Island.
Pantropical spotted dolphin	Hawaii Pelagic.
Pantropical spotted dolphin	Oahu.
Pantropical spotted dolphin	4-Island.
Pygmy killer whale	Hawaii.
Pygmy killer whale	Tropical.
Risso's dolphin	CA/OR/WA.
Risso's dolphin	Hawaii.
Rough-toothed dolphin	Hawaii.
Short-beaked common dolphin	CA/OR/WA.
Short-finned pilot whale	CA/OR/WA.
Short-finned pilot whale	Hawaii.
Spinner dolphin	Hawaii Island.
Spinner dolphin	Hawaii Pelagic.
Spinner dolphin	Kauai & Niihau.
Spinner dolphin	Oahu & 4-Island.
Striped dolphin	CA/OR/WA.
Striped dolphin	Hawaii.
Dall's porpoise	CA/OR/WA.
California sea lion	U.S.
Guadalupe fur seal	Mexico.
Northern fur seal	California.
Harbor seal	California.
Hawaiian monk seal	Hawaii.
Northern elephant seal	California.

Note to Table 1: CA/OR/WA = California/Oregon/Washington.

§ 218.73 Prohibitions.

Notwithstanding incidental takings contemplated in § 218.72(a) and authorized by LOAs issued under §§ 216.106 of this chapter and 218.76, no person in connection with the activities listed in § 218.70(c) may:

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

(b) Take any marine mammal not specified in § 218.72(b);

(c) Take any marine mammal specified in § 218.72(b) in any manner other than as specified in the LOAs; or

(d) Take a marine mammal specified in § 218.72(b) if NMFS determines such taking results in more than a negligible impact on the species or stocks of such marine mammal.

§ 218.74 Mitigation requirements.

When conducting the activities identified in § 218.70(c), the mitigation measures contained in any LOAs issued under §§ 216.106 of this chapter and 218.76 must be implemented. These mitigation measures 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 HSTT Study Area for each applicable activity category or stressor category and includes acoustic stressors (*i.e.,* active sonar, air guns, pile driving, weapons firing noise), explosive stressors (*i.e.,* sonobuoys, torpedoes, medium-caliber and large-caliber projectiles, missiles and rockets, bombs, sinking exercises, mines, anti-swimmer grenades, and mat weave and obstacle loading), and physical disturbance and strike stressors (*i.e.,* vessel movement; towed in-water devices; small-, medium-, and large-caliber non-explosive practice munitions; non-explosive missiles and rockets; 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 activity reporting under the specified activities will complete one or more modules identified in their career path training plan, as specified in the LOAs.

(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 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 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 on the ship or aircraft conducting the activity.

(ii) *Mitigation zone and requirements.* During the activity, at 1,000 yards (yd) Navy personnel must power down 6 decibels (dB), at 500 yd (457.2 m) Navy personnel must power down an additional 4 dB (for a total of 10 dB), and at 200 yd (182.9 m) Navy personnel must shut down for low-frequency active sonar ≥200 dB and hull-mounted mid-frequency active sonar; or at 200 yd (182.9 m) Navy personnel must shut down for low-frequency active sonar <200 dB, mid-frequency active sonar sources that are not hull-mounted, and high-frequency active sonar.

(A) *Prior to activity.* Prior to the start of the activity (*e.g.,* when maneuvering on station), Navy personnel must observe the mitigation zone for floating vegetation; if floating vegetation is observed, Navy personnel must relocate or delay the start of active sonar transmission until the mitigation zone is clear. Navy personnel must also 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.* 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 (914.4 m) of the sonar source; power down by an additional 4 dB (for a total of 10 dB total) if marine mammals are observed within 500 yd (457.2 m) of the sonar source; and cease transmission if marine mammals are observed within 200 yd (182.9 m) 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.* 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 (182.9 m) 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:

(*1*) *Observed exiting.* The animal is observed exiting the mitigation zone;

(*2*) *Thought to have exited.* 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*) *Clear from additional sightings.* 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;

(*4*) *Sonar source transit.* 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*) *Bow-riding dolphins.* For activities using hull-mounted sonar where a dolphin(s) is observed in the mitigation zone, the Lookout concludes that the dolphin(s) are deliberately closing in on the ship to ride the ship's bow wave, and are therefore out of the main transmission axis of the sonar (and there are no other marine mammal sightings within the mitigation zone).

(3) *Air guns*—(i) *Number of Lookouts and observation platform.* One Lookout positioned on a ship or pierside.

(ii) *Mitigation zone and requirements.* 150 yd (137.2 m) around the air gun.

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

(B) *During activity.* During the activity, Navy personnel must observe the mitigation zone for marine mammals; if marine mammals are observed, Navy personnel must cease air gun use.

(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 air gun use) until one of the following conditions has been met:

(*1*) *Observed exiting.* The animal is observed exiting the mitigation zone;

(*2*) *Thought to have exited.* The animal is thought to have exited the mitigation zone based on a determination of its course, speed, and movement relative to the air gun;

(*3*) *Clear from additional sightings.* The mitigation zone has been clear from any additional sightings for 30 min; or

(*4*) *Air gun transit.* For mobile activities, the air gun has transited a distance equal to double that of the mitigation zone size beyond the location of the last sighting.

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

(i) *Number of Lookouts and observation platform.* One Lookout must be positioned on the shore, the elevated causeway, or a small boat.

(ii) *Mitigation zone and requirements.* 100 yd (91.4 m) around the pile driver.

(A) *Prior to activity.* Prior to the initial start of the activity (for 30 min), Navy personnel must observe the mitigation zone for floating vegetation; if floating vegetation is observed, Navy personnel must delay the start until the mitigation zone is clear. Navy personnel also must observe the mitigation zone for marine mammals; if marine mammals are observed, Navy personnel must delay the start of pile driving or vibratory pile extraction.

(B) *During activity.* During the activity, Navy personnel must observe the mitigation zone for marine mammals; if marine mammals are observed, Navy personnel must cease impact pile driving or vibratory pile extraction.

(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 pile driving or pile extraction) until one of the following conditions has been met:

(*1*) *Observed exiting.* The animal is observed exiting the mitigation zone;

(*2*) *Thought to have exited.* The animal is thought to have exited the mitigation zone based on a determination of its course, speed, and movement relative to the pile driving location; or

(*3*) *Clear from additional sightings.* The mitigation zone has been clear from any additional sightings for 30 minutes.

(5) *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)(8)(i) and (a)(18)(i) of this section.

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

(A) *Prior to activity.* Prior to the start of the activity, Navy personnel must observe the mitigation zone for floating vegetation; if floating vegetation is observed, Navy personnel must relocate or delay the start of weapons firing until the mitigation zone is clear. Navy personnel must also 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 activity.* 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:

(*1*) *Observed exiting.* The animal is observed exiting the mitigation zone;

(*2*) *Thought to have exited.* 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*) *Clear from additional sightings.* The mitigation zone has been clear from any additional sightings for 30 min; or

(*4*) *Firing ship transit.* For mobile activities, the firing ship has transited a distance equal to double that of the mitigation zone size beyond the location of the last sighting.

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

(ii) *Mitigation zone and requirements.* 600 yd (548.6 m) around an explosive sonobuoy.

(A) *Prior to activity.* Prior to the initial start of the activity (*e.g.,* during deployment of a sonobuoy field, which typically lasts 20–30 min), Navy personnel must observe the mitigation zone for floating vegetation; if floating vegetation is observed, Navy personnel must relocate or delay the start of sonobuoy or source/receiver pair detonations until the mitigation zone is clear. 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.

(B) *During activity.* 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.

(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 detonations) until one of the following conditions has been met:

(*1*) *Observed exiting.* The animal is observed exiting the mitigation zone;

(*2*) *Thought to have exited.* 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*) *Clear from additional sightings.* 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.

(D) *After activity.* 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), these Navy assets must assist in the visual observation of the area where detonations occurred.

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

(ii) *Mitigation zone and requirements.* 2,100 yd around the intended impact location.

(A) *Prior to activity.* Prior to the initial start of the activity (*e.g.,* during deployment of the target), Navy personnel must observe the mitigation zone for floating vegetation and jellyfish aggregations; if floating vegetation or jellyfish aggregations are observed, Navy personnel must relocate or delay the start of firing until the mitigation zone is clear. 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.

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

(C) *Commencement/recommencement conditions after a marine mammal sighting before or during the activity.* Navy personnel must allow a sighted marine mammal to leave the mitigation zone prior to the initial start of the activity (by delaying the start) or during the activity (by not recommencing firing) until one of the following conditions has been met:

(*1*) *Observed exiting.* The animal is observed exiting the mitigation zone;

(*2*) *Thought to have exited.* 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*) *Clear from additional sightings.* The mitigation zone has been clear from any additional sightings for 10 min when the activity involves aircraft that have fuel constraints, or 30 min when

the activity involves aircraft that are not typically fuel constrained.

(D) *After activity.* 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), these Navy assets must assist in the visual observation of the area where detonations occurred.

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

(i) *Number of Lookouts and observation platform.* One Lookout 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)(5)(i) of this section. If additional platforms are participating in the activity, Navy personnel positioned in those assets (*e.g.,* safety observers, evaluators) must support observing the mitigation zone for applicable biological resources while performing their regular duties.

(ii) *Mitigation zone and requirements*—(A) *Air-to-surface activities.* 200 yd (182.9 m) around the intended impact location for air-to-surface activities using explosive medium-caliber projectiles.

(B) *Surface-to-surface activities, medium-caliber.* 600 yd (548.6 m) around the intended impact location for surface-to-surface activities using explosive medium-caliber projectiles.

(C) *Surface-to-surface activities, large-caliber.* 1,000 yd (914.4 m) around the intended impact location for surface-to-surface activities using explosive large-caliber projectiles.

(D) *Prior to activity.* Prior to the start of the activity (*e.g.,* when maneuvering on station), Navy personnel must observe the mitigation zone for floating vegetation; if floating vegetation is observed, Navy personnel must relocate or delay the start of firing until the mitigation zone is clear. Navy personnel also 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 activity.* During the activity, Navy personnel must observe 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:

(*1*) *Observed exiting.* The animal is observed exiting the mitigation zone;

(*2*) *Thought to have exited.* 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*) *Clear from additional sightings.* 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 activity.* 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), these Navy assets must assist in the visual observation of the area where detonations occurred.

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

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

(ii) *Mitigation zone and requirements*—(A) *Missiles or rockets with 0.6–20 lb net explosive weight.* 900 yd (823 m) around the intended impact location for missiles or rockets with 0.6–20 lb net explosive weight.

(B) *Missiles with 21–500 lb net explosive weight.* 2,000 yd (1,828.8 m) around the intended impact location for missiles with 21–500 lb net explosive weight.

(C) *Prior to activity.* Prior to the initial start of the activity (*e.g.,* during a fly-over of the mitigation zone), Navy personnel must observe the mitigation zone for floating vegetation; if floating vegetation is observed, Navy personnel must relocate or delay the start of firing until the mitigation zone is clear. Navy personnel also 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 activity.* During the activity, Navy personnel must observe 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:

(*1*) *Observed exiting.* The animal is observed exiting the mitigation zone;

(*2*) *Thought to have exited.* 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*) *Clear from additional sightings.* 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 activity.* 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), these Navy assets will assist in the visual observation of the area where detonations occurred.

(10) *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 in those assets (*e.g.,* safety observers, evaluators) must support observing the mitigation zone for applicable biological resources while performing their regular duties.

(ii) *Mitigation zone and requirements.* 2,500 yd (2,286 m) around the intended target.

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

(B) *During activity.* 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.

(C) *Commencement/recommencement conditions after a marine mammal sighting before or during the activity.* Navy personnel must allow a sighted marine mammal to leave the mitigation zone prior to the initial start of the activity (by delaying the start) or during the activity (by not recommencing bomb deployment) until one of the following conditions has been met:

(*1*) *Observed exiting.* The animal is observed exiting the mitigation zone;

(*2*) *Thought to have exited.* 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*) *Clear from additional sightings.* The mitigation zone has been clear from any additional sightings for 10 min; or for activities using mobile targets, the intended target has transited a distance equal to double that of the mitigation zone size beyond the location of the last sighting.

(D) *After activity.* 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), these Navy assets must assist in the visual observation of the area where detonations occurred.

(11) *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 in those assets (*e.g.,* safety observers, evaluators) must support observing the mitigation zone for applicable biological resources while performing their regular duties.

(ii) *Mitigation zone and requirements.* 2.5 nautical miles (nmi) around the target ship hulk.

(A) *Prior to activity.* 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 floating vegetation and jellyfish aggregations; if floating vegetation or jellyfish aggregations are observed, Navy personnel must delay the start of firing until the mitigation zone is clear. Navy personnel also must conduct aerial observations of the mitigation zone for marine mammals; if marine mammals are observed, Navy personnel must delay the start of firing.

(B) *During activity.* 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 2 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.

(C) *Commencement/recommencement conditions after a marine mammal sighting before or during the activity.* Navy personnel must allow a sighted marine mammal to leave the mitigation zone prior to the initial start of the activity (by delaying the start) or during the activity (by not recommencing firing) until one of the following conditions has been met:

(*1*) *Observed exiting.* The animal is observed exiting the mitigation zone;

(*2*) *Thought to have exited.* 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*) *Clear from additional sightings.* The mitigation zone has been clear from any additional sightings for 30 minutes.

(D) *After activity.* After completion of the activity (for 2 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), these Navy assets will assist in the visual observation of the area where detonations occurred.

(12) *Explosive mine countermeasure and neutralization activities*—(i) *Number of Lookouts and observation platform*—(A) *Smaller mitigation zone.* One Lookout must be positioned on a vessel or in an aircraft when implementing the smaller mitigation zone.

(B) *Larger mitigation zone.* Two Lookouts (one must be positioned in an aircraft and one must be on a small boat) when implementing the larger mitigation zone.

(C) *Additional platforms.* If additional platforms are participating in the activity, Navy personnel positioned in those assets (*e.g.,* safety observers, evaluators) must support observing the mitigation zone for applicable biological resources while performing their regular duties.

(ii) *Mitigation zone and requirements.* (A) *Activities using 0.1–5 lb net explosive weight.* 600 yd (548.6 m) around the detonation site for activities using 0.1–5 lb net explosive weight.

(B) *Activities using 6–650 lb net explosive weight.* 2,100 yd (1,920.2 m) around the detonation site for activities using 6–650 lb net explosive weight (including high explosive target mines).

(C) *Prior to activity.* 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 floating vegetation; if floating vegetation is observed, Navy personnel must relocate or delay the start of detonations until the mitigation zone is clear. Navy personnel also must observe the mitigation zone for marine mammals; if marine mammals are observed, Navy personnel must relocate or delay the start of detonations.

(D) *During activity.* During the activity, Navy personnel must observe the mitigation zone for marine mammals, concentrations of seabirds,

and individual foraging seabirds; if marine mammals, concentrations of seabirds, or individual foraging seabirds are observed, Navy personnel must cease detonations.

(E) *Commencement/recommencement conditions after a marine mammal sighting before or during the activity or a sighting of seabird concentrations or individual foraging seabirds during the activity.* Navy personnel must allow a sighted animal 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*) *Observed exiting.* The animal is observed exiting the mitigation zone;

(*2*) *Thought to have exited.* 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*) *Clear from additional sightings.* 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 activity.* 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), these Navy assets must assist in the visual observation of the area where detonations occurred.

(13) *Explosive mine neutralization activities involving Navy divers*—(i) *Number of Lookouts and observation platform*—(A) *Smaller mitigation zone.* 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) *Larger mitigation zone.* Four Lookouts (two small boats with two Lookouts each), and a pilot or member of an aircrew must serve as an additional Lookout if aircraft are used during the activity, when implementing the larger mitigation zone.

(C) *Divers.* 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) *Additional platforms.* If additional platforms are participating in the activity, Navy personnel positioned in those assets (*e.g.,* safety observers, evaluators) must support observing the mitigation zone for applicable biological resources while performing their regular duties.

(ii) *Mitigation zone and requirements*—(A) *Activities under positive control using 0.1–20 lb net explosive weight.* 500 yd (457.2 m) around the detonation site during activities under positive control using 0.1–20 lb net explosive weight.

(B) *Activities under positive control using 21–60 lb net explosive weight charges.* 1,000 yd (914.4 m) around the detonation site during all activities using time-delay fuses (0.1–29 lb net explosive weight) and during activities under positive control using 21–60 lb net explosive weight charges.

(C) *Prior to activity.* Prior to the initial start of the activity (*e.g.,* when maneuvering on station for activities under positive control; 30 min for activities using time-delay firing devices), Navy personnel must observe the mitigation zone for floating vegetation; if floating vegetation is observed, Navy personnel must relocate or delay the start of detonations or fuse initiation until the mitigation zone is clear. Navy personnel also 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.

(D) *During activity.* During the activity, Navy personnel must observe the mitigation zone for marine mammals, concentrations of seabirds, and individual foraging seabirds (in the water and not on shore); if marine mammals, concentrations of seabirds, or individual foraging seabirds are observed, Navy personnel 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 (0.1–29 lb net explosive weight) to exceed 10 minutes.

(E) *Commencement/recommencement conditions after a marine mammal sighting before or during the activity or a sighting of seabird concentrations or individual foraging seabirds during the activity.* Navy personnel must allow a sighted animal 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*) *Observed exiting.* The animal is observed exiting the mitigation zone;

(*2*) *Thought to have exited.* The animal is thought to have exited the mitigation zone based on a determination of its course, speed, and movement relative to the detonation site; or

(*3*) *Clear from additional sightings.* The mitigation zone has been clear from any additional sightings for 10 min during activities under positive control with aircraft that have fuel constraints, or 30 min during activities under positive control with aircraft that are not typically fuel constrained and during activities using time-delay firing devices.

(F) *After activity.* After completion of an activity (for 30 min), the Navy must observe for marine mammals for 30 minutes. 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), these Navy assets must assist in the visual observation of the area where detonations occurred.

(14) *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 in those assets (*e.g.,* safety observers, evaluators) must support observing the mitigation zone for applicable biological resources while performing their regular duties.

(ii) *Mitigation zone and requirements.* 200 yd (182.9 m) around the intended detonation location.

(A) *Prior to activity.* Prior to the initial start of the activity (*e.g.,* when maneuvering on station), Navy personnel must observe the mitigation zone for floating vegetation; if floating vegetation is observed, Navy personnel

must relocate or delay the start of detonations until the mitigation zone is clear. Navy personnel also must observe the mitigation zone for marine mammals; if marine mammals are observed, Navy personnel must relocate or delay the start of detonations.

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

(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 detonations) until one of the following conditions has been met:

(*1*) *Observed exiting.* The animal is observed exiting the mitigation zone;

(*2*) *Thought to have exited.* 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*) *Clear from additional sightings.* The mitigation zone has been clear from any additional sightings for 30 min; or

(*4*) *Detonation location transit.* The intended detonation location has transited a distance equal to double that of the mitigation zone size beyond the location of the last sighting.

(D) *After activity.* 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), these Navy assets will assist in the visual observation of the area where detonations occurred.

(15) *Underwater demolition multiple charge—mat weave and obstacle loading exercises*—(i) *Number of Lookouts and observation platform.* Two Lookouts (one must be positioned on a small boat and one must be positioned on shore from an elevated platform). If additional platforms are participating in the activity, Navy personnel positioned in those assets (*e.g.,* safety observers, evaluators) must support observing the mitigation zone for applicable biological resources while performing their regular duties.

(ii) *Mitigation zone and requirements.* 700 yd (640.1 m) around the intended detonation location.

(A) *Prior to activity.* Prior to the initial start of the activity, or 30 min prior to the first detonation, the Lookout positioned on a small boat must observe the mitigation zone for floating vegetation and marine mammals; if floating vegetation or marine mammals are observed, Navy personnel must delay the start of detonations until the mitigation zone is clear. For 10 min prior to the first detonation, the Lookout positioned on shore must use binoculars to observe the mitigation zone for marine mammals; if marine mammals are observed, Navy personnel must delay the start of detonations.

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

(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 detonations) until one of the following conditions has been met:

(*1*) *Observed exiting.* The animal is observed exiting the mitigation zone;

(*2*) *Thought to have exited.* The animal is thought to have exited the mitigation zone based on a determination of its course, speed, and movement relative to the detonation location; or

(*3*) *Clear from additional sightings.* The mitigation zone has been clear from any additional sightings for 10 min (as determined by the Navy shore observer).

(D) *After activity.* After completion of the activity (for 30 min), the Lookout positioned on a small boat 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), these Navy assets must assist in the visual observation of the area where detonations occurred.

(16) *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 operated autonomously; or when impracticable based on mission requirements (*e.g.,* during Amphibious Assault—Battalion Landing exercise).

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

(ii) *Mitigation zone and requirements*—(A) *Whales.* 500 yd (457.2 m) around whales.

(B) *Marine mammals other than whales.* 200 yd (182.9 m) around all other marine mammals (except bow-riding dolphins and pinnipeds hauled out on man-made navigational structures, port structures, and vessels).

(iii) *During the activity.* When underway, Navy personnel must observe the mitigation zone for marine mammals; if marine mammals are observed, Navy personnel must maneuver (which may include reducing speed as the mission or circumstances allow) to maintain distance.

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

(v) *Post-strike alerts.* Navy personnel must send alerts to Navy vessels of increased risk of strike following any reported Navy vessel strike in the HSTT Study Area.

(vi) *Large whale aggregation alerts.* Navy personnel must issue real-time notifications to Navy vessels of large whale aggregations (four or more whales) within 1 nmi (1.9 km) of a Navy vessel in the area between 32–33 degrees North and 117.2–119.5 degrees West.

(17) *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.* 250 yd (228.6 m) around marine mammals.

(iii) *During the activity.* 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.

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

(i) *Number of Lookouts and observation platform.* One Lookout 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)(5)(i) of this section.

(ii) *Mitigation zone and requirements.* 200 yd (182.9 m) around the intended impact location.

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

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

(C) *Commencement/recommencement conditions after a marine mammal sighting before or during the activity.* Navy personnel must allow a sighted marine mammal to leave the mitigation zone prior to the initial start of the activity (by delaying the start) or during the activity (by not recommencing firing) until one of the following conditions has been met:

(*1*) *Observed exiting.* The animal is observed exiting the mitigation zone;

(*2*) *Thought to have exited.* 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*) *Clear from additional sightings.* 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*) *Impact location transit.* For activities using a mobile target, the intended impact location has transited a distance equal to double that of the mitigation zone size beyond the location of the last sighting.

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

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

(ii) *Mitigation zone and requirements.* 900 yd around the intended impact location.

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

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

(C) *Commencement/recommencement conditions after a marine mammal sighting prior to or during the activity.* Navy personnel must allow a sighted marine mammal to leave the mitigation zone prior to the initial start of the activity (by delaying the start) or during the activity (by not recommencing firing) until one of the following conditions has been met:

(*1*) *Observed exiting.* The animal is observed exiting the mitigation zone;

(*2*) *Thought to have exited.* 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*) *Clear from additional sightings.* The mitigation zone has been clear from any additional sightings for 10 min when the activity involves aircraft that have fuel constraints, or 30 min when the activity involves aircraft that are not typically fuel constrained.

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

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

(ii) *Mitigation zone and requirements.* 1,000 yd (914.4 m) around the intended target.

(A) *Prior to activity.* Prior to the initial start of the activity (*e.g.,* when arriving on station), Navy personnel must observe the mitigation zone for floating vegetation; if floating vegetation is observed, Navy personnel must relocate or delay the start of bomb deployment or mine laying until the mitigation zone is clear. Navy personnel also 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.

(B) *During activity.* 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.

(C) *Commencement/recommencement conditions after a marine mammal sighting prior to or during the activity.* Navy personnel must allow a sighted marine mammal to leave the mitigation zone prior to the initial start of the activity (by delaying the start) or during the activity (by not recommencing bomb deployment or mine laying) until one of the following conditions has been met:

(*1*) *Observed exiting.* The animal is observed exiting the mitigation zone;

(*2*) *Thought to have exited.* 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*) *Clear from additional sightings.* The mitigation zone has been clear from any additional sightings for 10 min; or

(*4*) *Target transit.* 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 in the Hawaii Range Complex for sonar, explosives, and vessel strikes*—(i) *Mitigation area requirements*—(A) *Hawaii Island Mitigation Area (year-round)*—(*1*) *MF1 surface ship hull-mounted mid-frequency active sonar, MF4 dipping sonar, or explosives.* Except as provided in paragraph (b)(1)(i)(A)(*2*) of this section, Navy personnel must not conduct more than 300 hours of MF1 surface ship hull-mounted mid-frequency active sonar or 20 hours of MF4 dipping sonar annually, or use explosives that could potentially result in takes of marine mammals during training and testing.

(*2*) *National security exception.* Should national security require conduct of more than 300 hours of MF1 surface ship hull-mounted mid-frequency active sonar or 20 hours of MF4 dipping sonar, or use of explosives that could potentially result in the take of marine mammals during training or testing, Naval units 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 or explosives usage) in its annual activity reports submitted to NMFS.

(B) *4-Islands Region Mitigation Area (November 15–April 15 for active sonar; year-round for explosives)*—(*1*) *MF1 surface ship hull-mounted mid-frequency active sonar or explosives.* Except as provided in paragraph (b)(1)(i)(B)(*2*) of this section, Navy personnel must not use MF1 surface ship hull-mounted mid-frequency active sonar or explosives that could potentially result in takes of marine mammals during training and testing.

(*2*) *National security exception.* Should national security require use of MF1 surface ship hull-mounted mid-frequency active sonar or explosives that could potentially result in the take of marine mammals during training or testing, Naval units 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 or explosives usage) in its annual activity reports submitted to NMFS.

(C) *Humpback Whale Special Reporting Areas (December 15–April 15).* Navy personnel must report the total hours of surface ship hull-mounted mid-frequency active sonar used in the special reporting areas in its annual training and testing activity reports submitted to NMFS.

(D) *Humpback Whale Awareness Notification Message Area (November–April)*—(*1*) *Seasonal awareness notification message.* Navy personnel must issue a seasonal awareness notification message to alert ships and aircraft operating in the area to the possible presence of concentrations of large whales, including humpback whales.

(*2*) *Vessel instruction.* 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 large whale species (including humpback whales).

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

(ii) [Reserved]

(2) *Mitigation areas for marine mammals in the southern California portion of the study area for sonar, explosives, and vessel strikes*—(i) *Mitigation area requirements*—(A) *San Diego Arc, San Nicolas Island, and Santa Monica/Long Beach Mitigation Areas (June 1–October 31)*—(*1*) *MF1 surface ship hull-mounted mid-frequency active sonar.* Except as provided in paragraph (b)(2)(i)(A)(*2*) of this section, Navy personnel must not conduct more than a total of 200 hours of MF1 surface ship hull-mounted mid-frequency active sonar in the combined areas, excluding normal maintenance and systems checks, during training and testing.

(*2*) *National security exception.* Should national security require conduct of more than 200 hours of MF1 surface ship hull-mounted mid-frequency active sonar in the combined areas during training and testing (excluding normal maintenance and systems checks), Naval units 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) in its annual activity reports submitted to NMFS.

(*3*) *Explosives in San Diego Arc Mitigation Area.* Except as provided in paragraph (b)(2)(i)(A)(*4*) of this section, within the San Diego Arc Mitigation Area, Navy personnel must not use explosives that could potentially result in the take of marine mammals during large-caliber gunnery, torpedo, bombing, and missile (including 2.75-inch rockets) activities during training and testing.

(*4*) *National security exception.* Should national security require use of explosives that could potentially result in the take of marine mammals during large-caliber gunnery, torpedo, bombing, and missile (including 2.75-inch rockets) activities during training or testing within the San Diego Arc Mitigation Area, Naval units 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.,* explosives usage) in its annual activity reports submitted to NMFS.

(*5*) *Explosives in San Nicolas Island Mitigation Area.* Except as provided in paragraph (b)(2)(i)(A)(*6*) of this section, within the San Nicolas Island Mitigation Area, Navy personnel must not use explosives that could potentially result in the take of marine mammals during mine warfare, large-caliber gunnery, torpedo, bombing, and missile (including 2.75-inch rockets) activities during training.

(*6*) *National security exception.* Should national security require use of explosives that could potentially result in the take of marine mammals during mine warfare, large-caliber gunnery, torpedo, bombing, and missile (including 2.75-inch rockets) activities during training in the San Nicolas Island Mitigation Area, Naval units 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.,* explosives usage) in its annual activity reports submitted to NMFS.

(*7*) *Explosives in the Santa Monica/Long Beach Mitigation Area.* Except as provided in paragraph (b)(2)(i)(A)(*8*) of this section, within the Santa Monica/Long Beach Mitigation Area, Navy personnel must not use explosives that could potentially result in the take of marine mammals during mine warfare, large-caliber gunnery, torpedo, bombing, and missile (including 2.75-inch rockets) activities during training and testing.

(*8*) *National security exception.* Should national security require use of explosives that could potentially result in the take of marine mammals during mine warfare, large-caliber gunnery, torpedo, bombing, and missile (including 2.75-inch rockets) activities during training or testing in the Santa Monica/Long Beach Mitigation Area, Naval units 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.,* explosives usage) in its annual activity reports submitted to NMFS.

(B) *Santa Barbara Island Mitigation Area (year-round)*—(*1*) *MF1 surface ship hull-mounted mid-frequency active sonar or explosives.* Except as provided in paragraph (b)(2)(i)(B)(*2*) of this section, Navy personnel must not use MF1 surface ship hull-mounted mid-frequency active sonar during training or testing, or explosives that could potentially result in the take of marine mammals during medium-caliber or large-caliber gunnery, torpedo, bombing, and missile (including 2.75-inch rockets) activities during training.

(*2*) *National security exception.* Should national security require use of MF1 surface ship hull-mounted mid-frequency active sonar during training or testing, or explosives that could potentially result in the take of marine mammals during medium-caliber or large-caliber gunnery, torpedo, bombing,

and missile (including 2.75-inch rockets) activities during training, Naval units 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 or explosives usage) in its annual activity reports submitted to NMFS.

(C) *Spring Large Whale Awareness Notification Message*—(*1*) *Awareness notification message.* Navy personnel must issue an awareness notification message to alert ships and aircraft operating in the area to the possible presence of concentrations of large whales, including blue whales, fin whales, and humpback whales.

(*2*) *Applicable period.* This message must apply to a period that is based on predicted oceanographic conditions for a given year.

(*3*) *Marine mammals and vessel transit.* To maintain safety of navigation and to avoid interactions with large whales during transits, Navy personnel must emphasize to vessels that when a marine mammal is spotted, this may be an indicator that additional marine mammals are present nearby, and increased vigilance and awareness of Navy personnel is warranted.

(*4*) *Platform use of message.* Platforms must 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.

(D) *Gray Whale (November–March) and Fin Whale (November–May) Awareness Notification Message Areas*—(*1*) *Seasonal awareness message.* Navy personnel must issue a seasonal awareness notification message to alert ships and aircraft operating in the area to the possible presence of concentrations of large whales, including gray whales, and fin whales.

(*2*) *Marine mammals and vessel transit.* 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 large whale species.

(*3*) *Platform use of message.* Platforms must 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.

(ii) [Reserved]

§ 218.75 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 § 218.70 is thought to have resulted in the mortality or serious injury of any marine mammals, or in any Level A harassment or Level B harassment take of marine mammals not identified in this subpart.

(b) *Monitoring and reporting under the LOAs.* The Navy must conduct all monitoring and reporting required under the LOAs, including abiding by the HSTT Study Area monitoring program. 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.* The Navy 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/national/marine-mammal-protection/incidental-take-authorizations-military-readiness-activities.*

(d) *Changes in Lookout Policies.* The Navy must report changes in its Lookout policies to NMFS as soon as practicable after a change is made.

(e) *Annual HSTT Study Area marine species monitoring report.* The Navy must submit an annual report of the HSTT Study Area monitoring describing the implementation and results from the previous calendar year. Data collection methods must be standardized across range complexes and study areas to allow for comparison in different geographic locations. The report must be submitted to the Director, Office of Protected Resources, NMFS, either within 3 months after the end of the calendar year, or within 3 months after the conclusion of the monitoring year, to be determined by the Adaptive Management process. This report will describe progress of knowledge made with respect to intermediate scientific objectives within the HSTT Study Area associated with the Integrated Comprehensive Monitoring Program (ICMP). Similar study questions must be treated together so that progress on each topic can be summarized across all Navy ranges. The report need not include analyses and content that does not provide direct assessment of cumulative progress on the monitoring plan study questions. As an alternative, the Navy may submit a multi-Range Complex annual Monitoring Plan report to fulfill this requirement. Such a report 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 HSTT, Gulf of Alaska, Mariana Islands, and Northwest Study Areas.

(f) *Annual HSTT Study Area training exercise report and testing activity report.* Each year, the Navy must submit two preliminary reports (Quick Look Report) detailing the status of authorized sound sources within 21 days after the anniversary of the date of issuance of each LOA to the Director, Office of Protected Resources, NMFS. Each year, the Navy must submit detailed reports to the Director, Office of Protected Resources, NMFS, within 3 months after the 1-year anniversary of the date of issuance of the LOA. The HSTT annual Training Exercise Report and Testing Activity Report can be consolidated with other exercise reports from other range complexes in the Pacific Ocean for a single Pacific Exercise Report, if desired. The annual reports must contain information on major training exercises (MTEs), Sinking Exercise (SINKEX) events, and a summary of all sound sources used, including within specific mitigation reporting areas, as described in paragraph (e)(3) through (5) of this section. The analysis in the detailed reports must be based on the accumulation of data from the current year's report and data collected from previous reports. The detailed reports must contain information identified in paragraphs (e)(1) through (7) of this section.

(1) *MTEs.* This section of the report must contain the following information for MTEs conducted in the HSTT Study Area.

(i) Exercise information (for each MTE).

(A) Exercise designator.

(B) Date that exercise began and ended.

(C) Location.

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

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

(F) Number and types of vessels, aircraft, 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, and location of sighting.

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

(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 animal was less than 200 yd (182.9 m), 200 to 500 yd (182.9 to 457.2 m), 500 to 1,000 yd (457.2 m to 914.4 m), 1,000 to 2,000 yd (914.4 m to 1,828.8 m), or greater than 2,000 yd (1,828.8 m) 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, dolphin, or pinniped).

(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 (182.9 m), 200 to 500 yd (182.9 to 457.2 m), 500 to 1,000 yd (457.2 m to 914.4 m), 1,000 to 2,000 yd (914.4 m to 1,828.8 m), or greater than 2,000 yd (1,828.8 m).

(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 acoustic sources *(e.g.,* pile driving and air gun activities); and

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

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

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

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

(7) *Sonar exercise notification.* The Navy must submit to NMFS (contact as specified in the LOA) an electronic report within 15 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.

(g) *Seven-year close-out comprehensive training and testing activity report.* This report must be included as part of the 2025 annual training and testing report. This report must provide the annual totals for each sound source bin with a comparison to the annual allowance and the 7-year total for each sound source bin with a comparison to the 7-year allowance. Additionally, if there were any changes to the sound source allowance, this report must include a discussion of why the change was made and include the analysis to support how the change did or did not result in a change in the 2018 HSTT FEIS/OEIS and final rule determinations. The draft report must be submitted within 3 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 3 months of receipt. The report will be considered final after the Navy has addressed NMFS' comments, or 3 months after the submittal of the draft if NMFS does not provide comments.

§ 218.76 Letters of Authorization.

(a) To incidentally take marine mammals pursuant to the regulations in

this subpart, the Navy must apply for and obtain LOAs in accordance with § 216.106 of this chapter.

(b) LOAs, unless suspended or revoked, may be effective for a period of time not to exceed December 20, 2025.

(c) If an LOA expires prior to December 20, 2025, 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 § 218.77(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 § 218.77.

(e) Each LOA must set forth:

(1) Permissible methods of incidental taking;

(2) Geographic areas for incidental taking;

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

(4) Requirements for monitoring and reporting.

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

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

§ 218.77 Renewals and modifications of Letters of Authorization.

(a) An LOA issued under §§ 216.106 of this chapter and 218.76 for the activity identified in § 218.70(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 stock 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 chapter and 218.76 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 monitoring from the previous year(s);

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

(C) Any information that reveals marine mammals may have been taken in a manner, extent, or number not authorized by 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 or stocks of marine mammals specified in LOAs issued pursuant to §§ 216.106 of this chapter and 218.76, an LOA may be modified without prior notice or opportunity for public comment. Notice would be published in the **Federal Register** within 30 days of the action.

§§ 218.78–218.79 [Reserved]

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