



MARINE MAMMAL COMMISSION

12 March 2020

Ms. Jolie Harrison, Chief
Permits and Conservation Division
Office of Protected Resources
National Marine Fisheries Service
1315 East-West Highway
Silver Spring, MD 20910-3226

Dear Ms. Harrison:

The Marine Mammal Commission (the Commission), in consultation with its Committee of Scientific Advisors on Marine Mammals, has reviewed the National Marine Fisheries Service's (NMFS) 31 January 2020 notice (85 Fed. Reg. 5782) and the letter of authorization (LOA) application submitted by the U.S. Navy (the Navy) seeking the extension of regulations under section 101(a)(5)(A) of the Marine Mammal Protection Act (the MMPA). The taking would be incidental to conducting training and research, development, test, and evaluation (testing) activities within the Mariana Islands Training and Testing (MITT) study area (Phase III activities¹) during a seven-year period. The Commission reviewed and provided recommendations in its [11 February 2019 letter](#) on the Navy's Draft Supplemental Environmental Impact Statement/Overseas Environmental Impact Statement (DSEIS) regarding conducting training and testing activities in the MITT study area.

Background

The Navy's MITT study area in the Pacific Ocean encompasses the waters around Guam and the Commonwealth of the Northern Mariana Islands, throughout the Mariana Islands Range Complex (MIRC), and in the transit corridor between MIRC and the Hawaii Range Complex. The proposed activities would involve the use of low-, mid-, high-, and very high-frequency active sonar, weapons systems, explosive and non-explosive practice munitions and ordnance, high-explosive underwater detonations, expended materials, electromagnetic devices, high-energy lasers, vessels, underwater vehicles, and aircraft. In addition to some time-area closures, mitigation measures would include visual monitoring² to implement delay and shut-down procedures³.

¹ NMFS authorized the Navy to conduct similar activities first under the Tactical Training Theater Assessment and Planning (TAP I) LOA applications and second under Phase II LOA applications.

² Passive acoustic monitoring would be required only for sinking exercises, explosive sonobuoys, and explosive torpedoes.

³ NMFS also would require the Navy to conduct pre- and post-activity monitoring during all explosive activities based on the Commission's recommendations for other Phase III proposed rules.

Density estimates

The Commission had recommended in previous letters regarding Navy Phase II activities that the Navy incorporate more refined data in its extrapolated density estimates, including for cetaceans in regions or seasons that have not been surveyed or for which data are scant. For Phase III activities in the Atlantic Fleet Training and Testing (AFTT) study area and Hawaii-Southern California Training and Testing (HSTT) study area, the Navy used more refined density estimation methods for cetaceans and accounted for uncertainty in those densities and the group size estimates⁴ that seeded its animat modeling. Department of the Navy (2018a) indicated that uncertainty in group size estimates for MITT was based on either Poisson or lognormal distributions but remained silent on whether uncertainty was incorporated in the density estimates and what, if any, distribution was used. Rather, Department of the Navy (2018a) merely noted that a compound Poisson-gamma distribution was used for incorporating uncertainty in density estimates for AFTT and a lognormal distribution was used for densities associated with HSTT. The Commission assumes that the Navy incorporated uncertainty in its density estimates for MITT similar to AFTT and HSTT, but inadvertently omitted that fact in Department of the Navy (2018a).

Since much of the MITT density data are based on survey data from either the Hawaiian Islands or Equatorial Pacific Ocean and the remaining data that originated from MITT are less than ideal because they were collected during surveys that were conducted in a Beaufort sea state (BSS) of 4 or higher⁵ (Fulling et al. 2011), it would have been prudent for the Navy to incorporate uncertainty in all of its density estimates. Department of the Navy (2018b) included coefficients of variation (CVs) for the various datasets; those could have been used to inform the relevant standard deviations and underlying distributions. The Commission recommends that NMFS clarify whether and how the Navy incorporated uncertainty in its density estimates for its animat modeling specific to MITT and if uncertainty was not incorporated, re-estimate the numbers of marine mammal takes based on the uncertainty inherent in the density estimates provided in Department of the Navy (2018b).

Criteria and thresholds

Thresholds in general—As stated in letters related to “NMFS’s Technical guidance for assessing the effects of anthropogenic sound on marine mammal hearing: Underwater acoustic thresholds for onset of permanent and temporary threshold shifts” (PTS and TTS, respectively; NMFS 2018), the Commission supports the weighting functions and associated thresholds as stipulated in Finneran (2018), which are the same as those used for Navy Phase III activities (Department of the Navy 2017b). Although several more recent studies provide additional information on behavioral audiograms (Branstetter et al. 2017, Kastelein et al. 2017b) and TTS (Kastelein et al. 2017a and c, Popov et al. 2017, Kastelein et al. 2018a and 2019a and b)⁶, only Branstetter et al. (2017) was discussed in the LOA application. NMFS did not discuss any of the new studies in the preamble to the proposed rule. The Commission appreciates that developing weighting functions and associated

⁴ Using means and standard deviations that varied based on either a compound Poisson-gamma or lognormal distribution for densities and Poisson, lognormal, or inverse Gaussian distribution for group sizes.

⁵ More than 95 percent of the survey effort occurred in a BSS of 4 or higher.

⁶ However, more recent data regarding behavior response from Kastelein et al. (2018b) were discussed.

thresholds is an extensive process⁷ and that the Navy cannot amend them with each new published dataset. However, the agencies should have specified whether those newer data corroborate the current weighting functions and associated thresholds. The Commission recommends that NMFS specify in the preamble to the final rule whether the data regarding behavioral audiograms (Branstetter et al. 2017, Kastelein et al. 2017b) and TTS (Kastelein et al. 2017a and c, Popov et al. 2017, Kastelein et al. 2018a and 2019a and b) support the continued use of the current weighting functions and PTS and TTS thresholds.

Behavior thresholds for non-impulsive sources—To further define its behavior thresholds for non-impulsive sources⁸, the Navy developed multiple⁹ Bayesian biphasic dose response functions¹⁰ (Bayesian BRFs) for Phase III activities. The Bayesian BRFs were a generalization of the monophasic functions previously developed¹¹ and applied to behavioral response data¹² (see Department of the Navy 2017b for specifics). The biphasic portions of the functions are intended to describe both level- and context-based responses as proposed in Ellison et al. (2011). At higher amplitudes, a level-based response relates the received sound level to the probability of a behavioral response; whereas, at lower amplitudes, sound can cue the presence, proximity, and approach of a sound source and stimulate a context-based response based on factors other than received sound level¹³. The Bayesian BRFs are reasonable and a much-needed improvement on the two dose response functions (BRFs)¹⁴ that the Navy had used for both TAP I and Phase II activities.

The Commission is concerned, however, that following the development of the BRFs, the Navy then implemented various cut-off distances beyond which it considered the potential for significant behavioral responses to be unlikely (Table C.4 in Department of the Navy 2017b). The Navy indicated it was likely that the context of the exposure is more important than the amplitude at large distances¹⁵ (Department of the Navy 2017b)—that is, the context-based response dominates the level-based response. The Commission agrees with that notion but notes that the Bayesian BRFs specifically incorporate those factors. Thus, including additional cut-off distances *contradicts* the data underlying the Bayesian BRFs, *negates* the intent of the functions themselves, and *underestimates* the numbers of takes.

Adding to the Commission's concerns is that the cut-off distances used by the Navy seem to be based on scant acoustic data from a single species each for beaked whales and mysticetes and tag data from Risso's dolphins. Interestingly, Risso's dolphins tens of kilometers from the source exhibited similar responses to those that were within hundreds of meters of the source (Southall et

⁷ More so than amending point density estimates.

⁸ Acoustic sources (i.e., sonars and other transducers).

⁹ For odontocetes, mysticetes, beaked whales, and pinnipeds. The Navy used the 120-dB re 1 μ Pa unweighted, step-function threshold for harbor porpoises as it had done for Phase II activities.

¹⁰ Comprising two truncated cumulative normal distribution functions with separate mean and standard deviation values, as well as upper and lower bounds. The model was fitted to data using the Markov Chain Monte Carlo algorithm.

¹¹ By Antunes et al. (2014) and Miller et al. (2014).

¹² From both wild and captive animals.

¹³ e.g., the animal's previous experience, separation distance between sound source and animal, and behavioral state including feeding, traveling, etc.

¹⁴ One for odontocetes and pinnipeds and one for mysticetes.

¹⁵ For example, the Navy indicated that the range to the basement level of 120 dB re 1 μ Pa for the BRFs from TAP I and Phase II sometimes extended to more than 150 km during activities involving the most powerful sonar sources (e.g., AN/SQS-53).

al. 2014). That is, the dolphins did not exhibit any clear, overt behavioral response to either the real mid-frequency active (MFA) source or the scaled MF source at either distance, and the scaled MF source had to be shut down from full power when the dolphins entered the 200-m shut-down zone. The Commission remains unconvinced of the appropriateness of the cut-off distances.

Moreover, depending on the activity and species, the cut-off distances could effectively eliminate a large portion of the estimated numbers of takes. For sonar bin MF1 (the most powerful mid-frequency active sonars), the estimated numbers of takes would be reduced to zero for odontocetes beginning where the probability of response is 40 percent and for beaked whales where the probability of response is 45 percent (Table 6.4–9 in the LOA application). For mysticetes, takes would be eliminated for MF1 sources at a received level of 154 dB re 1 μ Pa equating to a probability of response of 17 percent. While that percentage may seem inconsequential, the received level is in fact greater than the level at which actual context-based behavioral responses were observed for feeding blue whales (see Figure 3 in Goldbogen et al. 2013¹⁶). The Navy attempted to assuage the Commission's concerns¹⁷ in its response to comments regarding the AFTT DEIS¹⁸ by asserting that the use of the Bayesian BRFs in conjunction with the cut-off distances is currently the best known method for providing the public and regulators with a more realistic (but still conservative where some uncertainties exist) estimate of impacts and potential takes. Use of the cut-off distances is neither conservative nor realistic and effectively discounts the underlying data, including Goldbogen et al. (2013), upon which the BRFs are based.

Tyack and Thomas (2019) recently compared results between setting a threshold where 50 percent of the animals respond and using the actual Bayesian BRF, which led to an underestimation of effect by greater than two orders of magnitude¹⁹. Although the arbitrary cut-off distance in the Navy's example occurred where up to 45 percent of the animals respond, the behavioral impacts and takes of the various species have been underestimated as well. As noted by Tyack and Thomas (2019), given the shape of the dose-response function and how efficiently sound propagates in the ocean, the number of animals that are predicted to have a low probability of response may in fact represent the dominant impact from a given sound source. For all these reasons, the Commission recommends that NMFS refrain from using cut-off distances in conjunction with the Bayesian BRFs and re-estimate the numbers of marine mammal takes based solely on the Bayesian BRFs. Use of cut-off distances could be perceived as an attempt to reduce the numbers of takes, which is discussed in a subsequent section of this letter.

Behavior threshold for explosives—The Navy assumed a behavior threshold 5 dB lower than the TTS thresholds for each functional hearing group for explosives. That value was derived from observed onset behavioral responses of captive bottlenose dolphins during non-impulsive TTS testing²⁰ (Schlundt et al. 2000). The justification for the threshold itself is questionable, but more concerning is that the Navy continues to believe that marine mammals do not exhibit behavioral responses to single detonations (Department of the Navy 2017b)²¹. The Navy has asserted that the most likely

¹⁶ Data that also were used to derive the Bayesian BRFs.

¹⁷ See its [2 August 2017 letter](#) on AFTT.

¹⁸ Which NMFS also included in the preamble to the final rule (83 Fed. Reg. 57112)

¹⁹ By a factor of 280.

²⁰ Based on 1-sec tones.

²¹ Including certain gunnery exercises that involve several detonations of small munitions within a few seconds.

behavioral response would be a brief alerting or orienting response and significant behavioral reactions would not be expected to occur if no further detonations followed. Although there are no data to substantiate that assertion, the Navy notes that the same reasoning was used in previous ship shock trial final rules in 1998, 2001, and 2008. Without such data, there is no reason to continue to ascribe validity to assumptions made 10 to 20 years ago. Larger single detonations (such as explosive torpedo testing²²) would be expected to elicit ‘significant behavioral responses’²³. The Navy provided no evidence that an animal would exhibit a significant behavioral response to two 5-lb charges detonated within a few minutes of each other but would not exhibit a similar response for a single detonation of 50 lbs., let alone detonations of more than 500 lbs.

In response to the Commission’s comments on the AFTT and HSTT DEISs²⁴, the Navy indicated that there is no evidence to support that animals have significant behavioral reactions to temporally and spatially isolated explosions and that they had been monitoring detonations since the 1990s and have not observed those types of reactions. The Commission is unaware of the Navy having personnel on station to monitor marine mammal responses during large single detonations due to human safety concerns. For some activities (i.e., missiles launched from a ship), the target area isn’t cleared prior to the exercise and personnel are 28 to 139 km from the target site (see section 5.3.3.4 of the DSEIS). In other instances (i.e., missiles launched and bombs dropped from aircraft), the lookout is tasked primarily with clearing the mitigation zone and realistically only observes for animals in the central portion of that zone immediately prior to the activity commencing. Lookouts are not responsible for documenting an animal’s behavioral response to the activity, but rather are responsible for minimizing serious injuries to and mortalities of any observed animal. Additionally, the Navy was required to conduct post-activity monitoring for only a portion of its explosive activities, specifically during mine countermeasure and neutralization activities, explosive torpedo testing, and sinking exercises under the MITT Phase II final rule (50 C.F.R. § 218.94). Post-activity monitoring during those activities is conducted primarily to document injured and dead marine mammals²⁵, not behavioral responses. The Commission continues to believe that the Navy, and in turn NMFS, has not provided adequate justification for ignoring the possibility that single underwater detonations can cause a behavioral response and therefore again recommends that NMFS estimate and ultimately authorize behavior takes of marine mammals during *all* explosive activities, including those that involve single detonations.

Mortality and injury thresholds for explosives—The Commission notes that the constants and exponents²⁶ associated with the impulse metrics for both onset mortality and onset slight lung injury have been amended from those used in TAP I and Phase II activities. The Navy did not explain why the constants and exponents have changed while the underlying data²⁷ remain the same. The

²² With net explosive weights of 500 to 650 lbs (Bin E11 in Table 1.5–3 in the LOA application).

²³ Including the animals (1) altering their migration path, speed and heading, or diving behavior; (2) stopping or altering feeding, breeding, nursing, resting, or vocalization behavior; (3) avoiding the area near the source; or (4) displaying aggression or annoyance (e.g., tail slapping). These factors were described in Department of the Navy (2017b) and used by the Navy to differentiate behavioral response severity.

²⁴ See its [November 13 2017 letter](#) on HSTT.

²⁵ Similar to those measures included in section 218.94 of the proposed rule.

²⁶ The constants have increased and the exponents have decreased from 1/2 to 1/6.

²⁷ Based on Richmond et al. (1973), Yelverton et al. (1973), Yelverton and Richmond (1981), and Goertner (1982).

modifications yield smaller zones²⁸ in some instances and larger zones in other instances²⁹. These results are counterintuitive since the Navy presumably amended the impulse metrics to account for lung compression with depth, thus the zones would be expected to be smaller rather than larger the deeper the animal dives.

The Commission provided similar comments in its letters regarding both the AFTT and HSTT DEISs. However, the Navy did not provide an explanation regarding the constants and exponents in either final EIS nor did it specify the assumptions made. The Navy merely directed the Commission to Department of the Navy (2017b)—the document from which the Commission’s comments originated. NMFS also did not provide additional information to address the Commission’s similar comments on the AFTT and HSTT proposed rules (83 Fed. Reg. 57113 and 66879, respectively). Therefore, the Commission recommends that NMFS (1) explain why, if the constants and exponents for onset mortality and onset slight lung injury thresholds³⁰ for Phase III have been amended to account for lung compression with depth, they result in lower rather than higher absolute thresholds when animals occur at depths greater than 8 m and (2) specify what additional assumptions were made to explain this counterintuitive result.

More importantly, the Navy used the onset³¹ mortality and onset slight lung injury criteria to determine only the range to effects³², while it used the 50 percent mortality and 50 percent slight lung injury criteria to estimate the numbers of marine mammal takes³³. That approach is inconsistent with the manner in which the Navy estimated the numbers of takes for PTS, TTS, and behavior for explosive activities. All of those takes have been and continue to be based on onset, not 50-percent values.

Although the effectiveness of the Navy’s mitigation measures³⁴ has yet to be determined, the circumstances of the deaths of multiple common dolphins during one of the Navy’s underwater detonation events in March 2011 (Danil and St. Leger 2011) indicate that the Navy’s mitigation measures are not fully effective, especially for explosive activities. It would be more prudent for the Navy to estimate injuries and mortalities based on onset rather than a 50-percent incidence of occurrence. The Navy did indicate that it is reasonable to assume for its impact analysis—thus its take estimation process—that extensive lung hemorrhage³⁵ is a level of injury that would result in mortality for a wild animal (Department of the Navy 2017b). Thus, it is unclear why the Navy did not estimate the numbers of takes based on onset rather than the 50-percent criterion.

What is clear is that the 50-percent rather than onset criteria underestimate both predicted mortalities and injuries. The Navy’s response in the AFTT and HSTT final EISs, and by default NMFS’s response in the AFTT and HSTT final rules (83 Fed. Reg. 57113 and 66879, respectively), that overpredicting impacts by using onset values would not afford extra protection to any animal³⁶

²⁸ When animals occur at depths between the surface and 8 m, yielding higher absolute thresholds.

²⁹ When animals occur at depths deeper than 8 m, yielding lower absolute thresholds.

³⁰ Equations 11 and 12 in Department of the Navy (2017b).

³¹ Defined as the 1-percent risk in the HSTT FEIS.

³² To inform the mitigation zones.

³³ A similar approach was taken for gastrointestinal (GI) tract injuries.

³⁴ Which is discussed further herein.

³⁵ i.e., onset mortality; see Table 4-1 in Department of the Navy (2017b).

³⁶ And yet the mitigation zones are based on the onset values, so the animals would in fact be afforded ‘extra protection’.

is irrelevant from an impact analysis standpoint. The intent of an impact analysis is to estimate and evaluate impacts (i.e., takes) from the proposed activities accurately. There is no logical reason for basing the estimated impacts on onset of PTS, TTS, and behavioral response for sublethal effects; while for lethal and injurious effects, the impacts are based on a 50-percent criterion. Potential mortalities and injuries must be fully accounted for rather than erroneously discounted in any impact analysis. The Commission again recommends that NMFS use onset mortality, onset slight lung injury, and onset GI tract injury thresholds rather than the 50-percent thresholds to estimate both the numbers of marine mammal takes *and* the respective ranges to effect. If NMFS does not implement the Commission's recommendation, the Commission further recommends that NMFS (1) specify why it is inconsistently basing its explosive thresholds for Level A harassment on onset PTS and Level B harassment on onset TTS and onset behavioral response, while the explosive thresholds for mortality and Level A harassment are based on the 50-percent criteria for mortality, slight lung injury, and GI tract injury, (2) provide scientific justification supporting that slight lung and GI tract injuries are less severe than PTS and thus the 50-percent rather than onset criteria are more appropriate for estimating Level A harassment for those types of injuries, and (3) justify why the number of estimated mortalities should be predicated on at least 50 percent rather than 1 percent of the animals dying. As noted in the following section, many of the mitigation zones are not sufficient to protect the various functional hearing groups—thus an argument by NMFS that the mitigation zones for mortality and slight lung and GI tract injuries are more conservative and will protect marine mammals because they have been based on onset criteria is unsupported. Further complicating this issue is the fact that the effectiveness of the various mitigation measures has yet to be proven. Thus, espousing the presumed effectiveness of those measures would be unfounded.

Mitigation measures

Mitigation areas—The Navy identified six potential geographic mitigation areas based on locations where species appeared to concentrate, the timeframes of apparent concentration, and documented behaviors from a litany of reports and publications (see section I.2.1 and Table I-1 in Appendix I of the DSEIS). The Navy included the Marpi Reef, Chalan Kanoa Reef and Agat Bay Nearshore Areas as mitigation areas in its LOA application, which NMFS then included in the proposed rule (see Tables 32 and 50 in the preamble and section 218.94(b) of the proposed rule). However, the three other potential geographic mitigation areas, including North Guam, Ritidian Point, and Tumon Bay Offshore Areas, were not included in the Navy's LOA application or NMFS's proposed rule. The Navy indicated that the protection focus for those three potential areas would be for marine mammals as a whole and the applicable timeframe would be year-round (Table I-1 of Appendix I of the DSEIS), but it then stated that, based on available data, those areas did not meet its criteria because they are not key areas of biological importance³⁷ (see section I.3 in Appendix I of the DSEIS).

Lack of data or insufficient data regarding marine mammal presence and abundance is not an adequate basis for failing to adopt precautionary measures, especially when such data are not available for most of the world's oceans. The Commission made this point in its 2011 letter on a previous DSEIS and the U.S. Court of Appeals for the Ninth Circuit (the Court) remanded the Surveillance Towed Array Sensor System Low Frequency Active (SURTASS LFA) sonar case on that basis (see *NRDC, Inc., et al. v. Penny Pritzker et al.*). The Court indicated that NMFS and the

³⁷ Specifically for biologically important life processes (e.g., foraging, migration, reproduction).

Navy should have considered whether a precautionary approach would give more protection to marine mammals, and then whether that protection would impede military training to a degree that makes such mitigation impracticable. It appears that NMFS is again failing to take a sufficiently precautionary approach.

The Navy did not include any of the information or data regarding the North Guam, Ritidian Point, and Tumon Bay Offshore Areas in Appendix I of the DSEIS. Thus, it is difficult to determine whether the three potential mitigation areas are not in fact key areas of biological importance. The Navy's approach for those areas is in stark contrast to its approach for the SURTASS LFA sonar DSEIS. The Navy included all relevant information for both the areas that it proposed to include and those it did not. It also is in stark contrast to the Navy's approach for numerous suggested mitigation areas that were provided during the public scoping process (see section I.4 in Appendix I of the DSEIS entitled *Geographic mitigation assessment—Areas not carried forward for implementation*). The Navy should have included the same level of information for the North Guam, Ritidian Point, and Tumon Bay Offshore Areas, as it did for the Marpi Reef, Chalan Kanoa Reef, and Agat Bay Nearshore Areas and the numerous suggested mitigation areas. Absent sufficient information warranting their exclusion and consistent with the Court's previous ruling, the Navy should have included those three areas as mitigation areas and determined whether implementing them would be practicable. The Commission recommends that NMFS determine whether the Navy's implementation of the North Guam, Ritidian Point, and Tumon Bay Offshore Areas would be practicable and if so, include them as mitigation areas in the final rule. In either case, all of the relevant information for North Guam, Ritidian Point, and Tumon Bay Offshore Areas must be included in the preamble to the final rule.

Mitigation effectiveness—The Navy's proposed mitigation zones are similar to the zones³⁸ previously used during Phase II activities and are intended, based on the Phase III DSEIS, to avoid the potential for marine mammals to be exposed to levels of sound that could result in injury (i.e., PTS). However, the Phase III proposed mitigation zones would not protect various functional hearing groups³⁹ from PTS. For example, the mitigation zone for an explosive sonobuoy⁴⁰ is 549 m (Table 31, 85 Fed. Reg. 5853), but the mean PTS zones range from 2,076–2,364 m for HF cetaceans⁴¹. Similarly, the mitigation zone for an explosive torpedo⁴² is 1,920 m (Table 31, 85 Fed. Reg. 5853), but the mean PTS zones range from 5,051–8,388 m for HF cetaceans⁴³. The appropriateness of such zones is further complicated by platforms firing munitions (e.g., for missiles⁴⁴ and rockets) at targets that are 28 to 139 km away from the firing platform. An aircraft would clear the target area well before it positions itself at the launch location and launches the missile or rocket. Ships, on the other

³⁸ The Commission appreciates that the Navy has provided the estimated mean, minimum, and maximum distances for all impact criteria (i.e., behavior, TTS, PTS, onset slight lung injury, onset slight gastrointestinal injury, and onset mortality) for the various proposed activity types and for all functional hearing groups of marine mammals. That approach is consistent with the Commission's recommendations on Phase II activities.

³⁹ Primarily high-frequency (HF) cetaceans for MITT, although this phenomenon has been documented for low-frequency cetaceans and phocids in other Phase III DEISs.

⁴⁰ Bin E4 in the Phase II final rule for MITT (80 Fed. Reg. 46166).

⁴¹ The maximum range extends to 4,775 m for HF (Table 6.5–7 in the LOA application).

⁴² Bin E11 in Table 1.4–3 in the LOA application.

⁴³ The maximum ranges extend to 24,275 m for HF (Table 6.5–7 in the LOA application).

⁴⁴ The mitigation zone for a missile is 823 m (Table 31, 85 Fed. Reg. 5853), but the mean PTS zones range from 2,546–3,242 for HF cetaceans (see Bin E6 in Tables 1.4–3 and 6.5–7 in the LOA application). The maximum range is 4,525 m for HF cetaceans.

hand, do not clear the target area before launching the missile or rocket. In either case, marine mammals could be present in the target area at the time of the launch unbeknownst to the Navy.

In addition, the Navy indicated in the DSEIS that lookouts would not be 100 percent effective at detecting all species of marine mammals for every activity because of the inherent limitations of observing marine species and because the likelihood of sighting individual animals is largely dependent on observation conditions (e.g., time of day, sea state, mitigation zone size, observation platform). The Commission agrees and has made repeated recommendations to the Navy regarding the effectiveness of visual monitoring. Since 2010, the Navy has been collaborating with researchers at the University of St. Andrews to study Navy lookout effectiveness. The Navy does not appear to have mentioned that study in its DSEIS for Phase III. For its Phase II DEISs, the Navy noted that the data that had been collected could not be analyzed in a statistically significant manner⁴⁵. The Commission understands that sufficient data have not been collected. However, the Navy has been conducting these studies for more than a decade and if sufficient data are still not available, then the Navy should devote additional resources to that effort. The most recent lookout effectiveness report posted on the Navy's monitoring website is from four years ago (Department of the Navy 2016). Based on the Navy's monitoring website it has allocated only \$40K to \$60K to the effort, while other projects range from 100s of thousands to \$1.4M⁴⁶. Moreover, many of the lookout effectiveness cruises have occurred in areas where few marine mammals are present, which only delays data analyses further. As such, the Commission recommends that NMFS require the Navy to (1) allocate additional resources to the lookout effectiveness study, (2) consult with the University of St. Andrews to determine how much additional data is necessary to analyze the data in a statistically significant manner, and (3) plan future lookout effectiveness cruises to maximize the potential number of sightings so that the study can be completed by the end of 2022.

Although statistically meaningful results are not currently available, the basic information provided by the study is useful. In one instance, the marine mammal observers (MMOs) sighted at least three marine mammals at distances of less than 914 m (i.e., within the mitigation zone for mid-frequency active sonar for cetaceans), which were not sighted by Navy lookouts (Department of the Navy 2012). In other instances, MMOs sighted a group of approximately three dolphins at a distance of 732 m (Department of the Navy 2014a), a group of approximately 20 dolphins at a distance of 759 m (Department of the Navy 2014c), a group of approximately 9 pilot whales at a distance of 383 m (Department of the Navy 2014b), and a small unidentified marine mammal at 733 m (Department of the Navy 2014b)—none of which were documented as having been sighted by the Navy lookouts. Further, MMOs have reported marine mammal sightings not observed by Navy lookouts to the Officer of the Deck, presumably to implement mitigation measures (Department of the Navy 2010a). Neither the details regarding those reports nor the raw sightings data were provided to confirm this. More recent data have confirmed the earlier observed trends. Department of the Navy (2016) noted that 10 of the 13 marine mammal sightings⁴⁷ occurred at or within 1 km of the vessel, and Navy lookouts only detected 4 of 13 total sightings.

The lookout effectiveness study will be very informative once completed, but the Commission believes that the preliminary data provide a basis for taking a precautionary approach in

⁴⁵ That is, sufficient data had not yet been collected to allow for a meaningful statistical analysis.

⁴⁶ The funding has only been allocated to Hawaii. <https://www.navymarinespeciesmonitoring.us/regions/>.

⁴⁷ Of humpback whales, rough-toothed dolphins, and unidentified large whales.

the interim. Accordingly, the Commission continues to believe that rather than simply reducing the size of the zones it plans to monitor, the Navy should supplement its visual monitoring efforts with other monitoring measures. The Navy proposed to supplement visual monitoring with passive acoustic monitoring during three explosive activity types but not during the other explosive activities or during low-, mid- and high-frequency active sonar activities. The Navy uses visual, passive acoustic, and active acoustic monitoring (via HF/M3) during SURTASS LFA sonar activities to augment its mitigation efforts over large areas. The Navy indicated in its Phase III DSEIS that it is not able to use HF/M3 during training and testing activities due to impacts on speed and maneuverability that can affect safety and mission requirements due to costs associated with designing, building, installing, maintaining, and manning the equipment.

The Navy also stated that it did not have sufficient resources to construct and maintain additional passive acoustic monitoring systems or platforms for each training and testing activity. The Commission again points out that sonobuoys, which are deployed and used during many of the Navy's activities, could be deployed and used without having to construct or maintain additional systems. For example, sonobuoys could be deployed with the target prior to an activity to better determine whether the target area is clear and remains clear until the munition is launched. The Navy went on to indicate that passive acoustic detections would not provide range or bearing to detected animals and therefore cannot be used to determine an animal's location or confirm its presence in a mitigation zone. The Commission does not agree with that supposition.

In the DSEIS, the Navy indicated that it had capabilities to monitor instrumented ranges in real time or through data recorded by hydrophones at the Southern California Offshore Range, the Pacific Missile Range Facility (PMRF) off Kauai, and the Atlantic Undersea Test and Evaluation Center in the Bahamas. The Commission also understands that the Navy is quite adept at detecting, classifying, and localizing individual marine mammals on those ranges⁴⁸. For example, Helble et al. (2015) were able to track multiple animals on PMRF hydrophones in real time, including humpback whales, a species that can be problematic to localize. Several animals were localized simultaneously with a localization error rate of 2 percent or less. Similar methods can be used for other species. Baird et al. (2015) also indicated that the PMRF hydrophones allow the PAM analyst to isolate animal vocalizations on the range, confirm species classification, and localize groups of animals in real time. Multiple detectors can be used for sperm whales, delphinids, beaked whales, and baleen whales. Similar to Helble et al. (2015), Baird et al. (2015) indicated that localization algorithms could determine an animal's position. In the case of bottlenose dolphins, localized positions were within approximately 100 m of the vocalizing animal. Similar localizations have been used to direct researchers to groups of vocalizing odontocetes to deploy satellite-linked tags (Baird et al. 2014). Moreover, the Navy has publicly touted the success of using sonobuoys to detect bottlenose dolphins in real-time during mine exercises and provides sonobuoys to researchers for the same purpose of detecting and localizing marine mammals.⁴⁹

Although the Navy indicated that it was continuing to improve its capabilities for using range instrumentation to aid in the passive acoustic detection of marine mammals, it also stated that

⁴⁸ Via the Marine Mammal Monitoring on Navy Ranges (M3R) program.

⁴⁹ Which include DIFAR sonobuoys, routinely used by the Navy.

http://navysustainability.dodlive.mil/files/2014/05/Spr14_Sonobuoys_Research_Monitoring.pdf

it didn't have the capability or resources to monitor instrumented ranges in real time for the purpose of mitigation. That capability clearly exists. While available resources could be a limiting factor, the Commission notes that personnel who monitor the hydrophones and sonobuoys on the operational side do have the ability to monitor for marine mammals as well⁵⁰. Department of the Navy (2013) confirmed that ability exists—four independent sightings were made not by the Navy lookouts but by the passive acoustic technicians. Similarly, Department of the Navy (2014c) reported that echolocation clicks of short-finned pilot whales were reported to the bridge by the sonar technician prior to mitigation being implemented. And, although aircraft may not have passive or active acoustic capabilities, the aircraft carriers or other vessels from which the aircraft may have originated very likely do have such capabilities. The Commission has supported the use of the instrumented ranges, operational hydrophones and active acoustic sources⁵¹, and sonobuoys to fulfill mitigation implementation for quite some time and contends that localizing certain species (or genera) provides more effective mitigation than localizing none at all.

Given that the effectiveness of Navy lookouts conducting visual monitoring has yet to be determined, the Commission believes that passive or active acoustic monitoring should be used to supplement visual monitoring, especially for activities that could injure or kill marine mammals. Therefore, the Commission again recommends that NMFS require the Navy to use passive and active acoustic monitoring, whenever practicable, to supplement visual monitoring during the implementation of its mitigation measures for all activities that could cause injury or mortality beyond those explosive activities for which passive acoustic monitoring already was proposed—at the very least, sonobuoys expended and active sources and hydrophones used during an activity should be monitored for marine mammals.

Least practicable adverse impact standard

The Commission has commented multiple times on NMFS's efforts to develop a policy to interpret and implement the least practicable adverse impact requirement under section 101(a)(5)(A)(i)(II)(aa) of the MMPA⁵². However, NMFS discounted many of the Commission's previous comments and recommendations (e.g., see the preamble to the AFTT final rule; 83 Fed. Reg. 57117-18). For example, the Commission previously indicated that, under the least practicable adverse impact requirement, and more generally under the purposes and policies of the MMPA, Congress embraced a policy that minimizes, whenever it is practicable, the risk of killing or seriously injuring a marine mammal incidental to an activity subject to section 101(a)(5)(A), including taking measures in an authorization to eliminate or reduce the likelihood of lethal taking. Accordingly, the Commission had recommended that NMFS address this point explicitly in its least practicable adverse impact analysis and clarify whether it agrees that the incidental serious injury or death of a marine mammal always should be considered an adverse impact for purposes of applying the least practicable adverse impact standard. In the preamble to the AFTT final rule, NMFS indicated that it was unnecessary or unhelpful to address explicitly the point made by the Commission that an

⁵⁰ For example, the engineer monitoring the hydrophones during a U.S. Air Force (USAF) activity at PMRF also listened for any signs of marine mammal life post [aerial clearance] survey and leading up to weapon impact (USAF 2016). Additionally, Department of the Navy (2014c) indicated that echolocation clicks of short-finned pilot whales were reported by the sonar technician to the bridge prior to mitigation being implemented.

⁵¹ Including the tactical sonars themselves.

⁵² For example, see the Commission's [30 May 2017](#), [16 April 2018](#), [13 July 2018](#), and [21 August 2019](#) letters regarding this matter.

incidental death or serious injury of a marine mammal should always be considered an adverse impact on the species or stock (83 Fed. Reg. 57117). The Commission disagrees.

The Commission does not see how NMFS can meet the mandate of the MMPA to reduce adverse impacts to the lowest level practicable if it does not first identify clearly which impacts are adverse and may require mitigation under section 101(a)(5)(A)(i)(II)(aa). The Commission appreciates NMFS's statement that it has adopted a practice to mitigate mortality to the greatest degree possible, but disagrees with the agency's conclusions that one mortality does not affect the population in a quantifiable or meaningful way. Clearly, each mortality is quantifiable—it increases human-caused mortality by one and reduces the population size by one (plus the lost reproductive potential of that individual). The Commission agrees that the loss of a single individual may not be meaningful at the population level, but that is relevant for making a negligible impact determination, not for applying the least practicable adverse impact standard. Under the statutory scheme, before the least practicable adverse impact standard is applied, NMFS already will have determined that the anticipated taking will have a negligible impact. However, the MMPA requires NMFS to go beyond that and reduce any adverse impacts to the greatest extent practicable, even though population-level impacts are not significant.

NMFS stated that it does not understand the problem the Commission's recommendation is aimed at addressing and that following it "would confuse the issue" (83 Fed. Reg. 57117). Rather than adding confusion, the Commission was attempting to alleviate the confusion caused by NMFS's analytical approach, which, as noted previously, tends to co-mingle the negligible impact and least practicable adverse impact standards. As such, the Commission continues to recommend that NMFS clearly separate its application of the least practicable adverse impact requirement from its negligible impact determination. Once NMFS determines that an applicant's proposed activities would have a negligible impact, it still has a responsibility to determine whether the activities would nevertheless have adverse impacts on marine mammal species and stocks and their habitat. If so, NMFS must condition the authorization to eliminate or reduce those impacts whenever, and to the greatest extent, practicable. As the statute is written, it is inappropriate to conflate the two standards, as NMFS seems to be doing.

The Commission's goal in continuing to make this recommendation is to compel NMFS to clarify how it is making the required determinations under the MMPA. Specifically, the Commission is recommending the adoption of a process that tracks the provisions of the MMPA, separates the different determinations that NMFS must make, and is clear and transparent. The fact that NMFS's practice is "always...to mitigate mortality to the greatest extent possible..." indicates that, at the "gut level," it agrees with the Commission that a mortality always has an adverse impact. The Commission wants NMFS to acknowledge this within the statutory context. The Commission recommends that NMFS follow an analysis consisting of three elements to (1) determine whether the impacts of the proposed activities are negligible at the species/stock level, (2) if so, determine whether some of those impacts nevertheless are adverse either to marine mammal species or stocks or key marine mammal habitat, and (3) if so, whether it is practicable for the applicant to reduce or eliminate those impacts through modifying those activities or by other means (e.g., requiring additional mitigation measures to be implemented).

Regarding previous Commission recommendations that NMFS address the habitat component of the least practicable adverse impact standard in greater detail, the Commission was

attempting to emphasize that the standard has two components, one directed to species and stocks and one to marine mammal habitat. The Commission was not suggesting that there is no link between the two, but rather that NMFS adopt a clear decision-making framework that recognizes the species and stock component *and* the marine mammal habitat component of the least practicable adverse impact provision. In applying the least practicable adverse impact requirement as it pertains to habitat, NMFS should consider first whether there are any potentially adverse impacts on key marine mammal habitat. If so, NMFS then should determine whether measures can be implemented to lessen or avoid those impacts and whether it is practicable for the applicant to implement them. Contrary to NMFS's characterization, the Commission was not suggesting that "NMFS must always consider separate measures aimed at marine mammal habitat" (83 Fed. Reg. 57117). As such, the Commission recommends that NMFS (1) adopt a clear decision-making framework that recognizes the species and stock component *and* the marine mammal habitat component of the least practicable adverse impact provision and (2) always consider whether there are potentially adverse impacts on marine mammal habitat and whether it is practicable to minimize them. The MMPA requires that NMFS address both types of impacts, not that there be no overlap between the mitigation measures designed to reduce those impacts.

NMFS's response to the Commission's previous recommendation is troubling in another important aspect. NMFS asserted that it had "clearly identified measures that provide *significant* reduction of impacts to both 'marine mammal species and stocks and their habitat' (emphasis added)" (83 Fed. Reg. 57117). While perhaps true, "significant" reduction is not the statutory legal standard in applying the least practicable adverse impact standard. Section 101(a)(5)(A)(i)(II)(aa) of the MMPA requires that any adverse impacts be reduced to the lowest level practicable. The Commission is advocating only that NMFS implement the statutory provision as written.

There are several reasons why an applicant would propose or NMFS would require habitat protection measures be implemented as part of an incidental take authorization. Excluding or limiting activities in key habitat may be necessary to reduce the impacts of anticipated taking to a negligible level. Such measures also may be necessary to meet the MMPA's "small numbers" requirement, for activities other than military readiness. In addition, measures could be implemented solely to satisfy the least practicable adverse impact requirement. The Commission is advocating that NMFS provide a clear discussion of the rationale behind and justification for such measures. Regarding the Commission's recommendation for the AFTT proposed rule, the Commission was informing NMFS that it did not include any discussion of habitat protection measures in the least practicable adverse impact section of the proposed rule. The Commission continues to believe that a separate examination of habitat protection measures specifically linked to the least practicable adverse impact requirements would be the best way for NMFS to demonstrate that it has thoroughly considered how the applicant's proposed activities might adversely affect marine mammal habitat and that it has adopted all practicable measures to reduce or eliminate such impacts.

In response to the Commission's previous recommendation to separate the analysis of impacts from the evaluation of the effectiveness of proposed mitigation measures in applying the least practicable adverse impact standard, NMFS misconstrued the Commission's intent (83 Fed. Reg. 57117). The Commission intended to emphasize that the effectiveness of mitigation measures is not relevant when determining whether the potential impacts of proposed activities on marine mammals and their habitat are or may be adverse. The effectiveness of any adopted measures could be considered to be a separate, implied criterion under section 101(a)(5)(A)(i)(II)(aa). However, as

the Commission previously stated, the linkage of “effecting” with “least practicable adverse impact” in the statutory provision also could be addressed by considering effectiveness to be one element of practicability. That is, a mitigation measure should be considered practicable in reducing impacts only if it is expected to be effective. As such, the Commission again recommends that NMFS rework its evaluation criteria for applying the least practicable adverse impact standard to separate the factors used to determine whether a potential impact on marine mammals or their habitat is adverse *and* whether possible mitigation measures would be effective.

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

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

Level A harassment and mortality takes

Post-model analyses—The Navy used various post-model analyses to estimate the numbers of marine mammal takes during acoustic and explosive activities that are similar to methods used in its Phase II DEISs. Those analyses effectively reduced the model-estimated numbers of Level A harassment (i.e., PTS) and mortality takes. The analyses were based on (1) animal avoidance, (2) mitigation effectiveness, and (3) cut-off distances. The Commission has discussed the first two aspects at length in letters regarding Phase II activities. That information is not repeated herein but should be reviewed in conjunction with this letter (see the Commission’s [31 March 2014](#) letter). The Commission has a few additional comments on those analyses.

For avoidance, the Navy assumed that animals present beyond the range to onset PTS for the first three to four pings would avoid any additional exposures at levels that could cause PTS (Department of the Navy 2018a). That equated to approximately 5 percent of the total pings or 5 percent of the overall time active; therefore, 95 percent of marine mammals predicted to experience PTS due to sonar and other transducers were instead assumed to experience TTS (Department of

the Navy 2018a). The Navy should have been able to query the dosimeters of the animals to verify whether its 5-percent assumption was valid⁵³, but on its face that assumption has no scientific basis. Given that sound sources are moving, it may not be until later in an exercise that the animal is close enough to experience PTS and it is those few close pings that contribute to the potential to experience PTS. Since both sources and animals are moving during an exercise, whether an animal is initially beyond the PTS zone has no bearing on whether it will later come within close range. Behavioral response studies (BRS) have shown this as well. For example, Southall et al. (2014) indicated that Risso's dolphins and California sea lions approached the 200-m shut-down zone when a source⁵⁴ was operating at full power, resulting in having to shut down the source. Both instances occurred well after the first three or four pings. Department of the Navy (2010b and 2012) also noted multiple instances in which unidentified dolphins and rough-toothed dolphins were observed 30 to 473 m from a vessel emitting mid-frequency active sonar, some instances were apparently numerous hours after the source was active. Those dolphins did not receive only the first three or four pings emitted, nor did they avoid the source. Avoidance aside, Navy vessels may move faster than animals are capable of moving to evacuate the area. Those animals would be exposed to pings after the first three or four as well.

In its response to the Commission's comments on the AFTT and HSTT proposed rules, NMFS indicated that the current best available science based on a growing body of behavioral response research shows that animals do in fact avoid the immediate area around sound sources to a distance of a few hundred meters or more depending upon the species (83 Fed. Reg. 57114 and 66880, respectively). That supposition directly contradicts data noted herein for Risso's dolphins, California sea lions, rough-toothed dolphins, common dolphins, and unidentified dolphins (Department of the Navy 2010b and 2012, Southall et al. 2011, 2012, 2013, and 2015). NMFS also noted the limited extents of the harassment zones for PTS, ranging from 10s of meters to a maximum of 270 m (83 Fed. Reg. 57114 and 66880). NMFS however did not discuss the fact that those zones are based on a presumed 30-sec exposure time (see Table 19 in the preamble for the MITT proposed rule). The presumed 30-sec exposure time was based on the maximum amount of time a marine mammal would realistically be exposed to levels that could cause the onset of PTS based on both platform (e.g., ship) speed and a nominal animal swim speed of approximately 1.5 m/sec (83 Fed. Reg. 57162 and 66928). That nominal swim speed is underestimated. Swim speeds compiled by the Navy for its SURTASS LFA sonar ranged from 0.3 to 8.3 m/sec FSEIS (see Table B-2, Department of the Navy 2017a). Thus, swim speeds of certain species, particularly odontocetes and California sea lions, would be underrepresented with a nominal swim speed of 1.5 m/sec, resulting in underestimated exposure times and Level A harassment zones for PTS. In short, NMFS's responses regarding why avoidance should be incorporated are unsubstantiated.

Regarding mitigation effectiveness, the Commission notes that the specific mitigation effectiveness scores for the various activities were provided for Phase II but not for Phase III activities. For Phase III, the Navy included more detail regarding how the scores were determined (including species sightability, observation area extent, visibility factors, and whether sound sources

⁵³ That is, whether the first three to four pings equated to 5 percent of the total pings *and* 5 percent of the overall time active, not whether the animals avoided the source since horizontal animal movement was not incorporated in the Navy's modeling.

⁵⁴ For both simulated and scaled sources. Similar results were observed with Risso's dolphins, California sea lions, and common dolphins during previous BRSs (Southall et al. 2011, 2012, 2013, and 2015).

were under positive control) but did not specify what the actual scores were for those four factors or the mitigation scores as a whole. The Navy also apparently did not include model-estimated numbers of takes. The lack of information makes it difficult for the Commission and the public to assess the appropriateness of the mitigation scores or their effect on the overall numbers of marine mammal takes. And, although the Navy did not reduce the numbers of injury (slight lung and GI tract) and PTS takes for explosive activities as it had for Phase II analyses, it still assumed its model-estimated mortality takes would not occur, zeroed out those takes, and enumerated them as injury takes. Since the Navy has yet to determine the effectiveness of its mitigation measures, it is premature to include *any* related assumptions to reduce the numbers of marine mammal takes.

Similarly in its response to the Commission's comments on the AFTT and HSTT proposed rules, NMFS indicated that the "credit taken for mitigation effectiveness" was extremely conservative (83 Fed. Reg. 57114 and 66880, respectively). For example, if lookouts could see the whole area, they received credit for it in the Navy's calculation. If they could see more than half the area, they received half credit and they received no credit if they could see less than half the area (83 Fed. Reg. 57114 and 66880). It is unclear whether NMFS's characterization of the Navy's analyses means that lookouts that could *see* the whole area were assumed to be 100 percent effective or some other percentage. In Phase II analyses, the type of platform and species sightability also factored into whether mitigation was effective, which does not appear to be the case in this instance. More concerning is the fact that being able to *see* an area has no bearing on whether lookouts can *detect* marine mammals. As noted herein, there are numerous instances in which Navy lookouts have been unable to detect animals at distances ranging from 383 m to 1 km (Department of the Navy 2012, 2014a, 2014b, 2014c, 2016)—ranges which a lookout could *see*, since the MMOs had unobstructed views when observing all associated sightings. On its face, reducing numbers of takes based on mitigation effectiveness is unfounded and not based on best available science. This conclusion is further substantiated by NMFS's statement that it is not necessary to view the many tables of numbers generated in the assessment to evaluate the method (83 Fed. Reg. 57114 and 66881). A notion that is patently false and further undermines the transparency of the process.

The Commission's concerns with the cut-off distances, which reduced the numbers of takes, were articulated in a previous section of this letter. When those distances are considered along with the post-analyses as a whole, it is clear that the various types and numbers of takes have been underestimated and that the analyses have not been informed by the best available science. Therefore, the Commission again recommends that NMFS (1) specify the total numbers of model-estimated Level A harassment (PTS) and mortality takes rather than reduce the estimated numbers of takes based on the Navy's post-model analyses and (2) include the model-estimated Level A harassment and mortality takes in its negligible impact determination analyses.

Beaked whale considerations—NMFS did not propose to authorize beaked whale⁵⁵ mortalities subsequent to MFA sonar use for any of the Navy's Phase III activities. That approach is inconsistent with the approach taken for both TAP I and Phase II activities. For example, NMFS authorized up to 10 beaked whale mortality takes during the five-year period of the Phase II final rule for HSTT⁵⁶ (78 Fed. Reg. 78153). NMFS justified authorizing those mortalities by stating that,

⁵⁵ The Navy notes in its LOA application that four species of beaked whales are present in the MITT study area and three occur regularly in the study area.

⁵⁶ NMFS authorized even more mortality takes under the TAP I final rules.

although NMFS does not expect injury or mortality of any beaked whales to occur as a result of active sonar training exercises, there remains the potential for the operation of MFA sonar to contribute to the mortality of beaked whales (78 Fed. Reg. 78149). That justification is still applicable.

For MITT Phase II activities, it is somewhat more complicated. The Navy originally had requested, and NMFS proposed to authorize, up to 10 beaked whale mortalities during the five-year period of the MITT Phase II rule (Table 13, 79 Fed. Reg. 15431). NMFS indicated that, while the Navy does not anticipate any beaked whale strandings or mortalities, the Navy requested mortality takes to account for unforeseen circumstances that could lead to such mortalities (79 Fed. Reg. 15431). The Commission concurred with that approach. However, NMFS ultimately did not authorize beaked whale mortalities under the final rule citing that, after decades of the Navy conducting similar activities in the MITT study area without incident, neither the Navy nor NMFS expects stranding, injury, or mortality of beaked whales to occur as a result of Navy activities (80 Fed. Reg. 46150).

As NMFS noted in its preamble to the proposed rule for Phase III activities, 10 stranding events⁵⁷ involving Cuvier's beaked whales were reported since 2007 in MITT (85 Fed. Reg. 5825). NMFS stated that Navy records indicated that sonar use occurred within 72 hours or 148 km of three of those stranding events (in 2011, 2015, and 2016; 85 Fed. Reg. 5825). Based on stranding network data, seven stranding events⁵⁷ involving beaked whales⁵⁸ were reported in the Hawaiian Islands (six in the Main Hawaiian Islands and one in the Northwestern Hawaiian Islands) from 2007 through 2019. It is unclear whether sonar use was coincident⁵⁹ with any of the events in Hawaii. However, more beaked whale stranding events were reported to have occurred in MITT than Hawaii, all of the stranding events included Cuvier's beaked whales in MITT⁶⁰, and sonar was operational⁵⁹ during at least 30 percent of those events. Recently, Simonis et al. (2020) analyzed much of the same data that was reported by NMFS in the preamble. Those researchers found that there is a 1 percent probability *based on chance* that three of eight beaked whale strandings occurred within 6 days after MFA sonar operations⁶¹ and all but one of the strandings involved individual animals⁶² (Simonis et al. 2020). Simonis (pers. comm.⁶³) further stated that the most recent beaked whale stranding⁶⁴ occurred on the island of Rota in the Mariana Islands on 21 November 2019, while a major multi-national anti-submarine warfare operation (Vanguard 2) began on 20 November in the waters around Guam⁶⁵. NMFS did not report in the preamble that sonar occurred within 72 hours or 148 km of the November 2019 beaked whale stranding (85 Fed. Reg. 5825)

⁵⁷ Of both live and dead animals.

⁵⁸ Two Cuvier's beaked whales, four Blainville's beaked whales, and one Longman's beaked whale.

⁵⁹ Within 72 hours or 148 km.

⁶⁰ Less than 30 percent of the reported stranding events involved Cuvier's beaked whales.

⁶¹ The statistical analysis was limited to assessing the overlap between beaked whale strandings and known MFA sonar operations based on either public reporting or through detection of sonar on passive acoustic devices.

⁶² See Table 1, one event involved two to three animals. Numerous previous stranding events that have occurred coincident with MFA sonar operations generally include multiple animals, not single individuals (85 Fed. Reg. 5821–4).

⁶³ Via MARMAM listserv.

⁶⁴ A single Cuvier's beaked whale that was included by NMFS in the preamble but not in the statistical analysis.

⁶⁵ Rota is 87 km from Guam.

Beaked whales are more sensitive than other species to anthropogenic sound, and previously unrecognized sensitivities have been elucidated in more recent years. For example, Falcone et al. (2017)⁶⁶ indicated that responses of Cuvier's beaked whales to MFA sonar within and near the Navy's Southern California Anti-submarine Warfare Range (SOAR) were more pronounced during mid-power (i.e., helicopter-dipping sonar, MF4) than high-power (i.e., hull-mounted sonar, MF1) sonar use. Thus, lower received levels from a less predictable source caused more marked responses than higher received levels from a predictable source traveling along a seemingly consistent course. Since multiple species of beaked whales are regularly observed on the Navy's ranges, those species have been a priority for the Navy's monitoring program⁶⁷. The Navy has funded projects investigating beaked whales from TAP I through Phase III activities. Currently, one of the Navy's four funded projects in MITT involves beaked whales, two of the Navy's four funded projects in Southern California involve Cuvier's beaked whales, and two of the three funded projects in Hawaii involve Blainville's beaked whales⁶⁸. Thus, it is apparent that research involving beaked whales continues to be a priority for the Navy and some of the whales' sensitivities to anthropogenic sound are just being discovered. Until such time that NMFS can better substantiate its conclusion that the Navy's activities do not have the potential to kill beaked whales, taking by mortality should be included in all related rulemakings.

Although NMFS does not expect injury or mortality of any of beaked whales to occur as a result of the Navy's active sonar training exercises, NMFS's justification for authorizing beaked whale mortalities under TAP I and Phase II final rules is still valid. That is, NMFS cannot ignore that there remains *the potential* for the operation of MFA sonar to contribute to the mortality of beaked whales. Given that the potential for beaked whale mortalities cannot be obviated, the Commission recommends that NMFS authorize at least 10 mortality takes of beaked whales subsequent to MFA sonar use in MITT in the final rule.

Negligible impact determination

NMFS applied both qualitative and quantitative analyses to inform its negligible impact determination. In general, NMFS has based negligible impact determinations⁶⁹ associated with incidental take authorizations on abundance estimates provided either in its stock assessment reports (SARs) or other more recent published literature for the affected species or stocks. For the MITT proposed rule, NMFS used the abundance estimates as determined by the Navy's underlying density estimates rather than abundance estimates from either the SARs or published literature. It is unclear how NMFS's derived abundance estimates compare to the actual abundance of the affected species or stocks.

NMFS also indicated that it estimated the 'instances of total takes as a percentage of the abundance' in Tables 51–55 in the preamble to the final rule. However, the metric NMFS estimated is not 'instances' of any sort of taking, rather it estimated the 'percentage of the total takes relative to the abundance'. For example, there were 203 total takes of sperm whales in the MITT study area

⁶⁶ The Commission notes that this study was not mentioned by NMFS in the previous or current proposed rule or the final rule for Phase III activities nor was it mentioned by the Navy in either of its LOA applications.

⁶⁷ https://www.navy.mil/submit/display.asp?story_id=10888

⁶⁸ Along with the only funded project in the Gulf of Alaska and the most expensive project of all of the Navy's projects—the Atlantic BRS.

⁶⁹ And small numbers determination, which is not applicable to military readiness activities.

and transit corridor and the abundance in the MITT study area and transit corridor was 1,635 sperm whales (Table 55, 85 Fed. Reg. 5890). This results in the Navy taking approximately 12 percent of sperm whales estimated to be present in the MITT study area and transit corridor. The calculation does not equate to 12 instances of total take, as implied in the table(s). In addition, that percentage does not provide any information on the number of times an individual could be taken in a given year or the number of days an animal could be taken, contrary to NMFS's assertion that the 12 percent suggests that some portion of the sperm whales in the MITT study area would be taken on one to a few days per year (85 Fed. Reg. 5888).

In short, NMFS's analytical approach does not substantiate its ultimate findings that the Navy's activities would have a negligible impact on the affected species and stocks. Quantitative analyses are preferred over qualitative analyses but only if those quantitative analyses are appropriate and well informed. NMFS indicated that stock information is available for only a few species in the MITT study area (85 Fed. Reg. 5798)—actual abundance estimates of those species and stocks do not exist. Thus, it is unclear how NMFS's analytical approach can lend credence to its negligible impact determinations.

Please contact me if you have questions concerning the Commission's recommendations or rationale.

Sincerely,



Peter O. Thomas, Ph.D.,
Executive Director

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