



MARINE MAMMAL COMMISSION

1 April 2019

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) 1 March 2019 notice (84 Fed. Reg. 7186) and the revised letter of authorization (LOA) application submitted by the U.S. Navy (the Navy) seeking issuance of regulations under section 101(a)(5)(A) of the Marine Mammal Protection Act (the MMPA). The taking would be incidental to conducting training, testing, and routine military operations that use Surveillance Towed Array Sensor System Low Frequency Active (SURTASS LFA) sonar. The Commission reviewed and provided recommendations in its [17 September 2018 letter](#) on the Navy's 2018 Draft Supplemental Environmental Impact Statement/Overseas Environmental Impact Statement (DSEIS) for SURTASS LFA sonar, which underpins the Navy's revised LOA application. The Commission also provided recommendations in its [30 May 2017 letter](#) on NMFS's proposed rule for the Navy's previous version of its LOA application¹.

Background

The Navy proposes to use multiple SURTASS LFA sonar systems for military readiness during training and testing activities from 2019–2026². Activities would occur in the central and western Pacific Ocean and the eastern Indian Ocean. At-sea missions would not exceed 240 days. SURTASS LFA sonar would not exceed a total of 496 hours of transmission time per year for each of the first four years and 592 hours for each year thereafter. In addition to time-area closures, mitigation measures would include visual, passive acoustic, and active acoustic³ monitoring to implement delay and shut-down procedures.

¹ NMFS did not issue a final rule in 2017. Rather, the Deputy Secretary of Defense, after conferring with the Secretary of Commerce, determined that it was necessary to exempt all military readiness activities that use SURTASS LFA sonar from compliance under the requirements of the MMPA for a period of two years from 13 August 2017 through 12 August 2019 via the 2017 National Defense Exemption (NDE).

² The timeframe during which a letter of authorization issued by NMFS is valid recently was increased from five to seven years based on the John S. McCain National Defense Authorization Act for Fiscal Year 2019 (section 316 of Public Law 115-232).

³ Via the H3/MF source.

Uncertainty in density estimates

The Navy estimated marine mammal densities in the 15 representative mission areas based on direct estimates from line-transect surveys that occurred in or near each of the mission areas. If density estimates were not available from a line-transect survey in a specific mission area, then the Navy extrapolated estimates from a region with similar oceanographic characteristics to the mission area. Densities for some mission areas also were derived from the Navy's Global Marine Species Density Database (Global NMSDD; Department of the Navy 2018a), which still is not available to the public for review⁴. The Commission continues to have concerns regarding the density estimates used in other versions of NMSDD and has expressed these concerns in multiple letters including its [13 July 2018 letter](#) regarding Navy activities in the Hawaii-Southern California Training and Testing (HSTT) study area—an area that overlaps with the mission areas in the proposed rule and data that were used for the proposed rule.

HSTT NMSDD included densities derived from (1) models that use line-transect survey sighting data and distance sampling theory, (2) models that use known or inferred habitat associations to predict densities (e.g., relative environmental suitability (RES) models), typically in areas where survey data are limited or non-existent, or (3) extrapolation from neighboring regional density estimates or from other population/stock assessments based on expert opinion. In previous letters the Commission noted that the types of areas⁵ from which sightings or abundance estimates were extrapolated varied and numerous correction factors for pinnipeds⁶ were used incorrectly. The Navy has acknowledged that estimates from RES models and extrapolated densities include a high degree of uncertainty (Department of the Navy 2017c), and uncertainty in some of the abundance and density estimates, including coefficients of variation (CVs), were discussed in Appendix D of the 2018 DSEIS. However, those measures of uncertainty do not appear to have been incorporated into either the abundance or density estimates in the proposed rule. The Commission again recommends that NMFS require the Navy to make available to the public the resulting products of the current version of the Global NMSDD, similar to the information provided in Department of the Navy (2017c), as soon as possible. The Commission has requested for several years that this information be made available to the public and is puzzled why neither the Navy nor NMFS has provided it. Without public access to such data, the process is not transparent and there is no basis to assert that either NMFS's or the Navy's analyses are based on best available data. The Commission further recommends that NMFS specify whether and how uncertainty was incorporated in abundance and density estimates⁷ in the preamble to the final rule and, if it was not, require the Navy to incorporate measures of uncertainty inherent in the underlying data (e.g., CV, standard deviations, standard errors) in those estimates and re-estimate the numbers of takes accordingly in the final rule. For all

⁴ The Commission discussed this issue in its [27 September 2016 letter](#) on the Navy's previous DSEIS for SURTASS LFA sonar. In the Navy's final SEIS from 2017 (FSEIS), it indicated that the Global NMSDD is not publicly available since proprietary spatial data are included in the database but that products of the Navy's database have been made available to the public (Department of the Navy 2017c). The Commission is not requesting that the spatial data themselves be available to the public but rather the resulting products, as described in Department of the Navy (2017c) and as provided by the Navy for all other DEISs regarding training and testing activities.

⁵ Including the entire range of the stock, the foraging range, the geographic area of occurrence, the modeling area, various specified strata, etc.

⁶ See the Commission's 13 July 2018 letter on this issue.

⁷ The Navy indicated in its FSEIS that information on uncertainty was added to the density and abundance estimates in Chapter 3. Although it appears that various measures of uncertainty were discussed in Chapter 3 in regard to density and abundance estimates, those measures of uncertainty were not specifically incorporated into the estimates used in the various analyses that underpin the 2018 DSEIS and the revised LOA application.

of the Navy's Phase III activities since 2016, including for HSTT, the Navy has incorporated uncertainty in the densities and the group size estimates⁸ that ultimately seed its animat modeling. It is unclear why the same approach was not taken for SURTASS LFA sonar, particularly since the action areas for HSTT and SURTASS LFA sonar overlap⁹.

NMFS also used multiple data sources to inform various density estimates stipulated in Tables 2–16 of the *Federal Register* notice and Table 3-2 of the revised LOA application. The Navy cited five different sources (Tillman 1977, Ferguson and Barlow 2001 and 2003, LGL Limited 2008, and Fulling et al. 2011) for the blue whale density estimate in Offshore Guam (mission area 4; Table 5 of the *Federal Register* notice and Table 3-2 of the revised LOA application). Ferguson and Barlow (2001 and 2003) are from the eastern tropical Pacific Ocean, Tillman (1977) is in reference to sei rather than blue whales, LGL Limited (2008) likely included density estimates that were themselves extrapolated from another region and/or from sightings data¹⁰, and Fulling et al. (2001) indicated that blue whales were not observed during the survey. Not only is the representativeness of density estimates questionable, but it also is unclear whether and how sightings data were used to derive the various densities and whether, when referencing multiple sources, mean or maximum¹¹ density estimates were used. The Commission again recommends that, in the preamble to the final rule, NMFS specify how density estimates were derived and what statistic (e.g., mean, median, maximum) was used when multiple sources are referenced in Tables 2–16 of the *Federal Register* notice and Table 3-2 of the revised LOA application.

Moreover, the Navy indicated that, in the absence of area-specific density data¹², it used densities from Bradford et al. (2017) to represent the best available data for the very same area off Guam as part of the DSEIS for MITT activities (Department of the Navy 2018b). The Navy used a greater density for MITT than was used for the proposed rule (0.00005 vs. 0.00001 blue whales/km², respectively). The Commission further notes that densities for Bryde's whales, fin whales, ginkgo-toothed beaked whales, and Deraniyagala's beaked whales in the proposed rule are similarly less than were stipulated in Department of the Navy (2018b) for the same area. NMFS and the Navy appear to claim that there are in fact two different densities considered best available for the same species in the same area during the same seasons¹³. Therefore, the Commission recommends that NMFS use the densities stipulated in Department of the Navy (2018b) for blue whales, Bryde's whales, fin whales, ginkgo-toothed beaked whales, and Deraniyagala's beaked whales rather than the densities in Table 5 of the *Federal Register* notice and re-estimate the numbers of takes accordingly in the final rule.

⁸ Using means and standard deviations that varied based on a lognormal distribution for densities and either a Poisson or lognormal distribution for group sizes.

⁹ As also is the case for the Mariana Islands Training and Testing (MITT) study area.

¹⁰ Similar issues exist for the blue whale abundance estimate in the West Philippine Sea. The Commission also notes that Thomas et al. (2016) indicated that populations of blue whales in the far western North Pacific Ocean appear to have been extirpated and that abundance estimates of blue whales in the eastern North Pacific Ocean are less than 3,000. Further, NMFS's 2015 stock assessment report for the blue whale stock in the eastern North Pacific Ocean indicated a minimum population estimate of 1,551. Neither estimate supports the Navy's abundance estimate of 9,250 blue whales in the West Philippine Sea, which the Commission considers extremely unrealistic.

¹¹ Or some other statistic.

¹² And consistent with recommendations from scientists at the Pacific Islands Fisheries Science Center.

¹³ Both of which are being handled by the agencies simultaneously. The Commission commented on the MITT DSEIS in its [11 February 2018 letter](#).

Single ping equivalent (SPE)

SPE in general—The Navy, and ultimately NMFS, has used SPE as the metric to estimate behavioral response¹⁴ of marine mammals to SURTASS LFA sonar for more than 18 years. The Navy has described SPE as an intermediate calculation for input into the behavior risk function¹⁵ that accounts for the energy of all LFA sonar transmissions that an animal may receive in a 24-hour period. However, SPE is not an energy-based metric or based on any sort of physical quantity¹⁶. It is a quasi-metric that the Navy has used to apply its behavior risk function¹⁷ since the first SURTASS LFA sonar EIS was drafted in 1999 and finalized in 2001. The Navy has defined SPE¹⁸ as the sum of the squares of the root-mean-square sound pressures (SP_{rms}) of individual pulses, with units similar to that of root-mean-square sound pressure level (SPL_{rms})¹⁹; whereas, sound exposure level (SEL) is an energy-based metric related to the summed products of the root-mean-square intensities squared and the signal duration of individual pulses²⁰, with units dB re 1 μPa^2 -sec.

For a single pulse, or for a set of pulses dominated by a single large pulse, the SPE effectively reduces to the SPL_{rms} of the dominant pulse. For multiple pulses, SPE only has a physical interpretation if one assumes that the intensity of a sonar pulse can be negative (in terms of linear SPL_{rms} values or SP_{rms}). Since intensities cannot be negative, SPE has no valid derivation from physical principles. That is, it is not based on an actual physical metric nor is it a metric defined by ANSI or ISO. Thus, SPE is clearly not considered best available science. The Navy has stated that SPE is more conservative than using an SPL-based threshold, although often, it is the same. However, SPE is in fact less conservative than an SEL-based threshold, particularly when multiple pulses of similar intensity are involved. The difference between SPE and SEL increases as the number of pulses received increases, thus SPE becomes less “conservative” with the increasing number of pulses. If the Navy is attempting to account for multiple pulses or energy accumulation in general, it would be prudent to just use SEL-based risk functions rather than a fictitious SPE metric with an associated, yet unsubstantiated risk function.

More to this point, it is unclear how received levels (in units of SPL) from the LFS SRP²¹ that apparently were used to inform the shape of the risk function reconcile with the x-axis of that function, which is based on SPE. Since the received levels were not measured in SPE, the

¹⁴ Level B harassment.

¹⁵ Based on the Feller (1968) function and parameters gleaned from data obtained during the Low Frequency Sound Scientific Research Program (LFS SRP) in 1997 and 1998. LFS SRP yielded little data to inform such functions. The lack of useable data could be due to the methods used nearly 20 years ago, the low received levels (estimated to be 120 to about 155 dB re 1 μPa in the *Federal Register* notice), and the fact that some of the animals exposed were migrating—recent data from behavioral response studies (BRS or controlled exposure experiments) off Australia indicate that migrating animals may not be the best focal animals for such studies.

¹⁶ It also is not a metric recognized by either the American National Standards Institute (ANSI) or the International Organization for Standardization (ISO)—the two bodies that define and set standards for metrics involving underwater acoustics.

¹⁷ Which is in units of SPE as well.

¹⁸ See the 2012 final SEIS for the equation.

¹⁹ dB re 1 μPa .

²⁰ More simplistically, SPE is merely proportional to intensity and SEL is the intensity summed over time.

²¹ Which appear to have been inferred based on the location of the whales and vessel rather than obtained via direct measurements from acoustic recording tags on the whales.

Commission is unsure if the LFS SRP data were converted to SPEs but surmises that they were not. Using SPL-based parameters as the basis for an SPE-based function²² is unfounded.

The Commission's greatest concern regarding the use of SPE for SURTASS LFA sonar is that neither NMFS nor the Navy use that metric for estimating behavior harassment takes for any other low-frequency (LF) sonar source. Rather, more than 10 years ago, NMFS and the Navy began using the Feller (1968) function based on SPL-based parameters for most species, with the exception of using an unweighted 140 dB re 1 μ Pa for beaked whales and 120 dB re 1 μ Pa for harbor porpoises in recent years (Finneran and Jenkins 2012). Recently for the Phase III EISs, the Navy developed multiple²³ Bayesian biphasic dose response functions²⁴ (Bayesian BRFs). The Bayesian BRFs were a generalization of the monophasic functions previously developed²⁵ and applied to behavioral response data²⁶ (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). Furthermore, the Navy still uses the unweighted 120-dB re 1 μ Pa threshold for harbor porpoises (Department of the Navy 2017b). NMFS has adopted all associated dose response functions and unweighted thresholds for its rulemakings associated with the Navy's Phase III EISs.

The Commission continues to believe that, if the Navy intended to include a measure of energy in its assessment of behavioral risk from exposure to SURTASS LFA sonar, it would have been more prudent to use SEL- rather than SPE-based thresholds. A review of the history of the use of SPE suggests that it is a metric that continues to be used mainly due to inertia rather than because it is considered the best available science for providing conservative estimates of cumulative impacts of sonar transmissions on marine mammal behavior. For all of these reasons, the Commission recommends that NMFS use either (1) a metric (i.e., SPL or SEL) and associated thresholds that are based on physics rather than SPE or (2) the behavioral response metrics and thresholds that the Navy currently uses for all other LF sonar sources based on Department of the Navy (2017b) to estimate behavior takes for the final rule. In either instance, the Navy should investigate the effects of SURTASS LFA sonar using updated BRS methods.

Updating behavior thresholds via monitoring requirements—To investigate the effects of SURTASS LFA sonar and update the behavior thresholds appropriately, BRSs should be conducted and should involve appropriate focal species and behavioral state of those species. In the preamble to the proposed rule, NMFS mentioned the possibility of the Navy conducting such studies but in regard to beaked whales and harbor porpoises rather than mysticetes, other odontocetes including sperm whales, or phocids—species that have greater sensitivities to LF sound. Although consistent with the 2012 final rule, it is nonsensical to propose to conduct a study investigating the impacts of a source that operates between 100 and 500 Hz on beaked whales and harbor porpoises²⁷. NMFS further indicated that SURTASS LFA sonar currently operates, and will continue to operate, in waters of the western and central North Pacific and eastern Indian Oceans; areas where BRSs have

²² The DSEIS also noted that the basement value (B) of the risk function is 120 dB and the 50 percent risk value (K) is 45 dB, but the 2012 final SEIS indicated that B is 119 dB and K is 46 dB.

²³ 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.

²⁴ 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.

²⁵ By Antunes et al. (2014) and Miller et al. (2014).

²⁶ From both wild and captive animals.

²⁷ Given that their predominant hearing range is above those frequencies.

not been conducted, making experiments with LFA sonar particularly difficult. The Commission doesn't follow that reasoning.

The Navy has funded BRSs in many 'new' areas over the last 10 years. Just recently the BRS that was conducted for numerous years off southern California was moved to the area off Hatteras, North Carolina. The SURTASS LFA mission area also includes waters off both the Mariana Islands and Hawaii, where both NMFS and Navy researchers have conducted and continue to conduct various studies. From a logistical standpoint, it would be more conducive to conduct a BRS off Hawaii than traveling 80 km off the east coast of North Carolina to find the target species to affix with tags. The Commission understands that conducting a BRS is not cheap, but if conducted properly, it would yield the necessary data to eliminate the use of SPE and to inform behavior thresholds based on actual acoustic metrics. As such, the Commission recommends that NMFS and the Navy prioritize conducting a BRS involving SURTASS LFA sonar and mysticetes, other odontocetes including sperm whales, and/or phocids under the monitoring requirements for the final rule and ensure that the behavior thresholds are able to be updated accordingly before the next rulemaking.

Furthermore, the Navy has an obligation under section 101(a)(5)(A) to fulfill requirements pertaining to monitoring. NMFS's implementing regulations specify that the monitoring requirements should result in increased knowledge of the species, the level of taking, or impacts on populations of marine mammals that are expected to be present while the activities are conducted (50 C.F.R. § 216.104(a)(13)). As referenced in the preamble to the proposed rule, monitoring projects were not conducted under the previous SURTASS LFA sonar final rule²⁸ and only recently were suggestions for monitoring and research provided to NMFS²⁹. Irrespective of why progress has not been made, monitoring and research priorities specific to SURTASS LFA sonar should not be left to languish for another five to seven years.

Level A and B harassment takes

Level A harassment takes—The Navy stated that it does not expect its use of SURTASS LFA sonar to cause Level A harassment (PTS) of any marine mammal species or stocks based on the application of the full suite of mitigation measures that would be employed when the sonar is transmitting. However, that supposition has not been substantiated and the Commission questions its validity given that SURTASS LFA sonar emits 60-sec transmissions for up to a total of 2.4 hours per day (84

²⁸ The Navy finalized, just a month ago, a modeling exercise investigating the effects of SURTASS LFA sonar on harbor porpoises—a species that is less sensitive to low-frequency sound particularly below 500 Hz, is not prevalent in the various mission areas, and, when it is expected to occur, generally resides within the coastal stand-off zone, where SURTASS LFA sonar is prohibited from exceeding 180 dB re 1 μ Pa. Not surprising, that modeling exercise indicated that effects to harbor porpoises would be very unlikely even for behavioral responses (Marine Acoustics, Inc. 2019). Utility aside, the modeling exercise should have taken a few months to complete rather than what appears to be numerous years.

²⁹ Apparently, those suggestions and recommendations took nearly five years to formulate and were intended to focus on impacts to beaked whales and harbor porpoises based on requirements in the 2012 final rule and LOAs. The preamble to this proposed rule noted that the Executive Oversight Group (EOG) had not met since 2014, while the preamble to the 2017 proposed rule indicated that the EOG was still considering which research/monitoring efforts are the most efficacious, given existing budgetary constraints, and would provide the Navy with a ranked list of monitoring and research recommendations (82 Fed. Reg. 19516). Furthermore, Department of the Navy (2017a), the report that ranked those recommendations, is still not available on the Navy's SURTASS LFA sonar website and NMFS either did not have or could not locate that report until it was sent to the Commission for review yesterday.

Fed. Reg. 7223). Appendix B of the 2018 DSEIS, which discussed the marine mammal impact analysis, did not mention inclusion of mitigation within the modeling scenarios or whether modeling was even conducted based on the Level A harassment thresholds. However, it appears that Level A harassment takes were not estimated and that the Navy assumed that mitigation was 100 percent effective based on information contained in the preamble to the proposed rule (84 Fed. Reg. 7223).

The Navy's HF/M3 active sonar source should be able to detect marine mammals but whether it can detect them 100 percent of the time has yet to be confirmed. Specifically, the HF/M3 sonar has four transducers with 8° horizontal and 10° vertical beamwidths, which sweep a full 360° in the horizontal plane every 45 to 60 sec with a maximum range of approximately 2 km (84 Fed. Reg. 7192). Depending on how close to the water's surface the top transducer is placed, the spacing of the transducers, the depth of the last transducer, and the water depth in which SURTASS LFA sonar is operating, the coverage of the entire water column out to 2 km may not be achieved. Thus, it would not be appropriate for the Navy and NMFS to assume mitigation would be 100 percent effective.

This issue is further confounded by the assumption that a marine mammal (except LF cetaceans) would need to be within 7 m of the LFA sonar source and an LF cetacean would need to be within 41 m for an entire LFA transmission to potentially experience PTS (84 Fed. Reg. 7223). An LFA sonar vessel would travel at 3 to 4 knots, and many marine mammals can travel parallel with or overtake a vessel at that speed. Furthermore, some marine mammals could be taken by multiple pings. The easiest way to determine whether in fact that is likely to occur in real-world situations is by querying the animat dosimeters that were part of the Navy's modeling scenarios. If Level A harassment takes were estimated by the Navy's model, then the previously-stated suppositions regarding distance and timeframe exposed to SURTASS LFA sonar should be revised³⁰. The Commission recommends that NMFS (1) specify the numbers of model-estimated Level A harassment (PTS) takes of marine mammals in the absence of implementing mitigation measures and any and all assumptions (including within the animat modeling scenarios) that were made to reduce those takes to zero in the preamble to the final rule and (2) authorize the model-estimated Level A harassment (PTS) takes rather than reducing them to zero in the final rule. Specifics regarding the situations in which those takes were estimated to occur (i.e., distances to the source and timeframe over which the exposure occurred) should be delineated in the preamble to the final rule³¹ as well.

The Commission again noticed that the proposed numbers of takes by TTS were greater by an order of magnitude or more than behavior takes for some LF cetaceans³² (see Tables 6-3 and 6-4 in the revised LOA application). For other LF cetaceans, the TTS and behavior takes were comparable³³; while for still others, the behavior takes were greater than the TTS takes³⁴, an outcome

³⁰ This applies to takes by temporary threshold shift (TTS) as well. Given that the numbers of TTS takes of phocids range from the 100s to 1000s in Table 6-3 of the LOA application, the animat dosimeters likely are accumulating multiple pings of SURTASS LFA sonar. Further, the extent of the TTS zone for a single SURTASS LFA sonar transmission is 66 m for phocids, which is not that much greater than the 41-m PTS zone for LF cetaceans. The Commission is skeptical that there were in fact zero model-estimated Level A harassment (PTS) takes, particularly for LF cetaceans.

³¹ This applies to takes by TTS as well.

³² See takes for blue whales of the Western North Pacific Ocean stock in Table 6-3.

³³ See takes for Bryde's whales of the Western North Pacific Ocean and Northern Indian Ocean stocks in Table 6-3.

³⁴ See Bryde's whales of the Hawaii stock in Table 6-3.

which makes most sense based on real-world scenarios. It is unclear how those differing trends in takes can occur within the same functional hearing group of animals for which the same thresholds are used. Therefore, the Commission recommends that NMFS explain why TTS takes are greater than behavior takes for some species of mysticetes, or stocks of mysticetes within the same species, in the preamble to the final rule.

General mitigation and monitoring measures

The proposed rule indicated that the Navy would be required to conduct visual³⁵, passive acoustic, and active acoustic monitoring for 30 minutes prior to, during, and for 15 minutes after³⁶ transmission of SURTASS LFA sonar. The proposed rule also stipulated that when SURTASS LFA sonar transmissions have been delayed or suspended because a marine mammal has been detected within the proposed LFA exclusion or buffer zone, active LFA sonar transmissions could resume 15 minutes after the last detection of the animal in those zones³⁷, if the marine mammal has not been observed to have left the zone.

The Commission continues to believe, as stated in previous letters regarding the 2012 and 2017 proposed rules, that both the clearance and post-activity monitoring timeframes should be at least 30 rather than 15 minutes. NMFS has required and continues to require the Navy to use a clearance time of 30 minutes when it conducts its other testing and training activities that employ LF and other sources (e.g., 83 Fed. Reg. 67022)—a similar clearance-time requirement is used by all other action proponents for medium-sized and large cetaceans (e.g., mysticetes, killer whales, beaked whales, etc). The Commission believes that a clearance time of 15 minutes is insufficient based on the dive times of many marine mammal species, especially when a vessel is transiting at only 3 to 4 knots.

NMFS also requires all other action proponents to conduct post-activity monitoring for 30 minutes, rather than the 15 minutes proposed in this instance, primarily to ensure that there were no unintended effects (e.g., unusual behaviors, signs of injured or dead animals) from the various activities. In response to the Commission's previous recommendation that a 30-minute post-activity monitoring period be required for SURTASS LFA sonar activities, NMFS indicated that prescription of the Navy's mitigation measures reflected a careful balancing of the likely benefit of any particular measure for marine mammals with the likely effect of that measure on personnel safety, practicality of implementation, and impact on the effectiveness of the military readiness activity (77 Fed. Reg. 50307). Given that the measures would not affect personnel safety and are practicable—the Navy implements them for LF sonar activities other than SURTASS LFA sonar and other activities in general, as do all other action proponents—the impact must be on the effectiveness of military readiness activities. NMFS stated that an extra 15 minutes would delay the ship's ability to depart the area at the normal transiting speed of 10 knots. The Commission is not convinced that an additional 15 minutes of post-activity monitoring at the end of a mission would appreciably impact the Navy's ability to conduct military readiness activities, particularly given the reduced number of sonar hours planned. In previous years, 5 to 31 total missions have been conducted in any given year among all four ships (Department of the Navy 2007 and 2011). Thus,

³⁵ If during daylight hours, i.e., from 30 minutes prior to sunrise until 30 minutes after sunset.

³⁶ Or, if marine mammals are exhibiting unusual changes in behavior patterns, for a period of time until behavior patterns return to normal or conditions prevent continued observations.

³⁷ By visual observation, passive acoustics, or the active sonar system.

an additional 1 to 8 hours of post-activity monitoring would be added over the course of a year, which should not appreciably impact the Navy's ability to conduct its activities or the effectiveness of those activities. Therefore, the Commission recommends that, in the final rule, NMFS require the Navy to (1) use a 30-minute clearance time when a marine mammal has not been observed to have left the mitigation zone, consistent with other Navy activities and (2) conduct post-activity monitoring including visual³⁸, passive acoustic, and active acoustic monitoring for 30 rather than 15 minutes.

As noted herein and in previous letters, it does not appear that the Navy has conducted a study to investigate the effectiveness of the suite of mitigation measures currently being employed or proposed for SURTASS LFA sonar activities. Such a study would be prudent. NMFS stated in the preamble to the 2012 final rule that the active sonar system's marine mammal detection probability approaches 100 percent based on multiple pings and that combined with visual (estimated to be a 9 percent detection probability) and passive acoustic (estimated to be a 25 percent detection probability) methods, all three systems would have an effective detection probability of at least 99 percent at 1 km from the vessel (77 Fed. Reg. 50307). However, when reviewing previous comprehensive monitoring reports (Department of the Navy 2007 and 2011), the Commission notes that determination of effectiveness has been based solely on what has been 'observed' via the three monitoring methods and some theoretical assumptions. True 'effectiveness' studies evaluate not only the animals that are detected, but also those that are missed. The Navy is conducting a lookout effectiveness study to assess the effectiveness of visual monitoring. A similar study, including the assessment of both passive and active acoustic monitoring³⁹, would provide a more appropriate means than the Navy's current approach for concluding that the measures are 100 percent effective.

Offshore biologically important areas (OBIA)

Through the implementation of the proposed mitigation measures, the Navy would ensure that SURTASS LFA sonar received levels would be less than 180 dB re 1 μ Pa⁴⁰ within (1) 22 kilometers of any land⁴¹ or (2) the boundary of a designated OBIA⁴² during biologically important seasons. NMFS further proposed to require the Navy to add an additional 1 km buffer around any designated OBIA. Designation of OBIA was based on the area being inhabited at least seasonally by marine mammal species whose best hearing sensitivity is in the LF range and on the area's biological importance as indicated by (1) its high marine mammal density, (2) its known/defined breeding/calving grounds, foraging grounds, or migration routes, (3) being inhabited by small, distinct populations with limited distribution, or (4) being designated as critical habitat. The Navy currently has recognized 29 OBIA, with 4 in the mission areas of the DSEIS.

NMFS indicated that three areas are on the OBIA watchlist, including the Pāpānāumokuākea Marine National Monument (MNM), the Marianas Trench MNM, and the Pacific Remote Islands MNM. In addition, NMFS indicated that 13 ecologically or biologically

³⁸ If during daylight hours, i.e., from 30 minutes prior to sunrise until 30 minutes after sunset.

³⁹ Which would include investigating the detection range with distance for the active acoustic source as compared to experienced protected species observers for visual monitoring and determining detection range with depth (e.g., full or partial water column depth) for both passive and active acoustic monitoring.

⁴⁰ root-mean-square.

⁴¹ The Navy also would not conduct SURTASS LFA sonar training and testing activities within the territorial seas of any foreign nation (up to 22 km from shore depending on the jurisdiction).

⁴² Which must be beyond 22 km of land.

significant marine areas (EBSAs), 5 areas suggested by the Natural Resources Defense Council (NRDC)⁴³, 2 areas designated as critical habitat, and 2 important marine mammal areas (IMMAs)⁴⁴ are being considered as potential additional OBIA's (see Table 21 in the *Federal Register* notice). Fourteen of those 25 potential OBIA's meet the various LF-sensitivity and biological importance criteria and occur within the SURTASS LFA sonar mission areas and, at least partially, outside the coastal stand-off range where SURTASS LFA sonar activities already are restricted⁴⁵. Thus, those 14 areas should be designated as OBIA's. The Commission questions why a few of the remaining 11 do not also meet the OBIA criteria.

Specifically, Raja Ampat and Northern Bird's Head serve as important habitat for migrating and/or foraging Bryde's and sperm whales and the Main Hawaiian Archipelago serves as important habitat for breeding and calving humpback whales. In addition, Peter the Great Bay serves as important breeding habitat for spotted seals. All of those species are sensitive to LF sound, and portions of those potential OBIA's meet the geographic criteria as well. Thus, it is unclear why NMFS does not believe that these three OBIA's also meet the OBIA criteria or why they were omitted from further consideration.

Finally, Pacific Remote Islands MNM, including areas around Wake and Johnston Atolls and a small part of the northern end of Kingman Reef/Palmyra Atoll, meet the geographic criteria. The Navy has recognized that the Pacific Remote Islands MNM is one of the largest marine protected areas in the world and is an important part of the most widespread collection of marine life on the planet under a single country's jurisdiction (Department of the Navy 2019). Although marine mammal data are limited, sperm whales have been observed in the MNM and the Navy noted that the MNM could serve as potential critical habitat for some threatened and endangered species (e.g., humpback whales). Baleen and sperm whales are considered sensitive to LF sound.

The Commission finds itself again needing to remind NMFS and the Navy that a 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 SURTASS LFA sonar case on that basis (see *NRDC, Inc., et al. v. Penny Pritzker et al.*). The Court indicated that NMFS and the 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. However, it appears that NMFS is again failing to take a sufficiently precautionary approach, particularly with respect to the Pacific Remote Island MNM. For all these reasons, the Commission recommends that NMFS include areas #1-15 and areas 19, 21, and 24 (as denoted in Table 21 of the *Federal Register* notice) as OBIA's in the final rule.

Of even greater concern regarding NMFS's OBIA assessment is that, although the agency has identified potential OBIA's it might include in the final rule, it has neither specified which ones it actually is proposing to include nor provided any assessment of whether it believes including specific areas that meet the designation criteria would be practicable. Rather, NMFS has only requested public comment on whether any of the potential areas satisfy the OBIA criteria, after which time the

⁴³ In its comments on the 2018 DSEIS.

⁴⁴ Even though three are erroneously listed in Table C-1.

⁴⁵ Both of which are referred to as the geographic criteria.

Navy and NMFS would, apparently without any additional public input, evaluate the practicability of those measures to avoid or reduce impacts in those areas. That approach effectively undermines the ability of the Commission and others to provide informed comments on that portion of the proposed rule.

Least practicable adverse impact requirement

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 MMPA⁴⁶. The Commission will not reiterate all of the points made in previous letters but has incorporated them by reference. Instead, the Commission will focus on points specifically germane to new information or positions presented in the preamble to the proposed rule.

On page 7227 of the *Federal Register* notice, NMFS stated that the Ninth Circuit Court of Appeals in *NRDC v. Pritzker* was "interpreting the statute without the benefit of NMFS formal interpretation." The suggestion is that the discussion in the preamble to the proposed rule and previous rules is intended to provide that "formal interpretation." The Commission notes that NMFS's interpretation of the least practicable impact standard in various proposed rules has been an evolving one, and it is unclear that any of those discussions, targeted to specific instances, should be considered to constitute a formal interpretation. Rather, it is a shifting target that requires the Commission and other stakeholders to comment repeatedly on the various permutations.

The Commission continues to believe that such generally applicable policies and interpretations should be developed through a separate rulemaking (e.g., in amendments to 50 C.F.R. § 216.103 or § 216.105) or policy statement rather than in individual incidental take authorizations and again recommends that NMFS pursue such a rulemaking or publish a proposed policy for public review and comment. Among other things, the Commission is concerned that some stakeholders may not be aware of or choose not to comment on the proposed interpretation in this context, because the particular authorization may not otherwise be of interest to them (e.g., because the activity is in a geographical location or concerns a type of activity not of particular interest).

In its previous letters, the Commission recommended that NMFS adopt a two-step approach when applying the least practicable adverse impact standard. First, it should identify the criteria it will use to determine whether adverse impacts on marine mammal species/stocks or their habitat are anticipated. If potential adverse impacts are identified, the second step should be to determine whether measures designed to reduce those impacts are available and practicable.

The Commission remains concerned that, because NMFS's proposed criteria for applying the least practicable adverse impact standard coningle elements related to whether impacts are adverse and whether potential mitigation measures are likely to be effective, NMFS's analysis is not as clear as it should be.⁴⁷ The Commission therefore again recommends that NMFS rework its

⁴⁶ For example, see the Commission's [30 May 2017](#), [16 April 2018](#), [13 July 2018](#), and [21 August 2018](#) letters regarding this matter.

⁴⁷ For example, it is not readily apparent how the status of a species or stock is relevant to determining "the appropriateness of potential mitigation measures in the context of least practicable adverse impact." Is it because the

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.

To illustrate this issue, the Commission points to page 7229 of the *Federal Register* notice—

Finally, because the least practicable adverse impact standard gives NMFS discretion to weigh a variety of factors when determining appropriate mitigation measures and because the focus of the standard is on reducing impacts at the species or stock level, the least practicable adverse impact standard does not compel mitigation for every kind of take, or every individual taken, if that mitigation is unlikely to meaningfully contribute to the reduction of adverse impacts on the species or stock and its habitat, even when practicable for implementation by the applicant.

The Commission disagrees with NMFS's analysis, although not necessarily its conclusion. The Commission believes that, under the first prong of its recommended analysis, the MMPA does compel the Secretary to include mitigation measures for all takings that reasonably can be expected to contribute to adverse impacts on the affected species or stocks and their habitat, if they are practicable. However, if the contribution to the reduction of impacts would not be meaningful, then such measures would not be considered practicable.

Section 101(a)(5)(A)(i)(II)(aa) of the MMPA specifies that incidental take regulations are to set forth “permissible methods of taking pursuant to such activity, and other means of effecting the least practicable adverse impact on such species or stock and its habitat, paying particular attention to rookeries, mating grounds, and other areas of similar significance....” In this case, NMFS has only identified in the most general sense the means it will use to effect the least practicable adverse impact—it will identify and impose heightened protections in as yet unidentified OBIAs—and has provided no information to assess when and where NMFS believes it would be practicable for the Navy to abide by those exclusions. Only at the final rule stage would NMFS generate a list of the areas that meet the OBIA criteria, provide its rationale for determining which areas satisfy those criteria, and discuss whether requiring the Navy to employ mitigation measures in and near those areas would be practicable. This approach is inconsistent with how NMFS has handled every previous rulemaking involving the Navy's activities, and more importantly, is inconsistent with the requirements of the Administrative Procedure Act, which requires that NMFS give the public a meaningful opportunity to comment on what the agency is proposing. In this instance, the public is not being given a meaningful opportunity to comment on what OBIAs are appropriate to include in the final rule. Rather, commenters are left to speculate on which OBIAs NMFS might select and to comment in a vacuum as to whether those would be practicable for the Navy to meet its operational goals if some or all of the OBIAs that meet the criteria are included in the final rule. Because of this shortcoming in the proposed rule, the Commission recommends that, in this and other proposed rules, NMFS inform the public what measures it is proposing to include in the final rule to satisfy

impact is not considered adverse in some cases, or because steps to mitigate adverse impact are not considered practicable? While the Commission believes that any incidental death of a marine mammal should always be considered adverse, it agrees that the status of a stock is relevant in determining whether sub-lethal impacts (e.g., those from behavioral disturbance) are considered adverse to the affected marine mammal species or stock. That is, an impact that is unlikely to lead directly to the death of a marine mammal might be considered adverse to a depleted and declining stock but not to a healthy, thriving one. However, once a determination has been made that an impact would be adverse, the only question remaining is whether it is practicable to eliminate or reduce that impact.

the requirements of section 101(a)(5)(A)(i)(II)(aa) of the MMPA rather than leaving the public to speculate on all of the possibilities and the practicability of implementing them.

The Commission also notes that the analysis provided in the *Federal Register* notice seems to conflate the species and habitat portions of the least practicable adverse impact standard. NMFS discussed the distinction between impacts on individual marine mammals versus impacts on species and stocks in some detail. However, that distinction is irrelevant when considering adverse impacts to important marine mammal habitat such as rookeries, mating grounds, and areas of similar significance. All of these types of areas are important at the species or stock level. Further, the Commission believes that all of the areas that meet the OBIA designation criteria constitute important habitat for purposes of implementing section 101(a)(5)(A)(i)(II)(aa) of the MMPA and that mitigation measures to avoid or reduce adverse impacts to all of those areas should be included in the final rule unless such measures are not practicable. The Commission therefore recommends that, in the final rule, NMFS again require that the Navy ensure that none of the areas designated as OBIA's (or the 1-km buffer zones around them) are subjected to SURTASS LFA sonar received levels of 180 dB re 1 μ Pa or greater. Further, because the proposed rule did not include any information that indicates it would be impracticable for the Navy to adhere to such a limitation for any of the OBIA's under consideration, the Commission recommends that this mitigation measure apply to all areas the Commission recommended be designated as OBIA's herein. If NMFS or the Navy believes it would be impracticable to implement the identified measures in any of those areas, then NMFS should make that case in a subsequent *Federal Register* notice and provide the public with an opportunity to comment on any proposed exceptions before adopting them.

The Commission appreciates the opportunity to provide comments on the proposed rule. Please contact me if you have questions concerning the Commission's recommendations or rationale.

Sincerely,



Peter O. Thomas, Ph.D.
Executive Director

References

- Antunes, R., P.H. Kvasdheim, F.P. Lam, P.L. Tyack, L. Thomas, P.J. Wensveen, and P.J. Miller. 2014. High thresholds for avoidance of sonar by free-ranging long-finned pilot whales (*Globicephala melas*). *Marine Pollution Bulletin* 83(1):165–180.
- Bradford, A.L., K.A. Forney, E.M. Oleson, and J. Barlow. 2017. Abundance estimates of cetaceans from a line-transect survey within the U.S. Hawaiian Islands exclusive economic zone. *Fishery Bulletin* 115(2):129–142.

- Department of the Navy. 2007. Final supplemental environmental impact statement for Surveillance Towed Array Sensor System Low Frequency Active (SURTASS LFA) sonar. Chief of Naval Operations, Washington, D.C. 592 pages.
- Department of the Navy. 2011. Application for letters of authorization under section 101 (a)(5)(A) of the Marine Mammal Protection Act for activities associated with the employment of Surveillance Towed Array Sensor System Low Frequency Active (SURTASS LFA) sonar. Chief of Naval Operations, Washington, D.C. 220 pages.
- Department of the Navy. 2017a. Beaked whale and harbor porpoise monitoring and reporting requirements: In support of the 2012 Final Rule for SURTASS LFA sonar. Washington, DC. 11 pages.
- Department of the Navy. 2017b. Technical report: Criteria and thresholds for U.S. Navy acoustic and explosive effects analysis (Phase III). SSC Pacific, San Diego, California. 194 pages.
- Department of the Navy. 2017c. U.S. Navy Marine Species Density Database Phase III for the Hawaii-Southern California Training and Testing study area. Naval Facilities Engineering Command Pacific, Pearl Harbor, Hawaii. 274 pages.
- Department of the Navy. 2018a. Navy marine species density database. Geospatial global database. Accessed May 2018. Chief of Naval Operations.
- Department of the Navy. 2018b. U.S. Navy marine species density database Phase III for the Mariana Islands Training and Testing Study Area: Technical report. U.S. Pacific Fleet, Pearl Harbor, Hawaii. 130 pages.
- Department of the Navy. 2019. Potential marine mammal offshore biologically important areas for Surveillance Towed Array Sensor System Low Frequency Active Sonar: Marine areas under consideration. Chief of Naval Operations, Washington, D.C. 175 pages.
- Ellison, W.T., B.L. Southall, C.W. Clark, and A.S. Frankel. 2011. A new context-based approach to assess marine mammal behavioral responses to anthropogenic sounds. *Conservation Biology* 26(1):21–28.
- Feller, W. 1968. Introduction to probability theory and its application: Volume 1, 3rd edition. John Wiley & Sons, New York, New York. 528 pages.
- Ferguson, M.C., and J. Barlow. 2001. Spatial distribution and density of cetaceans in the eastern tropical Pacific Ocean based on summer/fall research vessel surveys in 1986–1996. NMFS Southwest Fisheries Science Center Administrative Report LJ–01–04. La Jolla, California. 63 pages.
- Ferguson, M.C., and J. Barlow. 2003. Addendum: Spatial distribution and density of cetaceans in the eastern tropical Pacific Ocean based on summer/fall research vessel surveys in 1986–96. NMFS Southwest Fisheries Science Center Administrative Report LJ–01–04, Addendum. La Jolla, California. 100 pages.
- Finneran, J.J., and A.K. Jenkins. 2012. Criteria and thresholds for U.S. Navy acoustic and explosive effects analysis. SPAWAR Marine Mammal Program, San Diego, California, 64 pages.
- Fulling, G.L., P.H. Thorson, and J. Rivers. 2011. Distribution and abundance estimates for cetaceans in the waters off Guam and the Commonwealth of the Northern Mariana Islands. *Pacific Science* 65(3):321-343.
- LGL Limited. 2008. Environmental assessment of a marine geophysical survey by the R/V *Marcus G. Langseth* in Southeast Asia, March–July 2009. Prepared for Lamont-Doherty Earth Observatory and National Science Foundation Division of Ocean Sciences. 215 pages
- Marine Acoustics, Inc. 2019. Desktop study of the overlap between harbor porpoise habitat and regions of SURTASS LFA sonar use. In support of Chief of Naval Operations, Washington, DC. 22 pages.

- Miller, P.J., R.N. Antunes, P.J. Wensveen, F.I. Samarra, A.C. Alves, P.L. Tyack, P.H. Kvadsheim, L. Kleivane, F.P. Lam, M.A. Ainslie, and L. Thomas. 2014. Dose-response relationships for the onset of avoidance of sonar by free-ranging killer whales. *The Journal of Acoustical Society of America* 135(2):975–993.
- Thomas, P.O., R.R. Reeves, and R.L. Brownell. 2016. Status of the world's baleen whales. *Marine Mammal Science* 32:682–734.
- Tillman, M. F. 1977. Estimates of population size for the North Pacific sei whale. Report of the International Whaling Commission Special Issue (1):98–106.