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 application[1].

Background

The Navy proposes to use multiple SURTASS LFA sonar systems for military readiness during training and testing activities from 2019–2026[2]. 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 acoustic[3] 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 review[4]. 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 areas[5] from which sightings or abundance estimates were extrapolated varied and numerous correction factors for pinnipeds[6] 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 estimates[7] 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 estimates[8] 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 overlap[9].

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 data[10], 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 maximum[11] 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 data[12], 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/km^2, 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 seasons[13]. 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 response[14] 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 function[15] that accounts for the energy of all LFA sonar transmissions that an animat may receive in a 24-hour period. However, SPE is not an energy-based metric or based on any sort of physical quantity[16]. It is a quasi-metric that the Navy has used to apply its behavior risk function[17] since the first SURTASS LFA sonar EIS was drafted in 1999 and finalized in 2001. The Navy has defined SPE[18] 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 pulses[20], 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 SRP[21] 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 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 function[22] 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 μPa for beaked whales and 120 dB re 1 μPa for harbor porpoises in recent years (Finneran and Jenkins 2012). Recently for the Phase III EISs, the Navy developed multiple[23] Bayesian biphasic dose response functions[24] (Bayesian BRFs). The Bayesian BRFs were a generalization of the monophasic functions previously developed[25] and applied to behavioral response data[26] (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 μPa 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 porpoises[27]. 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 μPa 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 rule[28] and only recently were suggestions for monitoring and research provided to NMFS[29]. 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 μPa. 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 revised[30]. 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 rule[31] 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 cetaceans[32] (see Tables 6-3 and 6-4 in the revised LOA application). For other LF cetaceans, the TTS and behavior takes were comparable[33]; while for still others, the behavior takes were greater than the TTS takes[34], 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 visual[35], passive acoustic, and active acoustic monitoring for 30 minutes prior to, during, and for 15 minutes after[36] 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 zones[37], 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 visual[38], 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 monitoring[39], 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 (OBIAs)

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 μPa[40] within (1) 22 kilometers of any land[41] or (2) the boundary of a designated OBIA[42] during biologically important seasons. NMFS further proposed to require the Navy to add an additional 1 km buffer around any designated OBIA. Designation of OBIAs 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 OBIAs, with 4 in the mission areas of the DSEIS.

NMFS indicated that three areas are on the OBIA watchlist, including the Paphanāumokuākea 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 OBIAs (see Table 21 in the *Federal Register* notice). Fourteen of those 25 potential OBIAs 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 restricted[45]. Thus, those 14 areas should be designated as OBIAs. 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 OBIAs meet the geographic criteria as well. Thus, it is unclear why NMFS does not believe that these three OBIAs 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 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 OBIAs in the final rule.

Of even greater concern regarding NMFS's OBIA assessment is that, although the agency has identified potential OBIAs 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 MMPA[46]. 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 comingle 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

---

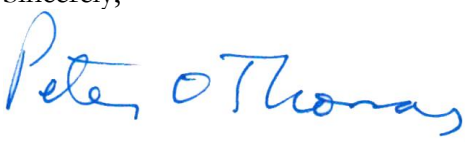
impact is not considered adverse in some cases, or because steps to mitigate adverse impact are not considered practicable? While the Commission believes that any incidental death of a marine mammal should always be considered adverse, it agrees that the status of a stock is relevant in determining whether 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 OBIAs (or the 1-km buffer zones around them) are subjected to SURTASS LFA sonar received levels of 180 dB re 1 µPa 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 OBIAs under consideration, the Commission recommends that this mitigation measure apply to all areas the Commission recommended be designated as OBIAs 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. Kvadsheim, 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.

Via Electronic Mail and regulations.gov

April 1, 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
jolie.harrison@noaa.gov

Re: *Proposed Rule for SURTASS LFA (NOAA-NMFS-2019-0014)*

Dear Ms. Harrison:

On behalf of the Natural Resources Defense Council ("NRDC"), The Humane Society of the United States, and Humane Society Legislative Fund, and our millions of members and activists, we are writing to submit comments on the Proposed Rule for the U.S. Navy's Surveillance Towed Array Sensor (SURTASS) Training and Testing in the Central and Western North Pacific Ocean and Eastern Indian Ocean. 84 Fed. Reg. 7186 (March 1, 2019) [hereafter, "Proposed Rule"].

As you know, our organizations have long been concerned about the Navy's operation of SURTASS LFA (or "LFA") sonar. Our concern derives not only from the system itself, and its capacity to introduce high-powered, disruptive, low-frequency noise into the marine environment, but from the scale of the Navy's activities. The present Proposed Rule differs in several respects from previous rules for SURTASS LFA over the last two decades in that the Navy is no longer seeking global deployment of LFA sonar, the annual number of transmission hours has been reduced to more accurately reflect actual need, and the Navy's application distinguishes among six categories of LFA activities (84 Fed. Reg. at 7189) which may be susceptible to different degrees of mitigation.

While these baseline changes have potential to focus the Navy's and NMFS' analysis of both impacts and mitigation, we remain concerned that NMFS has continued to pursue an analysis that does not satisfy the "least practicable adverse impact" standard set forth in the Marine Mammal Protection Act ("MMPA"), particularly in data-poor areas of ocean. *See NRDC v. Pritzker*, 828 F3d 1125, 1138, 1140, 1141 (9th Cir. 2016) (holding, *inter alia*, that protecting marine mammal habitat from Navy sonar is "of paramount importance" under the law, and that,

in defining habitat for mitigation, the agency is compelled to err on the side of overprotection rather than underprotection where data on marine mammal distribution are limited).

The agencies must ensure that their mitigation for LFA achieves the "least practicable adverse impact" on marine mammals while allowing the Navy to effectively operate the system. **We request a meeting with the Navy and NMFS to discuss the recommendations we have made below, with the aim of achieving this dual purpose and avoiding future rounds of conflict.**

I. THE MARINE MAMMAL PROTECTION ACT AND THE "LEAST PRACTICABLE ADVERSE IMPACT" STANDARD

The MMPA was adopted more than forty years ago to ameliorate the consequences of human impacts on marine mammals. Its goal is to protect and promote the growth of marine mammal populations "to the greatest extent feasible commensurate with sound policies of resource management" and to "maintain the health and stability of the marine ecosystem." 16 U.S.C. § 1361(6). A careful approach to management was necessary given the vulnerable status of many of these populations (a substantial percentage of which remain endangered or depleted) as well as the difficulty of measuring the impacts of human activities on marine mammals in the wild. 16 U.S.C. § 1361(l), (3). "[I]t seems elementary common sense," the House Committee on Merchant Marine and Fisheries observed in sending the bill to the floor, "that legislation should be adopted to require that we act conservatively—that no steps should be taken regarding these animals that might prove to be adverse or even irreversible in their effects until more is known. As far as could be done, we have endeavored to build such a conservative bias into the [MMPA]." Report of the House Committee on Merchant Marines and Fisheries, reprinted in 1972 U.S. Code Cong. & Admin. News 4148.

At the heart of the MMPA is its "take" provision, which establishes a moratorium on the harassing, hunting, or killing of marine mammals, and generally prohibits any person or vessel subject to the jurisdiction of the United States from taking a marine mammal on the high seas or in waters or on land under the jurisdiction of the United States. 16 U.S.C. §§ 1362(13), 1371(a). Under the law, NMFS may grant general exceptions to the take prohibition, but only after it determines, using the best available scientific evidence, that such take would have a negligible impact on marine mammal populations or stocks. And in authorizing take, NMFS must prescribe "methods" and "means of effecting the least practicable impact" on protected species as well as "requirements pertaining to the monitoring and reporting of such taking." 16 U.S.C. §§ 1371(a)(5)(A)(ii), (D)(vi).

This last requirement, on mitigation, has proven critical to the agency's regulation of marine mammal takes from SURTASS LFA operations. While NMFS is required to consult with the Department of Defense before making a determination under this provision, and to consider "personnel safety, practicality of implementation, and impact on the effectiveness of the military readiness activity" (*id.*), the "least practicable adverse impact" standard is, in any case, a rigorous one. *NRDC v. Pritzker*, 828 F.3d at 1133; *see also, e.g.*, *Conservation Council*, 97 F.Supp.3d at 1231.

We are concerned that NMFS, in its discussion of the standard, has set forth an interpretation that remains inconsistent with the plain language of the MMPA's mitigation provision and with the Court's ruling. Again, the agency reserves its consideration of mitigation measures to those that, ultimately, "are likely to increase the probability or severity of population-level effects." 84 Fed. Reg. at 7228. It appears to base this understanding on an imputation of population-level harm into the "least practicable adverse impact" standard, and particularly into the standard's reference to "such species or stock."[1] *See id.* Yet the Court in *Pritzker* specifically rejected this assumption when the agency attempted to import it into the statute via its existing regulations concerning "negligible impact":

> The inquiry as to "negligible impact" is thus focused on population-level effects—i.e., on "annual rates of recruitment or survival." Defendants seek to import that population-level focus to the "least practicable adverse impact" standard, but the regulations do not even define that standard, let alone limit its focus to population-level effects. Instead, the MMPA itself simply requires NMFS to prescribe regulations setting forth "means of effecting the least practicable adverse impact on such species or stock and its habitat," both of which could be adversely affected by activities that do not necessarily affect annual rates of recruitment or survival.

Pritzker, 828 Fed. Rep. at 1134 (citation omitted).

NMFS rightly observes that the reduction of impacts to affected species or stocks "accrues through the application of mitigation measures that limit impacts to individual animals" and, consistent with this, "focuses on measures that are designed to avoid or minimize impacts on individual marine mammals" that, in turn, are likely to increase the risk of population-level effects. 84 Fed. Reg. at 7228. This means, for example, that the agency recognizes measures "limiting interruption of known feeding, breeding, mother/young, or resting behaviors" as having "greater value" for mitigation. *Id*. at 7229.

But NMFS' formulation remains problematic in practice. In detaching itself from the MMPA's take provision (*id.*), it creates vagueness that leaves the provision open to inconsistent, arbitrary application. Indeed, the Proposed Rule itself appears to wander beyond the interpretation that NMFS sets down here when it rejects following the "White Paper" guidelines to establish Offshore Biologically Important Areas ("OBIAs") in data-poor regions. It does so on the grounds, *inter alia*, that establishing OBIAs would not further reduce fitness consequences (i.e., "the potential for impacts on reproduction or survival") in individual marine mammals and thus would not reduce the probability of population-level harm. *Id.* at 7247. Yet this is an ostensibly higher bar than is articulated by the agency in its section interpreting the "least practicable adverse impact" standard, requiring actual reduction of fitness impacts rather than reduced disruption of behavioral responses associated with fitness. *Compare id.* at 7229 (listing factors having "greater value" for mitigation to include "limiting interruption of known feeding,

[1] The MMPA also requires that NMFS regulations achieve the least practicable adverse impact on marine mammal "habitat." 16 U.S.C. 1371(a)(5)(ii). While NMFS acknowledges this requirement (84 Fed. Reg. at 7228), there is no indication in the Proposed Rule that NMFS has as yet given it separate effect in prescribing mitigation for training and testing with SURTASS LFA.

breeding, mother/young, or resting behaviors"). Putting aside the inconsistency with the statute, discussed above, our practical concern is that NMFS' interpretation will be used as a convenient legal defense—just as it was in *Pritzker*—to prop up an insufficient analysis. NMFS should ensure that it applies the "least practicable adverse impact" standard in a manner that reduces the impacts (e.g., Level A and Level B take) that Congress intended to prohibit in adopting the MMPA.

II. GENERAL COMMENTS ON THE IDENTIFICATION AND ASSESSMENT OF OFFSHORE BIOLOGICALLY IMPORTANT AREAS ("OBIAs")

The protection of Offshore Biologically Important Areas, or "OBIAs," is "a central component" of the agencies' mitigation measures for LFA sonar, as the Ninth Circuit has recognized. *NRDC v. Pritzker*, 828 F.3d at 1138.

In identifying OBIAs, NMFS references a series of selection criteria, including relevant geographic scope, specific importance to low frequency hearing cetaceans (the criteria also afford special consideration to sperm whales and elephant seals due to their increased sensitivity to low frequency sound), and three "biological criteria for eligibility": namely, (i) an area representing a location of known biologically important breeding, calving, foraging or migrating activity; (ii) geographic areas in which small distinct populations of marine mammals occur and whose distributional range are limited; and (iii) an area of high density for one or more species of marine mammal. 84 Fed. Reg. at 7234. Finally, it sets forth a brief criterion regarding the practicability of establishing an eligible area as an OBIA. 84 Fed. Reg. at 7228.

We remain concerned in several ways about NMFS' application of these criteria.

(A) Evidentiary standard in data-poor areas

The Navy's current application is limited to three regions in which LFA activities have predominantly been undertaken during past authorization cycles: the western North Pacific, the central North Pacific, and the eastern Indian Ocean. To identify potential OBIAs in these regions, the NMFS carried out a review of the OBIA Watchlist as well as a review of Important Marine Mammal Areas ("IMMAs"), Ecologically or Biologically Significant Areas ("EBSAs"), and the International Union for Conservation of Nature ("IUCN") Green List of Protected and Conserved Areas that are located within the Study Area (84 Fed. Reg. at 7324). Unfortunately, the only candidate OBIAs described in Proposed Rule, other than some of those identified during the previous authorization, appear based on their inclusion in established habitat identification processes, such as EBSAs and IMMAs. These processes do not yet apply to the entire LFA study area and cannot be considered comprehensive (84 Fed. Reg. at Table 21). As a result, NMFS has, in effect, passed over the vast majority of the deployment area for purposes of OBIA protection, which was the underlying problem in *Pritzker*.

As you know, the Ninth Circuit has soundly rejected an underprotective approach for data-poor areas, pursuant to the MMPA's mitigation provision. Specifically, the Court held, *inter alia*, that NMFS, in predicating its OBIAs in such regions on habitat-specific data, had made a policy

choice inconsistent with its duty to prescribe mitigation producing the "least practicable adverse impact" on marine mammals. *NRDC v. Pritzker*, F.3d at 1140. Protecting habitat, as the Court recognized, is "of paramount importance" under the MMPA. *Id.* at 1141 (citing the mitigation requirement's application to "species or stock and their habitat" and NMFS' duty to "pay[] particular attention to rookeries, mating grounds, and areas of similar significance"). To meet that law's "stringent standard" (*id.* at 1129), the agencies must follow a more precautionary approach that does not proceed "as if the 'no data' scenario were equivalent to… 'no biological importance'" (*id.* at 1140, quoting the NMFS White Paper, *infra*). *See* 40 C.F.R. § 1502.2(d). Yet that is what the agency has done here.

We make the following recommendations to address OBIA identification in data-poor areas.

First, **NMFS should reconsider the guidelines for capturing biologically important marine mammal habitat in data-poor areas that its subject-matter experts provided during the last LFA authorization cycle and that were addressed by the Ninth Circuit.**[2]

As discussed in the Proposed Rule (84 Fed. Reg. at 7241-47), these "White Paper" guidelines call for OBIA designation of: (i) continental shelf waters and waters 100 km seaward of the continental slope; (ii) waters within 100 km of all islands and seamounts that rise within 500 m of the surface; and (iii) high-productivity regions that are not included in the continental shelf, continental slope, seamount, and island ecosystems listed above. In its consideration of the guidelines, NMFS, while acknowledging that the guidelines "may add some small degree of protection in preferred habitat or during feeding behaviors in certain circumstances" (84 Fed. Reg. at 7247), argues that they would not benefit target species. The arguments are surprising, as they run against conventional understanding of where these species are likely to occur; and, indeed, they begin to unravel on closer examination.

For example, NMFS rejects inclusion of waters 100 km seaward of the continental shelf on the grounds that some denser concentrations of baleen whales would occur outside the area (*id.* at 7242-43), without considering whether that extraneous habitat would be captured by the two other guidelines or whether the three guidelines taken together would include the majority of important baleen habitat. In rejecting inclusion of high-productivity habitat, NMFS argues that the highest productivity waters would occur in polar areas and coastal runoff areas that already fall outside the LFA operations area (*id.* at 7426), without considering whether some waters of relatively higher productivity, such as oceanic fronts, occur in the area. Perhaps most remarkably, NMFS maintains that protecting this habitat is unlikely to reduce impacts on marine mammal fitness, and therefore on populations or species (e.g., 84 Fed. Reg. at 7247)—a position that is inconsistent with the OBIA concept and that was effectively rejected by the *Pritzker* Court.

Tellingly, in presenting what it characterizes as an "independent" examination of the White Paper guidelines, NMFS gives no indication that it consulted the guidelines' authors, the senior

[2] Ferguson, M.C., Barlow, J., Brownell Jr., R., and Pittman, R. *Identifying areas of biological importance*. NMFS A.R. Bates no. F-0000002189, F-0000002192 (2010).

agency scientists whom it identified, during the previous authorization cycle, as its main subject-matter experts. The agency's rejection of the guidelines on biological grounds is arbitrary and capricious.

More significantly, the Proposed Rule considers the practicability of excluding the guideline areas from OBIA operation, an analysis that it did not provide during the last authorization cycle. But that analysis treats geographic mitigation as an all-or-nothing proposition, in which the guidelines completely exclude training and testing within the entire LFA operations area or they do not apply at all. It should go without saying that NMFS should not categorically reject the guidelines as impracticable if they cannot feasibly apply, to the full extent recommended, in every data-poor region. In such cases, the agency should consider alternatives based on the criteria that protect marine mammals and their habitat to the greatest extent practicable, per the MMPA's mitigation standard, as discussed further below at subsection II(C).

Information on cetacean distribution and habitat use, presented in section III of this letter, demonstrate that the White Paper guidelines hold true in almost every case, with important marine mammal habitat areas occurring along continental shelf and shelf edge waters (*e.g.*, the multi-species migratory route off western Australia), around seamounts and island systems (*e.g.*, the humpback whale feeding area supported by the bathymetric and oceanographic complexity of the Commander Islands), and in other areas of high productivity (*e.g.*, the multi-species feeding area supported by the North Pacific Transition Zone). The agency should reconsider the White Paper guidelines.

Second, **we recommend that NMFS consider alternative habitat models and (particularly in the Northwest Pacific) additional line-transect data for identifying areas of biological importance.**

Within much of the U.S. Exclusive Economic Zone, and potentially in other "data-rich" areas, the identification of high-density marine mammal habitat is aided by predictive models.[3] As the agency is aware, however, the validity of such models can be impeded by large data gaps worldwide, particularly at tropical latitudes (*e.g.*, the eastern Indian Ocean). In this case it is prudent for the agency to consider alternative modeling approaches capable of accounting for non-standardized collection of survey data and opportunistic sightings.

For example, Corkeron *et al.* (2011) used quasi-Poisson generalized linear models and semi-parametric spatial filtering based on "haphazard" (*i.e.*, not standardized nor explicitly randomized) survey data to assess the distribution of humpback and Bryde's whales in three areas off Oman relative to three simple physiographic variables in a survey grid.[4] By focusing on the spatial eigenvector filtering of models, coupled with the spatial distribution of model

[3] *See*, *e.g*, Roberts, J.J., Best, B.D., Mannocci, L., Fujioka, E., Halpin, P.N., Palka, D.L., Garrison, L.P., Mullin, K.D., Cole, T.V.N., Khan, C.B., McLellan, W.A., Pabst, D.A., and Lockhart, G.G., "Habitat-based cetacean density models for the U.S. Atlantic and Gulf of Mexico," *Scientific Reports* 6, 22615 (2016).

[4] Corkeron, P.J., Minton, G., Collins, T., Findlay, K., Willson, A., and Baldwin, R., Spatial models of sparse data to inform cetacean conservation planning: an example from Oman, *Endangered Species Research* 15, 39-52 (2011).

residuals, the authors were able to account for spatial autocorrelation and make inference regarding relative importance of particular areas. The intent was not to build a habitat suitability model based on environmental predictors (as was the case with the Kaschner et al. model that the agency has rejected), but rather to develop a simple spatial model which, the authors argue, "can still provide the scientific foundation for management action" in areas where survey data and effort is lacking. Other powerful modeling approaches to extrapolate cetacean densities beyond surveyed regions are now emerging.[5] NMFS should assess the utility of such improved models in identifying areas of high marine mammal density in regions proposed for LFA sonar deployment.

Finally, the POWER large-area transect surveys conducted by Japan over the last decade (see Section III.C) now provide a basis for empirically grounded modeling and identification of high-density habitat for most of the Navy's Northwest Pacific operations area. In other words, the agency now has the data needed to conduct a data-based analysis in this region at least, satisfying its own criteria for OBIA identification. To move this forward, it should consult the same subject-matter experts it drew upon during the last authorization cycle, who are the agency's experts in marine mammal habitat modeling in the North Pacific.

Third, **we urge NMFS and the Navy to communicate directly with researchers in the Indian Ocean and Asia to identify potential areas of biological importance, including areas with high cetacean abundance.**

Considering that many of the locations to be impacted are located offshore of developing countries, which may lack the resources, or linguistic skills, to publish in English language journals, it is highly likely that there are large unpublished data sets belonging to researchers in these regions. Institutions such as the Environment Society of Oman, University of Karachi, CetAsia Research Group, The Institute of Cetacean Research (Japan), St. Petersburg State University, and Moscow State University, among others, would provide valuable local expertise.[6] In addition, two expert groups have been established by the IUCN Joint WCPA/SSC Marine Mammal Protected Area Task Force to support the identification and protection of IMMAs in the North East Indian Ocean and South East Asian Seas Region and the Western Indian Ocean and Adjacent Seas region; these groups provide a useful nexus of researchers from across the region. To facilitate NMFS' outreach, we have provided the names of regional experts, together with their contact information, as an appendix to this letter.

With respect to expert recommendations, we note our concern that NMFS' selection criteria for OBIAs maintain an evidentiary requirement that exceeds the information available for most of

[5] *See, e.g.*, Lambert, C., Mannocci, L., Lehody, P., and Ridoux, V., "Predicting cetacean habitats from their energetic needs and the distribution of their prey in two contrasted tropical regions," PLoS ONE, 9(8): e105958 (2014); Mannocci, L., Monestiez, P., Spitz, J., and Ridoux, V., "Extrapolating cetacean densities beyond surveyed regions: habitat-based predictions in the circumtropical belt," Journal of Biogeography, 42, 1267-1280 (2015).

[6] Key additional locations for marine mammal scientists may include: Karachi, Pakistan; Goa, India; Sri Lanka; Indian Ocean Islands (Maldives, Seychelles); Malaysia; Thailand; The Philippines; Taiwan; Southern China (including Hong Kong); Eastern China; South Korea; Mainland, Japan; Okinawa, Japan; Eastern Russia; Northern Australasia region (northern Australia, Papua New Guinea, Indonesia).

the LFA operations area. *See, e.g.*, 84 Fed. Reg. at 7234 (noting that "best source" of data demonstrating high marine mammal densities "is publicly-available, direct measurements from survey data"). While NMFS' criteria do allow for use of "other available data or information," they do so only if "those data and information, either alone or in combination with limited direct data, are sufficient to establish that at least one of the biological criteria are present." *Id*. It remains unclear from this description what evidentiary standard will apply to the consideration of OBIAs where direct data are not available.

(B) Screening of marine mammal species

As it did during the most recent authorization cycle, NMFS proposes to exclude from OBIA consideration all marine mammals that do not exhibit low-frequency specialization, excepting sperm whales and elephant seals. 84 Fed. Reg. at 7234. This position remains non-precautionary and inappropriate.

The Navy did not include odontocetes in the LFA Scientific Research Program ("SRP"), which it continues to take as the exclusive data source for estimating impacts from the LFA system, notwithstanding that study's age and limitations. Yet recent metanalyses of the ocean noise literature indicates that, taken as a whole, the odontocetes are behaviorally reactive to predominantly low-frequency sources of noise, in ways that are consistent with a higher potential for effects on vital rates, at exposure levels that would put them well outside the LFA shut-down zone.[7] And, as noted below at section IV(A), the ATOC Heard Island Feasibility Test reported complete cessations in vocalizations of long-finned pilot whales over a 4900 km^2 area following exposure to a tonal sound source operating below 500 Hz, entirely within the frequency range of the LFA system.[8]

The literature has also demonstrated that some species, such as harbor porpoises and beaked whales, are particularly sensitive to a diversity of anthropogenic sounds, including sounds of predominantly low frequency; and physiological research on finless porpoise indicates that a heightened sensitivity to lower-frequency sound may be conserved across porpoise species.[9] Harbor porpoises, for example, have been reported to react to pile-driving, a predominantly low-

[7] *See, e.g.*, Gomez, C., Lawson, J.W., Wright, A.J., Buren, A.D., Tollit, D., and Lesage, V., A systematic review on the behavioral responses of wild marine mammals to noise: The disparity between science and policy, *Canadian Journal of Zoology* 94: 801-19 (2016).

[8] Bowles, A.E., Smultea, M, Würsig. B., DeMaster, D.P. and Palka, D., The relative abundance and behaviour of marine mammals exposed to transmissions from the Heard Island Feasibility Test. *Journal of the Acoustical Society of America* 96: 2469-2484 (1994).

[9] Liu, R., The Ultrastructure and Function of the Tubercles on the Back of *Neophocaena phocaenoides* in the Changjiang River in China, *Acta Hydrobiol.* 9: 209-12 (1985) (in Chinese, English summary), noted that the tubercles on the backs of finless porpoise have nerve endings which might make them more sensitive to vibrations and/or low frequency sound; Li, S., Wang, K., Wang, D., Dong, S. and Akamatsu, T., Simultaneous production of low- and high-frequency sounds by neonatal finless porpoises, *Journal of the Acoustical Society of America* 124: 716-718 (2008), notes finless porpoise calves producing low frequency sounds of 2–3 kHz, indicating they are more sensitive to low frequency sound than other porpoises.

frequency source, at distances beyond 20 km[10] and at Leq-fast sound pressure levels ranging from 130 to 149 dB re 1 uPa (rms).[11] In beaked whales, responses include foraging disruption and displacement around such acoustic sources as commercial vessels and European LFAS systems, including tonal systems with outputs above the LFA frequency output range but between 1 and 2 kHz.[12] Some of these responses were shown to occur at distances, in some cases, beyond 20 km—*i.e.*, well beyond the 1 km safety zone that constitutes the only mitigation measure afforded.

Any conservative interpretation of the data would assume, barring specific data to the contrary on the effects of SURTASS LFA—research that the Navy has yet to acquire—that these highly reactive species would respond at distances that require additional mitigation. Yet one effect of the agency's narrow approach during the previous authorization cycle was the rejection of candidate areas with small, demographically isolated populations such as the Gully—a previously designated OBIA that was designed to protect a small population of northern bottlenose whales—without even considering the practicability of avoiding them. Other range-limited beaked whale populations have been found off Canada, in the Mediterranean, off Southern California, off North Carolina, in the Bahamas, and around the main Hawaiian Islands.[13] According to a recent paper on the vulnerability of range-limited populations to acoustic impacts, failure to consider the effects of both noise exposure and displacement of

---

[10] *E.g.*, Tougaard, J., Carstensen, J., Teilmann, J., Skov, H., and Rasmussen, P., Pile driving zone of responsiveness extends beyond 20 km for harbor porpoises (Phocoena, (L.)), *Journal of the Acoustical Society of America* 126: 11-14 (2009); Brandt, M. J., Diederichs, A., Betke, K., and Nehls, G., Responses of harbor porpoises to pile driving at the Horns Rev II offshore wind farm in the Danish North Sea, *Marine Ecology Progress Series* 421: 205-216 (2011); Dähne, M., Gilles, A., Lucke, K., Peschko, V., Adler, S., Krügel, K., Sunderleyer, J., and Siebert, U., Effects of pile-driving on harbor porpoises (*Phocoena phocoena*) at the first offshore wind farm in Germany. *Environmental Research Letters* 8: 025002 (2013); Parsons, E.C.M., "Impacts of Navy sonar on whales and dolphins: now beyond a smoking gun?" Frontiers in Marine Science, 4: 295 (2017).

[11] Following Bailey, H., Senior, B., Simmons, D., Rusin, J., Picken, G., and Thompson, P.M., Assessing underwater noise levels during pile-driving at an offshore windfarm and its potential effects on marine mammals, *Marine Pollution Bulletin* 60: 888-897 (2010).

[12] See, e.g., Aguilar de Soto, N., Johnson, M., Madsen, P.T., Tyack, P.L, Bocconcelli, A., and Borsani, J.F., Does intense ship noise disrupt foraging in deep-diving Cuvier's beaked whales (Ziphius cavirostris)? Marine Mammal Science 22: 690-699 (2006); Pirotta, E., Milor, R., Quick, N., Moretti, D., Di Marzio, N., Tyack, P., Boyd, I., and Hastie, G., Vessel noise affects beaked whale behavior: Results of a dedicated acoustic response study, PLoS ONE 7(8): e42535.doi:10.1371/journal.pone.0042535 (2012); Miller, P.J.O., Kvadsheim, P.H., Lam, F.-P.A., Tyack, P.L., Cure, C., DeRuiter, S.L., Kleivane, L., Sivle, L.D., van Ijsselmuide, S.P., Visser, F., Wensveen, P.J., von Benda-Beckmann, A.M., Martin Lopez, L.M., Narazaki, T., and Hooker, S.K., First indications that northern bottlenose whales are sensitive to behavioural disturbance from anthropogenic noise, Royal Society Open Sci. 2: 140484 (2015); Sivle, L.D., Kvadsheim, P.H., Cure, C., Isojunno, S., Wensveen, P.J., Lam, F.-P.A., Visser, F., Kleivane, L., Tyack, P.L., Harris, C.M., and Miller, P.J.O., Severity of expert-identified behavioural responses of humpback whale, minke whale, and northern bottlenose whale to naval sonar, Aquatic Mammals 41(4): 469-502 (2015).

[13] See, e.g., Wimmer, T., and Whitehead, H., Movements and distribution of northern bottlenose whales, Hyperoodon ampullatus, on the Scotian shelf and in adjacent waters, Canadian Journal of Zoology 82: 1782-1794 (2004); Falcone, E.A., and Schorr, G.S., Distribution and demographics of marine mammals in SOCAL through photoidentification, genetics, and satellite telemetry (2014) (prepared for CNO N-45); Forney, K.A., Southall, B.L., Slooten, E., Dawson, S., Read, A.J., Baird, R.W., and Brownell Jr., R.L. Nowhere to go: noise impact assessments for marine mammal populations with high site fidelity. *Endangered Species Research*, 32, pp.391-413 (2017).

Cuvier's beaked whales from their habitat in this region "could lead to more severe biological consequences than 'Level B Harassment.'"[14]

With each year, the SRP's application to acoustically sensitive species such as harbor porpoises and beaked whales—non-focal species for the SRP—becomes especially tenuous. NMFS' 2012 rule required the Navy to advance research on the impacts of LFA sonar on beaked whales and harbor porpoises, first, by convening an independent Scientific Advisory Group to make research and monitoring recommendations and, second, by either promulgating a plan of action to implement the Advisory Group's recommendations or submitting a written response to NMFS explaining why they are infeasible. The Advisory Group reported back within a year and an interagency oversight group subsequently ranked its recommendations. 84 Fed. Reg. at 7249-50.[15] Yet, according to the Proposed Rule, the only research to have been funded to date, aside from general research to extend the frequency range of field-based auditory measurements, is a desktop study of the potential spatial overlap between SURTASS LFA operations and harbor porpoise habitat. *Id.* at 7250. Remarkably, no effort has been made to assess the behavioral responses of beaked whale species or harbor porpoises to low-frequency tonal noise, which was the point of the original recommendation.

It is improper to exclude these acoustically sensitive species from OBIA mitigation, particularly in favor of a research effort on which the Navy has temporized for more than six years and that has yet to produce any data. *See NRDC v. Pritzker*, 828 F.3d at 1142 (holding, in finding NMFS' adaptive management scheme inadequate, that "[t]he mere possibility of changing the rules to accommodate new information does not satisfy the MMPA's strict requirements for mitigating the effects of incidental take"). The Navy and NMFS must take a precautionary approach to harbor porpoises and beaked whales, both in analyzing impacts and in considering habitat-based mitigation measures.

We understand that the Navy cannot practicably avoid every area of higher density of every marine mammal species, but that consideration should not provoke a complete exclusion of all odontocete species other than sperm whales from OBIA candidacy. We recommend, in line with NMFS' intent in previous authorizations, that frequency specialization be considered as one factor among several in determining the relative importance of a potential OBIA. The agency can then focus their practicability analysis for odontocete species on the most biologically important habitat. For example, they should give careful analysis to areas of high marine mammal biodiversity, which are also likely to be areas of high marine biodiversity—appropriate given the increasing evidence of impacts of low-frequency sound on non-marine mammal biota, some of which is described in the Proposed Rule (*see*, 84 Fed. Reg. at 7221). *See NRDC v. Pritzker*, 828 F.3d at 1141 (noting, as an illustration of the agencies' improperly underprotective approach, the elimination of the Galapagos Islands as an OBIA). And they should carefully analyze the practicability of protecting areas, such as those off the main Hawaiian Islands and around certain

[14] Forney *et al.*, Nowhere to go: noise impact assessments for marine mammal populations with high site fidelity, at 401.

[15] We hereby request a copy of any Scientific Advisory Group and Executive Oversight Group reports and recommendations and ask that they be made available to the public.

Hawaiian seamounts (which are important to beaked whales, among other species), that are known to contain small, resident odontocete populations.

(C) Practicability analysis

For the first time, the Navy's application distinguishes among types of LFA activities, ranging from "military crew (MILCREW) proficiency training" to "vessel and equipment maintenance." 84 Fed. Reg. at 7189. These categories suggest that geographic mitigation could potentially be implemented for a subset of activities in the case that blanket geographic mitigation is deemed impracticable—a development that could, if rigorously applied, substantially improve mitigation and help NMFS and the Navy meet their MMPA responsibilities. In its practicability analysis for OBIAs, NMFS should analyze the practicability of mitigating each individual category of activity and implement mitigation measures to the greatest extent practicable for each category. Such an approach will serve to reduce potential impact to marine mammals in an OBIA even if all Navy activities cannot practicably be mitigated geographically.

More generally, we urge NMFS and the Navy to consider the following alternatives when faced with genuine practicability limitations.

First, NMFS, in consultation with the Navy, should establish geographic alternatives for OBIAs that raise practicability concerns for certain categories of LFA activity. Given the importance of site-selection in minimizing environmental impacts, it is conventional for agencies to analyze the environmental effects of alternative sites that meet the activity's purpose and need. Doing so is essential where, as here, protecting habitat is of "paramount importance." *NRDC v. Pritzker*, 828 F.3d at 1141.

Second, where reasonable alternative sites are not available, NMFS, in consultation with the Navy, should consider other mitigation measures, including procedural requirements (*e.g.*, requiring Fleet-level approval for use), substantive standards (*e.g.*, allowing use only when certain criteria are met), and activity limits (*e.g.*, limiting the number of activities per annum or avoiding biologically important periods such as the blue whale foraging season), that would protect vital habitat while allowing continued use for training purposes. The Navy, in the "practicability criterion" it sets forth in the DSEIS, commits to identifying for NMFS the concerns that lead to its determination that a particular OBIA is not practicability, and discussing "whether modifications could be made to the proposed OBIA to alleviate the Navy's practicability concerns." DSEIS at 5-8. Both agencies should work to ensure that the resulting analysis is rigorous and searching, rather than a parroting of Navy conclusions. *Conservation Council for Hawaii v. NMFS*, 97 F.Supp.3d 1210, 1230 (D. Haw. 2015).

Third, and finally, to the extent that additional operational mitigation is impracticable, NMFS should consider compensatory mitigation to achieve the "least practicable adverse impact" required under the MMPA. Compensatory mitigation is a concept that is routinely employed in implementation of the Endangered Species Act, Clean Water Act, and other environmental laws. The MMPA itself is broad in its characterization of mitigation, requiring the agency to prescribe not only "permissible methods of taking pursuant to [a specified activity]," but also "*other means*

of effecting the least practicable adverse impact" on affected marine mammal species and populations and on their habitat. 16 U.S.C. § 1371(a)(5)(A)(II)(aa) (emphasis added). As the Ninth Circuit opinion in *Pritzker* makes clear, this requirement should be construed by the agency as a "stringent standard." 828 F.3d at 1129, 1133, 1135. The agency should consider compensatory mitigation for the adverse impacts of the permitted activity on marine mammals and their habitat that cannot be prevented or mitigated by modifying SURTASS LFA operations.

(D) Mitigation distance from OBIAs

According to the DSEIS, "the objective of the mitigation measures for SURTASS LFA sonar's training and testing activities is the reduction or avoidance of potential effects to marine animals and marine habitat." DSEIS at 5-1. NMFS considers this objective met, in part, by ensuring that sound pressure levels within its OBIAs and coastal exclusion zone do not exceed a specified threshold, which it defines as 180 dB re 1 μPa (rms). 84 Fed. Reg. at 7189. Remarkably, this threshold bears no relation to the Navy's behavioral response function, even though the agencies have repeatedly identified behavioral disruption as the primary marine mammal impact of concern from LFA sonar, or to any qualitative assessment of stress response or masking effects. Instead, it roughly reflects the Navy' threshold for the onset of auditory injury per NMFS guidance.

As we have written before, the criteria that NMFS has adopted, following the Navy, to estimate temporary and permanent threshold shift in marine mammals[16] are erroneous and non-conservative. Wright (2015)[17] has identified several statistical and numerical faults in the Navy's approach, such as pseudo-replication and inconsistent treatment of data, that tend to bias the proposed criteria towards an underestimation of effects. Similar and additional issues were raised by a dozen scientists during the public comment period on the draft criteria held by NMFS.[18] At the root of the problem is the agencies' broad extrapolation from a small number of individual animals, mostly bottlenose dolphins, without taking account of what Racca *et al.* (2015) have succinctly characterized as a "non-linear accumulation of uncertainty."[19]

---

[16] Finneran, J.J., Auditory weighting functions and TTS/ PTS exposure functions for cetaceans and marine carnivores (2015) (No. TR 3026) (Space and Naval Warfare Systems Center Pacific San Diego United States).

[17] Wright, A.J., Sound science: Maintaining numerical and statistical standards in the pursuit of noise exposure criteria for marine mammals, *Frontiers in Marine Science* 2: Art. 99 (2015).

[18] Letter from Racca, R., Hannay, D., Yurk, H., McPherson, C., Austin, M., MacGillivray, A., Martin, B. , Zeddies, D., Warner, G., Delarue, J., and Denes S., JASCO, to N. LeBoeuf, NMFS (Sept. 14, 2015) (Comment Letter on National Marine Fisheries Service's 31 July 2015 notice (80 Fed. Reg. 45642)); Letter from Racca, R., Yurk, H., Zeddies, D., Hannay, D., Austin, M., MacGillivray, A., Warner, G., Martin, B. and McPherson, C., JASCO, and Tyack, P., University of St. Andrews, to A.R. Scholik-Schlomer, NMFS (Sept. 11, 2015) ("Request for an extension of the public comment period on the proposed acoustic guidelines for assessing the effects of anthropogenic sound on marine mammals").

[19] Letter from Racca, R., *et al.* (Sept. 14, 2015), supra; Additionally, the criteria should be revised to incorporate, as appropriate, new data that were not available at the time they were developed. These new data include Branstetter, B.K., St. Leger, J., Acton, D., Stewart, J., Houser, D., Finneran, J.J., and Jenkins, K., Killer whale (Orcinus orca) behavioral audiograms, *Journal of the Acoustical Society of America*, 141, 2387-2398 (2017); Kastelein, R.A., Helder-Hoek, L., and Van de Voorde, S. Effects of exposure to sonar playback sounds (3.5-4.1 kHz) on harbor porpoise (Phocoena phocoena) hearing. *Journal of the Acoustical Society of America*, 142(2), 1965-1975 (2017). For

Perhaps even more importantly, the 180 dB threshold fails to meaningfully protect marine mammals from the behavioral impacts that the agencies have repeatedly characterized as the impacts of primary concern. According to prior Navy analysis, the 175-180 dB (rms) annulus has an average "take" risk of 91.5%, the 170-175 dB (RMS) annulus a take risk of 80.5%, the 165-170 dB (rms) annulus a risk of 61.5%, the 160-165 dB annulus a risk of 38.5% (RMS), the 155-160 dB annulus a risk of 18%, and the 150-155 dB annulus a risk on the order of 8-9%. *See* 2007 SEIS at 4-74. Given the greater area subsumed within the lower-decibel annuluses, the number of takes occurring within even the 150 dB annulus can be high, despite the lower relative risk. Indeed, the number of takes occurring within these areas is suggested by the Navy's nominal coastal exclusion analysis from 2007, for which the vast majority of take in each of the two scenarios the Navy examined is attributable to the 155-160 dB annulus (the 150-155 dB annulus being unassessed). *See* 2007 SEIS at 4-74 and 4-77 (comparing the "corrected risk areas" of the various annuluses).

Geographic sound field operational constraints designed to eliminate LFA exposures out to at least 150 dB (rms) are likely to be practicable for most, if not all, OBIAs. The Navy already avoids dive sites out to 145 dB (rms) (DSEIS at 5-5), nominally requiring a greater mitigation distance than a 150 dB (rms) standoff would entail. The Navy's broad claim of impracticability for any mitigation threshold lower than 180 dB exemplifies the non-rigorous rationalizing that the court in *Conservation Council* found unconvincing and unsupportable under the MMPA. *See* 97 F.Supp.3d at 1229-31. NMFS' "practicability criterion" requires a site-specific discussion, with the Navy, of any OBIA that the Navy initially determines to be impracticable, to see if a modification of the OBIA can address the issue. 84 Fed. Reg. at 7238. Here, the Navy and NMFS should presumptively adopt a 150 dB (rms) mitigation distance from each OBIA, except where geographically specific, clearly stated operational needs make such a distance impracticable, in which case it should adopt the largest practicable distance, to be determined on a case-by-case basis according to the procedure set forth in the "practicability criterion."

III. COMMENTS ON SPECIFIC OBIAs

(A) Existing and candidate OBIAs

In the Proposed Rule, NMFS identifies four existing OBIAs within the LFA study area for which geographic mitigation measures are currently observed: #16, Penguin Bank, Hawaiian Islands Humpback Whale National Marine Sanctuary; #20, Northern Bay of Bengal and Head of Swatch-of-No-Ground (SoNG); #26, Offshore Sri Lanka; and #27, Camden Sound Kimberley Region (84 Fed. Reg. at Table 19). NMFS also presents a list of 25 areas for further consideration as OBIAs (84 Fed. Reg. at Table 21). Of these 25, 14 areas are deemed to preliminarily meet the NMFS' geographic, LF-sensitivity, and biological criteria. *Id*. The Proposed Rule states that "NMFS will consider additional information received during the public

---

further discussion of these and other issues, see comment letters on NMFS' draft auditory impact criteria submitted to NMFS by NRDC *et al*.

comment period when further evaluating if these areas satisfy the criteria for OBIA designation." 84 Fed. Reg. at 7238.

The agency rightly draws on more governmental and intergovernmental sources to identify potential OBIAs than it did during its most recent authorizations, and its analysis in the Proposed Rule includes consideration of ESA Critical Habitat, IMMAs, and EBSAs, among others. We note, however, that ESA Critical Habitat, IMMAs, and EBSAs, have all previously been identified through a rigorous scientific process, including opportunity for public comment and peer review; as such, these areas should be immediately carried forward by the Navy for geographic mitigation purposes. Thirty IMMAs have recently been identified in the Northeast Indian Ocean and South East Asian Seas Region[20] and should be incorporated into the agency's analysis for its Final Rule. In addition, 55 candidate IMMAs have recently been identified in the Western Indian Ocean and Arabian Seas by regional experts and submitted for additional independent peer review (IMMA sub-regions "ii" and "vii" fall within the LFA Study Area).[21] These new IMMAs should immediately be taken into consideration by the NMFS and the Navy as potential OBIAs upon their release.

We provide further comment on specific important habitat areas for cetaceans below, including recommendations for additional OBIAs not yet under consideration by NMFS. **These recommendations do not obviate the need for measures to address data-poor areas, as discussed above, nor are they intended as a comprehensive summary of unidentified OBIAs.**

(a) Blue whales

Within the proposed LFA study area, there are three recognized subspecies of blue whale: the Antarctic blue whale (*Balaenoptera musculus intermedia*), the pygmy blue whale (*B. m. brevicauda*), and the resident Northern Indian Ocean blue whale (*B. m. indica*). Unlike the Antarctic blue whale, pygmy blue whales do not generally migrate to the Antarctic in summer, although the abundance of *B. m. brevicauda* peaks around Australia, south of Madagascar, and in the southern Indian Ocean during the summer months, evidencing some level of intra-oceanic migration.[22]

---

[20] IUCN Marine Mammal Protected Areas Task Force, Important Marine Mammal Area Regional Workshop for the North East Indian Ocean and South East Asian Seas: Final Report of the Third IMMA Workshop, Kota Kinabalu, Sabah, Malaysia, 12-16 March 2018 (2019).

[21] *See*, https://www.marinemammalhabitat.org/record-number-of-immas-awarded-in-west-indian-ocean-and-arabian-seas/

[22] Zemsky, V.A., and Sazhinov, E.G., Distribution and current abundance of pygmy blue whales, in Arsen'ev, V.A. (ed.), *Marine Mammals* 53-70 (1982); Miyashita, T., Kato, H., and Kasuya, T., Worldwide map of cetacean distribution based on Japanese sighting data (1995) (National Research Institute of Far Seas Fisheries, Shimizu, Japan); Gill, P.C., A blue whale (*Balaenoptera musculus*) feeding ground in a southern Australian coastal upwelling zone, *Journal of Cetacean Research and Management* 4: 179-184 (2002); Best, P.B., Rademeyer, R.A., Burton, C., Ljungblad, D., Sekiguchi, K., Shimada, H., Thiele, D., Reed, D., and Butterworth, D.S., The abundance of blue whales on the Madagascar Plateau, December 1996, *Journal of Cetacean Research and Management* 5: 253-260 (2003) (cited in Branch, T.A., Stafford, K.M., Palacios, D.M., Allison, C., Bannister, J.L., Burton, C.L.K., Cabrera, E., Carlson, C.A., Galletti Vernazzani, B., Gill, P.C., Hucke-Gaete, R., Jenner, K.C.S., Jenner, M.-N., Matsuoka, K.,

Blue whales tend to avoid the oligotrophic central gyres of the Indian, Pacific, and Atlantic Ocean and are more common in areas with higher phytoplankton density and with dynamic ocean processes like upwelling, eddy shedding, and current meandering.[23] On Southern Ocean feeding areas, blue whales have been recorded in bands stretching across entire ocean basins, but at lower latitudes they are progressively more clustered, localized and compressed along the continental margins; a pattern likely reflecting prey distribution.[24]

Many blue whales in the Northern Indian Ocean feed in highly productive zones associated with the major southwest monsoon upwellings, including the southwest coasts of India and Sri Lanka. The monsoon changes to the northeast in October–November, and zooplankton concentrations dissipate shortly thereafter. Blue whales then disperse more widely in the Northern Indian Ocean to seek out other, more localized zooplankton concentrations. Northeast monsoon feeding areas include the waters off the east coast of Sri Lanka and the waters west of the Maldives. Three populations of blue whales are observed to use the waters surrounding the Chagos Archipelago.

In the Eastern Indian Ocean, blue whales have been recorded in Indonesian waters during May to November while high concentrations are reported from the southern coast of Australia mostly during the austral summer (November to May). Recordings of blue whales off western Australia include Australia-specific pygmy blue whale calls, which peak from February to May.[25] Acoustic detections off West Australia (21°S) record blue whales apparently migrating northwards in June-July and southwards in November-December (R.D. McCauley, unpublished data). Pygmy blue whales likely represent the great majority of blue whales in this region and, given the near-continuous distribution of records from Tasmania to Indonesia, it is likely that pygmy blue whales form one migratory population.[26] However, limited numbers of Antarctic-type blue whale

---

Mikhalev, Y.A., Miyashita, T., Morrice, M.G., Nishiwaki, S., Sturrock, V.J., Tormosov, D., Anderson, R.C., Baker, A.N., Best, P.B., Borsa, P., Brownell, Jr., R.L., Childerhouse, S., Findlay, K.P., Gerrodette, T., Ilangakoon, A.D., Joergensen, M., Kahn, B., Ljungblad, K., Maughan, B., McCauley, R.D., McKay S., Norris, T.F., Oman Whale Dolphin Research Group, Rankin, S., Samaran, F., Thiele, D., Van Waerebeek, K., and Warneke, R.M., Past and present distribution, densities and movements of blue whales *Balaenoptera musculus* in the Southern Hemisphere and northern Indian Ocean, *Mammal Review* 37: 116-175 (2007).

[23] Branch, T.A., *et al*., Past and present distribution, densities and movements of blue whales *Balaenoptera musculus* in the Southern Hemisphere and northern Indian Ocean, *supra*.

[24] *Id*.

[25] Ljungblad, D.K., Stafford, K.M., Shimada, H., and Matsuoka, K., Sounds attributed to blue whales recorded off the southwest coast of Australia in December 1995, *Report of the International Whaling Commission* 47: 435-439 (1997); McCauley, R., Bannister, J., Burton, C., Jenner, C., Rennie, S., and Kent, C.S., Western Australian Exercise Area Blue Whale Project: Final summary report (2004) (CMST Report R2004-29, Project – 350); Stafford, K.M., Bohnenstiehl, D.R., Tolstoy, M., Chapp, E., Mellinger, D.K., and Moore, S.E., Antarctic-type blue whale calls recorded at low latitudes in the Indian and eastern Pacific Oceans, *Deep-Sea Research I* 51: 1337-1346 (2004) (cited in Branch, T. A., *et al*., Past and present distribution, densities and movements of blue whales *Balaenoptera musculus* in the Southern Hemisphere and northern Indian Ocean, *supra*).

[26] Branch, T. A., *et al*. Past and present distribution, densities and movements of blue whales *Balaenoptera musculus* in the Southern Hemisphere and northern Indian Ocean, *supra*.

calls have been recorded off western Australia from May to October indicating that some individuals of this species migrate through this area in the austral winter.[27]

OBIA: Chagos Archipelago

The Chagos Archipelago provides important habitat for three populations of blue whale as well as a rich diversity of other cetacean species, including sperm whales.[28] The waters represent some of the most biodiverse on the planet with more than 220 species of coral, 855 species of fish, and 355 species of mollusks. The British Indian Overseas Territory Commissioner declared a 640,000 km2 'no-take' marine protected area on April 1, 2010,[29] including the Great Chagos Bank. NMFS should ensure that the waters encompassed by the no-take marine protected area are included in a year-round OBIA to protect important habitat for these species.

OBIAs: Waters around Sri Lanka

Sighting, stranding and acoustic data[30] indicate that the pygmy blue whale occupies Sri Lankan waters almost year-round. This resident population is known from two major areas, off the Tricomalee Canyon in the northeast and off the southern coast. Whales have been observed engaging in mating activity, mother-calf pairs have been observed in both areas, and one blue whale birth has been observed in Tricomalee Harbour, indicating that it may be a calving area. Foraging aggregations are observed off the south coast of Sri Lanka during the Northeast monsoon (December to March).[31] In these southern feeding areas, blue whales are sighted largely between the 100 m and 1000 m depth contours[32] and a consistent peak in density has been observed at the 800m bathymetric contour;[33] however, the distribution of feeding whales

---

[27] Ljungblad, D.K., *et al*., Sounds attributed to blue whales recorded off the southwest coast of Australia in December 1995, *supra*; McCauley, R., *et al*., Western Australian Exercise Area Blue Whale Project, *supra*; Stafford, K.M., *et al*., Antarctic-type blue whale calls recorded at low latitudes in the Indian and eastern Pacific Oceans, *supra* (cited in Branch, T.A., *et al*., Past and present distribution, densities and movements of blue whales *Balaenoptera musculus* in the Southern Hemisphere and northern Indian Ocean, *supra*).

[28] Dunne R. P., Polunin N. V., Sand P. H., Johnson M. L., The Creation of the Chagos Marine Protected Area: A Fisheries Perspective. Advances in Marine Biology (69). pp.79-127 (2014).

[29] *See*, https://biot.gov.io/environment/marine-protected-area/

[30] Alling, A., Dorsey, E.M., and Gordon, J.C.D., Blue whales (*Balaenoptera musculus*) off the Northeast coast of Sri Lanka: Distribution, feeding, and individual identification, *UNEP Marine Mammal Technical Report* 3: 247-258 (1991); Ilangakoon, A.D., Preliminary analysis of large whale satrndings in Sri Lanka 1889-2004, *Pakistan Journal of Oceanography* 2: 61-68 (2006); Branch, T.A., *et al*., Past and present distribution, densities and movements of blue whales Balaenoptera musculus in the Southern Hemisphere and northern Indian Ocean, *supra*.; Afsal, V.V., Yousuf, K.S.S.M., Anoop, B., Krishnan, A.A., Kannan, P., Rajagopalan, M., and Vivekanandan, E., A note on cetacean distribution in the Indian EEZ and contiguous seas during 2003-07, *Journal of Cetacean Research and Management* 10(3): 209-215 (2008); de Vos, A., Clarke, R., Johnson, C., Johnson, G., Kerr, I., Payne, R., Madsen, P.T., Cetacean sightings and acoustic detections in the offshore waters of Sri Lanka: March-June 2003, *Journal of Cetacean Research and Management* 12(1): 185-193 (2008).

[31] De Vos, A., Brownell Jr., R.L., Tershy, B., and Croll, D., Anthropogenic threats and conservation needs of blue whales, *Balaenoptera musculus indica*, around Sri Lanka, *Journal of Marine Biology* Art. 8420846: 1-12 (2016).

[32] De Vos, A., Pattiaratchi, C. B., and Harcourt, R. G., Inter-annual variability in blue whale distribution off southern Sri Lanka between 2011-2012, *Journal of Marine Science and Engineering* 2: 534-50 (2014).

[33] Priyadarshana, T., Randage, S.M., Alling, A., Calderan, S., Gorgon, J., Leaper, R., and Porter, L., Distribution patterns of blue whale (*Balaenoptera musculus*) and shipping off southern Sri Lanka, Regional Studies in Marine Science 3: 181-188 (2016).

may vary annually, depending on monsoonal effects.[34] For example, whales were observed inshore of the 1000 m contour in 2008 and 2009, but were seen much further south to depths ranging at least >1500 m and were spread over a greater area in 2011.[35] These waters also appear valuable for Bryde's whales, with a more coastal distribution than pygmy blue whales, and sperm whales, sighted between the 1000 m and 2000 m depth contour.[36] Blue whales have also been seen off the west coast of Sri Lanka, between 30 and 190 nm offshore, during the southwest monsoon (June-October).[37]

The Proposed Rule identifies a single existing OBIA within the range of the Sri Lankan blue whale: "#26 Offshore Sri Lanka" that is effective annually from December through April. However, this area does not temporally or geographically encompass all important blue whale habitat in the waters off Sri Lanka. The "South West to Eastern Sri Lanka IMMA was recently designated in these waters to signify important habitat for blue whales and sperm whales,[38] and a number of EBSAs are included on the "OBIA Watchlist." Therefore, we urge NMFS to advance these as year-round blue whale mitigation areas in the Final Rule. These areas are the: (i) "Southern Coastal/Offshore Waters between Galle and Yala National Park," an area largely overlapping with OBIA #26 but which affords year-round protection to the submarine canyons that support high numbers of blue whales, and other marine megafauna, throughout the year (84 Fed. Reg. at Table 21, #4); (ii) "Trincomalee Canyon and Associated Ecosystems (*Id*., #3);" and (iii) "Coastal and Offshore Area of the Gulf of Mannar (OBIA Watchlist)," which also encompasses the currently not considered "Sri Lankan Side of Gulf of Mannar" EBSA. Any waters not yet included within the boundaries of the new "South West to Eastern Sri Lanka IMMA" should also be advanced for year-round protection.

OBIA: Southwest India and western Sri Lanka

We also recommend NMFS observe several areas as OBIAs to protect key upwelling areas for pygmy blue whales throughout the Indian Ocean. During the SW monsoon, the long-shore flow of the West Indian Coastal Current induces major upwelling along the coast of India, promoting a major phytoplankton bloom there. This productive water is carried southward around the west and south coasts of Sri Lanka, where it is enhanced by further upwelling, before being transported into the Bay of Bengal. Visual and acoustic surveys, strandings, and Soviet whaling data support that blue whales occur in this area of high productivity to forage from May through November, during the southwest monsoon season.[39] This area was recently designated as the

---

[34] De Vos, A., *et al*. Inter-annual variability in blue whale distribution off southern Sri Lanka between 2011-2012, *supra.*

[35] Martenstyn, H., Sri Lanka marine mammal records, Centre for Research on Indian Ocean Marine Mammals (2013).

[36] Priyadarshana, T., *et al*., Distribution patterns of blue whale (*Balaenoptera musculus*) and shipping off southern Sri Lanka, *supra*.

[37] Martenstyn, H., Sri Lanka marine mammal records, *supra*.

[38] *See*, https://www.marinemammalhabitat.org/portfolio-item/southwest-east-sri-lanka/

[39] Anderson, R.C., Branch, T.A., Alagiyawadu, A.N.O.M.A., Baldwin, R., and Marsac, F., Seasonal distribution, movements and taxonomic status of blue whales (*Balaenoptera musculus*) in the northern Indian Ocean, *Journal of Cetacean Resources and Management* 12(2): 203-218 (2012).

"Gulf of Mannar and Palk Bay IMMA" for blue whales and sperm whales.[40] We recommend NMFS establish an OBIA southwest of India and west of Sri Lanka that reflects the boundaries of the new "Gulf of Mannar and Palk Bay IMMA" that includes the buffer recommended for protection purposes.[41]

OBIA: West of the Maldives (November and April)
Another key upwelling area lies west of the Maldives. Sightings and strandings have been recorded year-round in high-productivity portions of the northern Indian Ocean, including off the Maldives.[42] Blue whale occurrence in Maldivian waters appears to be highly seasonal, with all sightings and strandings to date occurring between November and April.[43] Anderson *et al.* (2012) defined this high-productivity area based on an analysis of relative chlorophyll *a* concentration.[44] We recommend NMFS establish an OBIA west of the Maldives that reflects the boundaries described in Anderson et al (2012): 1°–6°N, 70.5°–72.5°E.[45]

OBIAs: Indonesia – Western Australia migration route
There exists at least one pygmy blue migratory route in the southeast Indian Ocean. Satellite telemetry data shows that pygmy blue whales migrate north from the Perth Canyon/Naturaliste Plateau region in March/April, reaching potential breeding grounds in Indonesia by June, where they remain until at least September. Southern migration from Indonesia may occur from September and finish by December in the subtropical frontal zone, after which the animals return north to the Perth Canyon region by March/April.[46] This is supported by acoustic recordings of Australian type pygmy whale calls off south western Australia.[47]

---

[40] *See*, https://www.marinemammalhabitat.org/portfolio-item/gulf-mannar-palk-bay/

[41] *Id.*

[42] Anderson, R.C., Observations of cetaceans in the Maldives, 1990–2002. *Journal of Cetacean Research and Management* 7: 119–135 (2005).

[43] *Id.*

[44] Anderson, R.C., *et al*., Seasonal distribution, movements and taxonomic status of blue whales (*Balaenoptera musculus*) in the northern Indian Ocean, *supra*.

[45] *Id.*

[46] Double, M.C., Andrews-Golf, V., Jenner, K.C.S., Jenner, M-N., Laverick, S.M., Branch, T.A., and Gales, N.J., Migratory movements of pygmy blue whales (*Balaenoptera musculus brevicauda*) between Australia and Indonesia as revealed by satellite telemetry, *PLoS ONE* 9(4): e93578 (2014).

[47] McCauley, R., *et al.*, Western Australian Exercise Area Blue Whale Project, *supra*; Stafford, K.M., Chapp, E., Bohnensteil, D.R., and Tolstoy, M., Seasonal detection of three types of "pygmy" blue whale calls in the Indian Ocean. Marine Mammal Science 27: 828-840 (2011); Gavrilov, A.N., McCauley, R.D., Salgado-Kent, C., Tripovich, J., and Burton, C., Vocal characteristics of pygmy blue whales and their change over time, *Journal of Acoustical Society of America* 130: 3651-3660 (2011); Salgado-Kent, C.P., Gavrilov, A.N., McCauley, R.D., Burton, C., Recalde-Salas, and Marley, S.A., Passive acoustic monitoring of baleen whales in Geographe Bay, Western Australia, *Acoustics Australia*, 1-8 (2012); Salgado-Kent, C.P., Gavrilov, A.N., Recalde-Salas, A., Burton, C.L.K., McCauley, R.D., Gavrilov, A.N. and McCauley, R.D., Acoustic detection and long-term monitoring of pygmy blue whales over the continental slope in southwest Australia, *Journal of Acoustical Society of America* 134: 2505-2513 (2013) (cited in *id.*).

Within the proposed SURTASS LFA action area, lower rates of travel and higher rates of occupancy were recorded in the North West Cape/Ningaloo Reef region,[48] an area with the capacity to offer feeding opportunities as primary production rates are equal to those recorded in upwelling systems (*see* Fig. 1).[49] Surface lunge feeding of pygmy blue whales has been observed at the North West Cape and Ningaloo Reef in June.[50] This area may also host relatively high blue whale densities due to the convergence of migration routes of different individuals as they progress pass the peninsula.[51] After passing the peninsula, the whales depart the coastline and travel offshore, proximate to the continental shelf edge until reaching Indonesian waters.

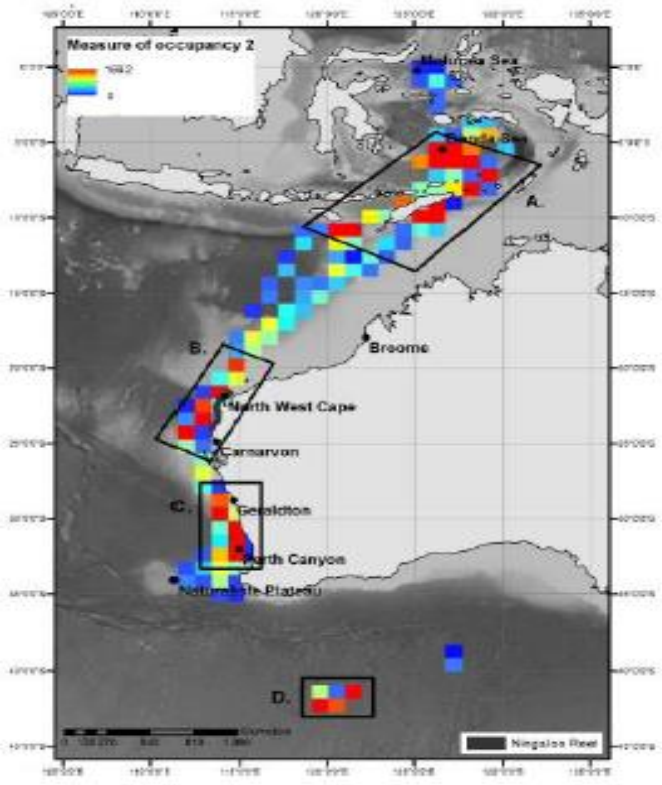


Fig. 1. Gridded measure of time spent and occupancy for satellite tagged pygmy blue whales (n=11). "Measure of occupancy 2" represents sum of individual time spent per grid cell adjusted by the contribution to total time spent by individuals for all pygmy blue whales throughout the tracking period. Four regions of potentially higher occupancy are identified: A. Indonesia; B. Ningloo Reef; C. Perth Canyon/Naturaliste Plateau; and D. Subtropical frontal zone. The grid presented is 100 km x 100 km. GEBCO bathymetry is also shown (Adapted from Double *et al.* 2014, Figure 4).

Browse Basin, located at ~14°S between 121°E and 124°E off northwestern Australia, has recently been identified as a highly biodiverse area due to its coral atolls, steep submarine cliffs, oceanographic sub-mesoscale fronts and upwelling that support at least 14 species of cetaceans,

---

[48] Double, M.C., *et al*., Migratory movements of pygmy blue whales (*Balaenoptera musculus brevicauda*) between Australia and Indonesia as revealed by satellite telemetry, *supra*.

[49] Furnas, M., Intra-seasonal and inter-seasonal variations in phytoplankton biomass, primary production, and bacterial production at North West Cape, Western Australia: Links to 1997-1998 El Nino event, *Continental Shelf Research* 27: 958-980 (2007) (cited in *id*.).

[50] Jenner, C., and Jenner, M.-N. (unpublished data 2001) (cited in Double, M.C., *et al*., Migratory movements of pygmy blue whales (*Balaenoptera musculus brevicauda*) between Australia and Indonesia as revealed by satellite telemetry, *supra*).

[51] Double, M. C., *et al*., Migratory movements of pygmy blue whales (*Balaenoptera musculus brevicauda*) between Australia and Indonesia as revealed by satellite telemetry, *supra*.

including pygmy blue whales, Bryde's whales, humpback whales, dwarf minke whales, minke whales, as well as a myriad of odontocetes.[52] There is evidence to suggest that at least some areas within the Basin (*e.g.*, Scott Reef) may provide year-round foraging opportunities. Pygmy blue whales have been observed feeding at Scott's Reef during their southern migration in October, indicating that blue whales target this area to replenish their energy stores in preparation for the southern migration.[53]

Upwelling is also evident along the southern coasts of Java and the Sumbawa Islands, Indonesia.[54] Java is located where the southeast monsoon season dominates during the austral winter. Between July and October, the southeast monsoon generates seasonal upwelling which produces cold water in the surface, creating a difference in sea surface temperature and biological productivity between coastal and ocean-ward locations.[55]

Based on this information, we make the following recommendations:

i. The Navy should establish an OBIA encompassing the continental shelf along western Australia between March through June and September through December. Importantly, the North West Cape/Ningaloo Reef region, out to the continental shelf edge, needs to be protected from at least April through June.

ii. The Navy should also take measures to avoid the continental shelf edge off northwestern Australia between May through July and September through November, to protect whales traveling along the migration route.

iii. An OBIA should be established to protect Browse Basin (~14°S between 121°E and 124°E) year-round, in light of its persistent upwelling and high levels of cetacean diversity, including foraging pygmy blue whales.

iv. For similar reasons, an OBIA should also be established bounding the upwelling system along the southern coasts of Java and the Sumbawa Islands, Indonesia. A similar approach to that employed by Anderson *et al.* (2012)[56] could be used to map the boundaries of this region. The waters of the newly designated "Savu Sea and

---

[52] Sutton, A.L., Jenner, K.C.S., and Jenner, M-N., Habitat associations of cetaceans and seabirds in the tropical eastern Indian Ocean, *Deep-Sea Research Part II*, in press.

[53] *Id.*

[54] Hendriati, N., Siegel, H., and Ohde, T., Investigation of different coastal processes in Indonesian waters using SeaWIFS data, *Deep-Sea Research II* 51: 85-97 (2004) (cited in Branch, T. A., *et al*., Past and present distribution, densities and movements of blue whales Balaenoptera musculus in the Southern Hemisphere and northern Indian Ocean, *supra*).

[55] Varela, R., Santos, F., Gómez-Gesteira, M., Álvarez, I., Costoya, X., and Días, J.M., Influence of coastal upwelling on SST trends along the south coast of Java, *PLoS ONE* 11(9): e0162122 (2016).

[56] Anderson, R.C., *et al*., Seasonal distribution, movements and taxonomic status of blue whales (*Balaenoptera musculus*) in the northern Indian Ocean, *supra*.

Surrounding Areas IMMA" and the associated buffer recommended for protection should also be included.[57]

(b) Humpback whales

OBIAs: Humpback whale habitat in the southeastern Indian Ocean
Humpback whale wintering grounds and coastal migratory routes in the eastern Indian Ocean are located between 15-35°S along the west coast of Australia, with major calving grounds in the Kimberley Region (15-18°S) and resting areas along the southern migration at Exmouth Gulf (21°S) and Shark Bay (25°S).[58] During the southward migration to their Antarctic feeding grounds, whales are found close to shore along much of the coast, mostly occurring within the 200m isobath. During the northward migration, however, whales tend to be distributed farther from shore, out to the continental shelf boundary, with whales observed as far out as the 1400 m isobath in some places (*e.g.*, Northwest Cape).[59]

In addition to protecting the important calving habitat of Kimberley Bay during the months of June through September (existing OBIA #27 "Camden Sound/Kimberly Region"), NMFS should establish the following: (i) an OBIA to protect the resting habitat of Exmouth Gulf and Shark Bay during the months July through November; (ii) an OBIA off western Australia encompassing the area from the coastline out to the 200 m depth contour from September, to December to protect humpback whales on their southern migration; and (iii) an OBIA off western Australia encompassing the area from the coastline out to the 1400 m depth contour from May to August to protect humpback whales on their northern migration.

We note that many of these areas coincide with the additional OBIAs that we have proposed above for blue whale habitat and important migratory habitat for the southern right whale, and are therefore of benefit to multiple species.

OBIA: Northern Arabian Sea

---

[57] *See*, https://www.marinemammalhabitat.org/portfolio-item/savu-sea-surrounding-area/.

[58] Bannister, J.L. and Hedley, S.L., Southern Hemisphere Group IV humpback whales: their status from recent aerial surveys, *Memoirs of the Queensland Museum* 47(2): 587-598 (2001); Jenner, K.C.S., Jenner, M.N., and McCabe, K.A., Geographical and temporal movements of humpback whales in Western Australian waters, *APPEA Journal* 2001: 749-765 (2001) (cited in Bettridge, S., Baker, C. S., Barlow, P., Clapham, P. J., Ford, M., Guveia, D., Mattila, D.K., Pace III, R.M., Rosel, P.E., Silber, G.K., and Wade, P.R., Status Review of the humpback whales (*Megaptera novaeangliae*) under the Endangered Species Act, NOAA-TM-NMFS-SWFSC-540 (2014).

[59] Jenner, K. C. S., Jenner, M. N., and McCabe, K. A, Geographical and temporal movements of humpback whales in Western Australian waters, *supra*; Jenner, K. C. S., Jenner, M. N., Salgado-Kent, C. P., and Sturrock, V. J., Recent trends in relative abundance of humpback whales in breeding stock D from aerial and vessel based surveys, Paper SC/A06/HW21 submitted to the IWC Southern Hemisphere Humpback Workshop, Hobart, April 2006, pp. 13 (2006); cited in Bettridge, S., *et al*. Status Review of the humpback whales (*Megaptera novaeangliae*) under the Endangered Species Act, *supra*.

The Arabian Sea Discrete Population Segment ("DPS"), recently recognized as a separate humpback whale subspecies,[60] includes those whales that are currently known to breed and feed along the coast of Oman; however, sightings and strandings indicate a population range that encompasses the northern Gulf of Aden, the Balochistan coast of Pakistan, and western India and Sri Lanka, with occasional sightings along the Sistan and Baluchistan coasts of Iran and also Iraq.[61] Photo-identification re-sightings suggest that humpback whales move seasonally between the Dhofar region (Kuria Muria Islands) in winter and the Gulf of Masirah to the north in summer, with similar re-sighting rates between and within regions.[62]

The Arabian Sea DPS is a small, highly isolated, resident population that requires an OBIA encompassing all waters north of 21°50'N from the western coast of Indian westward to the boundary of the proposed SURTASS LFA study area.

OBIA: Maldives Archipelago

The Maldives comprises a north-south chain of coral atolls in the equatorial Indian Ocean. The atolls, the slopes immediately outside the atolls, the channels and other waters between the atolls, and oceanic waters out to approximately 30 nautical miles offshore from the archipelago baseline are considered important habitat for a wide diversity of marine mammal species. Notably, Maldives is at the southern end of the range of the Arabian Sea humpback whale DPS and Southern Ocean humpback whales visit Maldives in increasing numbers during June through October. The proportion of sightings with calves increases dramatically in September and October indicating the region is a calving area for this species. Several other species are seen regularly with calves, including many dolphin species, short-finned pilot whale, melon-headed whale, Cuvier's beaked whale, Blainville's beaked whale and Longman's beaked whale.[63]

---

[60] Pomilla, C., Amaral, A.R., Collins, T., Minton, G., Findlay, K., Leslie, M.S., Ponnampalam, L., Baldwin, R. and Rosenbaum, H., The world's most isolated and distinct whale population? Humpback whales of the Arabian Sea, *PLoS ONE* 9(12): e114162 (2014).

[61] AL Robaae, K., Bottlenose dolphin (*Tursiops aduncus*): A new record for the Arab Gulf, with notes on Cetacea of the region, *Bulletin of Basrah Natural History Museum* 1(1): 7-16 (1974); Braulik, G.T., Ranjbar, S., Owfi, F., Aminrad, T., Dahtek, S.M.H., Kamrani, E., and Mohsenizadeh, F., Marine mammal records from Iran, *Journal of Cetacean Research and Management* 11(1): 49-64 (2010) (cited in Bettridge, S., *et al*., Status Review of the humpback whales (*Megaptera novaeangliae*) under the Endangered Species Act, *supra*).

[62] Minton, G., Collins, T., Findlay, K., Ersts, P., Rosenbaum, H., Berggren, P., and Baldwin, R., Seasonal distribution, abundance, habitat use, and population identity of humpback whales in Oman, *Journal of Cetacean Research and Management* (Special Issue on Southern Hemisphere Humpback Whales) 3: 185-198 (2010) (cited in Bettridge, S., *et al*., Status Review of the humpback whales (*Megaptera novaeangliae*) under the Endangered Species Act, *supra*).

[63] Anderson R.C., Sattar, S.A., and Adam, M.S., Cetaceans in the Maldives: a review. Journal of Cetacean Research and Management, 12: 219-225 (2012); Anderson R.C., Clark, R., Madsen, P.T., Johnson, C., Kiszka J., and Breysse, O., Observations of Longman's beaked whale (*Indopacetus pacificus*) in the western Indian Ocean. Aquatic Mammals, 32(2): 223-231 (2006); Clark R.A., Johnson, C.M., Johnson, G., Payne, R., Kerr, I., Anderson, R.C., Sattar, S.A., Godard, C.A.J., and Madsen, P.T., Cetacean sightings and acoustic detections in the offshore waters of the Maldives during the northeast monsoon seasons of 2003 and 2004, Journal of Cetacean Research and Management, 12(2): 227–234 (2012).

Bryde's whales (*Balaenoptera brydei* or *edeni*) also aggregate in the Maldives during El Nino years[64] and blue whales are also observed.[65]

Given the importance of this area for multiple species, including Arabian Sea and Southern Ocean humpback whales, and Bryde's whales, we recommend NMFS establish an OBIA encompassing the waters within 30 nautical miles of the archipelago baseline.

OBIA: Konkan and Malabar Coast
The Arabian Sea DPS is known to use habitat within the Konkan and Malabar Coast (up to 60 km from shore) based on acoustic recordings, opportunistic visual sightings, and strandings.[66] This area is also known to represent important seasonal habitat for blue whales and year-round habitat for Bryde's whales and a diversity of odontocetes. We therefore recommend MFS establish an OBIA to protect this important habitat area for Arabian Sea humpback whales, blue whales, and Bryde's whales (See Figure 2 for proposed approximate boundaries).

[64] Anderson R.C., Observations of cetaceans in the Maldives, 1990-2002, Journal of Cetacean Research and Management, 7(2): 119-135 (2005); Kershaw F., Leslie, M.S., Collins, T., Mansur, R.M., Smith, B.D., Minton, G., Baldwin, R., Leduc, R.G., Anderson, R.C., Brownell Jr., R.L., and Rosenbaum, H.C., Population differentiation of 2 forms of Bryde's Whales in the Indian and Pacific Oceans, Journal of Heredity, 104, 755-764 (2013); Cerchio, S., Yamada, T.K., and Brownell Jr., R.L., Global distribution of Omura's whales (*Balaenoptera omurai*) and assessment of range-wide threats, *Frontiers in Marine Science*, 15 March 2019.

[65] Anderson R.C., Branch, T.A., Alagiyawadu, A., Baldwin, R., and Marsac, F., Seasonal distribution, movements and taxonomic status of blue whales (Balaenoptera musculus) in the northern Indian Ocean, *Journal of Cetacean Research and Management*, 12: 203-218 (2012).

[66] *See*, *e.g.*, Afsal, V.V., Yousuf, K.S.S.M., Anoop, B., Anoop, A.K., Kannan, P., Rajagopalan, M., and Vivekanandan, E., A note on cetacean distribution in the Indian EEZ and contiguous seas during 2003-07, *Journal of Cetacean Research and Management* 10: 209-215 (2008); Mahanty, M.M., Latha, G., and Thirunavukkarasu, A., Analysis of humpback whale sounds in shallow waters of the Southeastern Arabian Sea: An indication of breeding habitat, *Journal of Biosciences*, 40: 407-417 (2015); Srinivasan, M., Stafford, K., Yin, S., VÃ¡zquez, E., Baumgartner, M., Kumar, A., Panicker, D., Banerjee, A., and Saravanane, N., Marine Mammal Research in India Symposium - Part 2 Multispecies Cetacean Line-Transect Survey Training off Kochi, India 15-18 December 2017(Cruise# 368). Final Cruise Report. U.S. Dept. Of Commer., NOAA. NOAA Technical Memorandum NMFS-F/SPO-182, 20 p; Sutaria D., Sule M., Jog K., Bopardikar I., Panicker D., Baleen Whale Records from the Arabian Sea, India, A Note Submitted to the IWC Sub-Committee, May 2017. SC/67a/CMP/03 (2017).

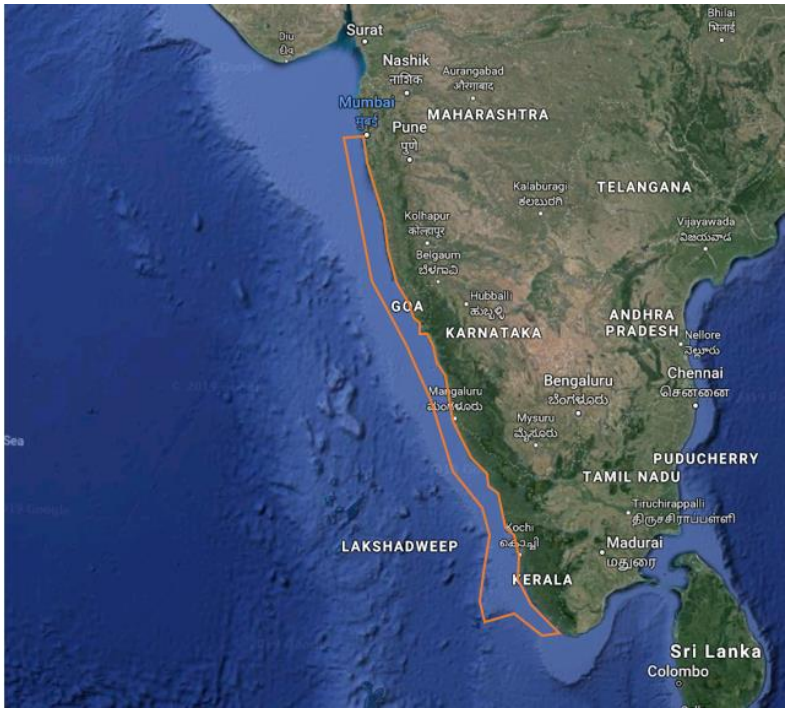


Fig. 2. Approximate boundaries of the proposed Konkan and Malabar Coast OBIA (seaward boundary extends 60 km from shore and extends eastward to cover the shelf feature in the southwest.

OBIA: Muttom-Kanyakumari and Wadge Bank, southern India

This area has not yet been systematically surveyed; however, in 2018 a satellite tagged Arabian Sea humpback whale traveled from Oman to India, reaching Kanyakumari within the first week of arriving in India and spent close to two months in this area before returning to Oman.[67] The Wadge Bank, located off the Kanyakumari district is a region of high chlorophyll content due to the mixing of waters from Bay of Bengal, Arabian Sea, and the Indian Ocean. Interviews with fishermen confirm that baleen whales forage in this area and usually at least two or three animals are seen foraging together (unpublished data). We recommend MFS establish an OBIA to protect this important foraging habitat area for Arabian Sea humpback whales and potentially other baleen whale species (See Figure 3 for proposed approximate boundaries).

[67] *See*, Figure on page 4: https://arabianseawhalenetworkdotorg.files.wordpress.com/2018/10/aswn-2018_10-newsletter_final.pdf

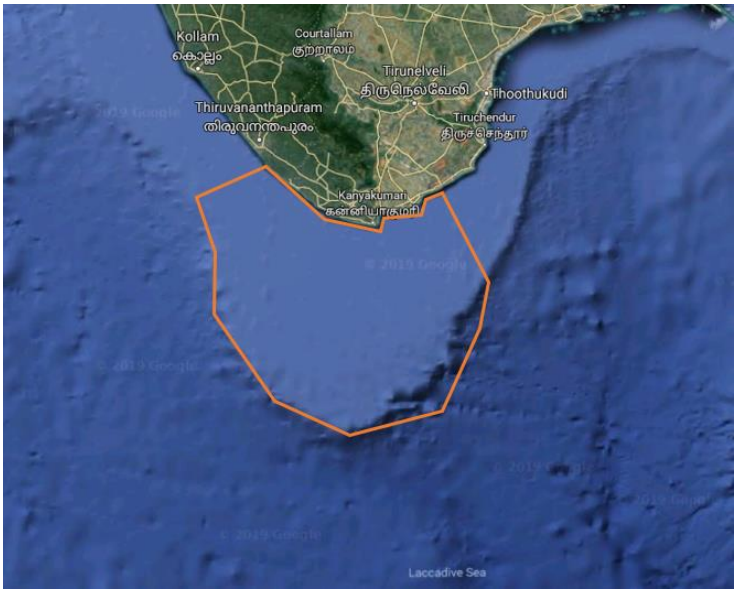


Fig. 3. Approximate boundaries of the proposed Wadge Bank OBIA.

OBIA: Northwestern Pacific breeding areas
During the winter, humpback whales in the northwestern Pacific concentrate in five isolated locations, three of which fall within the proposed SURTASS LFA study area: Hawaii, Okinawa/Philippines, and a third area whose exact location is unknown.[68] These areas are used by discrete population segments of humpback whales.

The Okinawa/Philippines DPS is considered to be of "moderate" risk of extinction.[69] Whales have been commonly sighted throughout the Ogasawara archipelago from December to May and were present during the same period near the Kerama Islands, Okinawa. Repeat sightings of individuals indicate that some whales were present for extended periods off Ogasawara. The predominant behavior patterns were those related to calving and mating.[70] The Ogasawara Islands of Japan are also likely to be an area of mixing for whales continuing to Okinawa/Philippines and to habitat used by another humpback whale DPS, known as the Second West Pacific DPS.[71]

We recommend NMFS afford protection to:

---

[68] Baker, C.S., Steel, D., Calambokidis, J., Falcone, E., González-Peral, U., Barlow, J., Burdin, A.M., Clapham, P.J., Ford, J.K., Gabriele, C.M., and Mattila, D., Strong maternal fidelity and natal philopatry shape genetic structure in North Pacific humpback whales, *Marine Ecology Progress Series* 494: 291-306 (2013).

[69] Bettridge, S., *et al*., Status Review of the humpback whales (*Megaptera novaeangliae*) under the Endangered Species Act, *supra*.

[70] Darling, J.D., and Mori, K., Recent observations of humpback whales (*Megaptera novaeangliae*) in Japanese waters off Ogasawara and Okinawa, *Canadian Journal of Zoology* 71: 325-333 (1993).

[71] *Id*.

i. The Okinawa/Philippines DPS by establishing an OBIA encompassing waters <200 m deep—typical of humpback whale wintering habitat—surrounding the islands of Okinawa from January to April and the islands of Ogasawara from December to June.[72] We note that Ogasawara is included on NMFS' list of potential OBIAs (84 Fed. Reg. at Table 21, #7) and strongly recommend that this area is carried forward for inclusion, and expanded to the 200 m depth contour.

ii. The newly designated "Babuyan Marine Corridor IMMA" and buffer recommended for protection, primarily identified as the only breeding area for humpback whales in the Philippines.[73]

OBIAs: Northwestern Pacific feeding areas
Humpback whales aggregate in relatively discontinuous feeding grounds in the Northern Pacific from Kamchatka in the west to central California in the east. The Okinawa/Philippines DPS migrates to summer feeding areas in the northwestern Pacific, including the waters east of Kamchatka and surrounding the Commander Islands.[74] Humpback whales show remarkable site fidelity to this feeding area, with no interchange with feeding areas to the east recorded to date.[75]

We recommend NMFS establish (i) an OBIA extending from the east Kamchatka coastline offshore to the continental shelf break (encompassing the 'Watchlist' OBIA "Southeast Kamchatka Coastal waters," *Id.*, #9), from June through September; and (ii) an OBIA reflecting the boundaries of the "Commander Islands Shelf and Slope EBSA," which has not yet been considered.

(c) Bryde's whales

The "Coastal Northern Bay of Bengal IMMA" has been recently designated as, in part, due to its importance for Bryde's whales (*Balaenoptera edeni*).[76] In addition, this area has been identified as an area of significant importance for a diversity of odontocetes, including endangered Irrawaddy dolphins, vulnerable and genetically distinct Indo-Pacific humpback dolphins, and finless dolphins.[77] Due south of this area lies the Swatch-of-No-Ground submarine canyon that provides the physical conditions that support extraordinary biological productivity including globally significant populations of Bryde's whales (*Balaenoptera brydei*) as well as wide

[72] Following *Id.*

[73] *See*, https://www.marinemammalhabitat.org/portfolio-item/babuyan-marine-corridor/

[74] Calambokidis, J., Falcone, E.A., Quinn, T.J., Burdin, A.M., Clapham, P.J., Ford, J.K.B., Gabriele, C.M., LeDuc, R., Mattila, D., Rojas-Bracho, L., Straley, J.M., Taylor, B.L., Urban, J., Weller, D., Witteveen, B.H., Yamaguchi, M., Bendlin, A., Camacho, D., Flynn, K., Havron, A., Huggins, J., and Maloney, N., SPLASH: Structure of Populations, Levels of Abundance and Status of Humpback Whales in the North Pacific, Final Report for Contract AB133F-03-RP-00078 prepared by Cascadia Research for U. S. Department of Commerce (2008).

[75] *Id.*

[76] *See*, https://www.marinemammalhabitat.org/portfolio-item/coastal-northern-bay-bengal/

[77] *Id.*

diversity of odontocetes; the area was recently designated as the "Swatch-of-No-Ground IMMA."[78]

We therefore recommend NMFS designate a year-round OBIA reflecting the boundaries of both the "Coastal Northern Bay of Bengal IMMA" and the "Swatch-of-No-Ground IMMA," and their associated buffers designed to inform place-based conservation measures.

(d) Gray whales

The critically endangered western gray whale population numbered only approximately 130 animals in 2008. The survival and recovery of the population depends on prompt and effective conservation action throughout their range.[79]

OBIA: Western gray whale migratory route off Japan
Gray whales migrate from winter breeding grounds, suspected, but not confirmed, to lie in the South China Sea, to summer feeding areas off the northeastern coasts of Sakhalin Island and southeastern Kamchatka.[80] While the coastal waters of eastern Russia, the Korean Peninsula, and both sides of Japan have all been recorded as migratory corridors in the past 50 years, the current migration route(s) of the population is not well known.[81] Of the 17 records since 1955 that exist in Japan, 76% (n=13) were reported from the Pacific coast and 24% (n=4) in the Sea of Japan (west coast). All occurrences took place between January and July, with the highest number of records reported between March and May. A rare, photo-identification match was made of a whale first sighted off northeastern Sakhalin Island in July 2006 and was next seen entrapped in fishing gear off the eastern coast of Japan.[82]

While questions remain regarding the full migration route of the western gray whale, it is clear from existing records that at least the eastern coast of Japan between March and May represents an important portion of the overall route. We therefore recommend NMFS establish an OBIA off eastern Japan extending from the coast out to the continental shelf edge from March through May.

(e) Sei whales

---

[78] *See*, https://www.marinemammalhabitat.org/portfolio-item/swatch-of-no-ground/

[79] Brownell, Jr., R.L., Donovan, G.P., Kato, H., Larsen, F., Mattila, D., Reeves, R.R., Rock, Y., Vladimirov, V., Weller, D., and Zhu, Q., Draft conservation plan for western North Pacific gray whales (*Eschrichtius robustus*), IWC Doc. SC/62/BRG 24, draft dated June 2010 (2010).

[80] Weller, D.W., Burdin, A.M., Würsig, B., Taylor, B.L. and Brownell Jr., R.L., The western gray whale: a review of past exploitation, current status and potential threats. Journal Cetacean Research Management, 4(1), 7-12 (2002); cited in *Id*.

[81] *See* reviews in *Id* and, also, Weller, D.W., Bradford, A L., Kato, H., Bando, T., Ohtani, S., Burdin, A.M., and Brownell, Jr., R.L., Photographic match of a western gray whale between Sakhalin Island, Russia, and Honshu, Japan: First link between feeding ground and migratory corridor, *Journal Cetacean Research and Management* 10(1): 89-91 (2008).

[82] *Id*.

The spatial distribution of sei whales in the subarctic-subtropical transition area of the western North Pacific is associated with three oceanic fronts: the Pacific Front, the Subarctic Front, and the Kurioshio Extension Front (*see* Fig. 4).[83] These basin-scale oceanic fronts are indicators of their feeding grounds at the macro to meso scale. It was reported that energetic jets (streamers) and mesoscale eddies associated with these fronts were observed in the feeding grounds.[84]

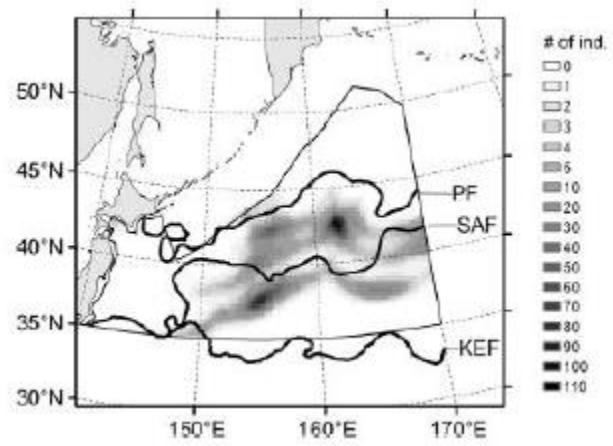


Fig. 4. The estimated distribution patterns of the number of individual sei whales obtained nu using a generalized additive model. The locations of the Polar Front (PF), Subarctic Front (SAF), and Kuroshio Extension Front (KEF) are also shown. (Adapted from Murase *et al.* (2014) at Fig. 3)

OBIA: Sei whale and other whale habitat along the Polar and Kuroshio Extension fronts
Following the findings of Murase *et al.* (2014),[85] we recommend NMFS establish an OBIA that extends from the Polar Front boundary southwards towards the Kuroshio Extension Front (*i.e.*, approximately 45°N to 35°N, 152°E to 170°E) to protect foraging sei whales (*i.e.*, the "Polar/Kuroshio Extension Front" area that NMFS is currently considering (84 Fed. Reg. at Table 21, #25). Protecting this highly productive foraging area would have broad benefit for a number of marine mammal species, including sperm whales, other odontocetes, and elephant seals.

(f) Sperm whales

OBIAs: Waters off Sri Lanka
The physical characteristics of the coast of Sri Lanka, which include the presence of numerous deep canyons adjacent to the coast, help create a heterogeneous environment, which provides habitats for a variety of cetacean species, including resident pygmy blue whales (see above),

[83] Murase, H., Hakamada, T., Matsuoka, K., Nishiwaki, S., Inagake, D., Okazaki, M., Tojo, N., and Kitakado, T., Distribution of sei whales (*Balaenoptera borealis*) in the subarctic–subtropical transition area of the western North Pacific in relation to oceanic fronts, *Deep Sea Research Part II: Topical Studies in Oceanography* 107: 22-28 (2014).

[84] *Id.*

[85] *Id.*

Bryde's whales, and sperm whales, which are "commonly recorded and widely distributed in Sri Lankan waters."[86]

Large groups of sperm whales have been observed directly off the southern coast, coincident with the Dondra Submarine Canyon, and off the northwest coast, in the vicinity of the Bar Reef Marine Sanctuary during the inter-monsoonal period of August through September; this area was also the site of 19th-century whaling activities between the months of August and December. Frequent sightings of large sperm whale groups including calves are also made off the northeast coast and may indicate that Sri Lankan waters are an important calving ground for this species.[87]

Similar to blue whales, we recommend that NMFS advance the following three areas currently being considered by NMFS as year-round mitigation areas for both blue and sperm whales (and, in some cases, Bryde's whales): (i) "Southern Coastal/Offshore Waters between Galle and Yala National Park" (*Id*., #4), (ii) "Trincomalee Canyon and Associated Ecosystems" (*Id*., #3), and (iii) "Coastal and Offshore Area of the Gulf of Mannar" (OBIA Watchlist), which also encompasses the currently not considered "Sri Lankan Side of Gulf of Mannar" EBSA.

OBIA: Lakshadweep Archipelago
The Lakshadweep Archipelago offshore of the southwest coast of India is reported to represent habitat for at least 16 species of cetaceans, including sperm whales, beaked whales, and *Kogia*. The archipelago consists of coral atolls located 220-440 km to the southwest of the Indian coast and represents a diverse range of habitats including coral reefs, seagrass beds, deep-water canyons and trenches that generate flows and upwellings that create elevated primary productivity. Oceanic surveys of this area have recently started to be carried out from platforms of opportunity and sightings of sperm whales have been confirmed, as well as unidentified baleen whales, and a diversity of odontocetes. Cuvier's beaked whale and pygmy sperm whales have been reported as strandings in the area.[88]

We therefore recommend NMFS consider designating an OBIA to encompass the entirety the Lakshadweep Archipelago and the waters therein (see Figure 5 for approximate boundaries).

---

[86] de Vos, A., *et al*., Cetacean sightings and acoustic detections in the offshore waters of Sri Lanka: March-June 2003, *supra*.

[87] *Id*.

[88] Kumar, K.V., Aneesh, S.T., Baby, K.V., Dhaneesh, H.M., Saravanane, N., and Sudhakar, M., A Stranding Record of Dwarf Sperm Whale *Kogia sima* in Lakshadweep Archipelago, India and its Genetic Analogy by Molecular Phylogeny, Thalassas: An International Journal of Marine Sciences, 1-7 (2018); Panicker, D., Cetacean Diversity and Distribution in the Lakshadweep Islands, India. Final report to Rufford Foundation for Small Grants (2017) https://www.rufford.org/files/16159-2%20Final%20Report.pdf; Panicker, D, Sutaria, D, Kumar, A, Stafford, K., Cetacean Distribution and Diversity in Lakshadweep Waters, India Using a Platform of Opportunity: October 2015 to April 2016, Aquatic Mammals (2019; in review).

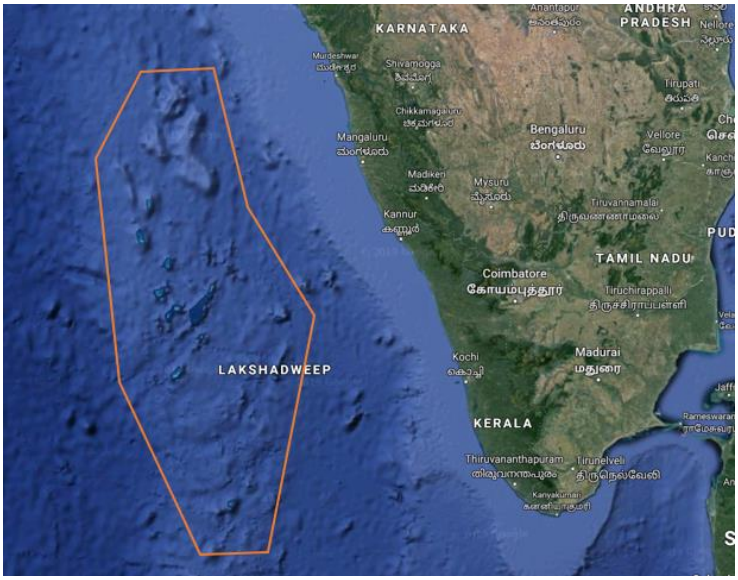


Fig. 5. Approximate boundaries of the proposed Lakshadweep Archipelago OBIA.

OBIAs: Northwestern Pacific

Sperm whales in the Northwestern Pacific appear to be largely nomadic, traveling in response to the geographical and temporal variations in the abundance of medium- and large-size pelagic squids, their primary prey. Whaling catch location data show that sperm whales are often found in great densities along oceanographic frontal zones. These areas have dense concentrations of many invertebrates, fish, and marine mammals, and are also areas with extensive commercial fisheries for squid.[89]

Yankee whaling data and pelagic Soviet catches show a major overlap in the area known as the "Japan Ground," located between approximately 26° and 36°N. This area of sperm whale concentration overlaps with what is known as the Kuroshio Extension Bifurcation Region, where meanders and eddies of the Kurioshio Extension Current drive some of the highest primary productivity in the North Pacific.[90] This area is likely to have been a consistent foraging ground for sperm whales to the present day.[91] Additional overlap between the Yankee and Soviet catches is observed on the "Coast of Japan Ground" and (to a somewhat lesser extent in terms of the number of 19th century catches) the "Japan-Bonin Island Ground" to the south (*see* Fig. 6).[92]

[89] Mizroch, S.A., and Rice, D.W., Ocean nomads: Distribution and movements of sperm whales in the North Pacific shown by whaling data and Discovery marks, *Marine Mammal Science* 29(2): E136-E165 (2013).

[90] *Id*.; Ivashchenko, Y.V., Brownell, Jr., R.L., and Clapham, P.J., Distribution of Soviet catches of sperm whales *Physeter microcephalus* in the North Pacific, *Endangered Species Research*, 25: 249-263 (2014).

[91] *Id*.

[92] Ivashchenko, Y.V., *et al*., Distribution of Soviet catches of sperm whales *Physeter microcephalus* in the North Pacific, *supra*.

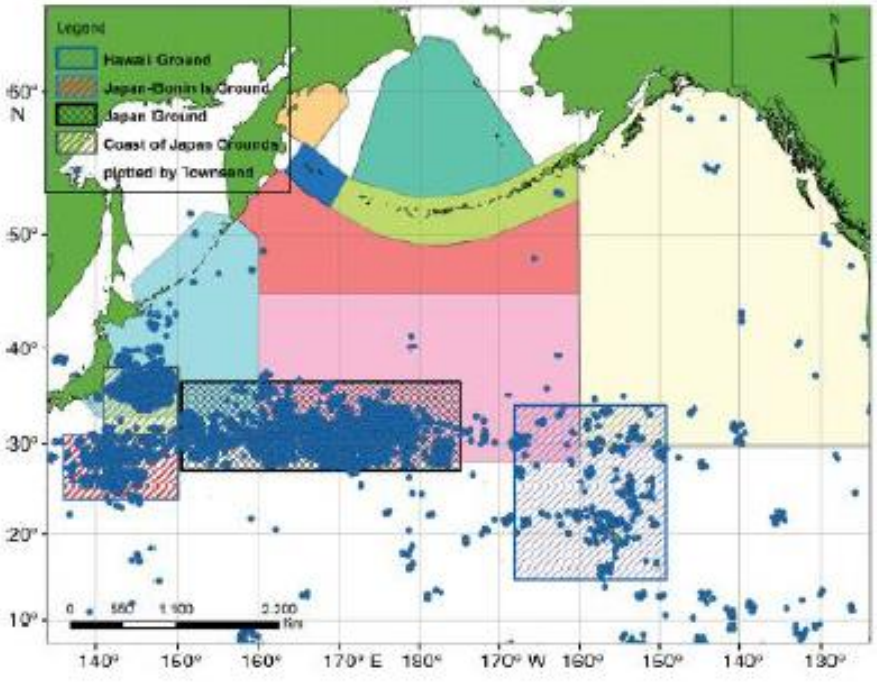


Fig. 6. Major areas of concentration of American (Yankee) whaling catches in the 19th century (from Townsend 1935. Hatched rectangles show the primary 19th century whaling grounds. Colored regions represent Soviet catch areas. (Adapted from Ivashchenko *et al.* (2014), Fig. 9).

To protect these important foraging areas for sperm whales, we recommend NMFS utilize the boundaries of the three aforementioned historic whaling grounds (*i.e.*, Japan Ground, Coast of Japan Ground, and Japan-Bonin Island Ground) to delineate OBIAs for sperm whales in the Northwestern Pacific Ocean (following the areas described in Ivashchenko *et al.* 2014; Fig. 9).[93] The Japan Ground area is generally consistent with that of the "Polar/Kurioshio Extension Fronts" area that NMFS is currently considering (84 Fed. Reg. at Table 21, #25).

(g) Resident killer whales off eastern Russia

There are 688 identified resident killer whales in the Avacha Gulf, southeast Kamchatka, and more than 800 resident killer whales around the Commander Islands, but the status of the population in the western Okhotsk Sea is unknown.[94] The population size of the mammal-eating ecotype in this region is estimated at only 240-260 individuals in the Okhotsk Sea.[95] The Russian

[93] *Id.*

[94] Filatova, O.A., Shpak, O.V., Ivkovich, T.V., Borisova, E.A., Burdin, A.M., and Hoyt, E., Killer whale status and live-captures in the waters of the Russian Far East, Paper SC/65b/SM07 presented to the Scientific Committee at the 65th Meeting of the International Whaling Commission, 12-24 May 2014, Bled, Slovenia (2014).

[95] Filatova, O.A. and Shpak, O.V., Update on the killer whale live captures in Okhotsk Sea, Paper SC67a/SM24 presented to the Scientific Committee at the 67th Meeting of the International Whaling Commission, 9-21 May 2017, Bled, Slovenia (2017).

government recently issued a quota of 13 killer whale captures for 2018,[96] which will likely be taken from the mammal-eating ecotype as they are distributed closer to shore and are more accessible to the capture operators, amounting to a potentially unsustainable 5% catch of the mammal-eating population. The taking of killer whales off the coast of Russia for the aquarium trade is currently a cause of international concern.[97] For geographic mitigation, the small population size and cumulative impacts upon mammal-eating killer whales in this area should be carefully considered by NMFS. Neglecting to include the best available science on the population structure, ecotypes, and abundance estimates of killer whales in this region is a major oversight of Proposed Rule.

OBIA: Avacha Gulf
The Avacha Gulf is a 'core area' in the Russian Far East for resident killer whales, as well as a transit corridor for killer whales of other communities.[98] We recommend NMFS establish a year-round OBIA in the waters of the Avacha Gulf to protect this important foraging habitat and transitory corridor.

(h) Harbor porpoises and beaked whales

As discussed above at section II(B)(1)(b), the literature has also demonstrated an acute sensitivity of certain marine mammal species, including beaked whales and harbor porpoises, to various anthropogenic sounds, including sounds of predominantly low frequency. It is improper to exclude these acoustically sensitive species from OBIA mitigation, as the Proposed Rule proposes, particularly in favor of a research effort that has yet to produce any data. *See NRDC v. Pritzker*, 828 F.3d at 1142.

While a more comprehensive evaluation of important habitat for these species is needed, we make the following recommendations for the protection of biologically important beaked whale habitat around the Hawaiian Islands.

OBIA: Main Hawaiian Islands
Waters around the Big Island exhibit the greatest degree of marine mammal endemism of virtually any known area on the planet. They constitute biologically important habitat, and indeed the entire observed range, for ten small, resident populations of odontocetes, including Blainville's beaked whales and Cuvier's beaked whales, as well as dwarf sperm whales, pygmy killer whales, short-finned pilot whales, melon-headed whales, pantropical spotted dolphins, spinner dolphins, rough-toothed dolphins, bottlenose dolphins, and the endangered main

[96] International Whaling Commission, Report of the Sub-Committee on Small Cetaceans, *Journal of Cetacean Research and Management* 20 (Supplement): in press.

[97] International Whaling Commission, Report of the Sub-Committee on Small Cetaceans, *Journal of Cetacean Research and Management* 10 (Supplement): 302-321 (2008).

[98] Ivkovich, T., Filatova, O.A., Burdin, A.M., Sato, H. and Hoyt, E., The social organization of resident-type killer whales (*Orcinus orca*) in Avacha Gulf, Northwest Pacific, as revealed through association patterns and acoustic similarity, *Mammalian Biology-Zeitschrift für Säugetierkunde 75*(3): 198-210 (2010).

Hawaiian Islands Insular population of false killer whales.[99] Populations that are resident or seasonally resident have a greater vulnerability to population-level effects.

The agency should establish OBIAs in waters outside the coastal exclusion zone that are contained within the Biologically Important Areas for Blainville's and Cuvier's beaked whales, as well as for other small, resident odontocete populations, around the main Hawaiian Islands, as defined in Baird *et al.* (2015).[100] Additionally, it should include critical habitat that NMFS recently designated, under the Endangered Species Act, for the main Hawaiian Islands insular false killer whale. 83 Fed. Reg. 35062 (July 24, 2018). It is likely that these areas would substantially overlap, to the extent that a single continuous OBIA could be established around the islands.

OBIA: Cross Seamount
Cross Seamount is located at approximately 18°40' N. latitude and 158°10' W. longitude and rises to a charted depth of 330 m, representing the shallowest of the Navigator Seamounts that lie south of Oahu and southwest of the island of Hawai'i.[101] The seamount has a strong influence on the abundance, biomass, and community composition of micronekton, the diverse assemblage of small (<20 cm) fish, shrimp, and squid that form a key trophic link between zooplankton and top predators.[102] Higher densities of squid and fish are observed over the seamount summit and flanks relative to those in ambient water, particularly in the upper 200 m of the water column and near the seafloor of the seamount.[103] These prey fields represent important foraging habitat for top predators: bigeye tuna caught at Cross Seamount have fuller stomachs and demonstrate a more diverse prey base, including a high percentage of cephalopods, than those caught in the open ocean.[104]

---

[99] Baird, R.W., Cholewiak, D., Webster, D. L., Schorr, G. S., Mahaffy, S. D., Curtice, C., Harrison, J., and Van Parijs, S., Biologically Important Areas for cetaceans within U.S. waters – Hawai'i Region, *Aquatic Mammals* 41(1): 54-64 (2015); Baird, R.W., *The lives of Hawai'i's dolphins and whales: Natural history and conservation* (2016); Abecassis, M., Polovina, J., Baird, R.W., Copeland, A., Drazen, J.C., Domokos, R., Oleson, E., Jia, Y., Schorr, G.S., Webster, D.L., and Andrews, R.D., Characterizing a foraging hotspot for short-finned pilot whales and Blainville's beaked whales located off the west side of Hawai'i Island by using tagging and oceanographic data, *PLoS ONE* 10(11): e0142628 (2015).

[100] Baird, R.W., *et al*., Biologically Important Areas for cetaceans, *supra*.

[101] Itano, D.G., Hawaii offshore handline fishery: A seamount fishery for juvenile bigeye tuna, Working Paper 48 to the 11th Meeting of the Standing Committee on Tuna and Billfish, held in Honolulu, Hawaii (May 30—June 6, 1998).

[102] Drazen, J.C., Lisa, G., and Domokos, R., Micronekton abundance and biomass in Hawaiian waters as influenced by seamounts, eddies, and the moon, *Deep Sea Research Part I: Oceanographic Research Papers*, 58(5): 557-566 (2011).

[103] Johnston, D.W., McDonald, M., Polovina, J., Domokos, R., Wiggins, S. and Hildebrand, J., Temporal patterns in the acoustic signals of beaked whales at Cross Seamount, *Biology Letters* 4(2): 208-211 (2008).

[104] Grubbs, R.D., Holland, K.N. and Itano, D.G., Comparative trophic ecology of yellowfin and bigeye tuna associated with natural and man-made aggregation sites in Hawaiian waters, 15th Meeting of the Standing Committee on Tuna and Billfish. SCTB15-Working paper, YFT-6, Honolulu, Hawai'i (July 22-27, 2002).

Acoustic studies have revealed that beaked whales forage year-round at Cross Seamount on most nights, primarily at the summit.[105] Importantly, the beaked whales found at Cross Seamount are not Blainville's or Cuvier's beaked whale—the species expected to be found in this region—but are either a geographic variant of these species, or Longman's beaked whale, or another beaked whale species not yet known to occur in the region.[106] The absence of other beaked whale echolocation sounds at Cross Seamount also provides evidence of niche differentiation at this location.[107] From November to May, feeding buzzes from other non-beaked whale species were also detected, suggesting a seasonal increase in other species during this time.[108]

The agency should therefore establish a year-round OBIA at Cross Seamount, which represents important foraging habitat for a potentially rare or evolutionary distinct species of beaked whale. Such a designation would have secondary benefits for a variety of other odontocete species foraging at Cross Seamount seasonally between November and May.

(i) Data-deficient species

A number of marine mammal species occurring within the proposed SURTASS LFA study area are considered "data deficient" by IUCN, due to the eastern Indian Ocean and, to a lesser extent, the Northwestern Pacific regions being understudied. It has recently been suggested that such species should be assumed "threatened," as it is likely certain data-deficient species are, in fact, "vulnerable" or "endangered," given their low sightings rates and restricted ranges.[109] We remind the agency that data-deficiency does not equate to healthy populations and recommend that the delineation of OBIAs be precautionary in this regard. As discussed elsewhere in these comments, we recommend NMFS and the Navy work with researchers embedded within these regions to help build our state of knowledge on these species and identify potential OBIAs. Again, a list of region experts is provided as an appendix to these comments.

Three species of data-deficient cetaceans are worth particular note: Omurai's whale (*Balaenoptera omurai*) and Deraniyagala's beaked whale (*Mespolodon hotula*)[110] and *Berardius* beaked whale, which have both been recently described in the northern Pacific Ocean.[111]

---

[105] Johnston, D.W., *et al*., "Temporal patterns in the acoustic signals of beaked whales at Cross Seamount," *supra*; McDonald, M.A., Hildebrand, J.A., Wiggins, S.M., Johnston, D.W. and Polovina, J.J., An acoustic survey of beaked whales at Cross Seamount near Hawaii, *Journal of the Acoustical Society of America* 125(2): 624-627 (2009).

[106] McDonald, M.A., *et al*., "An acoustic survey of beaked whales at Cross Seamount near Hawaii," *supra*.

[107] *Id*.

[108] *Id*.

[109] Parsons, E.C.M., Why IUCN should replace "Data Deficient" conservation status with a precautionary "Assume Threatened" status—A cetacean case study, *Frontiers in Marine Science* 3: 193 (2016).

[110] Dalebout, M.L., Baker, C.S., Steel, D., Thompson, K., Robertson, K.M., Chivers, S.J., Perrin, W.F., Goonatilake, M., Anderson R.C., Mead, J.G., Potter, C.W., Resurrection of *Mesoplodon hotaula* Deraniyagala 1963: A new species of beaked whale in the tropical Indo-Pacific, *Marine Mammal Science* 30(3): 1081-108 (2014).

[111] Morin, P.A., Baker, C.S., Brewer, R.S., Burdin, A.M., Dalebout, M.L., Dines, J.P., Fedutin, I., Filatova, O., Hoyt, E., Jung, J., Lauf, M. , Potter, C.W., Richard, G., Ridgway, M., Robertson, K.M., and Wade, P.R., Genetic structure of the beaked whale genus Berardius in the North Pacific, with genetic evidence for a new species, *Marine Mammal Science* 33: 96-111 (2017).

Omurai's whale were originally reported from the Cocos (Keeling) Islands, Indonesia, Japan; Malaysia, Philippines and Solomon Islands.[112] Recently, a scientific synthesis of genetic, skull morphology, photographic, acoustic, and visual sightings data generated expanded the species' distribution beyond the originally suspected Indo-Pacific core region to a global distribution for this species between 35°N and 35°S (83.2% of records fall within the tropics between 23.5°N and 23.5°S; no records have been found to date in the eastern Pacific).[113] Deraniyagala's beaked whale has been reported from the Seychelles, Maldives, Gilbert Islands, the Line Islands, Sri Lanka and Kiribati.[114] The new *Berardius* beaked whale was recorded from the north Pacific.[115]

(j) Coastal Exclusion Zone

The agency, in the Proposed Rule, gives little consideration to expanding the LFA coastal exclusion zone, assuming, based on its analysis in prior environmental reviews, that its standoff distance should remain 12 nautical miles from shore. Yet this reliance on prior analyses is not supportable. The district court in *LFA III* accepted NMFS' rationale that further consideration was unnecessary since, in its estimation, the OBIA analysis was adequate for data-poor areas (62 F.Supp.3d at 1009); but the Ninth Circuit's decision, in finding that OBIA analysis arbitrary and capricious (see *Pritzker*, 828 F.3d at 1138-41), effectively negated that rationale.

For years, our groups have called on the Navy and NMFS to adopt a more expansive, more biologically meaningful coastal exclusion, particularly one that protects the continental shelf and slope with a standoff from the shelf break. NMFS' own subject-matter experts, in the White Paper discussed earlier in these comments, recommend that, absent specific data to the contrary, "all continental shelf waters and waters 100 km of the continental slope should be designated as biologically important habitat for marine mammals."[116] Notably, in *LFA II*, the district court held that, while the Navy need not necessarily analyze the specific exclusion established in the previous years' injunction for the Philippine Sea, this did not excuse it "from evaluating a dual criteria alternative [*i.e.*, a measure based both on the location of the continental shelf break and on an absolute distance from shore] that would meet the stated purpose and need, such as a dual criteria alternative used in some areas, but not others, with an exception for non-routine military tracking operations." *NRDC v. Gutierrez*, 2008 WL 360852 at *23. The court based its conclusion particularly on "the importance of the location of the continental shelf to the environmental impact and the fact that the Navy has been operating under dual criteria for five

[112] Sasaki, T., Nikaido, M., Wada, S., Yamada, T. K., Cao, Y., Hasegawa, M. and Okada, N., *Balaenoptera omurai* is a newly discovered baleen whale that represents an ancient evolutionary lineage, *Molecular Phylogenetics and Evolution*, 41(1): 40-52 (2006).

[113] Cerchio, S., Yamada, T.K., and Brownell Jr., R.L., Global distribution of Omura's whales (*Balaenoptera omurai*) and assessment of range-wide threats, *supra*.

[114] Dalebout, M. L., *et al*., Resurrection of Mesoplodon hotaula Deraniyagala 1963: A new species of beaked whale in the tropical Indo-Pacific, *supra*.

[115] Morin, P. A., *et al*., Genetic structure of the beaked whale genus Berardius in the North Pacific, with genetic evidence for a new species, *supra*.

[116] Ferguson *et al.*, Identifying areas of biological importance, *supra.*

years." *Id.* NMFS, in consultation with the Navy, should consider alternative coastal exclusion areas.

IV. NEGLIGIBLE IMPACT ANALYSIS

Under the MMPA's general permit provision, NMFS can authorize exceptions to the take moratorium only upon making an affirmative finding that an activity will have no more than a "negligible impact" on a species or stock. 16 U.S.C. §§ 1371(a)(5)(A)(i), (D)(i)(I). "Negligible impact" has been defined by the agency as one "that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival" (50 C.F.R. § 216.103); or, as the agency translates, one that is "not likely to reduce annual rates of adult survival or recruitment" (71 Fed. Reg. 21003). Unfortunately, NMFS' negligible impact determination is fundamentally undermined by its reliance on several outdated data sources and methods of risk analysis.

(A) Behavioral response function

The Proposed Rule, like the Navy's new DSEIS, relies entirely on the LFA Scientific Research Program ("SRP") in establishing behavioral risk parameters for the SURTASS LFA system. 84 Fed. Reg. at 7222. This study, though ambitious at the time, took place twenty years ago and is inconsistent with more recent science on the behavioral response of marine mammals to low-frequency underwater noise. Reliance on the SRP to the exclusion of all other scientific literature on the impacts of low-frequency sound would be arbitrary and capricious.

Marine mammal science, including the technology used to study behavioral response to underwater noise, has advanced significantly over the two decades since the SRP concluded.

The tags used in the SRP were Time-Depth Recorders, which, in rendering only depth profile, are primitive by comparison with contemporary marine mammal tags, which include accelerometers, magnetometers, and hydrophones. The newer tags provide far greater capacity to track alterations in animal orientation, velocity, and noise production, and therefore to detect disruptions in marine mammal feeding and other behaviors. Additionally, the SRP's sample sizes were small, focal species were limited, and the LFA system was generally operated at less than full power.

Behavioral response studies that have taken place in the intervening years, using considerably more advanced technologies and methods, indicate the limitations of the earlier Navy experiment. For example, a tagging study of sperm whales in the Gulf of Mexico did not detect any significant avoidance of the noise source (an airgun array), but did find significant reductions in buzz rate, a proxy for prey capture,[117] a finding that could not have made without acoustic tags. A similar decline in buzz rate has been documented, through the use of modern

[117] Miller, P.J.O., Johnson, M.P., Madsen, P.T., Biassoni, N., Quero, M., and Tyack, P.L., Using at-sea experiments to study the effects of airguns on the foraging behavior of sperm whales in the Gulf of Mexico, *Deep-Sea Research I*, 56, 1168-1181 (2009).

CPOD tags, in harbor porpoises exposed to piledriving noise.[118] It is unlikely that the SRP's tagging and focal follow technique, which was designed to pick up basic changes in vocalization and movement patterns, could detect these other types of responses, which have significant implications for foraging and other biologically important activities. Indeed, Gomez et al. (2016), the only comprehensive, peer-reviewed study of dose-response relationships in the marine mammal disturbance literature, warn repeatedly of relying exclusively on horizontal displacement and limited tagging data in determining when behavioral responses occur.[119]

The Navy claims that the SRP remains more relevant than the host of more recent investigations because it is the only study of a tonal source operating at frequencies below 500 Hz. DSEIS at 4-29. Yet researchers in the Stellwagen Bank National Marine Sanctuary documented suppression in humpback whale vocalization during operations of an Ocean Acoustic Waveguard Remote Sensing system, a powerful low-frequency fish sensor operating at similar frequencies, at distances of 200 km from the source,[120] The Heard Island Feasibility Test, which likewise involved a tonal sound source operating below 500 Hz, reported complete cessations in vocalizations of long-finned pilot whales and sperm whales over a 4900 km^2 area following exposure.[121] These papers join a spate of other studies documenting large-scale changes in baleen whale vocalizations and those of other species in response to predominantly low-frequency anthropogenic noise.[122] In short, the best available science indicates that the Navy's behavioral response function for LFA, promulgated by NMFS in the Proposed Rule, is non-conservative.

(B) Single Ping Equivalent

In assessing the aggregate effect of multiple LFA exposures, the Proposed Rule applies a formula known as the Single Ping Equivalent, or "SPE" (84 Fed. Reg. at 7202), which the Navy first deployed in its original 2001 EIS. This concept, which derives originally from observations of auditory impacts in humans, assumes that the exposure level required to induce temporary threshold shift drops by 5 decibels for every 10-fold increase in the number of exposures. *See* 2001 EIS at 4.2-21 to 23. Here the Navy applies it only to determine behavioral impacts from cumulative noise exposure. 84 Fed. Reg. at 7202.

---

[118] Pirotta, E., Brookes, K.L., Graham, I.M., and Thompson, P.M., Variation in harbour porpoise activity in response to seismic survey noise, *Biology Letters* 10: 20131090 (2014).

[119] Gomez, C., Lawson, J.W., Wright, A.J., Buren, A.D., Tollit, D., and Lesage, V., A systematic review on the behavioral responses of wild marine mammals to noise: The disparity between science and policy, *Canadian Journal of Zoology* 94: 801-19 (2016).

[120] Risch, D., Corkeron, P.J., Ellison, W.T., and Van Parijs, S.M., Changes in humpback whale song occurrence in response to an acoustic source 200 km away, *PLoS ONE* 7(1): e29741 (2012); *see also* Dr. Chris Clark, "Re: NY-MARES: new acoustics paper," message to ny-mares@lists.seaturtle.org, January 14, 2012 (noting that, while source levels of the OAWRS are unknown, the system "was and is essentially the same as a [SURTASS LFA] sound source").

[121] Bowles, A.E., *et al*., The relative abundance and behaviour of marine mammals exposed to transmissions, *supra*.

[122] *See, e.g.*, Nowacek, D.P., Clark, C.W., Mann, D., Miller, P.J.O., Rosenbaum, H.C., Golden, J.S., Jasny, M., Kraska, J., and Southall, B.L., Marine seismic surveys and ocean noise: Time for coordinated and prudent planning, *Frontiers in Ecology and the Environment* 13: 378-386 (2015).

As the Marine Mammal Commission points out, however, the SPE has no basis in physical reality and has long since been replaced in other environmental compliance documents by "sound energy level" ("SEL"), an energetic metric that, like SPE, aims to integrate the multiple exposures likely to occur in real-world applications into a single, aggregate exposure.[123] It is noteworthy that NMFS' new guidance for estimating auditory impacts in take applications expressly includes an SEL-based threshold that represents total acoustic energy received over a 24-hour period.[124] In addition, the Navy's SPE concept—aside from being outdated—is plainly less conservative than the SEL metric, becoming less conservative as the number of LFA exposures increases. The Navy's use of the less precautionary SPE is particularly concerning for resident populations and other marine mammals with limited range, which are more likely to experience multiple LFA transmissions. Given the lack of any tenable justification for maintaining an SPE approach, NMFS, and the Navy, should use the more widely accepted, more conservative SEL in determining the effect of multiple exposures on marine mammals.

(C) Density and abundance estimates

In calculating marine mammal take across twenty-six mission areas, the Navy appears to use a variety of data types. Extrapolations from oceanographically similar areas are made in some instances where line-transect data are not available; for other locations, the Navy draws on its publicly unavailable Marine Species Density Database, which, according to the Marine Mammal Commission, has relied in past iterations on habitat suitability modeling (presumably the Kaschner *et al.* model produced by SMRU) among other data sources.[125] In using these methods, however, the Navy does not account for uncertainty.

We ask that NMFS make the Navy's Density Database available for public review and recommend, following the Marine Mammal Commission, that it incorporate an uncertainty factor in calculating take based on habitat suitability and other indirect data sources. Further, we recommend that it consider alternative and potentially more powerful modeling approaches that are emerging to extrapolate cetacean densities beyond surveyed regions (*see* Section II.B.1.a for further discussion),[126] which are likely to be superior to the Kaschner *et al.* model (and more consistent with the prior recommendations of NMFS biologists) that the Navy has relied on in the past. The Navy should consult with NMFS experts on the utility of these models for estimating densities within the LFA study area.

---

[123] Comment letter from Rebecca Lent, Director, Marine Mammal Commission, to LCDR Mark Murnane, SURTASS LFA Sonar SEIS/ SOEIS Project Manager (Sept. 27, 2016).

[124] NMFS, Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing: Underwater Acoustic Thresholds for Onset of Permanent and Temporary Threshold Shifts, NOAA Tech. Memo. NMFS-OPR-55 (2016).

[125] Comment letter from Rebecca Lent, at 2.

[126] *See, e.g.*, Corkeron, P.J., Minton, G., Collins, T., Findlay, K., Willson, A., and Baldwin, R., Spatial models of sparse data to inform cetacean conservation planning: an example from Oman, *Endangered Species Research* 15, 39-52 (2011); Lambert, C., Mannocci, L., Lehody, P., and Ridoux, V., Predicting cetacean habitats from their energetic needs and the distribution of their prey in two contrasted tropical regions, *PLoS ONE* 9(8): e105958 (2014); Mannocci, L., Monestiez, P., Spitz, J., and Ridoux, V., Extrapolating cetacean densities beyond surveyed regions: habitat-based predictions in the circumtropical belt, *Journal of Biogeography* 42: 1267-1280 (2015).

Notably, the International Whaling Commission's Pacific Ocean Whale and Ecosystem Research Programme (IWC-POWER) offer an opportunity for NMFS and the Navy to develop improved marine mammal density models in certain areas of the western and central Pacific. The focus of the program is to survey relatively understudied areas of the North Pacific Ocean to develop necessary baseline data to inform management efforts.[127] The IWC-POWER Programme is entering the ninth of ten planned survey years and has already surveyed several areas included in the LFA Study Area (see Figure 7). We recommend that NMFS closely examine the data collected during the 2010,[128] 2013,[129] 2014,[130] 2015,[131] and 2016[132] surveys with the view to developing improved marine mammal density models for regions of the western and central Pacific.

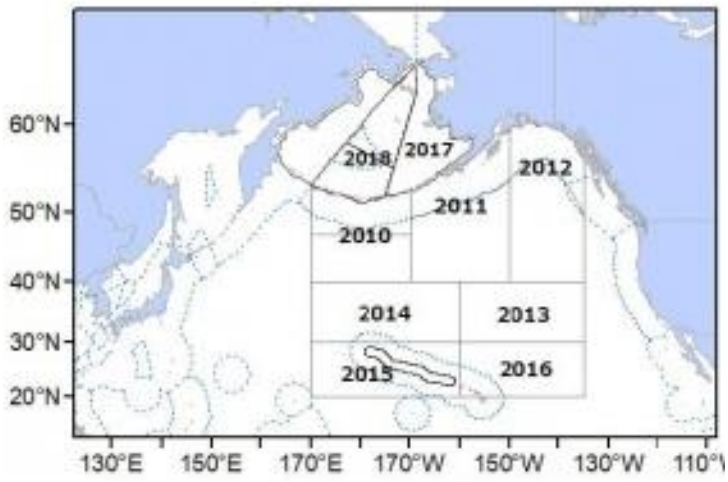


Fig. 7. Area surveyed by IWC-POWER each year since 2010.

[127] *See*, https://iwc.int/power

[128] Matsuoka, K., Hakala, S. Kim, H.W., Aki, M., and Shinyasiki, Y., IWC/Japan Joint Cetacean Sighting Survey Cruise in the North Pacific. International Whaling Commission Scientific Committee paper, SC/63/05 (2010).

[129] Matsuoka, K., Kim, H.W., Martinez-Aguilar, S., Kumagai, S., and Sasaki, Y., Cruise Report of the 2013 IWC-Pacific Ocean Whale and Ecosystem Research (IWC-POWER), International Whaling Commission Scientific Committee paper, SC/65b/A05 (2013).

[130] Matsuoka, K., Mizroch, S., Taylor, J., Yoshimura, I., and Yamauchi, Y., Cruise Report of the 2014 IWC-Pacific Ocean Whale and Ecosystem Research (IWC-POWER), International Whaling Commission Scientific Committee paper, SC/66a/IA/5 (2014).

[131] Matsuoka, K., Gilpatrick Jr., J.W., Taylor, J., Yoshimura, I., Katsumata, T., Ohkoshi, C., Cruise Report of the 2015 IWC-Pacific Ocean Whale and Ecosystem Research (IWC-POWER), International Whaling Commission Scientific Committee paper, SC/66b/IA/09 (2015).

[132] Matsuoka, K., Gilpatrick, J.W., Kim, J., and Yoshimura, I., Cruise Report of the 2015 IWC-Pacific Ocean Whale and Ecosystem Research (IWC-POWER), International Whaling Commission Scientific Committee paper, SC/67/ASI/09 (2015).

Finally, we recommend that NMFS require the Navy to conduct baseline research in unsurveyed areas that it repeatedly employs in LFA operations, prioritizing areas on the basis of exposure frequency, environmental vulnerability, and research feasibility.

V. NEPA COMPLIANCE

NMFS cannot rely on the Navy's EIS to fulfill its obligations under NEPA. NEPA requires federal agencies to include an environmental impact statement ("EIS") "in every recommendation or report on . . . major Federal actions significantly affecting the quality of the human environment." 42 U.S.C. § 4332(2)(C). While the law allows agencies to adopt an EIS of another agency, that document must "meet[] the standards for an adequate statement" under NEPA regulations. 40 C.F.R. 1506.3(a). Here, NMFS cannot rely on the Navy's unlawful EIS. *See*, *e.g.*, *Sierra Club v. United States Army Corps of Engineers*, 701 F.2d 1011, 1030 (2d Cir. 1983) (holding that permitting agency cannot rely on action agency's inadequate EIS).

The fundamental purpose of an EIS is to compel decision-makers to take a "hard look" at a particular action, both at the environmental impacts it will have and at the alternatives and mitigation measures available to reduce those impacts, before a decision about how to proceed is made. 40 C.F.R. §§ 1500.1(b), 1502.1; *Baltimore Gas & Electric v. NRDC*, 462 U.S. 87, 97 (1983); *Robertson*, 490 U.S. at 349.[133] But the Navy's DEIS serves only that agency's interests, considering only the purpose and need of military readiness, thus limiting the range of alternatives and mitigation.

Notably, the Navy's purpose and need is unrelated to NMFS' statutory obligations under the MMPA. Those obligations in this instance involve prescribing regulations for the incidental take of marine mammals that "effect[] the least practicable adverse impact on such species or stock and its habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of such species or stock for subsistence uses." 16 U.S.C. § 1371(a)(5)(A)(i). While military readiness effectiveness must be considered, *id.* § 1371(a)(5)(ii), the ultimate purpose of the MMPA is to protect marine mammals, and NMFS is charged with that duty. Thus, NMFS has a distinct purpose and need for its proposed regulations that may dictate consideration of a broader set of alternatives.

VI. CONCLUSION

We strongly urge the NMFS, in revising its Proposed Rule, to protect areas of likely biological importance, in accordance with the Ninth Circuit ruling in *NRDC v. Pritzker*, and to otherwise improve its impact, alternatives, and mitigation analyses in the ways described above. We would welcome the opportunity to discuss these issues with you and your staff.

[133] The requirement that an agency must look before it leaps is a bedrock principle of the NEPA process. *Save the Yak Comm. v. Block*, 840 F.2d 714, 718 (9th Cir. 1988).

Very truly yours,

Michael Jasny
Director, Marine Mammal Protection Project
NRDC

Francine Kershaw
Marine Mammal Scientist
NRDC

APPENDIX:
EXPERTS ON IMPORTANT MARINE MAMMAL AREAS (IMMAs)
IN THE INDIAN OCEAN AND ADJACENT SEAS

Region: North East Indian Ocean and South East Asian Seas

Jo Marie V. ACEBES
Senior Museum Researcher, Zoology Division
National Museum of the Philippines
P. Burgos St.
Manila 1000, Philippines
Founder & President, BALYENA.ORG
Paseo del Mar, Barangay Pangdan
Jagna 6308, Bohol, Philippines

Nantarika CHANSUE
Veterinary Medical Aquatic Animal Research Center
Faculty of Veterinary Science, Chulalongkorn University
Henri Dunant Rd., Patumwan
Bangkok 10330, Thailand

Yusuf FAJARIYANTO
Marine Spatial Planning Manager, The Nature Conservancy Indonesia Oceans Program
Graha Iskandarsyah 3rd Floor
Jl. Iskandarsyah No 66C
Kebayoran Baru, Jakarta Selatan 12160
Indonesia

Ellen HINES
Estuary and Ocean Science Center (formerly Romberg Tiburon Center)
San Francisco State University
Associate Director and Professor of Geography & Environment
3150 Paradise Dr.
Tiburon, CA 94920 USA

Anoukchika ILANGAKOON
Cetacean Specialist Group
Independent Researcher, Sri Lanka
215 Grandburg Place
Maharagama, Sri Lanka

Fairul Izmal JAMAL HISNE
Vice-Chairperson & Co-Founder
The MareCet Research Organization
Unit 3-1-1, Rumah Bandar Antilla, Jalan Anggerik Malaxis 31/171

Seksyen 31, Kota Kemuning
Shah Alam, 40460, Malaysia

Benjamin KAHN
Director, APEX Environmental
Coral Triangle Oceanic Cetacean Program
Adjunct Research Fellow
Centre of Marine Science and Technology, Curtin University
Perth, WA, Australia

Kongkiat KITTIWATANAWONG
Phuket Marine Biological Center
51 Sakdides Rd
Phuket 83000, Thailand

Danielle KREB
Scientific Program Manager
Yayasan Konservasi RASI (Rare Aquatic Species of Indonesia)
Komplek Pandan Harum Indah Blok C 52
75124 Samarinda
Kalimantan Timur, Indonesia

Kuppusamy SIVAKUMAR
Head & Scientist F
Department of Endangered Species Management
Wildlife Institute of India
P.O. Box. 18
Chandrbani, Dehradun 248001, India

Muhammad Erdi LAZUARDI
Project Leader for Lesser Sunda
WWF-Indonesia
Jl. Sam Ratulangi No. 6,
Kupang, 85228
Nusa Tenggara Timur, Indonesia

Putu Liza MUSTIKA (“Icha”)
Cetacean Sirenian Indonesia
Jl. Kalibaru II/31 Jakarta Utara, Jakarta, Indonesia
James Cook University, College of Business, Law and Governance
Townsville, Queensland, Australia

Cindy PETER
Sarawak Dolphin Project
Institute of Biodiversity and Environmental Conservation

Universiti Malaysia Sarawak (UNIMAS)
94300 Kota Samarahan, Sarawak, Malaysia

Somany PHAY
Deputy Director of the Fisheries Conservation Department of the Fisheries Administration
Government Fisheries Administration Liaison at WWF- Cambodia office
186 Preah Norodom Blvd, Sangkat Tonle Basac, Khan Chamcar Mon,
P.O. Box: 582
Phnom Penh, Cambodia

Louisa PONNAMPALAM
Chairperson & Co-Founder
The MareCet Research Organization
Unit 3-1-1, Rumah Bandar Antilla, Jalan Anggerik Malaxis 31/171
Seksyen 31, Kota Kemuning
Shah Alam, 40460, Malaysia

Alessandro PONZO
Large Marine Vertebrates Research Institute Philippines
Executive Director
Cagulada Compound
6308, Jagna, Bohol, Philippines

Lindsay PORTER
SMRU Asia Pacific
The University of St. Andrews
1802 One MidTown
11 Hoi Shing Road, Tseun Wan West
Hong Kong SAR

Mochamad Iqbal Herwata PUTRA
Marine Megafauna Research Group - Misool Foundation, Savu Sea Program
Larantuka 86213, East Flores, Indonesia

Achmad SAHRI
Marine Animal Ecology Group-Wageningen University & Research
Adjunct Lecturer for Digital Cartography and Coastal Planning at UNISSULA Indonesia
De Elst 1, 6708 WD Wageningen, The Netherlands
Adjunct Lecturer for Digital Cartography & Coastal Planning
Department of Urban & Regional Planning
Islamic University of Sultan Agung (UNISSULA)
Jl. Kaligawe Raya Km.4
50112 Semarang, Indonesia
Brian D. SMITH

Director, WCS Asian Coastal Cetacean Program
Asia Coordinator, IUCN SSC Cetacean Specialist Group
P.O. Box 4554
Arcata, CA 95518 USA

Dipani SUTARIA
Freelance Ecologist, IUCN Cetacean Specialist Group
9, Aranya Farms, Shilaj, Ahmedabad
382115 Gujarat – India
Senior Research Fellow
James Cook University, Australia

Tint TUN
Independent Marine Biologist and Consultant
No. 19, Rm. 301, Mya nan dar housing,
Ward 14, Hlaing Township
Yangon, Myanmar

Long VU
Viet Nam Marine Mammal Network
Zoology Lab, Department of Ecology and Evolutionary Biology
University of Science Ho Chi Minh City
541 Nguyen Duy Trinh, District 2
Ho Chi Minh City, Viet Nam

Region: Western Indian Ocean and Adjacent Seas

Musallem Al BARAMI
Ministry of Environment & Climate Affairs
musallem.albarami@meca.gov.om

Issam Al BOOSI
Head of Marine Conservation, Dhofar
Ministry of Environment & Climate Affairs
Issam.alboosi@meca.gov.om

Bader Al BULUSHI
Head of Wetland Environment
Marine Environment Conservation Dep
Ministry of Environment & Climate Affairs
badermoon123@gmail.com

Gill BRAULIK
Research Fellow,
University of St. Andrews
GillBraulik@downstream.vg

Sal CERCHIO
New England Aquarium
scerchio@gmail.com

Vic COCKCROFT
Nelson Mandela University, Port Elizabeth
vic@dugongs.org

Tim COLLINS
Wildlife Conservation Society
tcollins@wcs.org

Himansu Sekhar DAS
Unit Head, Marine Threatened Species and Habitats,
Environment Agency Abu Dhabi, UAE
hsdas@ead.ae
Violaine DULAU
GLOBICE
violaine.dulau@globice.org

Ken FINDLAY
CPUT Research Chair: Oceans Economy
Centre for Sustainable Oceans
Cape Peninsula University of Technology
Cape Town, 8000, South Africa
FINDLAYK@cput.ac.za

Suaad Al HARTHI
Environment Society of Oman
salharthi@eso.org.om

Francine KERSHAW
Project Scientist, Marine Mammal Protection & Oceans
Natural Resources Defense Council
fkershaw@nrdc.org

Jeremy KISZKA
Research Assistant Professor
Florida International University, USA
jeremy.kiszka@gmail.com

Muhammad Moazzam KHAN
Technical Advisor
WWF-Pakistan
Karachi, Pakistan
mmoazzamkhan@gmail.com

Sophie LARAN
Observatoire Pelagis
Université de la Rochelle – CNRS
5, Allée de l'Ocean
17000 La Rochelle, France
sophie.laran@univ-lr.fr

Bruno Díaz LÓPEZ
Bottlenose Dolphin Research Institute
bruno@thebdri.com

Yohannes T. MEBRAHTU
Ministry of Marine Resources
Massawa, Eritrea
ejohnsh@gmail.com

Gianna MINTON
Megaptera Marine Conservation
gianna.minton@gmail.com

Nazanin MOHSENIAN
Marine mammals project manager
Plan for the Land Society of Iran
mohsenian@plan4land.org

Hamed MOSHIRI
CEO, Plan for the Land society of Iran
moshiri@plan4land.org

Hussain Mohamed Redha Al MUSCATI
Director of Development and Management of Fisheries Resources
Ministry of Agriculture and Fisheries
hmmuscati@yahoo.com

Ada NATOLI
UAE Dolphin Project / Zayed University
Dubai, UAE
ada.natoli@zu.ac.ae

Hamood Khamis Al NEERI
Marine Reserve Specialist
Ministry of Environment & Climate Affairs
hamood.alneeri@meca.gov.om

Stephanie PLÖN
Earth Stewardship Science Research Institute
Nelson Mandela University
Port Elizabeth, South Africa
stephanie.ploen@gmail.com

Dipani SUTARIA
Marine Mammal Conservation Network of India
dipani.sutaria@gmail.com

Maia Sarrouf WILLSON
Environment Society of Oman
maia.sarroufwillson@eso.org.om

Andy WILSON
Five Oceans Environmental Services
andy.willson@5oes.com

My name is Thomas Allie, I am a current Humboldt State University student majoring in Oceanography with an emphasis in biology and environmental planning. Through my studies I have analyzed and researched different environmental impacts of decisions such as the one intended here today. It was for this reason that I decided I would comment on my position **against** 'Takes of Marine Mammals Incidental to Specified Activities: Taking Marine Mammals Incidental to U.S. Navy Surveillance Towed Array Sensor System Low Frequency Active Sonar Training and Testing in the Central and Western North Pacific Ocean and Eastern Indian Ocean 84 FR 7186 (March 1, 2019)', which would allow for the U.S. Navy to take marine mammals to be used for training and testing activities linked to Surveillance Towed Array Sensor System Low Frequency Active Sonar. Having studied biological oceanography for the past 5 years, my background in this subject has given me the proper knowledge on why this decision would be detrimental to the biological organisms taken and the surrounding ecosystem. This would also contradict the various ways that the Marine Mammal Protection Act has enforced damage being done on marine biological organisms. I have researched this proposal fairly well enough to be able to have an opinion on this controversial issue.

The purpose of the Marine Mammal Protection Act (MMPA) is to protect and enforce any negative impacts on marine mammals. There are certain exceptions that would allow for specific marine mammals to be taken, with the proper incidental taking permits. Sections 101(a)(5)(A) and (D) of the MMPA (16 U.S.C. 1361 et seq.) does allow for this when the issues are just limited to harassment of the mammals. Even a small-scale harassment of a marine mammal though can have detrimental effects on the ecosystem as a whole. The fact is that allowing the harassment of an animal is violating the whole point of the MMPA. There are always special cases where incidental takings can be okay, specifically when its intended use is based on protecting that animal from harm. This is not one of those cases. The U.S. Navy is using this ambiguity in the MMPA with the intended purpose to use these animals for testing and training of their projects. This proposed project is due to start August 13, 2019 through August 12, 2026. That is seven years of testing, seven years of harassment. Even though this might not be as damaging as other projects, we are still talking about subjecting marine mammals to potential long-term harm.

On page 7192, it clearly states that there are 11 marine mammal species that are listed as endangered or threatened under the Endangered Species Act (ESA) that can potentially be used in this study. Once again, the MMPA and the ESA are clearly being violated with this case. These Acts are meant to protect, not allow any entity to come in and use these organisms for their benefit. Especially if there is a potential for them to be harmed.

On page 7204 under the potential effects of the specified activities, repeated exposure can have long term negative impacts on certain senses, mainly hearing. The main issue I have found with this project is that because what is proposed is only defined as small-scale harassment it is not considered that big of a deal. Where this thought becomes a real problem is when we consider the long-term effects to these tests. In the short term, we might not see much of an issue, but after seven years of testing, that's where we'll see the lasting impacts.

There are proposed mitigation measures that are being taken, but I feel that it is still not enough to justify any sort of long term damage to the health of the marine mammals. The overall problem with the project is that ambiguity of certain sections of the MMPA is allowing for this to be justified. Possibly with more scientific data we can see that there might not be any major problems, but at the moment it seems like there isn't much thought being made about the impact that this may cause the marine mammals. This proposed rule would completely violate the efforts made by laws created to protect the environment and the biological organisms that are a part of these ecosystems.

In conclusion, I am **against** 'Takes of Marine Mammals Incidental to Specified Activities: Taking Marine Mammals Incidental to U.S. Navy Surveillance Towed Array Sensor System Low Frequency Active Sonar Training and Testing in the Central and Western North Pacific Ocean and Eastern Indian Ocean 84 FR 7186 (March 1, 2019)', as it violates the MMPA, the ESA, and overall will do more harm than good. I am certain there are other ways that the U.S. Navy can test their projects without the use of marine mammals.

Public Comment on Incidental Takings of Marine Mammals by the US Navy

in the Central and Western North Pacific Ocean and Eastern Indian Ocean

My name is Christi Nash and I am a senior in Environmental Science and Management, with an emphasis in Environmental Education and Interpretation, at Humboldt State University. As someone who has studied biology, oceanography and ecology, I am gravely disappointed in the US Navy's request to extend their already excessive and scientifically unsound takings of marine mammals to the high seas of the Western North Pacific Ocean and the Eastern Indian Ocean. Mounting evidence over more than a decade of harm to endangered species by US Navy sonar, including several species of whales, has been ignored in other geographic locations already, so to extend that area of testing and training is irresponsible at best. I am writing to comment on my position **against** the proposal of Taking Marine Mammals Incidental to U.S. Navy Surveillance Towed Array Sensor System Low Frequency Active Sonar Training and Testing in the Central and Western North Pacific Ocean and Eastern Indian Ocean, 84 Federal Register, 7186 (March 1, 2019).

On page 7192, the notice states that of 46 marine mammals potentially impacted (through confirmed or highly probable presence of these species) by US Navy sonar activities in these international waters, 11 are listed as threatened or endangered species under the Endangered Species Act (ESA; 16 U.S.C 1531 *et seq*.) In section 1531, ESA Section 2, (a) Findings, 4, it is stated that "the United States has pledged itself as a sovereign state in the international community to conserve to the extent practicable the various species of fish or wildlife and plants facing extinction." Then in Section 1536, Interagency Cooperation, ESA Section 7, (j) Exemption for National Security Reasons is listed. However, in Section 1539, Exceptions, ESA Section 10, (g) Burden of Proof is listed in relation to gaining any benefit or exemption by permit. At present there is no clear and present danger that upholds this "proof" that the US Navy must expand its harmful activities to marine mammals for national security reasons, since we are not a world at war, and there have been no significant attacks in those areas warranting an aggressive marine military presence.

On page 7221, the document claims that past monitoring has only resulted in Level B harassment rather than Level A harassment, under the Marine Mammal Protection Act. However, in the case of a species listed as endangered under the Endangered Species Act anything that disrupts "migration, breathing, nursing, breeding, feeding, or sheltering" – as is the case with MMPA Level B harassment - is very plausibly a threat to Critical Habitat, which could interfere with established Recovery Plans (Sec. 1533, ESA Section 4, a(A) & f(A)). Even more disturbingly, past or concurrent related documents such as the 2019 Mariana Islands Training and Testing Draft Supplemental EIS and SEIS have reportedly blatantly ignored decades of scientific evidence that US Navy sonar activity is, in fact, resulting in repeated MMPA Level A harassment to beaked whales in Guam. While the beaked whale is not listed as an endangered species under the ESA, this fact should merit enough caution to research long-term effects on marine mammals who are listed as threatened or endangered.

Overall, the decades of US Navy training and testing with the usage of disturbing anthropogenic noise has been correlated repeatedly with harm to multiple species of marine mammals, including beaching of whales and subsequent deaths. A 2019 study of blue whales in the *Journal of Experimental Biology* revealed that their feeding patterns are severely disrupted by sonar, which can indirectly lead to sickness and mortality, even if no immediate consequence is observed by US Navy officials. To extend the international range of marine military presence at such risk, for only vague rationalizations of "being prepared" for an event that may never take place is unnecessary. The US Navy can train and test adequately without further increasing the oceanic range of damage they've already been demonstrated to cause to whales and other marine mammals. This request is a gross abuse of imperialist military power – and a waste of taxpayer money - at the cost of innocent wildlife who may be threatened or endangered.

In conclusion, as an informed citizen and student of science, I stand firmly against the proposal of Taking Marine Mammals Incidental to U.S. Navy Surveillance Towed Array Sensor System Low Frequency Active Sonar Training and Testing in the Central and Western North Pacific Ocean and Eastern Indian Ocean, 84 Federal Register, 7186 (March 1, 2019). Legally it fails to uphold the Endangered Species Act and portrays a dishonest interpretation of the Marine Mammal Protection Act. Established science is present to show the superfluous potential harm to

species listed as threatened and endangered under ESA, as well as decades of documented cases of MMPA Level A rather than Level B harassment to marine mammals in other locations.

References:

Kaur, A. (3 March 2019). Military proposes continued sonar use as more whales wash up on Guam's shores. *Pacific Daily News.* https://www.guampdn.com/story/news/2019/03/03/military-proposes-sonar-use-more-whales-wash-up-guams-shores/2865769002/ . Accessed 6 March 2019.

Southall, B. L., DeRuiter, S. L., Friedlaender, A., Stimpert, A. K., Goldbogen, J. A., Hazen, E., Casey, C., Fregosi, S., Cade, D. E., Allen, A. N. et al. (2019). Behavioral responses of individual blue whales (Balaenoptera musculus) to mid-frequency military sonar. *J. Exp. Biol.* 222, jeb190637. http://jeb.biologists.org/content/222/5/jeb190637. Accessed 6 March 2019.

PUBLIC SUBMISSION

As of: 6/11/19 11:17 AM
Received: March 04, 2019
Status: Posted
Posted: March 14, 2019
Tracking No. 1k3-98l5-o8ko
Comments Due: April 01, 2019
Submission Type: Web

Docket: NOAA-NMFS-2019-0014
Takes of Marine Mammals Incidental to Specified Activities: Taking of Marine Mammals Incidental to U.S. Navy Surveillance Towed Array Sensor System Low Frequency Active Sonar Training and Testing in the Central and Western North Pacific Ocean and Eastern Indian Ocean

Comment On: NOAA-NMFS-2019-0014-0001
Takes of Marine Mammals Incidental to Specified Activities: U.S. Navy Surveillance Towed Array Sensor System Low Frequency Active Sonar Training and Testing in the Central and Western North Pacific Ocean and Eastern Indian Ocean

Document: NOAA-NMFS-2019-0014-0002
Comment from Lois Ira

Submitter Information

Name: Lois Ira

General Comment

I submit that the importance of this activity is not proportional to the potential harm of incidental takes. The Endangered Species Act is a treasured statute, largely because of its intractability. There are some governmental activities which give purpose to the incidental take exception, governmental activities which are absolutely essential. This activity is not one of them. Recall Tennessee Valley Authority v. Hill; a project of such magnitude--such importance--stopped in its tracks by the ESA. At the time, the outcry was that to interfere with such sure benefit was not the legislative intent. Shortly, we found that it was, indeed, the purpose of our major statute. I submit that the benefit of that dam, once it was able to continue after direct Congressional action, was far higher than the proposed benefit of the proposed research. It bears repeating--the essence of the ESA is intractability. Should the Navy seek to interfere with protected species for a project so suspiciously non-essential, Congress must act in such a way as to explicitly grant it. Any other result will erode US law.

PUBLIC SUBMISSION

As of: 6/11/19 11:18 AM
Received: March 04, 2019
Status: Posted
Posted: March 14, 2019
Tracking No. 1k3-98l8-f3z8
Comments Due: April 01, 2019
Submission Type: API

Docket: NOAA-NMFS-2019-0014
Takes of Marine Mammals Incidental to Specified Activities: Taking of Marine Mammals Incidental to U.S. Navy Surveillance Towed Array Sensor System Low Frequency Active Sonar Training and Testing in the Central and Western North Pacific Ocean and Eastern Indian Ocean

Comment On: NOAA-NMFS-2019-0014-0001
Takes of Marine Mammals Incidental to Specified Activities: U.S. Navy Surveillance Towed Array Sensor System Low Frequency Active Sonar Training and Testing in the Central and Western North Pacific Ocean and Eastern Indian Ocean

Document: NOAA-NMFS-2019-0014-0003
Comment from Aileen Jeffries

Submitter Information

Name: Aileen Jeffries

General Comment

As a research scientist who studies cetaceans using acoustics, I am acutely aware of a large number of activities by the Navy and other branches of our Armed Forces that affect the sound landscape of marine mammals. These activities affect the hearing either temporarily or permanently. Or these activities disrupt feeding and other behaviors making it more difficult for the marine animals to accomplish daily activities.It becomes difficult to gauge the full impact of these many activities, since they are presented individually for varying time durations at widely ranging locations.

I oppose all such take authorizations that cover long time intervals over large areas. Take authorizations should be specified for specific intervals at specific areas. Also I request that all take authorizations be tabulated at one location accessible to the public so that it is possible to assess the cumulative effect of all of these activities.

Aileen Jeffries, Research Scientist
Harbor Porpoise Project
WWW.harborporpoiseproject.org

PUBLIC SUBMISSION

As of: 6/11/19 11:20 AM
Received: March 04, 2019
Status: Posted
Posted: March 14, 2019
Tracking No. 1k3-98lb-wqa4
Comments Due: April 01, 2019
Submission Type: Web

Docket: NOAA-NMFS-2019-0014
Takes of Marine Mammals Incidental to Specified Activities: Taking of Marine Mammals Incidental to U.S. Navy Surveillance Towed Array Sensor System Low Frequency Active Sonar Training and Testing in the Central and Western North Pacific Ocean and Eastern Indian Ocean

Comment On: NOAA-NMFS-2019-0014-0001
Takes of Marine Mammals Incidental to Specified Activities: U.S. Navy Surveillance Towed Array Sensor System Low Frequency Active Sonar Training and Testing in the Central and Western North Pacific Ocean and Eastern Indian Ocean

Document: NOAA-NMFS-2019-0014-0004
Comment from Elizabeth Prazak

Submitter Information

Name: Elizabeth Prazak

General Comment

I oppose any use of marine mammals for the incidental use of the Navy. They should create an alternate way to test their submarine detecting sonar than using it on marine mammals or other sea life. While in the Navys response it says they dont intend to commit level A harassment, it is not certain. Many marine species are already endangered from being harmed by human interactions and adding sonar has a major potential to harm the animals ability to navigate. Purposefully or not, taking marine animals will negatively affect the oceanic ecosystems. Once interfered with, it cant be undone and the harm from these animals will produce more harm than good. There is no logical sense as to why the Navy needs to test on live marine mammals and should invest their time and resources into a better system that doesnt involve the use of marine mammals. There is also the chance of unintended consequences in harming marine animals that arent intended for this study and that can also result in major damages to their populations.