6 August 2021

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) 16 July 2021 notice (86 Fed. Reg. 37790) and the letter of authorization (LOA) application submitted by the U.S. Navy (the Navy) seeking regulations under section 101(a)(5)(A) of the Marine Mammal Protection Act (the MMPA). The taking would be incidental to conducting training and research, development, test, and evaluation (testing) activities within the Point Mugu Sea Range study area (PMSR; Phase III activities[1]). The Commission has commented on previous authorizations regarding the proposed activities, including extensive comments on the 2019 incidental harassment authorization regarding launch activities at San Nicolas Island (SNI; see its 22 May 2019 letter).

Background

The Navy proposes to conduct training and testing activities that involve at-surface and near-surface detonations in the waters off southern California[2]. The activities would involve the use weapons systems, explosive and non-explosive practice munitions and ordnance, high-explosive underwater detonations, expended materials, electronic warfare systems, high-energy lasers, vessels, and aircraft. The Navy also would conduct target and missile launch activities at SNI. The Navy's mitigation measures would include visual monitoring to implement delay and shut-down procedures.

Density estimates

Pinniped density estimates— For the Navy's TAP I and Phase II and III environmental compliance documents, including the various versions of the Navy Marine Species Density Database (NMSDD; see, for example, Appendix B of Department of the Navy 2009, Department of the Navy 2012, Department of the Navy 2017c, Department of the Navy 2020b), the Navy specified the underlying

[1] NMFS authorized the Navy to conduct similar activities first under the Tactical Training Theater Assessment and Planning (TAP I) LOA applications and second under Phase II LOA applications.
[2] From Los Angeles through San Luis Obispo Counties.

data and assumptions[3] that it had used to estimate all previous cetacean and pinniped densities. However, the Navy did not do so for the PMSR study area (Department of the Navy 2020a). The following pinniped information was omitted—

- Abundance(s), percentages of occurrence in the area and whether those percentages were dependent on age and sex, and percentages within the three stipulated geographic distances from shore[4] for California sea lions. Only fall and winter densities were parsed by the three geographic distances, spring and summer were parsed by two distances (e.g., see Figures 7-40 to 7-43 in Department of the Navy 2020a).
- Abundance(s), percentages of the population at sea, and percentages within the two depth regimes[5] for Guadalupe fur seals.
- Abundance and whether haul-out correction factors or percentages of the population at-sea were incorporated for harbor seals, as was done for other locations (e.g., Department of the Navy 2019b).

In addition, the area metrics necessary to derive the density estimates were omitted from Department of the Navy (2020a). Since the densities were exactly the same for elephant seals and northern fur seals in Department of the Navy (2020a) as had been used previously for the Hawaii-Southern California Training and Testing (HSTT) study area (Department of the Navy 2017c), the same presumed occurrence areas had to have been used. For northern fur seals, the area used was based on the NMFS Southern California (SOCAL) stratum[6] for its vessel-based surveys (i.e., Barlow 2010); while for elephant seals[7], the area was based on the Navy SOCAL modeling area (Department of the Navy 2017c). None of the underlying abundance data that were provided in Department of the Navy (2017c) and (2020a) are related to either of those areas. As such, it is unclear why the Navy felt it necessary to use two different areas, when neither of them relates to the abundance data. Both areas are similar in extent, with the Navy SOCAL modeling area being approximately 13 percent larger than the NMFS SOCAL stratum.

For the other three pinniped species, some of the densities provided in Department of the Navy (2020a) differ by orders of magnitude from those provided in Department of the Navy (2017c), even though some of the same data appear to have been used and are based on some of the same geographic areas. It should not fall to the Commission or the public to attempt to decipher what data the Navy, and hence NMFS, used to inform its density estimates. The Navy stated that, although the density estimates may not be accurate given interannual variability and fluctuations in population size or may not exactly reflect spatial distributions, they represent the best available science due to the paucity of other data and are considered to be the most conservative (Department of the Navy 2020a). It is unclear how such a statement can be evaluated when the underlying data were not provided for public review and comment. The lack of transparency regarding the data that

[3] Including line-transect and aerial survey data references, sightings data and/or references, abundance estimates from NMFS's stock assessment reports (SARs) and other references, haul-out correction factors, percentages of time spent at sea and/or diving, age and sex delineations, presumed occurrence areas, depth distributions, seasonality, etc., as well as the pertinent references (see Department of the Navy 2017c).
[4] 0–40 km, 40–70 km, and 70–450 km.
[5] Within and beyond the 3,000-m isobath.
[6] Extending to the outer edge of the U.S. exclusive economic zone, 370 km from the coast.
[7] As well as California sea lions and Guadalupe fur seals.

informed the pinniped density estimates is unacceptable, is inconsistent with other range-specific Navy rulemakings, and undermines the public comment period afforded under the MMPA. Absent the necessary information, neither the Commission nor the public can provide informed comments. As such, the Commission recommends that, prior to issuing any final rule, NMFS provide information regarding the data and assumptions[8] used to inform the pinniped density estimates and allow for additional public review and comment on that information.

The Commission previously provided extensive comments regarding the manner in and the data upon which the Navy had derived its pinniped density estimates, including for the densities that were used by the Navy for the HSTT study area, as provided in Department of the Navy (2017c; see the Commission's 13 July 2018 letter). NMFS responded that recalculating the estimated take for any of the pinniped stocks based on the Commission's detailed recommendations would not change NMFS's assessment of impacts on the recruitment or survival of any of these stocks or its negligible impact determination (84 Fed. Reg. 66874). NMFS further indicated that it had reviewed the Navy's analysis and choices and concurred that they are technically sound and reflect the best available science (84 Fed. Reg. 66874). Although implementation of the Commission's recommendations likely would not change NMFS's negligible impact determination—as the Commission is unaware of NMFS ever officially coming to a non-negligible impact determination when it has been argued in some instances that NMFS should have[9]—the Navy's analysis, and thus NMFS's determinations, were not based on the best available science.

As one example, the Commission recommended in 2018 that NMFS should re-estimate the elephant seal density by using an increasing trend of 3.8 percent[10] annually, which is used by NMFS in its SAR, for the last 15 years[11] instead of 1.7 percent[12] up until 2011 for the California population and at least 31,000 seals[13] instead of 15,083 seals as representative of the Mexico population. At that time, that would have resulted in a revised abundance estimate of 63,246 seals rather than NMFS's and the Navy's estimate of 36,646 seals. Forward-projecting the abundance into 2021 instead of 2016 would result in 71,333 elephant seals. However, even that forward-projected abundance is an underestimate.

It appears that both NMFS and the Navy failed to recognize that the original abundance estimate that they had used of 18,430 seals from Lowry (2002)[14] was based on seal counts from only Santa Barbara Island (SBI), San Clemente Island (SCI), and SNI (Department of the Navy 2017c). Department of the Navy (2017c) specified that large rookeries also occur on San Miguel Island (SMI) and Santa Rosa Island (SRI), but both islands are located at least 55 km north of the HSTT

[8] Including the relevant line-transect and aerial survey data references, sightings data and/or references, abundance estimates from NMFS's SARs and other references, haul-out correction factors, percentages of time spent at sea and/or diving, age and sex delineations, presumed occurrence areas, depth distributions, seasonality, etc.
[9] e.g., see the Commission's 23 January 2020 letter as one example.
[10] Based on the 3.8 percent growth rate that has occurred from 1988–2010 from Lowry et al. (2014) and as used by NMFS in its own SARs since 2014.
[11] Which, at the time of the 2018 letter, would have been through 2016 and would have informed the 2017 draft environmental impact statement/overseas environmental impact statement (DEIS) and 2018 proposed rule for HSTT.
[12] Based on Lowry's (2002) field effort from 2001.
[13] Based on Lowry et al.'s (2014) assertion that 31,000–60,000 elephant seals were estimated to occur in the Mexican population in 2010.
[14] The Commission notes that Lowry et al. (2014) only included information on elephant seal pups and Lowry et al. (2017) did not include counts of adult female elephant seals or pups. Thus, both are underestimates.

study area and thus were not included. That may be appropriate for the HSTT study area, but SMI and SRI are both well within the PMSR study area (see Figure 1 in *Federal Register* notice). A total of 37,294 elephant seals were sighted at SBI, SNI, SMI, and SRI in *2001* (Lowry 2002), which is greater than the 36,646 seals that NMFS estimated would occur in the PMSR study area *presently*. If the relevant abundance estimates had been forward-projected using the applicable 3.8-percent growth rate into 2021, the California population estimate would be 81,618 elephant seals. Added to the Mexico population estimate, 112,618 seals would be expected to occur in the PMSR study area rather than the 36,646 seals used to inform the density estimate for the proposed rule. An underestimation by a factor of more than three is not considered insignificant. Moreover, NMFS cannot deem one growth rate best available science for incidental taking purposes and another best available science for its SARs, particularly since NMFS used the same overall stock abundance for both purposes (Tables 5, 31, and 32 in the *Federal Register* notice). At a minimum and until additional data are provided for the other pinniped species and additional assumptions are provided for elephant seals, the Commission recommends that NMFS (1) re-estimate the density for elephant seals based on (a) the 2001 abundance of 37,294 elephant seals from SBI, SNI, SMI, and SRI (Lowry 2002) forward-projected to 2021[15] using the 3.8-percent growth rate from Lowry et al. (2014) for the California population and (b) at least 31,000 seals from Lowry et al. (2014) as representative of the Mexico population and (2) then re-estimate the numbers of takes accordingly in the final rule.

Although the Commission has recommended since 2014 that the Navy and NMFS consult with various experts to develop more refined and appropriate pinniped density estimates, that has yet to occur for locations beyond the Northwest Training and Testing (NWTT) study area. Pinniped densities must be refined for the Navy's Phase IV compliance documents. As such, the Commission again recommends that NMFS consult with the Navy and experts in academia and at its own Science Centers to develop more refined pinniped density estimates that account for pinniped movements[16], distribution, at-sea correction factors, and density gradients associated with proximity to haul-out sites or rookeries.

Cetacean density estimates—Similar to the pinniped densities, the Navy did not specify the underlying data and assumptions[17] used to estimate most of its cetacean density estimates for the PMSR NMSDD (Department of the Navy 2020a). The lack of transparency does not afford either the Commission or the public an opportunity to provide informed comments. Further, many of the densities in the same geographic areas differ by an order of magnitude or more from those provided in Department of the Navy (2017c) and/or Becker et al. (2020), which included updated models of some of the densities that were provided in Department of the Navy (2017c). The Commission understands that densities provided by Becker et al. (2020) are considered best available science, and it is unclear why those were not used for the PMSR study area. Therefore, the Commission recommends that, prior to issuing any final rule, NMFS provide information regarding the data and assumptions[18] used to inform the cetacean density estimates, allow for additional public review and comment on that information, and, if Becker et al. (2020) was not used to inform those estimates, explain why.

[15] That is, for 20 years.
[16] Including using telemetry data and Markov process methods to estimate habitat-use probability densities.
[17] Including line-transect and aerial survey data, percentages of time diving, age and sex delineations, geographic areas, depth distributions, seasonality, etc., as well as the pertinent references (see Department of the Navy 2017c).
[18] Including the relevant line-transect and aerial survey data references, any depth or distance from shore constraints, types of models used and associated references, seasonality, etc.

U*ncertainty in density estimates*—The Commission recommended in previous letters regarding Navy Phase II activities that the Navy incorporate uncertainty and more refined data in its density estimates, including for cetaceans in regions or seasons that have not been surveyed and for pinnipeds in general. For Phase III activities in the HSTT study area, the Navy used more refined density estimation methods for cetaceans and accounted for uncertainty in the density and group size estimates[19] that seeded its animat modeling (Department of the Navy 2018). Department of the Navy (2020a) indicated that uncertainty in its density and group size estimates for PMSR was incorporated but did not specify what type of uncertainty[20] or what, if any, distribution was used. Department of the Navy (2020a) also did not specify whether uncertainty was used for its density estimates for pinnipeds. NMFS similarly did not include in the preamble to the proposed rule any details regarding whether and how uncertainty was incorporated into either the density or group size estimates. The Commission recommends that NMFS (1) clarify whether and how uncertainty was incorporated in the density *and* group size estimates, including densities for pinnipeds, and specify the distribution(s) used and, (2) if uncertainty was not incorporated, re-estimate the numbers of takes based on the uncertainty inherent in the density estimates (e.g., Becker et al. 2020) or the underlying references (e.g., Lowry 2002, Lowry et al. 2014, NMFS SARs, etc.). If NMFS chooses not to incorporate uncertainty in its density estimates, including for pinnipeds, the Commission recommends that NMFS specify why it did not do so in the preamble to the final rule.

Criteria, thresholds, and numbers of takes

Thresholds in general—As noted in letters related to "NMFS's Technical guidance for assessing the effects of anthropogenic sound on marine mammal hearing: Underwater acoustic thresholds for onset of permanent and temporary threshold shifts" (PTS and TTS, respectively; NMFS 2016 and 2018), the Commission has supported the weighting functions and associated thresholds used for Navy Phase III activities (Department of the Navy 2017b). However, numerous more recent studies provide additional information on behavioral audiograms (e.g., Cunningham and Reichmuth 2015, Branstetter et al. 2017, Kastelein et al. 2017b and 2019a, Sills et al. 2020a, Kastelein 2021a and b, Ruscher et al. 2021, and Sills et al. 2021) and TTS (e.g., Kastelein et al. 2017a and c, Popov et al. 2017, Kastelein et al. 2018a and b, 2019b–d, and 2020a–f, Sills et al. 2020b, Kastelein et al. 2021a and b). The Navy discussed only a few of these references in its DSEIS and LOA application. It also noted that the otariid and phocid composite audiograms are consistent with recently published behavioral audiograms of pinnipeds but did not provide any references, including those denoted herein, in its LOA application. NMFS similarly did not discuss any of the aforementioned references in its preamble to the proposed rule, whether the composite audiograms were consistent with the recently-reported behavioral audiograms or whether the criteria, presumably the TTS (and thus PTS) thresholds, were still considered conservative as compared to the recently-reported TTS data for harbor porpoises, harbor seals, and California sea lions[21]. As such, the Commission recommends that NMFS specify in the preamble to the final rule whether the aforementioned references support the continued use of the current weighting functions and PTS and TTS thresholds for the various functional hearing groups and, if the newer data indicate that either the current weighting functions

[19] Using means and standard deviations (SDs) that varied based on a Poisson or lognormal distribution,
[20] Including SDs, coefficients of variation (CVs), standard error (SEs), 95 percent confidence intervals (CIs), etc.
[21] The Commission recognizes that the most recent Kastelein et al. (2021b) data indicated that the TTS thresholds for otariids were underestimated by 20 dB but that the threshold would apply to non-impulsive, in-water sources rather than impulsive, in-water sources that would be used in the PMSR study area.

or PTS and TTS thresholds would significantly underestimate impacts, specify whether and how it plans to revise them.

In-water behavior thresholds for explosives—The Navy assumed a behavior threshold 5 dB lower than the TTS threshold for each functional hearing group for in-water explosive activities. As noted in Department of the Navy (2017b), that value was derived from observed *onset* behavioral responses of captive bottlenose dolphins during non-impulsive TTS testing using narrowband 1-sec tones[22] (Schlundt et al. 2000). Basing an impulsive threshold on responses of dolphins to a non-impulsive source is questionable, but more concerning is that the Navy continues to claim that marine mammals do not exhibit behavioral responses to single detonations (Department of the Navy 2017b)[23]. The Navy has asserted that the most likely behavioral response would be a brief alerting or orienting response and significant behavioral reactions would not be expected to occur if no further detonations followed. Although there are no data to substantiate that assertion, the Navy notes that the same reasoning was used in previous ship shock trial final rules in 1998, 2001, and 2008. Without such data, there is no reason to continue to ascribe validity to assumptions made more than 20 years ago. Larger single detonations (such as bombing exercises[24]) would be expected to elicit 'significant behavioral responses'[25]. The Navy provided no evidence regarding why an animal would exhibit a significant behavioral response to two 5-lb charges detonated within a few minutes of each other but would not exhibit a similar response for a single detonation of 100 lbs., let alone detonations of up to 500 lbs.

In response to the Commission's comments on the HSTT DEISs[26], the Navy indicated that there is no evidence to support that animals have significant behavioral reactions to temporally and spatially isolated explosions and that it has been monitoring detonations since the 1990s and has not observed those types of reactions. Due to human safety concerns, the Navy has never, as far as the Commission is aware, stationed personnel at the target site to monitor marine mammal responses during large single detonations. For missile exercises, the launch platform can be stationed up to 139 km from the target. In other instances (i.e., bombs dropped from aircraft), the lookout is tasked primarily with clearing the mitigation zone and realistically only observes for animals in the central portion of that zone immediately prior to the activity commencing. Lookouts are not responsible for documenting an animal's behavioral response to the activity, but rather are responsible for minimizing serious injury to and mortality of any observed animal. Additionally, the Navy was not required to conduct post-activity monitoring for any of its activities under the Phase II final rules (e.g., 50 C.F.R. § 218.144) and post-activity monitoring is conducted primarily to document injured and dead marine mammals, not behavioral responses.

In response to the Commission's comments on the NWTT proposed rule, NMFS acknowledged that individuals exposed *above* the TTS threshold also may be harassed by behavioral

[22] Underwater detonations are broadband not narrowband sources.
[23] Including certain gunnery exercises that involve several detonations of small munitions within a few seconds.
[24] With net explosive weights of 251–500 lbs for bin E10.
[25] Including the animals (1) altering their migration path, speed and heading, or diving behavior; (2) stopping or altering feeding, breeding, nursing, resting, or vocalization behavior; (3) avoiding the area near the source; or (4) displaying aggression or annoyance (e.g., tail slapping). These factors were described in Department of the Navy (2017b) and used by the Navy to differentiate behavioral response severity.
[26] See its 13 November 2017 letter on the HSTT DEIS.

disruption, that those potential impacts are considered in the negligible impact determination, and that neither NMFS nor the Navy is aware of evidence to support the assertion that animals will have significant behavioral responses (i.e., those that would rise to the level of a take) to temporally or spatially isolated explosions at received levels below the TTS threshold (85 Fed. Reg. 72325). Delineation of behavior takes occurring above the TTS threshold is irrelevant to those that occur below the TTS threshold[27]. Furthermore, a lack of evidence, particularly when concerted monitoring is *not* occurring for any portion of the Level B harassment zones for behavior during detonations, does not equate to behavior takes not likely occurring. Behavior takes from numerous types of activities have not been documented, but are presumed to occur, including for low-level activities such as those involving high-resolution geophysical and other mapping devices and ice breaking.

Moreover, the Navy routinely requests and NMFS routinely authorizes behavior takes of marine mammals associated with exposure to *single* in-air explosive events (e.g., missile launch noise and sonic booms), including those that occur in the PMSR study area (see section 6.6 in the Navy's LOA application). In fact, NMFS has based its take estimates on the numbers of animals that have responded behaviorally to single launch events, including for the PMSR proposed rule (see section 6.6 in the Navy's LOA application and 84 Fed. Reg. 28470, as one example for previous authorizations issued for launch activities at SNI). Continuing to dismiss the fact that a single explosive event, including that of a 500-lb bomb, has the potential to cause behavior takes to marine mammals underwater is illogical. This is particularly ridiculous given that an animal exposed to such an event is expected to exhibit the factors the Navy differentiated as a behavioral response in Department of the Navy (2017b) *and* NMFS routinely authorizes behavior takes for such events when exposed in air, including for the Navy's own proposed launch activities under the PMSR proposed rule. The Commission continues to maintain that the Navy, and in turn NMFS, has not provided adequate justification for dismissing the possibility that single underwater detonations can cause a behavioral response and therefore again recommends that NMFS estimate and ultimately authorize behavior takes of marine mammals during *all* in-water explosive activities, including those that involve single detonations consistent with in-air explosive activities in the final rule. If NMFS does not authorize behavior takes of marine mammals for all in-water explosive activities, the Commission recommends that NMFS justify in the preamble to the final rule why it believes that marine mammals, including pinnipeds, would only be taken by single in-air explosive detonations and not single in-water explosive detonations. The Commission further recommends that NMFS and the Navy revise the behavior thresholds for in-water explosive sources for Phase IV activities and ensure that any such threshold is based on data that involve impulsive sources, rather than the currently-used threshold that was based on non-impulsive tones.

In-water takes for explosives—Unlike other Phase III rulemakings, the Navy did not implement its post-model analyses that reduced the model-estimated numbers of Level A harassment (i.e., PTS) and mortality takes based on animal avoidance and mitigation effectiveness for the PMSR rulemaking[28]. The Commission supports that approach as it has repeatedly recommended that NMFS refrain from reducing the estimated numbers of takes based on the Navy's post-model analyses and instead

[27] That is, animals are expected to respond behaviorally to stressors that also can cause auditory impairment and other types of injuries. In those instances, it is the more adverse impact that prevails.
[28] Cut-off distances that were applied to non-impulsive acoustic sources (e.g., sonar and other transducers) for other Phase III rulemakings also were not used for the PMSR proposed rule.

authorize the model-estimated Level A harassment (PTS) and mortality takes[29]. However, the numbers of takes NMFS proposed to authorize does not accurately reflect the group sizes of various species. Department of the Navy (2017a)[30] specified that the mean group size of long-beaked common dolphins was 255, 16 for the offshore stock of common bottlenose dolphins, and 56 for striped dolphins. However, NMFS proposed to authorize a *total* of 119 takes of long-beaked common dolphins[31], 11 takes of offshore bottlenose dolphins[32], and 2 takes of striped dolphins[33] per year (see Table 18 in the *Federal Register* notice)—all of which are less than the mean group sizes reported by the Navy. The numbers of takes of northern right whale dolphins, Pacific white-sided dolphins, Risso's dolphins, short-beaked common dolphins, and sperm whales also are less than the mean group sizes specified in Table 48 of Department of the Navy (2017a). For other species that routinely occur in the PMSR study area but for which model-estimated takes were zero (e.g., Cuvier's beaked whales, Baird's beaked whales, *Kogia* spp., etc.), NMFS did not propose to authorize any takes (see Table 18 in the *Federal Register* notice).

For other Navy rulemakings for training and testing activities, the numbers of takes are neither zero nor less than the mean group size estimates[34]. In this case, if the Navy were to take a single group of offshore delphinids or even a single beaked whale or *Kogia* spp., it would be in violation of the final rule. As such, the Commission recommends that NMFS, at minimum, authorize Level B harassment (behavior) takes that are at least the mean group size reported in Table 48 of Department of the Navy (2017a) for all species in which model-estimated takes are either less than mean group size (long- and short-beaked common dolphins, offshore bottlenose dolphins, striped dolphins, northern right whale dolphins, Pacific white-sided dolphins, Risso's dolphins, and sperm whales) *or* zero for those species that routinely occur in the PMSR study area (e.g., Cuvier's beaked whales, Baird's beaked whales, *Kogia* spp., etc.) in the final rule.

In-air thresholds for explosives—The in-air PTS, TTS, and behavior thresholds[35] were conspicuously absent from both the Navy's LOA application and NMFS's preamble to the proposed rule[36]. As such, it is unclear what, if any, thresholds were used to inform either the Navy's or NMFS's impact analyses. In the Commission's 22 May 2019 letter regarding a proposed incidental harassment authorization for launch activities at SNI, the Commission highlighted the fact that, although Department of the Navy (2017b) included in-air thresholds and the thresholds were used by NMFS and the Navy for that authorization, NMFS had yet to review, assess, propose, or finalize in-air thresholds for PTS and TTS by way of a guidance document, such as NMFS (2016 and 2018).

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[29] e.g., see the Commission's 12 June 2020 letter on the NWTT proposed rule.
[30] Which was included as a technical document on the PMSR DEIS website (https://pmsr-eis.com/Documents/2020-Draft-EIS-OEIS-Documents/Supporting-Technical-Documents) but was not cited in the Navy's LOA application or NMFS's preamble to the proposed rule.
[31] Comprised of 9 Level A harassment (PTS), 44 Level B harassment (TTS), and 66 Level B harassment (behavior) takes.
[32] Comprised of one Level A harassment (PTS), five Level B harassment (TTS), and five Level B harassment (behavior) takes.
[33] Comprised of one Level B harassment (TTS) and one Level B harassment (behavior) take.
[34] For example, the number of Level B harassment takes of short-beaked common dolphins was more than 1.4 million per year for training and testing activities in HSTT (Tables 41 and 42; 83 Fed. Reg. 66939–6942).
[35] NMFS also inadvertently omitted the in-water criteria and thresholds for phocids and otariids from Table 7 in the *Federal Register* notice.
[36] Nor were the thresholds or underlying acoustic analyses included in Department of the Navy (2018), which quantified the acoustic impacts from activities occurring in the PMSR study area.

Rather than include any in-air PTS and TTS thresholds for the PMSR rulemaking, the thresholds were omitted[37]. Finneran (2016), which served as the basis for Department of the Navy (2017b), has been available to NMFS for more than six years, so it is unclear why the in-air auditory thresholds have yet to be publicly reviewed. The Commission recommends that NMFS provide any Phase IV in-air and in-water PTS and TTS thresholds and associated weighting functions to the public for review and comment, consistent with the Phase III in-water auditory thresholds.

The Commission also stated in its May 2019 letter that the unweighted behavior threshold of 100 dB re 20 μPa^2-sec to be applied to all pinnipeds from Department of the Navy (2017b) was inconsistent with other recent proposed and final rules for the U.S. Air Force (Air Force; 84 Fed. Reg. 335 and 14321) and other recent proposed rules or authorizations involving other launch activities (83 Fed. Reg. 57434, 82 Fed. Reg. 49334, 82 Fed. Reg. 6463, 81 Fed. Reg. 18584, etc.). NMFS similarly did not use the 100-dB re 20 μPa^2-sec threshold for all pinnipeds under the previous proposed rule for the Navy's launch activities at SNI, instead it noted that it made an additional adjustment for harbor seals that are known to react strongly to sound exposure levels (SELs) below 100 dB (79 Fed. Reg. 13030). Department of the Navy (2017b) did not specify where the in-air behavior threshold for pinnipeds originated and neither did the preceding Finneran and Jenkins (2012) or Southall et al. (2007). The Commission further indicated in its May 2019 letter that the Navy's own monitoring reports from launch activities at SNI did not support the threshold[38].

It appears that, rather than substantiating where and upon what the various in-air thresholds were based, the agencies merely omitted them from the underlying documents for the PMSR study area. Removing the in-air thresholds entirely from the rulemaking undermines the public process and calls into question whether the numbers of takes were even estimated and will be reported accurately. Therefore, the Commission reiterates its 2019 recommendation that NMFS compile all in-air response data and determine whether the in-air behavior thresholds can be revised or whether additional paired visual and acoustic monitoring data are necessary to refine the in-air thresholds *before* issuing the PMSR final rule. If the thresholds cannot be revised with data currently available, the Commission recommends that NMFS (1) ensure that the Navy, the Air Force, and any other relevant entities collect the necessary data to inform in-air behavior thresholds and (2) revise, allow for public comment on, and finalize those thresholds in the next three years.

In-air behavior takes for launch activities—Similar to the various in-air thresholds, the take estimation method for launch activities was omitted from the preamble to the proposed rule. NMFS indicated in the preamble to the proposed rule that it had reviewed the Navy's data, methodology, and analysis and determined that it was complete and accurate (86 Fed. Reg. 37822). If that was the case, it is unclear why the details were omitted from the proposed rule for the very activities that were estimated to result in the greatest numbers of takes for California sea lions, harbor seals, and elephant seals (see Tables 18 and 19 in the *Federal Register* notice). Rather than specify the basis for the numbers of pinniped takes per launch event, the Navy cited the proposed incidental harassment authorization from 2019 (84 Fed. Reg. 18809). However, the preamble to the Navy's 2019 proposed incidental harassment authorization indicated that 3 harbor seals could be taken per launch event (84

[37] NMFS did not include mortality, slight lung injury, GI tract injury, or behavior thresholds in its acoustic guidance but has described them and used them in all relevant rulemakings and incidental harassment authorizations, including the PMSR proposed rule.
[38] See the Commission's 22 May 2019 letter for detailed justification that will not be repeated herein.

Fed. Reg. 18822) rather than 12 seals that were assumed in the Navy's LOA application (Table 6-17). The preamble to the Navy's 2019 proposed authorization also indicated that a total of 4,940 Level B harassment takes of California sea lions occurred during 18 launches in the 2015–2017 monitoring seasons (84 (Fed. Reg. 18822), which equates to an average of 275 takes per launch. There were only 15 launches during the 2015–2017 monitoring seasons (see Tables 4.1, 4.1, and 4.2 in the respective monitoring reports). Therefore, the average number of takes per launch should have been 329 rather than 275 sea lions. NMFS must specify the underlying references, assumptions, and methods used to estimate the numbers of takes for all activities for which taking would be authorized for each *Federal Register* notice.

The method that NMFS appears to have used to determine in-air takes is flawed for several reasons. First, the Navy is only able to monitor at most three haul-out sites[39] during each launch event[40]. However, California sea lions and harbor seals are present at several additional haul-out sites on the west side of SNI. The Navy also estimates the number of pinnipeds hauled out at least 2 hours before the launch occurs. For safety reasons, the observers are not allowed to be at the haul-out sites for at least 2 hours before and during a launch. The video cameras that document the responses of the hauled-out animals are able to view only a portion of the animals. Thus, it is unclear whether new animals haul out or enter the water in the more than 2 hours after the animals were last counted[41]. When equipment failures occur or launches occur at night, responses are not observed at all.

In addition, the criteria that the Navy used to enumerate takes under the previous authorization and in the previous monitoring reports were based on animals moving at least 10 m (84 Fed. Reg. 37845). NMFS's more recent criteria, including those that it used for the Air Force's 2019 final rule (see Table 9; 84 Fed. Reg. 337), are based on animals moving at least two body lengths (Level 2 response[42]). The 10-m metric is much greater than the estimated 4 or 5 m that adult female and male sea lions[43] move in two body lengths[44]. More concerning is the fact that NMFS is arbitrarily allowing Department of Defense agencies to use two different sets of criteria for the same activities (i.e., launch activities) as related to the same definition of Level B harassment under section 3(18)(B)(ii) of the MMPA. The Commission recommends that NMFS specify in section 218.15 of the PMSR final rule that the Level B harassment criteria are based on the definitions of Level 2 and 3 responses provided in section 217.65(b)(3)(ii) of the Air Force's final rule.

Further regarding the underestimation of pinniped takes, NMFS previously had noted, and the Navy's monitoring reports have confirmed, that harbor seals were not always present when the Navy conducted its monitoring during launch events and there have not been many places to observe harbor seals during the launches (84 Fed. Reg. 18821). NMFS indicated that most of the beaches where harbor seals have been hauled out, and which the Navy has been able to monitor,

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[39] Generally, two California sea lion haul-out sites and one harbor seal haul-out site.
[40] Assuming 100 percent equipment success.
[41] The Navy, and thus NMFS, used the reported numbers of animals taken based on the pre-launch survey as the basis for the take estimates.
[42] A Level 2 response also includes a change of direction of greater than 90 degrees, and a Level 3 response includes all retreats (or flushes) into the water.
[43] Adult females are approximately 1.8 m in length and males are 2.4 m in length. Juveniles would be even smaller.
[44] Takes of harbor seals would have been underrepresented to an even greater degree than sea lions.

occur in area O[45], which is not in the trajectory of most of the launches. That may be the case, but the animals still have responded to sound levels that range from 79–99 dB 20 re μPa at those beaches. NMFS also indicated that harbor seal presence at the haul-out sites is dependent on tides. Since the Navy cannot predict whether it will conduct launches during high or low tide, NMFS must assume that harbor seals have the potential to be present during each launch irrespective of the tidal cycle. Furthermore, the Navy focuses much of its monitoring on sea lion haul-out sites, where harbor seals generally do not haul out. NMFS noted that harbor seals do not prefer beaches with California sea lions present (84 Fed. Reg. 18821). Moreover, and as routinely is the case for harbor seals, Navy monitoring reports from 2014–2017 indicated that for all but one launch[46] 100 percent of the hauled-out harbor seals within the view of the camera responded to the launch[47] . Thus, NMFS's presumption that only 12 harbor seals are taken per launch on all of SNI is illogical and a vast underestimate.

Most concerning is that the Navy's take estimation method is not consistent with either the method recently used by the Air Force for its proposed and final rule (84 Fed. Reg. 321 and 14314, respectively) or the intent of the MMPA to estimate the numbers of marine mammals that are likely to be disturbed. The Air Force based its take estimates on abundance estimates at the various haul-out sites based on Lowry et al. (2017), previous response rates of the various pinniped species, and the number of launches per year. Specifically for harbor seals, NMFS should have estimated the number of takes based on a 100-percent response rate and the number of animals that were documented in areas J through N on SNI in 2015 and area O in 2014, as stipulated in Lowry et al. (2017) and as was considered best available science for the Air Force's proposed and final rule. Using that approach, 110 harbor seals could be taken during each of the 40 proposed launch events, for a total of 4,400 harbor seal takes. For California sea lions, the response rate should be based on the number of sea lions that moved a 'short distance'[48] according to the 2014–2017 monitoring reports[49] multiplied by the number of sea lions in the same areas in 2015 from Lowry et al. (2017) and the number of launches. A similar approach should be taken for elephant seals[50]. Accordingly, the Commission recommends that NMFS (1) authorize 4,400 Level B harassment takes of harbor seals and (2) estimate Level B harassment takes of California sea lions and elephant seals based on the numbers of both species in areas J through N in 2015 as stipulated in Lowry et al. (2017), response rates based on each species moving a short distance according to the 2014–2017 monitoring reports, and 40 proposed launch events in the final rule.

In-water mortality and injury thresholds for explosives—The Commission notes that the constants and exponents[51] associated with the impulse metrics for both onset mortality and onset slight lung injury have been amended from those used in TAP I and Phase II activities. The Navy did not explain why

[45] Which is 2 to 5+ km from the closest point of approach of the launch trajectories.
[46] Four of the six harbor seals entered the water during that launch with recorded sound levels of 79.8 dB re 20 μPa on the cliffs overlooking the haul-out site—the source levels would have been even lower on the beach where the seals were hauled out.
[47] Exhibiting mainly Level 3 responses, flushing into the water.
[48] Instead of at least 10 m.
[49] Based on a cursory review of the monitoring reports, the response rate for California sea lions would equate to approximately 75 percent.
[50] Based on a cursory review of the monitoring reports, the response rate for elephant seals would equate to 10 percent.
[51] The constants have increased and the exponents have decreased from 1/2 to 1/6.

the constants and exponents have changed when the underlying data[52] have not. The modifications yield both smaller[53] and larger[54] zones. These results are counterintuitive since the Navy presumably amended the impulse metrics to account for lung compression with depth, thus the zones would be expected to be smaller rather than larger the deeper the animal dives.

The Commission provided similar comments in its letters regarding the other Phase III DEIS/DSEISs and rulemakings. However, the Navy has yet to provide a sufficient explanation regarding the constants and exponents or specify the assumptions made. The Navy merely has directed the Commission to Department of the Navy (2017b)—the document upon which the Commission's comments were based. NMFS, however, did provide a response in the preamble to the NWTT final rule. It stated that the numerical coefficients are slightly larger in Phase III than in Phase II, resulting in a slightly greater threshold near the surface and the rate of increase for the Phase II thresholds with depth is greater than the rate of increase for Phase III thresholds with depth because the Phase III equations take into account the corresponding reduction in lung size with depth (making an animal more vulnerable to injury per the Goertner model; 85 Fed. Reg. 72327). NMFS's response does not explain why *lower* absolute thresholds prevail below 8 m in depth and why, if lung compression is accounted for in Phase III, the rate of *increase* of the Phase II thresholds with depth would be greater when lung compression was not accounted for. The Commission again recommends that NMFS explain in the preamble to the final rule why the constants and exponents for onset mortality and onset slight lung injury thresholds[55] for Phase III that consider lung compression with depth result in lower rather than higher absolute thresholds when animals occur at depths greater than 8 m.

Consistent with other Phase III documents, the Navy used the onset[56] mortality and onset slight lung injury criteria to determine only the range to effects[57], while it used the 50 percent mortality and 50 percent slight lung injury criteria to estimate the numbers of marine mammal takes[58]. That approach is inconsistent with the manner in which the Navy estimated the numbers of takes for PTS, TTS[59], and behavior[60] for explosive activities. All of those takes have been and continue to be based on onset, not 50-percent values.

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[52] Based on Richmond et al. (1973), Yelverton et al. (1973), Yelverton and Richmond (1981), and Goertner (1982).
[53] When animals occur at depths between the surface and 8 m, yielding higher absolute thresholds.
[54] When animals occur at depths greater than 8 m, yielding lower absolute thresholds.
[55] Equations 11 and 12 in Department of the Navy (2017b).
[56] Defined as the 1-percent risk in the HSTT FEIS. In the preamble to the final rule, NMFS suggested that onset values for the amount of threshold shift necessary to be deemed TTS (i.e., 6 dB; 85 Fed. Reg. 72328) is different from deeming onset mortality and onset injury criteria are represented by a 1-percent risk. A 1-percent risk does not somehow equate to only a 1-dB of a TS. Onset mortality and onset injury are based on a 1-percent risk, onset TTS is based on a temporary elevation of a hearing threshold by 6 dB, and onset PTS is based on an elevation of a hearing threshold by 40 dB. Regardless of what criteria need to be met to be deemed 'onset', once a criterion has been met, onset of that criterion could occur.
[57] To inform the mitigation zones.
[58] A similar approach was taken for gastrointestinal (GI) tract injuries.
[59] In the preamble to the NWTT final rule, NMFS appeared to conflate onset values with the amount of a threshold shift necessary to be deemed TTS, which is 6 dB (85 Fed. Reg. 72328).
[60] Contrary to NMFS's assertion that the behavior thresholds are not based on onset values in the preamble to the NWTT final rule, the Navy specified that the behavior thresholds for explosives were derived from observed *onset* behavioral responses of captive bottlenose dolphins during non-impulsive TTS testing based on Schlundt et al. (2000; see Department of the Navy 2017b).

Although the effectiveness of the Navy's mitigation measures has yet to be determined, the circumstances of the deaths of multiple common dolphins during one of the Navy's underwater detonation events in March 2011 (Danil and St. Leger 2011) indicate that the Navy's mitigation measures are not fully effective, especially for explosive activities. It would be more prudent for the Navy and NMFS to estimate injuries and mortalities based on onset rather than a 50-percent incidence of occurrence. The Navy indicated that it is reasonable to assume for its impact analysis—thus its take estimation process—that extensive lung hemorrhage[61] is a level of injury that would result in mortality for a wild animal (Department of the Navy 2017b). Thus, it is unclear why the Navy did not estimate the numbers of takes based on onset rather than the 50-percent criterion.

It is clear that the 50-percent criteria underestimate both predicted mortalities and injuries. The Navy's response in the Phase III final EIS/SEISs, and NMFS's responses in the corresponding preamble to the final rules, that overpredicting impacts by using onset values would not afford extra protection to any animal[62], is irrelevant from an impact analysis standpoint. The intent of an impact analysis is to estimate and evaluate impacts (i.e., takes) from the proposed activities accurately. There is no logical reason for basing the estimated impacts on onset of PTS, TTS, and behavioral response for sublethal effects, while for lethal and injurious effects, the impacts are based on a 50-percent criterion. NMFS's additional response in the preamble to the NWTT final rule that estimating takes based on the onset values would overpredict effects because many of those exposures would not happen because of effective mitigation (85 Fed. Reg.72328) is unsubstantiated. The Navy has not determined the effectiveness of any of its mitigation measures, and explosive activities for which mitigation measures were implemented still resulted in the deaths of multiple common dolphins. Furthermore, the Navy indicated that it did *not* incorporate the effectiveness of mitigation measures into its post-model analysis for the PMSR study area. Potential mortalities and injuries must be fully accounted for rather than erroneously discounted in any impact analysis. The Commission again recommends that NMFS use onset mortality, onset slight lung injury, and onset GI tract injury thresholds rather than the 50-percent thresholds to estimate both the numbers of marine mammal takes *and* the respective ranges to effect in the final rule. If NMFS does not implement the Commission's recommendation, the Commission further recommends that in the preamble to the final rule NMFS (1) specify why it is inconsistently basing its explosive thresholds for Level A harassment on onset PTS and for Level B harassment on onset TTS and onset behavioral response, while the explosive thresholds for mortality and Level A harassment are based on the 50-percent criteria for mortality, slight lung injury, and GI tract injury, (2) provide scientific justification supporting the assumption that slight lung and GI tract injuries are less severe than PTS and thus the 50-percent rather than onset criteria are more appropriate for estimating Level A harassment for those types of injuries, and (3) justify why the number of estimated mortalities should be predicated on at least 50 percent rather than 1 percent of the animals dying.

[61] i.e., onset mortality; see Table 4-1 in Department of the Navy (2017b).
[62] Yet the mitigation zones are based on the onset values, so the animals would in fact be afforded 'extra protection'.

Mitigation measures

Extents of zones and passive acoustic monitoring—The Navy's proposed mitigation zones are similar to the zones[63] previously used during Phase II activities and are intended, based on the Phase III DEIS, to avoid the potential for marine mammals to be exposed to levels of sound that could result in injury (i.e., PTS) or mortality. However, the Phase III proposed mitigation zones would not protect high-frequency (HF) cetaceans from PTS. For example, the mitigation zone for a missile is 1,829 m (Table 23 in the *Federal Register* notice), but the mean PTS zones range from 2,177–3,791 m[64] for HF cetaceans[65] (Table 6-8 in the LOA application). The mitigation zone for an explosive bomb is 2,286 m (Table 24 in the *Federal Register* notice), but the mean PTS zones similarly range from 2,177–3,791 m for HF cetaceans[66]. The appropriateness of such zones is further complicated by aircraft deploying bombs at surface targets directly beneath the aircraft, minimizing the ability to observe the entire extent of the zone(s). In addition, missiles and rockets can be fired from vessels at targets 139 km away from the firing platform (Table 23 in the *Federal Register* notice). In either case, marine mammals could be present in the target area at the time of the launch unbeknownst to the Navy.

The Commission also notes that NMFS included only the SEL_{cum}-based ranges to effect in the preamble to the proposed rule (see Tables 11–15) and specified that sound from multiple successive explosions can be expected to increase the range to the onset of an impact based on the SEL_{cum} thresholds (86 Fed. Reg. 37817). Although that may be true relative to the SEL_{cum} of a single detonation, the SPL_{peak} thresholds result in larger ranges to effect for the majority of the explosive bins for HF, low-frequency (LF), and mid-frequency (MF) cetaceans and phocids for PTS and LF cetaceans and otariids[67] for TTS (see Tables 6-7 to 6-16 in the Navy's LOA application). For otariids and phocids, the range to onset PTS is larger for the SPL_{peak} rather than the SEL_{cum} threshold for clusters of 10, 12, and/or 25 munitions. As such, NMFS should have included the relevant zones in the preamble to the proposed rule for transparency purposes.

In addition, the Navy indicated in the PMSR DEIS that lookouts would not be 100 percent effective at detecting all species of marine mammals for every activity because of the inherent limitations of observing marine species and because the likelihood of sighting individual animals is largely dependent on observation conditions (e.g., time of day, sea state, mitigation zone size, observation platform) and animal behavior (e.g., the amount of time an animal spends at the surface of the water and group size). The Commission agrees and has made repeated recommendations regarding the effectiveness of the Navy's visual monitoring. Since 2010, the Navy has been collaborating with researchers at the University of St. Andrews to study Navy lookout effectiveness.

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

[64] Based on the peak sound pressure level (SPL_{peak}) threshold, which results in larger zones than the cumulative SEL (SEL_{cum}) thresholds.

[65] Bins E6 to E10 based on Table 2 in the *Federal Register* notice.

[66] Bins E6 and E10 based on Table 2 in the *Federal Register* notice.

[67] The Commission also notes that for Bin E3 the cluster size of 12 is represented by two different sets of ranges (see Table 6-13), which is not possible unless one of the clusters detonated at depth. Otherwise, one of the rows has an incorrect cluster size attributed to it.

Even though the Navy has been conducting those studies for more than a decade, they have not been conducted on a scale and in a manner sufficient to provide useful results.

Accordingly, the Commission continues to assert that a precautionary approach should be taken until such time that sufficient data are available and that the Navy should supplement its visual monitoring measures with other monitoring measures rather than simply reducing the size of the zones it plans to monitor. The Navy did not propose to supplement visual monitoring with passive acoustic monitoring during any of its explosive activities, nor did it mention passive acoustic monitoring in relation to mitigation in either its LOA application or its DEIS for PMSR. Further, NMFS did not propose to require the Navy to use passive acoustic monitoring and did not mention passive acoustic monitoring in regard to mitigation in the preamble to the PMSR proposed rule.

For previous rulemakings, the Navy had stated that it did not have sufficient resources to construct and maintain additional passive acoustic monitoring systems or platforms for each training and testing activity. The Commission again points out that sonobuoys, which are deployed and used during many of the Navy's activities, could be deployed and used without having to construct or maintain additional systems. For example, multiple sonobuoys could be deployed with the target prior to an activity to better determine whether the target area is clear and remains clear until the munition is launched. The Navy previously specified that passive acoustic detections would not provide range or bearing to detected animals and therefore cannot be used to determine an animal's location or confirm its presence in a mitigation zone. The Commission does not agree, as Directional Frequency Analysis and Recording (DIFAR) sonobuoys[68] perform both functions and are routinely used by the Navy.

The Navy itself has drawn attention to the success of using sonobuoys to detect bottlenose dolphins in real-time during mine exercises and provides sonobuoys to researchers for the same purpose of detecting and localizing marine mammals.[69] Contrary to NMFS's assertion in the preamble to the NWTT final rule that sonobuoys have a narrow band that does not overlap with the vocalizations of all marine mammals (85 Fed. Reg. 72349), the Navy has highlighted numerous instances of sonobuoys being used to detect and locate baleen whales, delphinids, and beaked whales[69]. All instances represent detection of a broadband, rather than narrow band, repertoire of frequencies. NMFS also indicated that bearing or distance of detections cannot be provided based on the number and type of devices typically used (85 Fed. Reg. 72349). This too is incorrect[69].

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[68] Likely as well as other types.

[69] Including DIFAR sonobuoys. http://navysustainability.dodlive.mil/files/2014/05/Spr14_Sonobuoys_Research_Monitoring.pdf. The most recent annual report for the Living Marine Resources (LMR) division of the Navy also highlighted the Sonobuoy Liaison Working Group and the fact that LMR is responsible for determining allocation of sonobuoy assets to researchers at, for example, NMFS's numerous Science Centers and Scripps Institution of Oceanography, https://www.navfac.navy.mil/content/dam/navfac/Specialty%20Centers/Engineering%20and%20Expeditionary%20Warfare%20Center/Environmental/lmr/LMRAnnualReport2020v2.pdf.

The Commission further notes that personnel who monitor hydrophones and sonobuoys used by the Navy on the operational side also have the ability to monitor for marine mammals[70]. Department of the Navy (2013) confirmed that ability exists—four independent sightings were made not by the Navy lookouts but by the passive acoustic technicians. Similarly, Department of the Navy (2014) reported that echolocation clicks of short-finned pilot whales were reported to the bridge by the sonar technician prior to mitigation being implemented. Department of the Navy (2019a) recently reported biologics being heard by the sonar technician. And, although aircraft may not have passive or active acoustic capabilities, aircraft carriers or other vessels from which the aircraft originated very likely do have such capabilities. The Commission has long supported the use of the instrumented ranges[71], operational hydrophones and active acoustic sources[72], and sonobuoys[73] to fulfill mitigation measure implementation and contends that localizing some species (or genera) acoustically provides more effective mitigation than localizing none.

Given that the effectiveness of Navy lookouts conducting visual monitoring has yet to be determined, the Commission contends that, at a minimum for PMSR, passive acoustic monitoring[73] should be used to supplement visual monitoring, especially since the activities that the Navy proposed to conduct could injure or kill marine mammals. Therefore, the Commission again recommends that NMFS require the Navy to use passive acoustic monitoring (i.e., DIFAR and other types of sonobuoys), whenever practicable, to supplement visual monitoring during implementation of its mitigation measures for all explosive activities in the final rule.

Mitigation areas and least practicable adverse impact standard—Unlike other Phase III documents, the Navy did not identify and NMFS did not propose any geographic mitigation areas where certain activities would be restricted during specific timeframes. Generally, mitigation areas have been based on previous mitigation areas, public comments received on the DEIS or DSEIS, critical habitat, the best available science and biologically important areas (BIAs), and the practicability of implementing these additional mitigation measures (e.g., 83 Fed. Reg. 66956, 85 Fed. Reg. 34000). The Navy and NMFS included basic information regarding certain BIAs in the LOA application and preamble to the proposed rule, and the Navy mentioned the SNI mitigation area that was included in the HSTT final rule (83 Fed. Reg. 69956) in the LOA application. However, the analysis, including analyzing other mitigation areas that were part of the HSTT final rule and that are within the PMSR study area, and justification for not including the areas as mitigation areas for the PMSR proposed rule is insufficient. The Commission understands that the training and testing activities that would occur in the PMSR study area involve only explosives and at a much-reduced tempo than those in the HSTT study area. Nevertheless, that does not excuse NMFS from doing its due diligence.

For example, NMFS restricted the Navy from using explosives (including various types of gunnery rounds, bombs, rockets, and missiles) at any time of the year in the SBI Mitigation Area to protect blue and gray whales and other species (Figure 4 on 83 Fed. Reg. 66954 and Table 44 on 83

[70] For example, the engineer monitoring the hydrophones during an Air Force activity at the Pacific Missile Range Facility also listened for any signs of marine mammal life post (aerial clearance) survey and leading up to weapon impact (Air Force 2016).
[71] Which are not an option for PMSR.
[72] Including tactical sonars that are used during actual training or testing activities, which would not be used at PMSR, and other sources similar to fish-finding sonars.
[73] Including DIFAR and other types of sonobuoys.

Fed. Reg. 69956) under the HSTT final rule (50 C.F.R. §218.74). That mitigation area was not mentioned by NMFS in the preamble to the proposed rule, nor was justification for its exclusion provided. For humpback whales, NMFS mentioned the Morro Bay to Point Sal[74] and the Santa Barbara Channel–San Miguel[75] Feeding Areas in regard to its negligible impact determination but not in regard to whether inclusion of the areas as mitigation areas was practicable or warranted under the least practicable adverse impact requirement of the MMPA (86 Fed. Reg. 37839). Instead, NMFS indicated that the Navy's explosive training and testing activities could occur year round within the PMSR study area, although they generally would not occur in those relatively nearshore feeding areas, because both areas are close to the northern Channel Islands National Marine Sanctuary, oil production platforms, and major vessel routes leading to and from the ports of Los Angeles and Long Beach (86 Fed. Reg. 37839). NMFS further stated that, even if some small number of humpback whale takes occurred in these BIAs and feeding behavior was disrupted, the short-term nature of the anticipated takes from these activities, combined with the likelihood that they would not occur on more than one day for any individual within a year, means that they are not expected to impact the reproduction or survival of any individuals (86 Fed. Reg. 37839)[76]. None of that justification is related to the practicability of implementing mitigation measures. Further, NMFS has no basis for stating that takes to individuals would not occur on more than one day, particularly in known feeding areas. More importantly, NMFS yet again is co-mingling its negligible impact determination and the least practicable adverse impact standard required under section 101(a)(5)(A)(i)(II)(aa) of the MMPA.

Rather than including the necessary information in the preamble to the PMSR proposed rule, NMFS referred the reader to the NWTT final rule for its explanation of its interpretation of least practicable adverse impact and what distinguishes it from the negligible impact determination (86 Fed. Reg. 37822–37823) NMFS's least practicable adverse impact analysis for the PMSR proposed rule is cursory at best and much less detailed than even the one previously provided in the preamble to the NWTT proposed rule (85 Fed. Reg. 33987–33991), on which the Commission had extensive comments (see the Commission's 12 June 2020 letter for its detailed justification and critique of NMFS's analysis) and that apparently still apply. As such, the Commission again recommends that NMFS clearly separate its application of the least practicable adverse impact requirement from its negligible impact determination—both analyses must be included in all preambles to a proposed and final rule for the subject activities, not for previously authorized and unrelated activities. The Commission also recommends that NMFS follow an analysis framework consisting of three elements to (1) determine whether the impacts of the proposed activities are negligible at the species or stock level, (2) if so, determine whether some of those impacts nevertheless are adverse either to marine mammal species or stocks or to key marine mammal habitat, and (3) if so, determine whether it is practicable for the applicant to reduce or eliminate those impacts through modifying those activities or by other means (e.g., requiring additional mitigation measures to be implemented). If NMFS is using some other legal standard to implement the least practicable adverse impact requirements, then the Commission further recommends that

[74] Which is designated from April to November.
[75] Which is designated from March to September.
[76] Similar justification was provided for the blue whale Point Conception/Arguello to Point Sal, the Santa Barbara Channel and San Miguel, and the SNI Feeding Areas and the various Gray Whale Migration Areas from Calambokidis et al. (2015; 86 Fed. Reg. 37839–37840).

NMFS provide a clear and concise description of that standard and explain why it believes it to be "sufficient" to meet the statutory legal requirements.

In regard to mitigation areas, NMFS did not justify why the humpback, blue and gray whale feeding areas were impracticable to implement. In fact, NMFS's discussion of those areas leads one to believe that the Navy generally does not conduct its activities in those areas, or in the SBI Mitigation Area. As such, limiting explosive activities to avoid unintentionally injuring or killing a large whale and restricting activities in an area where the Navy generally does not train would meet both tenets of the least practicable adverse impact requirement. That is, implementation of the measure would reduce the adverse impact of either killing or injuring an animal and implementing such a measure is practicable. The Commission recommends that, at a minimum, NMFS restrict the Navy from conducting explosive activities in (1) the Morro Bay to Point Sal Humpback Whale Feeding Area from April to November and the Santa Barbara Channel–San Miguel Humpback Whale Feeding Area from March to September, (2) the Point Conception/Arguello to Point Sal Blue Whale Feeding Area and the Santa Barbara Channel and San Miguel Feeding Areas from June to October, and (3) the SBI Mitigation Area in the PMSR final rule. The Commission further recommends that NMFS include in the preamble to the final rule justification regarding why the various Gray Whale Migration Areas were not included as mitigation areas in the final rule.

The Commission has previously commented on NMFS's analyses regarding the marine mammal habitat component of the least practicable adverse impact requirement, and again finds that the agency has not interpreted this provision correctly. For the PMSR proposed rule, NMFS indicated that the Navy agreed to implement procedural mitigation measures that would reduce the probability and/or severity of impacts expected to result from acute exposure to explosives and launch activities, vessel strike, and impacts on *marine mammal habitat* (86 Fed. Reg. 37823). Specifically, the Navy would use a combination of delayed starts and cease firing to avoid mortality or serious injury, minimize the likelihood or severity of PTS or other injury, and reduce instances of TTS or more severe behavioral disruption caused by explosives and launch activities (86 Fed. Reg. 37823). All of those procedural mitigation measures are intended to protect the animal, not its *habitat*; whereas, mitigation areas are intended to protect the *habitat* as well as the animal. Similarly, all the aforementioned impacts are related to the species or stock, not the *habitat*. The Commission again recommends that NMFS (1) adopt a clear decision-making framework that distinguishes between the species and stock component *and* the marine mammal habitat components of the least practicable adverse impact requirement and (2) always consider whether there are potentially adverse impacts on marine mammal habitat and whether it is practicable to minimize them.

NMFS specified that, to determine whether a mitigation measure meets the least practicable adverse impact standard, the effectiveness of such a measure is considered (86 Fed. Reg. 37822). However, NMFS did not mention mitigation effectiveness in the preamble to the PMSR proposed rule, rather it repeatedly mentioned mission effectiveness, which also is a consideration regarding the practicability of mitigation measure implementation. Given these continued shortcomings, the Commission recommends that that NMFS evaluate whether in fact the mitigation measures would be effective if implemented appropriately and ensure that its evaluation criteria for applying the least practicable adverse impact standard separates 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.

Monitoring and reporting measures for launch activities

In previous incidental harassment authorizations for launch activities at SNI, the Navy was required to use forward-looking infrared (FLIR) video cameras to maximize viewing ability in low-light conditions[77]. That information was not specified in the preamble to the proposed rule or the proposed rule itself. The Commission recommends that, at a minimum, NMFS specify in any issued LOA that the Navy must use FLIR video cameras in low-light conditions.

The Navy's draft notification and reporting plan for injured and stranded marine mammals included provisions for reporting dead-stranded and live-stranded animals and vessel strikes to NMFS. The plan is nearly identical to other plans issued under the Phase III rulemakings, which only included taking associated with in-water sources. Thus, the possibility that SNI launch activities could cause a stampede, thereby injuring or killing a pinniped, was inadvertently omitted. In such a case, details of the launch activities should be provided, consistent with section 2 of the draft plan for the in-water explosive activities that may have injured or killed a marine mammal. The Commission recommends that NMFS ensure that the final notification and reporting plan accounts for the possibility of pinnipeds being injured or killed due to launch activities at SNI and include specific details regarding those activities in section 2 of the plan.

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

Sincerely,

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

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[77] See condition 5(b) in the current incidental harassment authorization, https://media.fisheries.noaa.gov/2021-06/PtMugu_SNI_2021FIHA_OPR1.pdf?null=.

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