16 May 2017

Ms. Jolie Harrison, Chief
Permits and Conservation Division
Office of Protected Resources
National Marine Fisheries Service
1315 East-West Highway
Silver Spring, MD 20910-3225

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) 5 May 2017 notice (82 Fed. Reg. 21156) and the letter of authorization (LOA) application submitted by the U.S. Air Force (the Air Force) seeking issuance of regulations under section 101(a)(5)(A) of the Marine Mammal Protection Act. The taking would be incidental to conducting long range strike weapon systems evaluation program (WSEP) activities at the Pacific Missile Range Facility (PMRF), off Kauai, Hawaii. The proposed activities would occur from August 2017 to August 2022.

Background

The Air Force plans to conduct its WSEP activities on the Barking Sands Underwater Range Expansion (BSURE) at PMRF. The purpose of those activities is to evaluate the maneuvers and performance of various munitions. Those activities involve the use of missiles and bombs[1] (ranging from a 10 kg bomb to a 136 kg missile). The Air Force would conduct all WSEP activities in waters approximately 4,645 m in depth and at a distance of approximately 81 km from the coast. The activities generally would occur on five consecutive days in summer or fall[2] of each year.

NMFS preliminarily has determined that the proposed activities could cause both Level A harassment of 4 marine mammal species and Level B harassment of 16 marine mammal species but anticipates that any impact on the affected species and stocks would be negligible. NMFS does not anticipate any take of marine mammals by serious injury or death and believes the proposed mitigation measures provide the means of effecting the least practicable impact on marine mammal species or stocks and their habitat. The proposed mitigation, monitoring, and reporting measures include—

[1] Approximately 106 munitions could be detonated either at the surface or at 3 m in depth.
[2] NMFS indicated in the *Federal Register* notice that activities would not occur from January through May of each year. However, that was an error. The Commission understands that activities would not occur from December through May, during winter and spring.

- conducting activities only during daylight hours and on weekdays;
- conducting aerial monitoring for approximately 30 minutes both 1 hour before and 30 minutes after the proposed activities;
- using delay and shut-down procedures;
- using the PMRF hydrophones to collect acoustic data before, during, and after WSEP activities[3], which would be analyzed as funding allows;
- reporting injured and dead marine mammals immediately to NMFS's Office of Protected Resources and the Pacific Islands regional stranding coordinator; and
- submitting a final report.

Ranges to effects

As indicated in previous Commission letters, the methods used by the Air Force to estimate range to effects[4] for the various thresholds and the numbers of marine mammal takes have been inconsistent and imprecise, resulting in overly conservative estimates. The Commission understands that the Air Force estimated the range to effects based on the longest radial of any of the depth bins for the representative scenario[5], which appears to include a cumulative metric rather than adding the ranges of the multiple munitions. However, the ranges to those thresholds are quite large. For sound exposure level (SEL) thresholds, some of the estimated ranges are 7 to 11 times larger[6] than comparable munitions analyzed under the Navy's Draft Environmental Impact Statement/Overseas Environmental Impact Statement (DEIS) and Letter of Authorization application for training and research, development, test, and evaluation within the Hawaii-Southern California Fleet Training and Testing study area (HSTT) for Phase II. While the Commission has advocated being precautionary, that should not be confused with being overly conservative and inaccurate.

The Commission understands that the Phase III HSTT DEIS will be provided to the public for comment in the coming months. Given the discrepancies noted in ranges to effects for similar munitions being detonated in the same general area in Hawaii, the Commission believes NMFS should investigate the issue further. Therefore, the Commission recommends that NMFS review the Air Force's and Navy's modeling of range to effects to ensure that the results are comparable for similar munitions at the various thresholds, including the same trends in range to effects. A similar trend should be evident between the Air Force and Navy documents for the dual criteria of SEL and peak sound pressure level (SPL_{peak}) metrics for PTS and temporary threshold shift (TTS) thresholds—that is, the range to effects should be based on the same metric. It would be inconsistent for the Air Force to be basing the PTS and TTS ranges on the SEL metric and the Navy on SPL_{peak} metric. In addition, the Commission recommends that NMFS require the Air Force to revise the estimated numbers of takes based on any changes to the range to effects, and thus impact areas, after comparison with the Navy ranges.

[3] In support of monitoring rather than mitigation requirements under the MMPA.
[4] i.e., distance to the various thresholds or radii.
[5] Three missiles and 18 bombs detonating within a given area in a 4-hour timeframe.
[6] The Commission acknowledges the slight difference in thresholds and weighting function shapes between the two documents, but those likely would not explain such large differences in the ranges.

Mitigation and monitoring measures

In previous Commission letters regarding the Air Force's activities at Eglin Air Force Base (Eglin) off Florida and at the Navy's PMRF, the Commission has recommended that NMFS require the Air Force to determine the effectiveness of its mitigation measures and to supplement those measures with the use of passive acoustic monitoring (PAM) devices, which in this case already are in place at PMRF[7] and would be used to collect acoustic data to be analyzed at a later date. For the proposed authorization, the mission area would be determined to be clear of marine mammals at least 30 minutes, and likely longer, before the munitions are detonated. The monitoring aircraft typically would move to the periphery of the human safety zone, which appears to be at least 13 km. Given that distance, the Commission is not convinced that the Air Force would be able to monitor effectively for marine mammals entering the mortality and injury zones after the area has been cleared and during the timeframe prior to detonation (see Table 5 of the *Federal Register* notice for sizes of the relevant zones).

NMFS described multiple limitations regarding using the PMRF hydrophones for real-time mitigation in the *Federal Register* notice based on information provided by the Navy (82 Fed. Reg. 21174). Those limitations include (1) the inability to detect, classify, and localize individual marine mammals and (2) animals that are present either aren't vocalizing or are vocalizing at frequencies beyond the hydrophone detection range. However, the Commission understands that the Navy is quite adept at detecting, classifying, and localizing individual marine mammals on PMRF[8]. For example, Helble et al. (2015) indicated that they were able to track multiple animals on PMRF hydrophones in real time, including humpback whales, a species that can be problematic to localize. Multiple animals were localized simultaneously with a localization error rate of 2 percent or less. Similar methods can be used for other species. Baird et al. (2015) also indicated that the PMRF hydrophones allow the PAM analyst to isolate animal vocalizations on the range, confirm species classification, and localize groups of animals in real time. Multiple detectors can be used for sperm whales, delphinids, beaked whales, and baleen whales. Similar to Helble et al. (2016), Baird et al. (2015) indicated that localization algorithms could determine an animal's position. In the case of bottlenose dolphins, that location was within approximately 100 m of the vocalizing animal. Similar localizations have been used to direct researchers to groups of vocalizing odonotocetes to deploy satellite tags as well (Baird et al. 2014).

The *Federal Register* notice indicated that the detection ranges are generally larger than current mitigation zones for many activities, which according to the Navy would delay the activities unnecessarily due to uncertainty in the animal's location. However, the range to mortality is more than 300 m, slight lung injury is more than 600 m, and permanent threshold shift (PTS) is more than 20 km depending on the species. Therefore, the Commission is not convinced that the inability to detect, classify, and localize vocalizing marine mammals on PMRF is the limiting factor.

Regarding the second limitation, the Commission does not follow the Navy's logic regarding animals that are present and may not be vocalizing. That phenomenon is no different than that of visual monitoring when an animal may be present but not at the surface to be observed. This does not preclude visual monitoring from being used as a primary means of mitigation for nearly all

[7] PMRF has 199 bottom-mounted hydrophones for PAM capabilities.
[8] Via the Marine Mammal Monitoring on Navy Ranges (M3R) program.

activities, including WSEP activities. The Navy expressed the view that, if an activity were to be moved based upon low-confidence localizations, it may be moved inadvertently to an area where non-vocalizing animals of endangered/threatened species are present. However, the Commission has not advocated physically moving an activity, but rather delaying an activity. In addition, the Navy's rationale is similar to moving an activity from an area in which a few animals may have been sighted to an area where other animals could be below the surface but has been deemed clear during range clearance procedures. This issue is further compounded by the area being swept during range clearance procedures up to an hour or more before the activity begins—a circumstance that likely has occurred in the past.

Lastly, the Navy indicated that, since large baleen species vocalize at frequencies well below 1 kHz, there are few broadband hydrophones with low-frequency capabilities at PMRF. The Navy asserts that those hydrophones are widely spaced, especially on the southern portion of the PMRF range, which makes estimating the positions of low-frequency baleen whales difficult in that area. A review of published information indicates otherwise. Martin and Matsuyama (2015) noted that 41 of the BSURE hydrophones were replaced in 2010[9] with a high pass filter at 50 Hz with roll-off characteristics that enable detection of signals down to approximately 12 Hz—those enable call detection for fin, sei, and Bryde's whales. Further, in Figure 8 of Martin and Matsuyama (2015), it appears the spacing of the hydrophones is similar or even closer at the southern portion of the PMRF range[10]. In fact, Martin and Matsuyama (2015) provide tracks of Bryde's whales[11] based on multiple BSURE hydrophones, both those in the north and south (see Figure 7 as an example).

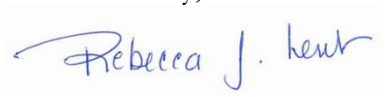
In short, the Commission doesn't agree with the Navy's, and thus NMFS's, rationale regarding the PMRF hydrophone limitations. The PMRF hydrophones appear to be capable of localizing animals and as such, they should be used to supplement visual monitoring, which itself has yet to be deemed effective. Being able to localize certain species (or genuses) provides more effective mitigation than localizing none at all. Further, USAF activities would only occur on five consecutive days each year, thus requesting that the Navy's M3R analysts be on site for those few days should be neither impractical nor overly expensive. For these reasons, the Commission again recommends that NMFS require the Air Force to supplement its mitigation measures with the use of real-time PAM using the PMRF hydrophones and M3R analysts and to delay WSEP activities if vocalizing animals are localized within the relevant mortality or injury zones. The injury zones would include the PTS zones for those species for which Level A harassment takes are not authorized.

In addition to supplementing mitigation, PAM devices also can be used to provide in-situ measurements[12] of the detonations and data on impacts to marine mammals in the vicinity prior to, during, and after the detonations. NMFS indicated that USAF would archive the PAM recordings for analysis when funding is available at a later time. Fulfilling the monitoring requirements under section 101(a)(5) of the MMPA should be made a priority in addition to real-time mitigation implementation.

[9] Which were expanded to 62 hydrophones in 2012 to support localization of whale calls.
[10] USAF indicated it would be operating in the northern not southern portion of the PMRF range (Figure 2–2 in the LOA application). Thus, the point may be moot.
[11] That vocalize at 21 to 37 Hz.
[12] Including sound propagation.

The Commission trusts you will find its letter helpful. Please contact me if you have questions regarding the Commission's comments and recommendations.

Sincerely,



Rebecca J. Lent, Ph.D.,
Executive Director

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