5 August 2019

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

Re: Permit Application No. 21163
(Marine Ecology and
Telemetry Research)

Dear Ms. Harrison:

The Marine Mammal Commission (the Commission), in consultation with its Committee of Scientific Advisors on Marine Mammals, has reviewed the above-referenced permit application with regard to the goals, policies, and requirements of the Marine Mammal Protection Act (the MMPA). Marine Ecology and Telemetry Research (MarEcoTel) is requesting authorization to conduct research on cetaceans in the Pacific Ocean during a five-year period.

The purpose of the research is to investigate (1) abundance and distribution, (2) habitat use, (3) foraging and behavioral ecology, (4) stock structure and demographics, and (5) health of cetaceans. Researchers also would assess the impacts of military activities on cetaceans. MarEcoTel would harass, observe, photograph/videotape[1], sample[2], instrument[3], passively record, and/or conduct acoustic playbacks on numerous cetacean species of any age class and either sex (see the application and take tables for specifics). It also requests authorization to import, receive, possess, and/or export samples from cetaceans. MarEcoTel would use various measures to minimize impacts on marine mammals and would be required to abide by the National Marine Fisheries Service's (NMFS) standard permit conditions. MarEcoTel's Institutional Animal Care and Use Committee currently is reviewing the proposed research protocols—the approval will be obtained before the proposed activities begin.

Level B harassment thresholds

MarEcoTel proposed to conduct two types of acoustic studies on cetaceans. Researchers would coordinate with the Navy to deploy its operational sources (e.g., helicopter-dipping sonar) at specific locations, and they would deploy their own sound sources (e.g.,

[1] Including photogrammetry and underwater photography/videography.
[2] Including biopsy samples, exhaled air, eDNA, feces, and sloughed skin.
[3] Including suction-cup, dart, and/or implantable tags.

vertical line array (VLA) and Directional Command Activated Sonobuoy System (DICASS))[4]. NMFS indicated that Level B harassment takes associated with the Navy-deployed assets are accounted for under the Navy's final rule (83 Fed. Reg. 66846), similar to other previous permits. Thus, MarEcoTel included in its permit application Level B harassment takes associated with only those sources that it plans to deploy. The Commission agrees with that approach but is concerned that the Level B harassment thresholds used to estimate marine mammal takes under the final rule and the research permit differ considerably for the same types of sources.

Under its final rule, the Navy used multiple[5] Bayesian biphasic dose response functions[6] (Bayesian BRFs) as its Level B harassment thresholds for behavior for non-impulsive sources[7]. The Bayesian BRFs were a generalization of the monophasic functions previously developed[8] and applied to behavioral response data[9] (see Department of the Navy 2017 for specifics). Conversely, NMFS directed MarEcoTel to use its generic unweighted 160-dB re 1 μPa threshold to estimate takes for the permit application. Although that threshold has been used historically by NMFS for estimating Level B harassment takes from MF sonar for research permits[10], it has *never* been used by the Navy to estimate takes from any of its non-impulsive, acoustic sources[11]. It does not make sense that NMFS used two different thresholds to estimate Level B harassment takes for the same type of sources, and doing so runs counter to the agency's approach for the Level A harassment thresholds. The same Level A harassment thresholds were used in both the Navy's final rule and MarEcoTel's permit application.

Inconsistencies aside, use of the generic 160-dB re 1 μPa threshold underestimates the ranges to Level B harassment and the numbers of takes for certain species. In the application that underpins the final rule, the Navy noted that the average range to 160 dB re 1 μPa was 133 m for DICASS (denoted as MF5[12] in Table 6-12 of Department of the Navy 2018), which is similar to MarEcoTel's estimate of 118 m in Table 8 of its application. However, Table 6-12 in Department of the Navy (2018) also shows that the probability of a behavioral response and the potential for taking occur at received levels lower than and ranges greater than specified in MarEcoTel's application. For example, the probability for a beaked whale to respond behaviorally to DICASS at 160 dB re 1 μPa is 93 percent, and the 50-percent probability of response occurs at approximately 146 dB re 1 μPa and out to ranges of 1 km or more (Table 6-12 in Department of the Navy 2018). Beaked whales have a 10 percent probability of response at received levels of less than 105 dB re 1 μPa. Similar trends are evident for odontocetes at

[4] All sources emit mid-frequency (MF) sonar signals.
[5] For odontocetes, mysticetes, beaked whales, and pinnipeds. The Navy used the unweighted 120-dB re 1 μPa threshold for harbor porpoises as it had done for Phase II activities.
[6] 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.
[7] Acoustic sources (i.e., sonars and other transducers) that include VLA and DICASS.
[8] By Antunes et al. (2014) and Miller et al. (2014).
[9] From both wild and captive animals.
[10] The last of which was finalized in 2016.
[11] For TAP I and Phase II activities, the Navy used two monophasic dose response functions, one for odontocetes and pinnipeds and one for mysticetes. The unweighted 120- and 140-dB re 1 μPa thresholds also were used for harbor porpoises and beaked whales, respectively, for Phase II activities.
[12] See Table 1-2 that describes the various source bins and sound source types.

lower received levels. The Navy also employs various cut-off distances[13] beyond which it does not believe impacts occur. For beaked whales, that distance is 50 km. Thus, impacts can occur at ranges greater than estimated by MarEcoTel and at received levels much lower than 160 dB re 1 µPa. Further, more pronounced effects would be evident for the VLA that operates at a higher source level.

Once the final rule was issued in 2018, the Commission had hoped that NMFS would require research permit applicants to use the Navy's current Level B harassment thresholds rather than continue to rely on NMFS's generic threshold[14], which does not reflect the best available science. Given that very few applications and subsequent permits include such activities[15] and the Navy is funding and directly coordinating with those researchers, the Navy could easily provide estimated numbers of Level B harassment takes based on the appropriate behavior thresholds to inform the permit applications. For these reasons, the Commission recommends that NMFS require MarEcoTel and all other applicants and permit holders to use the Navy's Level B harassment thresholds for behavior rather than the generic 160-dB re 1 µPa threshold to estimate the numbers of takes during acoustic studies involving MF sonar and other military sources.

The Commission believes that the proposed activities are consistent with the purposes and policies of the MMPA. Kindly contact me if you have any questions concerning the Commission's recommendation.

Sincerely,

Peter O Thomas

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.

Department of the Navy. 2017. 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. 2018. Request to regulations and letters of authorization for the incidental taking of marine mammals resulting from U.S. Navy training and testing activities in the Hawaii-Southern California Training and Testing study area. U.S. Pacific Fleet, Pearl Harbor, Hawaii and Naval Sea Systems Command, Washington, District of Columbia. 580 pages.

[13] For Table 6-12, those distances are 10 m for pinnipeds and 20 m for odontocetes and mysticetes.
[14] The size of the Level B harassment zones also should not be a factor since NMFS uses its generic 120-dB re 1 µPa threshold for continuous sources that result in comparatively large zones in other permit applications.
[15] Currently, the Commission is only aware of three or four.

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.