8 January 2020

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 U.S. Navy's application seeking authorization under section 101(a)(5)(D) of the Marine Mammal Protection Act to take marine mammals by harassment. The taking would be incidental to conducting its ice exercise (ICEX) in the Beaufort Sea and Arctic Ocean in 2020. The Commission also has reviewed the National Marine Fisheries Service's (NMFS) 17 December 2019 notice (84 Fed. Reg. 68886) announcing receipt of the application and proposing to issue the authorization, subject to certain conditions.

Background

The Navy plans to conduct its ICEX approximately 185–370 km north of Prudhoe Bay, Alaska. The purpose is to conduct submarine training and testing activities from an ice camp. During a six-week timeframe beginning in February, the ice camp would be established, acoustic activities would occur, and the ice camp would be demobilized. Various active acoustic sources would be used[1].

NMFS preliminarily has determined that, at most, the proposed activities could cause Level B harassment of small numbers of ringed and bearded seals. It also anticipates that any impact on the affected species and stocks would be negligible. NMFS does not anticipate any take of marine mammals by death or serious injury and believes that the potential for temporary or permanent hearing impairment would be at the least practicable level because of the proposed mitigation measures. The proposed mitigation, monitoring, and reporting measures include—

- avoiding ice camp establishment near pressure ridges;
- establishing the ice camp gradually over five days[2] to allow seals to relocate to lairs that are not in the immediate vicinity of the camp;
- avoiding transiting pressure ridges and snow drifts on foot and on snowmobiles;

[1] The frequency range of the sources to be used during ICEX2020 is classified.
[2] And completed by March 15.

- requiring snowmobiles to follow established routes;
- approaching marine mammals on the ice no closer than 100 m;
- implementing delay and shut-down procedures using passive acoustic capabilities;
- reporting injured and dead marine mammals to NMFS and the Alaska Regional Stranding Coordinator and suspending activities, if appropriate; and
- submitting a draft and final exercise monitoring report[3] to NMFS.

Availability of marine mammals for subsistence

The proposed activity would occur outside of the primary subsistence hunting season (i.e., summer months) and is 185–370 km seaward of known subsistence hunting areas during that time of year. However, the Navy did contact the Inupiat Community of the Arctic Slope Native Village of Nuiqsut and received no comments on the proposed activities. Based on the location and timing of the proposed activities, NMFS has preliminarily determined that the proposed taking would not have an unmitigable adverse impact on the availability of marine mammals for subsistence use by Alaska Natives.

The Commission concurs with NMFS's preliminary findings and therefore recommends that NMFS issue the incidental harassment authorization, subject to inclusion of the proposed mitigation, monitoring, and reporting measures.

Behavior thresholds

To further define its behavior thresholds for non-impulsive sources[4], the Navy developed multiple[5] Bayesian biphasic dose response functions[6] (Bayesian BRFs) for Phase III activities. The Bayesian BRFs were a generalization of the monophasic functions previously developed[7] and applied to behavioral response data[8] (see Department of the Navy 2017 for specifics). The biphasic portions of the functions are intended to describe both level- and context-based responses as proposed in Ellison et al. (2012). At higher amplitudes, a level-based response relates the received sound level to the probability of a behavioral response; whereas, at lower amplitudes, sound can cue the presence,

[3] The Commission informally noted that NMFS did not include specific reporting requirements in the *Federal Register* notice or in section 6(a) of the draft authorization. NMFS indicated it would require the Navy to report data regarding sonar use, the number of sonar shut downs, the number of marine mammal acoustic detections (including the date and time when first and last heard), length of any shut down, the types and nature of sounds heard (e.g., clicks, whistles, creaks, burst pulses, continuous, sporadic, strength of signal), and any additional information recorded such as water depth of the acoustic receiver (if not classified), bearing of the animal to the submarine (if determinable), species or taxonomic group (if determinable), spectrogram screenshot, and any other notable information. The Navy also must report details of any marine mammal sightings on the ice, including the marine mammal's location (latitude and longitude), the number of individuals and age classes of each species observed, and their behavior and distance from project activities. NMFS plans to revise the notice for final issuance and section 6(a) of the final authorization accordingly.

[4] Acoustic sources (i.e., sonars and other transducers).

[5] For odontocetes (except beaked whales), beaked whales, mysticetes, and pinnipeds. The Navy used the 120-dB re 1 μPa unweighted, step-function threshold for harbor porpoises as it had done for Phase II activities.

[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] By Antunes et al. (2014) and Miller et al. (2014).

[8] From both wild and captive animals.

proximity, and approach of a sound source and stimulate a context-based response based on factors other than received sound level[9]. The Commission considers the Bayesian BRFs to be reasonable and a much-needed improvement on the two dose response functions (BRFs)[10] that the Navy used for both TAP I and Phase II activities.

The Commission is concerned, however, that following the development of the BRFs, the Navy then implemented various cut-off distances beyond which it considered the potential for significant behavioral responses to be unlikely (Table C.4 in Department of the Navy 2017). The Navy indicated it was likely that the context of the exposure is more important than the amplitude at large distances[11] (Department of the Navy 2017)—that is, the context-based response dominates the level-based response. The Commission agrees with that notion but notes that the Bayesian BRFs specifically incorporate those factors. Including additional cut-off distances *contradicts* the data underlying the Bayesian BRFs, *negates* the intent of the functions themselves, and *underestimates* the numbers of takes.

Adding to the Commission's concerns is that the cut-off distances used by the Navy seem to be largely unsubstantiated or based on very limited data. The Navy and NMFS indicated that data on pinniped behavioral responses in general are limited, and that there is a total lack of data for distances beyond 3 km from the source (Department of the Navy 2017 and 84 Fed. Reg. 37258). Nevertheless, the Navy arbitrarily set the cut-off distance at 10 km for pinnipeds. In response to the Commission's previous comments regarding those cut-off distances, the Navy indicated that pinnipeds do not exhibit strong reactions to sound pressure levels up to 140 dB re 1 μPa based on Southall et al. (2007; 83 Fed. Reg. 65230). The Commission notes, as did the Navy and NMFS, that those data were limited and were based on sources that did not have characteristics similar to MFA sonar[12]. Southall et al. (2007) additionally indicated that data did not exist regarding exposures at higher received levels at that time. Fortunately, data on pinniped behavioral responses now exist both for sound sources similar to MFA sonar and at higher received levels. Those data ultimately were used by the Navy to develop the Bayesian BRF for pinnipeds (see Table 3-2 in Department of the Navy 2017 for details), while none of the data cited in Southall et al. (2007) were used. Some of the pinnipeds did in fact exhibit 'strong' reactions based on the Southall et al. (2007) severity scale[13] to received levels less than or equal to 140 dB re 1 μPa, and those data were used to inform the context portion of the Bayesian BRF.

As noted herein, use of the cut-off distance would eliminate a large portion of the estimated numbers of takes—takes that occurred at much higher received levels than 140 dB re 1 μPa. For

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[9] e.g., the animal's previous experience, separation distance between sound source and animal, and behavioral state including feeding, traveling, etc.

[10] One for odontocetes and pinnipeds and one for mysticetes.

[11] For example, the Navy indicated that the distance to the basement level of 120 dB re 1 μPa for the BRFs from TAP I and Phase II sometimes extended to more than 150 km during activities involving the most powerful sonar sources (e.g., AN/SQS-53).

[12] Some sources emitted sound at much lower frequencies (the acoustic thermometry of the ocean climate (ATOC) sound source emitted signals at a center frequency of 75 Hz) and at a greater repetition rate than MFA sonar (Costa et al. 2003). Other sources emitted sound at higher frequencies (the Airmar™ acoustic harassment device (AHD) emitted signals at 10 kHz or higher and acoustic communication signals were emitted at 12 kHz with higher-frequency harmonics) and at a greater repetition rate with shorter pulse durations (specifically the AHD) than MFA sonar (Jacobs and Terhune 2002, Kastelein et al. 2006).

[13] Equating to significant behavioral responses as specified by the Navy.

example, for the Hawaii-Southern California Fleet Training and Testing letter of authorization (LOA) application, the estimated numbers of takes would be reduced to zero for pinnipeds beginning where the probability of response is 27 percent and the received level is approximately 160 dB re 1 µPa (for sonar bin MF1 in Table 6-10 in the LOA application)[14]. The received level at the cut-off distance exceeds levels at which actual context-based behavioral responses have been observed (see the Commission's 15 April 2019 letter detailing this issue). Moreover, NMFS indicated in the *Federal Register* notice that data on gray and harbor seals indicated avoidance response at received levels of 135–144 dB re 1 µPa (Götz and Janik[15] 2010) and diving activity also was modified for those species (84 Fed. Reg. 68894–68895). Thus, the cut-off distance arbitrarily reduced the numbers of takes at levels where Level B harassment has been documented to occur.

Tyack and Thomas (2019) recently compared results between setting a threshold where 50 percent of the animals respond and using the actual Bayesian BRF. Their analysis led to an underestimation of effect by greater than two orders of magnitude[16]. Although the arbitrary cut-off distance in the Navy's example occurred where 27 percent of the animals respond, the behavioral impacts and takes of pinnipeds have been underestimated as well. As noted by Tyack and Thomas (2019), given the shape of the dose-response function and how efficiently sound propagates in the ocean, the number of animals that are predicted to have a low probability of response may in fact represent the dominant impact from a given sound source. For all of these reasons, the Commission again recommends that the Navy refrain from using cut-off distances in conjunction with the Bayesian BRFs and re-estimate the numbers of Level B harassment takes based solely on the Bayesian BRFs.

Proposed one-year authorization renewals

NMFS has indicated that it may issue a one-year incidental harassment authorization renewal for this and other future authorizations if various criteria are met and after an expedited public comment period of 15 days. The Commission and various other entities (e.g., 84 Fed. Reg. 31035 and 52466) have asserted and continue to affirm that the renewal process is inconsistent with the statutory requirements under section 101(a)(5)(D) of the MMPA. As such, the Commission recommends that NMFS refrain from issuing renewals for any authorization and instead use its abbreviated *Federal Register* notice process. That process is similarly expeditious and fulfills NMFS's intent to maximize efficiencies.

Over the past few years, NMFS informed the Commission that a renewal would be issued as a one-time opportunity, after which time a new authorization application would be required. NMFS also has included such verbiage in its response to comments regarding renewals. Specifically, NMFS indicated that it had modified the language for future proposed incidental harassment authorizations to clarify that all authorizations, including renewal authorizations, are valid for no more than one year and that the agency will consider *only one renewal* for a project at this time (e.g., 84 Fed Reg. 36892 from 30 July 2019). However, NMFS has yet to stipulate that the agency will consider *only one renewal* or that a renewal is a *one-time opportunity* in any *Federal Register* notice requesting comments on

[14] The Navy did not provide similar information for its ICEX authorization application.
[15] NMFS inadvertently referred to this reference as Götz et al (2010) rather than Götz and Janik (2010).
[16] By a factor of 280.

the possibility of a renewal, on its webpage detailing the renewal process[17], or in any draft or final authorization that includes a term and condition for a renewal (including section 8 of the Navy's draft authorization).

In response to the Commission's 29 November 2019 letter recommending that NMFS stipulate those specifics in the relevant documents and on its webpage, NMFS indicated that, in the 'summary' portion of its notices, it requests comments on a possible *one-year renewal* that could be issued under certain circumstances and if all requirements are met (84 Fed. Reg. 68131). However, neither the notices, nor the webpage or final authorizations state that *one-year renewals* are *one-time opportunities*. NMFS also indicated that, for notices involving proposed renewals, it has not included an option of an additional renewal (84 Fed. Reg. 68131). Absent specifics regarding one-year renewals being a one-time opportunity in the *Federal Register* notices, on NMFS's webpage, and more importantly as a term and condition in its draft and final authorizations, NMFS appears to knowingly allow that door to remain open. If NMFS chooses to continue proposing to issue renewals, the Commission recommends that it (1) stipulate that a renewal is a *one-time opportunity* (a) in all *Federal Register* notices requesting comments on the possibility of a renewal, (b) on its webpage detailing the renewal process, and (c) in all draft and final authorizations that include a term and condition for a renewal and, (2) if NMFS refuses to stipulate a renewal being a one-time opportunity, justify why it will not do so in its *Federal Register* notices, on its webpage, and in all draft and final authorizations.

The Commission hopes its comments are useful. Please contact me if you have questions regarding the Commission's recommendations.

Sincerely,

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

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