



MARINE MAMMAL COMMISSION

25 July 2023

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. 26623
(Erin Ashe, Ph.D.,
Ocean Initiatives)

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). Dr. Erin Ashe is requesting authorization to conduct research on cetaceans and pinnipeds in the coastal and inland waters of Washington State during a five-year period.

Dr. Ashe proposed to conduct research on numerous species of cetaceans and pinnipeds in the Pacific Northwest. The purpose of the research is to investigate (1) abundance, distribution, and conservation status, (2) consequences of sublethal stressors, (3) health and disease, and (4) behavioral response to acoustic deterrents. Researchers would harass, count, observe, photograph/videotape¹, record acoustically, sample², and conduct procedures on (i.e., active acoustic studies using multiple types and configurations of pingers, targeted acoustic startle technology (TAST), and experimental fisheries signals) individuals of each species per year. Researchers would use various measures to minimize impacts on marine mammals and also would be required to abide by the National Marine Fisheries Service's (NMFS) standard permit conditions.

Dr. Ashe's permit application was published for review and public comment on 18 April 2023 (88 Fed. Reg. 23645). Following its review, the Commission submitted informal comments to NMFS, including numerous questions and concerns about the active acoustic studies and the sufficiency of some of the take estimates. The Commission received responses to its informal comments and a revised application on 12 July 2023. Although several changes were made in the revised application, many of the Commission's initial concerns were not resolved.

¹ Including via unmanned aircraft systems and for procedures including photo-identification and photogrammetry.

² Including feces, breath, and/or prey remains.

Pinger studies

Dr. Ashe proposed to assess the effectiveness of commercially-available pingers (e.g., Fishtek's porpoise and dolphin deterrent pinger, porpoise deterrent pinger, and whale deterrent pinger) by documenting the behavioral responses of oceanic cetaceans. The researchers would estimate the specific distance at which cetaceans respond to the signal emitted and assess whether avoidance occurred. Although Dr. Ashe indicated in the revised application that the sample sizes requested in the take table are the minimum needed to detect whether cetaceans respond to pinger playbacks, NMFS determined that take by acoustic harassment was not likely to occur per NMFS (2018) based on the proposed pinger source levels (not to exceed 145 dB re 1 μ Pa at 1 m). The Commission strongly disagrees with NMFS's supposition for numerous reasons, including—

1. Given that the objective of Dr. Ashe's pinger study is to "detect whether cetaceans do or do not respond to pinger playbacks", the researchers' intent is clearly for the animals to respond behaviorally. NMFS considers behavioral disturbance to be Level B harassment, which includes the *potential* to disturb, as defined in section 3(18)(A)(2) of the MMPA. The pinger study has the potential, and actually is intended, to disturb the animals.
2. NMFS's implementing regulations (50 C.F.R. § 216.44 (b)) require that any intrusive research be authorized under a scientific research permit. The implementing regulations (50 C.F.R. § 216.3) and [NMFS's current application instructions](#) define intrusive research as a procedure conducted for *bona fide* scientific research involving, amongst other things, a stimulus directed at animals that may have an impact on normal function or behavior (i.e., audio broadcasts directed at animals that may affect behavior). The pinger study is considered intrusive research and any related taking must be authorized under a scientific research permit.
3. NMFS (2018) applies only to auditory impacts (permanent and temporary threshold shifts (PTS and TTS, respectively)), does not include or define what was intended by the term "acoustic harassment", and specifically states that assessing the behavioral response of marine mammals to sound is outside the scope of the document. As such, NMFS (2018) is irrelevant to authorizing taking by behavioral disturbance from the pinger study.
4. In other previous permits, NMFS has deemed any directed playback or acoustic study that is intended to elicit a behavioral response (adverse or attractant), a procedure for which there is the potential for take and NMFS has authorized those takes regardless of the source levels³ (e.g., see the application, recommendation memo, and issued permit for Marine Mammal Laboratory #23858). The pinger study should be authorized accordingly.
5. NMFS recently indicated that it would authorize the taking of target and non-target marine mammals that could result from the use of Fishtek's pingers (and other brands of pingers) at the same maximum source level of 145 dB re 1 μ Pa at 1 m (e.g., see NMFS's response to the Commission's informal comments and the Commission's [22 June 2023 letter](#) regarding Alaska Whale Foundation #23858). The pinger study should be authorized similarly.
6. Pingers and other acoustic deterrent devices, including the Fishtek pingers (see NMFS 2020b), are used specifically to take marine mammals by harassment in accordance with

³ Including at source levels that are below NMFS's generic 160-dB re 1 μ Pa threshold for Level B harassment.

section 101(a)(4) of the MMPA⁴. NMFS has published a proposed rule regarding deterrence guidelines specifying that any actions taken to deter marine mammals that are consistent with the guidelines or specific measures are not a violation of the Act (85 Fed. Reg. 53763). Take could occur as a result of the pinger study and must be authorized under section 104(c) of the MMPA when a scientific research permit is being requested to conduct such taking.

7. NMFS indicated in its response to the Commission's informal comments that takes that may occur via harassment/close approach were included in the proposed take table. However, that does not appear to be the case for the pinger study⁵. Takes for the pinger study should be included in the take table based on the potential to disturb animals from both the close approach and, more importantly, the sound emitted.

In short, NMFS must authorize takes of marine mammals under scientific research permits when the potential to disturb exists and it must do so consistently across all permits. Consistent with the MMPA, NMFS's implementing regulations, NMFS's application instructions, and other issued and soon-to-be issued permits, the Commission recommends that NMFS authorize takes of the various cetacean species⁶ for the pinger study in any final take table included in the permit, if issued, and ensure that the take table specifies which "Active acoustics playback/broadcast" would be authorized, pinger and/or TAST studies⁷, in the details portion. As currently specified, the take table is ambiguous regarding what acoustic studies are being authorized, and that is further compounded by the inconsistencies in the revised application. Any issued permit must clearly state what procedures are being authorized for which species.

Generally speaking, the consistent and appropriate authorization of takes of target and non-target species has been an issue recently for multiple applications that include active acoustic studies involving pingers, playback studies, and prey mapping. As such, the Commission recommends that NMFS include in any take table associated with an application or issued permit involving active acoustic studies—

- "Active, acoustic playback/broadcast" for target species for any active acoustic study (playbacks, pingers, actual sound sources, etc.) that is intended to elicit a behavioral response (adverse or attractant), regardless of the source level or size of the harassment zones;
- "Active, acoustic playback/broadcast" for non-target species for any active acoustic study (playbacks, pingers, actual sound sources, etc.) in which the mitigation zone is less than the estimated Level A or B harassment zone *or* for which there is the potential for incidental taking for other reasons;
- "Acoustic, sonar for prey mapping" for target species whose hearing range overlaps with that of the echosounder being used and that either may be feeding in the prey field or is the subject of target strength (and other) studies; and

⁴ The deterrence provisions of the MMPA (16 U.S.C. 1361 *et seq.*) provide an exception to otherwise prohibited acts, including take by harassment, and allow specified persons to deter a marine mammal from damaging fishing gear and catch, damaging personal or public property, or endangering personal safety, so long as those deterrents do not result in the death or serious injury of a marine mammal.

⁵ Takes that could occur during the pinger study for the Eastern North Pacific Offshore stock of killer whales were removed from the revised application, and NMFS indicated that the takes were intended to be removed from the take table.

⁶ Including two stocks of killer whales.

⁷ Including whether the studies are in-water and/or in-air for the studies involving pinnipeds.

- “Acoustic, sonar for prey mapping” for non-target species whose hearing range overlaps with that of the echosounder being used and for which the mitigation zone is less than the Level B harassment zone *or* there is the potential for incidental taking for other reasons.

Moreover, NMFS should not assume that directed taking from acoustic sources cannot occur based on the 160-dB re 1 μ Pa threshold from 2005 that was considered “interim” even at the time, is not based on best available science or related to behavioral responses to deterrent-like devices, and is in the process of being revised. Therefore, the Commission recommends that NMFS (1) authorize directed taking of target and non-target species based on whether the animals have the potential to be disturbed, rather than on whether the maximum source level proposed for use would be greater than NMFS’s 160-dB re 1 μ Pa threshold and (2) prioritize updating its outdated behavior thresholds.

TAST studies

The Commission provided numerous informal comments to NMFS regarding the specific details and acoustic parameters for the proposed TAST studies. Although NMFS indicated that many responses were incorporated into the revised application, parameters remain unspecified and issues remain unresolved (see the Addendum herein for the outstanding acoustic and other general comments). Worst-case acoustic parameters are necessary to determine whether the mitigation measures included in the revised application are appropriate. As one example, the revised application stated that the TAST odontocete signal could be used at a maximum broadband source level of 183 dB re 1 μ Pa at 1 m emitted in the frequency range from 5–20 kHz and at 1-percent duty cycle for three 20-minute trials per day when high-frequency (HF) cetaceans⁸ are the target species. Assuming a weighting factor adjustment (WFA) of 20 kHz, which is the frequency where HF cetaceans are the most sensitive, the Level A harassment zone for PTS would be 23 m for HF cetaceans. If the correct source level of 184 dB re 1 μ Pa at 1 m was used, the zone would be 26 m. Both are larger than the proposed closest point of approach of 15 m.

It appears that Dr. Ashe assumed that the WFA was 10 kHz⁹, corresponding to the frequency of the one-third octave band (OTB) with the maximum energy. This is not consistent with the manner in which NMFS has recommended that action proponents estimate the WFA for a broadband source¹⁰ or the manner in which the worst-case scenario zones were estimated for NMFS’s deterrence guidelines¹¹. Both would yield WFAs higher than 10 kHz, resulting in Level A harassment zones for PTS that are greater than 15 m. Furthermore, the extended explanation and justification for using OTB source levels, which relates to the frequency of the OTB with the maximum energy, is incorrect and unnecessary and can cause confusion for other applicants. NMFS’s acoustic expert recommended removing the incorrect information regarding NMFS (2018) and Southall et al. (2019) in the OTB justification. The Commission recommends that NMFS require Dr. Ashe to remove the entire OTB section from any final application and condition the permit to require that the closest point of approach to target or non-target species during TAST in-water and in-air studies must be greater than the worst-case scenario Level A harassment zone for

⁸ Based on NMFS (2018).

⁹ Which would result in a PTS zone of 15 m or less.

¹⁰ Based on the 95-percent frequency if the spectrum is not used (NMFS 2020a).

¹¹ Based on a WFA at most sensitive frequency.

PTS using either the 95-percent frequency or the most sensitive frequency for each functional hearing group.

Numbers of takes

In addition to uncertainty regarding whether the corresponding mitigation measures are appropriate, it is unclear how the numbers of takes for the active acoustic studies were determined. Dr. Ashe indicated that a minimum sample size of 30 was needed to determine if a given species responds to a specified signal but proposed only 80 takes for Dall's porpoises, 55 takes for harbor porpoises, 50 takes for West Coast Transient killer whales, 500 takes for Pacific white-sided dolphins, and 450 takes for each of the three pinniped species. During its informal review, the Commission expressed concern that the numbers of takes were low based on mean group size, the potential to take 30 different groups in 30 trials of each signal type and frequency, and the potential for non-target incidental takes. In response, the applicant increased the harbor porpoise takes to 80 and killer whale takes to 100. The numbers of takes for Dall's porpoises, Pacific white-sided dolphins, and pinnipeds were not revised.

The Commission is still concerned that the proposed numbers of takes are insufficient. For example, the maximum mean group size in waters within the study area is 5.04 for Dall's porpoises and 28.5 for Pacific white-sided dolphins (Watwood et al. 2018). Conducting 30 trials on 30 different groups could result in approximately 151 takes of Dall's porpoises and 855 takes of Pacific white-sided dolphins for the TAST odontocete signal trials alone. Those would not account for any incidental takes during experimental fisheries signal trials on pinnipeds when cetaceans are in the area or takes via harassment during pinger trials¹², potentially with multiple¹³ pinger types. This suggests that the proposed takes for each species could be easily exceeded. As such, the Commission recommends that NMFS increase the numbers of takes for Dall's porpoises, harbor porpoises, West Coast Transient killer whales, and Pacific white-sided dolphins based on mean group size and the potential for 30 trials of each signal type¹⁴ and frequency to be conducted on 30 different groups of each species that could be intentionally or incidentally harassed.

Quality control and application completeness

Based on outstanding issues delineated in the Addendum and the contradictory information in the revised application, it is still difficult to fully assess the proposed acoustic studies. The application available for public comment was inadequate and should not have been deemed complete by the agency. The acoustic studies should have either been fully revised or removed from the application. The Commission recommends that NMFS conduct a quality control review to better ensure that errors, omissions, or inconsistencies in permit applications and associated documents are identified and corrected, prior to publishing applications for review in the *Federal*

¹² Incidental or intentional, which, as previously discussed, should be included.

¹³ For example, at least two pinger types could be used with porpoises, Fishtek's dolphin and porpoise deterrent pinger and Fishtek's porpoise deterrent pinger. Conducting 30 trials with each pinger type could result in an additional 302 takes of Dall's porpoises.

¹⁴ For pingers, TAST, and experimental fisheries signals.

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Register—in particular, this quality control review should involve NMFS’s acoustic expert for any proposed acoustic study.

Please contact me if you have any questions concerning the Commission’s recommendation.

Sincerely,



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

cc: Dr. Amy Scholik-Schlomer, Office of Protected Resources
Ms. Amy Sloan, Office of Protected Resources

References

- NMFS. 2018. 2018 Revision to: Technical guidance for assessing the effects of anthropogenic sound on marine mammal hearing: Underwater acoustic thresholds for onset of permanent and temporary threshold shifts. Office of Protected Resources, Silver Spring, Maryland. 178 pages.
- NMFS. 2020a. Manual for optional user spreadsheet tool (Version 2.2; December) for: 2018 Technical guidance for assessing the effects of anthropogenic sound on marine mammal hearing (Version 2.0): Underwater thresholds for onset of permanent and temporary threshold shifts. Office of Protected Resources, Silver Spring, Maryland. 103 pages.
- NMFS. 2020b. Marine mammal non-lethal deterrents environmental assessment. Office of Protected Resources, Silver Spring, Maryland. 139 pages.
- Watwood, S.L., J.R. Borcuk, E.R. Robinson, E.M. Oliveira, and S.L. Sleeman. 2018. Dive distribution and group size parameters for marine species occurring in the U.S. Navy’s Northwest Training and Testing study area. NUWC-NPT Technical Report 12,298, Naval Undersea Warfare Center Division, Newport, Rhode Island. 75 pages.

Addendum

Outstanding issues include—

- The revised application still states that the TAST signals could be played at two frequencies but only one frequency is included in Table 3. The application text and Table 3 should be revised accordingly.
- It remains unclear how long a single focal follow could occur and how focal follow protocols for Southern Resident killer whales are different from other species. The application text should be clarified.
- The revised application text and Table 4 indicate that TAST in-air studies would include harbor seals, while other portions of the application indicate that the in-air studies would include California and Steller sea lions only. The application text should be revised accordingly.
- The frequency range of signals 1, 2a, and 4 should be specified in the revised application text consistent with signals 2b and 3.
- The maximum broadband source level of the TAST odontocete signal¹⁵ should be 187 not 185 dB re 1 μ Pa at 1 m in the revised application text.
- The reference distance must be included for the source levels specified in the revised application text.
- The OTB frequency with the maximum energy is irrelevant to the maximum broadband source level in Table 3.
- The maximum broadband source level for configuration 1 of the experimental fisheries signal should be 187 not 185 dB re 1 μ Pa at 1 m in Table 3.
- The maximum broadband source level of the TAST odontocete signal⁸ for mid-frequency cetaceans should be 187 not 185 dB re 1 μ Pa at 1 m in Table 3.
- The maximum broadband source level of the TAST odontocete signal⁸ for HF cetaceans¹⁵ should be 184 not 183 dB re 1 μ Pa at 1 m in Table 3.
- The reference distance must be included for the TAST in-air source level in Table 3.
- Citing Veirs et al. (2016) for the 18logR transmission loss is sufficient, the additional information in the revised application is unnecessary and, in some instances, irrelevant.
- Pseudo-replication would not be avoided or minimized if the same animals are exposed during three trials per day and numerous trials across days. A mixed-effects model will not solve autocorrelation issues if the same animals are exposed for multiple of the 30 trials needed for each source type, source level, frequency, and configuration specified in Table 3.
- Inconsistencies remain in the revised application text, Table 4, and the take table regarding whether the Eastern North Pacific Offshore stock of killer whales would be part of either the pinger *or* TAST studies. The application and take table should be revised accordingly.
- The 1.5-percent duty cycle for configuration 3 would only allow for one trial to occur on the same animals per day to remain below the 130-dB 20 μ Pa²-s specified sound level.

¹⁵ The applicant specified that the maximum broadband source level is 4 dB greater than the maximum OTB source level for the TAST odontocete and phocid signals.

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Reference

Veirs, S., V. Veirs, and J.D. Wood. 2016. Ship noise extends to frequencies used for echolocation by endangered killer whales. *PeerJ* 4:e1657.