



MARINE MAMMAL COMMISSION

1 May 2018

Mr. Stephen P. Henry, Field Supervisor
Ventura Fish and Wildlife Office
U.S. Fish and Wildlife Service
2493 Portola Road, Suite B
Ventura, CA 93003

Dear Mr. Henry:

The Marine Mammal Commission (the Commission), in consultation with its Committee of Scientific Advisors on Marine Mammals, has reviewed the application submitted by the U.S. Coast Guard (USCG) seeking authorization under section 101(a)(5)(D) of the Marine Mammal Protection Act (the MMPA) to take small numbers of marine mammals by harassment. The taking would be incidental to replacement of structures at USCG's Station Monterey in Monterey, California. The incidental harassment authorization would be valid for one year. The Commission also has reviewed the Fish and Wildlife Service's (FWS) 25 April 2018 notice (83 Fed. Reg. 18077) announcing receipt of the application and proposing to issue the authorization, subject to certain conditions.

Background

USCG plans to replace various structures at its Monterey Station. USCG was issued an incidental harassment authorization to conduct the proposed activities in 2015, but no work was conducted under that authorization. Operators would remove 17 16- to 18-in PVC-covered timber piles using a vibratory hammer. They also would install 17 14-in steel piles using a vibratory hammer and/or impact hammer. USCG expects pile removal and installation to occur on up to 8 days during daylight hours only.

FWS preliminarily has determined that, at most, the proposed activities temporarily would modify the behavior of small numbers of sea otters. It also anticipates that any impact on the affected species and stock would be negligible. FWS does not anticipate any take of sea otters by death or serious injury and believes that the potential for disturbance will be at the least practicable level because of the proposed mitigation measures. The proposed mitigation, monitoring, and reporting measures include—

- using a sound attenuation device (i.e., bubble curtain and cushion pads) during impact pile driving;
- conducting in-situ source level and sound propagation measurements¹ and adjusting the sizes of the Level A and B harassment zones, as necessary;

¹ During the installation of five piles and removal of five piles.

- ceasing activities if any marine mammal comes within 10 m of the equipment;
- using ramp-up, delay, and shut-down procedures;
- using delay and shut-down procedures, if the authorized takes are met and a sea otter approaches or is observed within the Level A and/or B harassment zone;
- using FWS-approved protected species observers (PSOs) to conduct baseline monitoring for two days during the week prior to pile removal and driving;
- using three land-based PSOs to monitor the Level A and B harassment zones 30 minutes prior to, during, and 30 minutes after pile removal and driving;
- reporting injured and dead marine mammals to the FWS's Southern Sea Otter Recovery Coordinator and the Monterey Bay Aquarium using FWS's phased approach and suspending activities, if appropriate; and
- submitting a final report.

Appropriateness of the Level B harassment threshold

As with numerous other proposed authorizations in recent years, FWS used the 160- rather than 120-dB re 1 μ Pa threshold for continuous non-impulsive sources² to estimate the extent of the Level B harassment zone and the number of takes during vibratory pile driving and removal. This tack differs from the USCG authorization for the 2015 activities (79 Fed. Reg. 58798) and other authorizations issued for activities that had the potential to harass southern sea otters (82 Fed. Reg. 6631). In those instances, FWS used the 120-dB re 1 μ Pa threshold³ for activities involving vibratory pile driving.

The Commission continues to question⁴ FWS's assumption that disruption of behavioral patterns occurs only at levels that *exceed* 160 dB re 1 μ Pa. In this particular *Federal Register* notice, FWS indicated that it used 160 dB re 1 μ Pa as the threshold for Level B harassment for both impulsive and non-impulsive sources based on the lack of disturbance or any other reaction by sea otters to the 1980s playback studies of Riedman (1983, 1984) and the absence of a clear pattern of disturbance or avoidance behaviors attributable to underwater sound levels up to about 160 dB re 1 μ Pa resulting from vibratory pile driving during previous monitoring activities. The Riedman (1983, 1984) studies were part of the larger Malme et al. (1983, 1984) playback studies that both were conducted off the California coast to assess responses of migrating gray whales and informed the 160-dB re 1 μ Pa threshold for impulsive sources. However, Riedman (1983, 1984) was not a true controlled exposure experiment, because it did not provide information regarding received levels paired with an otter's response (or lack thereof) to the associated sound emitted. The Commission questions the use of the Riedman data in general⁵ but also notes that methods associated with controlled exposure experiments have advanced considerably in the last 35 years. The Commission also is perplexed that FWS accepts the data from the Malme (1983, 1984) studies on gray whale

² FWS did indicate that it used the National Marine Fisheries Service's (NMFS) Level A harassment thresholds based on permanent threshold shift (PTS) for *non-impulsive, continuous* sources. Thus, the appropriate Level A harassment thresholds were used.

³ Which is based on Malme et al. (1988) investigating gray whale responses to playbacks of drillship sounds in Alaska.

⁴ See the Commission's [13 June 2017 letter](#) detailing this issue.

⁵ Including issues associated with inclement weather conditions as referenced by Riedman (1983) and greater distances to the target animals from the playback source in Riedman (1984).

response to impulsive sources but rejects the same studies related to gray whale response to non-impulsive sources (Malme et al. 1988). That choice appears arbitrary.

FWS also indicated that previous monitoring results during vibratory pile driving in California⁶ showed no clear pattern of sea otter disturbance or avoidance in relation to the various levels of underwater sound exposure. The Commission disagrees. During vibratory installation of sheet piles, 55 percent of the observed sea otters traveled away from the area or exhibited a startle dive in response to received levels less than 160 dB re 1 μ Pa (Table 8 in ESNERR 2011). Similarly, 50 percent of the observed sea otters⁷ traveled away from the area or exhibited a startle dive in response to received levels ranging from 141–144 dB re 1 μ Pa during vibratory installation of H-piles, and 33 percent of the observed sea otters traveled away from the area at received levels less than 135 dB re 1 μ Pa (Table 7 in ESNERR 2011). The pattern is quite clear, sea otters are disturbed by or avoid vibratory pile-driving activities well below 160 dB re 1 μ Pa. The Commission further notes that these observed responses would equate to a behavioral severity score of 6 or more (based on Southall et al. 2007), which have a greater potential to affect sea otter foraging, reproduction, or survival.

In addition, FWS asserted that much of the sound generated by vibratory pile driving is expected to be inaudible or marginally audible to sea otters based on their poor hearing sensitivity below 2 kHz (Ghoul and Reichmuth 2014⁸) and most of the acoustic energy emitted during vibratory pile driving being limited to frequencies below 2 kHz (Dahl et al. 2015). Based on the previous monitoring results discussed herein, sea otters can definitely hear vibratory pile driving. Thus, FWS's assertion that vibratory pile driving sound is inaudible is patently false. The assumption that vibratory pile driving sound would be marginally audible also is refuted by the actual reference provided by FWS to support its claim. Ghoul and Reichmuth (2014) indicated that sea otter hearing sensitivity measured from 125 Hz to 2 kHz ranged from 90 to 116 dB re 1 μ Pa, which are below 120 dB re 1 μ Pa. An additional point to note is that the Level B harassment thresholds are all unweighted—that is, sound at 125 Hz and 2 kHz are assumed to be perceived by an animal equally and an animal needs to only hear the greatest sound pressure level in any octave band to respond. Sea otters can hear, and thus respond to, vibratory pile-driving sound down to the 120-dB re 1 μ Pa threshold.

Finally, FWS estimated the distance to the in-air Level B harassment zone to be greater than the in-water Level B harassment zone (20 vs 14 m, respectively⁹). This defies physics and basic underwater acoustic principles, given that sound is transmitted much more efficiently in water than in air. Although FWS has revised its rationale for its use of the 160-dB re 1 μ Pa threshold for each

⁶ Elkhorn Slough National Estuarine Research Reserve (ESNERR, 2011).

⁷ At 30–60 m from the source.

⁸ Best hearing sensitivity is defined as occurring within 20 dB of the lowest measured threshold (Reichmuth et al. 2013, Ghoul and Reichmuth 2014). Although FWS noted that best hearing sensitivity for sea otters ranged from 8–16 kHz (83 Fed. Reg. 18079), Ghoul and Reichmuth (2014) indicated that the best hearing sensitivity actually occurred from 2–26 kHz. It is important to note that FWS, in another recent proposed authorization, indicated that the sea otter's best hearing sensitivity occurred between 1.25 and 27 kHz (83 Fed. Reg. 18333), which is more comparable to the hearing data provided by Ghoul and Reichmuth (2014). FWS should not have differing stances on a sea otter's best hearing sensitivity when the underlying data are the same.

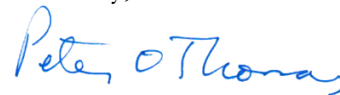
⁹ The in-air source level was based on vibratory driving of 18-in piles and the in-water source level was based on vibratory driving of 24-in piles as proxies. The difference would have been even more pronounced if data would have been available for in-water vibratory driving of 18-in piles.

proposed authorization, it has yet to provide relevant justification or scientific substantiation for its use. Until such time that the 120- and 160-dB re 1 μ Pa thresholds are updated or FWS develops its own Level B harassment thresholds, the Commission again recommends that FWS use the 120- rather than 160-dB re 1 μ Pa threshold to estimate extent of the Level B harassment zone and numbers of sea otter takes during vibratory pile driving and removal.

In previous letters regarding this matter, the Commission had strongly suggested that FWS consult with NMFS regarding the appropriateness of the various thresholds. This does not appear to have occurred. FWS provided informal comments on NMFS's originally proposed PTS thresholds during the interagency review in 2013, but did not provide formal comments on them during any of the four public comment periods¹⁰. FWS also did not participate with the 11 other federal agencies¹¹ during NMFS's 2017 interagency consultation regarding its final PTS thresholds. Given that FWS is one of only two regulatory agencies responsible for authorizing the incidental taking of marine mammals based on the various thresholds, the Commissions recommends that FWS take a more active role in the development, review, and implementation of any and all acoustic and behavior thresholds for marine mammal species under its jurisdiction.

Thank you for the opportunity to provide comments on USCG's application. Please contact me if you have questions regarding the Commission's recommendations.

Sincerely,



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

cc: Diane Bowen, FWS

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¹⁰ Six federal agencies provided formal written comments on the proposed thresholds.

¹¹ Including NMFS, the Commission, Bureau of Ocean Energy Management, Department of State, Federal Highway Administration, National Park Service, National Science Foundation, U.S. Air Force, U.S. Army Corps of Engineers, U.S. Geological Survey, and U.S. Navy.

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