



MARINE MAMMAL COMMISSION

29 August 2016

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 application submitted by the Alaska Department of Transportation and Public Facilities (AK DOT) 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 reconstruction of the ferry terminal in Gustavus, Alaska. The Commission also has reviewed the National Marine Fisheries Service's (NMFS) 23 June 2016 notice (81 Fed. Reg. 40852) announcing receipt of the application and proposing to issue the authorization, subject to certain conditions.

AK DOT plans to reconstruct portions of the Gustavus Ferry Terminal. Operators would install up to 57 12.75- to 30-in steel piles using a vibratory and an impact hammer. They also would remove up to 16 12.75-in steel piles using a vibratory hammer or by cutting them off at the mudline. AK DOT expects activities to take up to 50 days, weather permitting. It would limit pile-driving and -removal activities to daylight hours only during the timeframe from 1 September–30 November 2017 and 1 March–31 May 2018.

NMFS preliminarily has determined that, at most, the proposed activities temporarily would modify the behavior of small numbers of seven marine mammal species. NMFS anticipates that any impact on the affected species and stocks would be negligible. NMFS also does not anticipate any take of marine mammals 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 mitigation, monitoring, and reporting measures include—

- using a sound attenuation device (e.g., pile caps) during impact driving of steel piles¹;
- ceasing pile-driving and -removal activities if any marine mammal comes within 10 m of the equipment;
- using standard² soft-start, delay, and shut-down procedures;

¹ NMFS informed the Commission that it would require these measures after publication of the notice in the *Federal Register*.

- using two³ qualified land-based protected species observers (PSOs) to monitor the Level A and B harassment zones for 30 minutes before, during, and for 30 minutes after the proposed activities—supplementing those observations with information from the National Park Service and local whale-watching charters on locations of humpback whales and Steller sea lions within Icy Strait/Passage;
- using delay and shut-down procedures if a species for which authorization has not been granted (including but not limited to gray whales and Pacific white-sided dolphins) or if a species for which authorization has been granted but the authorized number of takes are met, approaches or is observed within the Level B harassment zone¹;
- reporting injured and dead marine mammals to the Office of Protected Resources and the Alaska Stranding Coordinator using NMFS's phased approach and suspending activities, if appropriate; and
- submitting a final report.

Source level and extent of the Level B harassment zone

AK DOT proposed to use 154.3 dB re 1 μ Pa at 10 m⁴ as the source level for vibratory pile driving of the 30-in steel piles based on measurement of a single pile obtained at the ferry terminal in Kake, Alaska (MacGillivray et al. 2015). Although that measurement is much lower than other measurements obtained for vibratory pile driving of 30-in steel piles obtained at other locations (averages range from 160 to 170 dB re 1 μ Pa at 10 m⁵) and lower than measurements obtained from another pile at Kake, NMFS apparently agreed with AK DOT and proposed to use that single source level to determine the extent of the Level B harassment zone. The Commission is unsure why NMFS decided to accept AK DOT's proposal to use a source level that is well below the range of source levels measured during similar vibratory pile-driving activities⁶ or cited/used in NMFS's other incidental harassment authorizations for the same pile size and type (81 Fed. Reg. 52656, 80 Fed. Reg. 53126, 79 Fed. Reg. 53038, 77 Fed. Reg. 39473). Sediment composition is the most important environmental factor affecting source level generation. Source level estimates obtained by hydrophones placed more than several hundred meters away from the site will also be affected by environmental factors like bathymetry and sound speed profiles.

The main factors affecting source level measurements are first and foremost the installation method (vibratory vs. impact) and then the type and size of the piles, followed by sediment composition as the most important environmental factor. Bathymetry/water depth and sound speed profiles also would affect source level measurements obtained by hydrophones farther from the source. Starkes and Stutes (2016) did state that geotechnical reports indicated that substrates at Kake and Gustavus are somewhat different. They indicated that sediments at Kake are largely composed

² NMFS informed the Commission that it incorrectly included in the notice 30 rather than 15 minutes as the clearance time for small cetaceans and pinnipeds and will amend this for the final authorization.

³ NMFS informed the Commission that it would increase the number of observers from one as proposed in the notice to two.

⁴ MacGillivray et al. (2015) measured vibratory driving of two piles, one with a source level of 154 and another with a source level of 160 dB re 1 μ Pa at 10 m.

⁵ With the overall maximum source level of 174 dB re 1 μ Pa at 10 m.

⁶ See Laughlin (2010) and Naval Facilities Engineering Command Southwest (NAVFAC SW; 2014 and 2015) for source level measurements of vibratory pile driving of 30-in steel piles.

of organic muds between 10 and 15 feet deep over silty sands and gravel (Dames & Moore 1973). However, substrates at Gustavus have a smaller percentage of fines, but are fine-grained, composed primarily of sand and silty sands (AK DOT 2008). Those findings would explain why the values obtained at Kake are much lower than other measured source levels, thus raising the question of why NMFS would consider that a location with a deep layer of mud (which is more absorptive of sound) is comparable to one with sand and silt (which are more reflective). Considering only NAVFAC SW (2014, 2015) data from Naval Base Point Loma (Point Loma), which also has primarily a sand and silt substrate⁷, source levels from four 30-in piles ranged from 160 to 172 dB re 1 μ Pa at 10 m (with a mean of 166 dB re 1 μ Pa at 10 m). Given that AK DOT would not be conducting in-situ measurements to confirm either the source level or sound propagation at Gustavus, the Commission believes, based on similarities in sediment properties, that it would be prudent for NMFS to use the mean of the measurements obtained at Point Loma as a proxy for the source level at Gustavus.

Further, it has been surmised that source level measurements obtained closer to Gustavus (i.e., Kake) would be more applicable than measurements made at more distant sites, such as in Washington or California. That assumption is a bit perplexing since sound speed profiles (which are more characteristic of regional temperature and salinity stratifications) would influence long-range sound propagation but not close-range source levels that are measured generally within 5 m of the 10-m reference standard. The geographic location of such measurements is the least important factor when determining source level proxies. For these reasons, the Commission recommends that NMFS use 166 rather than 154.3 dB re 1 μ Pa at 10 m as the source level for vibratory driving of 30-in steel piles at Gustavus and re-estimate the extent of the Level B harassment zone accordingly.

In addition, Starks and Stutes (2016) indicated that using sound source data from the Kake ferry terminal project would provide a considerably more manageable monitoring program and likely a much smaller take estimate given the difference in order of magnitude observed when using a vibratory hammer⁸. Source levels that inform incidental take authorizations should be based on best available science, not the manageability of monitoring the respective Level B harassment zones and the estimated numbers of takes.

With respect to monitoring requirements, AK DOT proposed to use, and NMFS planned to require, only one PSO to monitor the respective Level A and B harassment zones (81 Fed. Reg. 40869). NMFS has since informed the Commission that it would require AK DOT to have two PSOs monitoring during all vibratory pile-driving activities. However, given that the extent of the Level B harassment zone, if properly amended, would be 11.7 km⁹ rather than 1.9 km, two PSOs likely would not be sufficient to monitor the entire ensonified area.

⁷ See Table 2-10 in Department of the Navy (DON; 2012).

⁸ It appears AK DOT was referred by NMFS to data from California Department of Transportation (Caltrans; 2012). Data for vibratory driving of 30-in steel piles were not available so a source level of 170 dB re 1 μ Pa at 10 m for 36-in steel piles was used as a proxy, which interestingly is in the range of source levels measured at Point Loma for 30-in steel piles. That higher source level yielded a Level B harassment zone of 21.5 km vs. 1.9 km estimated from the Kake source level.

⁹ Assuming a source level of 166 dB re 1 μ Pa at 10 m and practical spreading loss, which was proposed for use in the authorization and the Commission believes is applicable.

Furthermore, the amended Level B harassment zone would extend farther into Icy Strait than originally proposed. In multiple instances, AK DOT, and in turn NMFS, based its take estimates¹⁰ on the lesser probability that a species would occur in Icy Passage rather than in Icy Strait. If the number of takes authorized for any species is met, the activities would be delayed or shut down. NMFS should ensure that the numbers of takes to be authorized are adequate for the proposed activities. The Commission therefore recommends that NMFS (1) require AK DOT to use the appropriate number of PSOs needed to monitor the full extent of the Level B harassment zone during all vibratory pile-driving activities, which may necessitate using additional PSOs and/or vessel-based PSOs and (2) ensure that the currently estimated numbers of takes are adequate given the amended Level B harassment zone extending into Icy Strait and if they are not, amend the estimated numbers of takes accordingly.

General improvements

The Commission finds it regrettable that NMFS did not realize the issue with the proposed source level prior to publishing the proposed incidental harassment authorization. Given the amount of in-situ source level data obtained by Caltrans, DON, Washington State Department of Transportation, and other action proponents in the last 10 years, the Commission believes it would be useful for NMFS to compile all of the in-situ pile-driving and -removal data into a central database. This would enable analysts to crosscheck data in situations like the one discussed herein, as well as in situations when action proponents are having difficulty determining proxy source levels. The Commission recognizes that the available data have limitations, but that does not preclude NMFS from compiling those data and working to ensure the quality of what is collected and available in the future.

Specifically, some of the relevant information is not contained within the various hydroacoustic monitoring reports, including sediment composition, water depth (in terms of hydrophone placement and bathymetry), and duration over which the pressure was averaged for vibratory pile driving sound pressure level root-mean-square (SPL_{rms}) metrics. Further, results reported in the various reports use inconsistent integration timeframes for SPL_{rms} . Some reports note averages of 1-second averages, while others report averages of the maximum SPL_{rms} over 10-second and 30-second timeframes of continuous sound. In either case, reporting the median rather than the average¹¹ would be more informative and avoid the problem of skewing results by including any single value that is extremely high or low compared to the rest of the measurements. Therefore, the Commission recommends that NMFS (1) compile all in-situ source level¹² pile-driving and -removal measurements from past and future projects in a central database, (2) require that each action proponent specify the sediment composition, water depth (in terms of hydrophone placement and bathymetry), duration over which the pressure was averaged for SPL_{rms} metrics, and median values in all future hydroacoustic monitoring reports, and (3) ensure consistency regarding integration timeframes used for SPL_{rms} measurements (e.g., 1-second averages, maximum over 10 seconds, or maximum over 30 seconds) in all future hydroacoustic monitoring reports. The Commission would be happy to consult with NMFS on these improvements.

¹⁰ Group sizes of the various species observed locally were used to inform the take estimates.

¹¹ In addition to the minimum and maximum.

¹² Including sediment composition and water depth. Transmission loss values would be valuable as well.

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

Sincerely,



Rebecca J. Lent, Ph.D.
Executive Director

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