



MARINE MAMMAL COMMISSION

18 September 2018

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 Port of San Francisco (Port of SF) 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 ferry and water taxi landing construction in San Francisco, California. The Commission also has reviewed the National Marine Fisheries Service's (NMFS) 22 August 2018 notice (83 Fed. Reg. 42465) announcing receipt of the application and proposing to issue the authorization, subject to certain conditions.

Port of SF plans to construct the Mission Bay Ferry Landing and Water Taxi Landing in San Francisco. Operators would install up to 28 permanent 16- to 36-in steel piles and numerous temporary 14- and 30-in steel piles¹ using a vibratory hammer, an impact hammer, and/or down-the-hole (DTH) drilling. They also would remove up to 12 12-in steel piles using direct pull or a vibratory hammer. Port of SF expects pile-installation and -removal activities to take 15 days, weather permitting. It would limit pile-driving and -removal activities to daylight hours from 1 June to 30 November 2019.

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 proposed mitigation, monitoring, and reporting measures include—

- conducting ambient sound measurements²;
- using a sound attenuation device (i.e., bubble curtain) during impact driving and implementing performance standards measures for the bubble curtain;
- ceasing pile-driving and -removal activities if any marine mammal comes within 10 m of the equipment;

¹ Temporary piles would be removed using direct pull.

² As required by the regional NMFS office and U.S. Army Corps of Engineers.

- using two to four³ 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;
- using standard soft-start, delay, and shut-down procedures;
- using delay and shut-down procedures, if a species for which authorization has not been granted (including but not limited to humpback whales or Guadalupe fur seals) or a species for which authorization has been granted but the authorized takes are met, approaches or is observed within the Level B harassment zone;
- reporting injured and dead marine mammals to the Office of Protected Resources and the West Coast Regional Stranding Coordinator using NMFS's phased approach and suspending activities, if appropriate; and
- submitting a final report.

General comments and concerns

In its review of the preamble and proposed authorization, the Commission informally advised NMFS of various errors and omissions, including a few major concerns. Those concerns included—

- using an incorrect number of piles and/or incorrect hours of installation to estimate the extents of the Level A harassment zone⁴ for vibratory installation of 14- and 36-in piles and for DTH drilling;
- using an incorrect source level or reference distance to estimate the extents of the Level B harassment zone⁵ for impact and vibratory installation of 16-in piles and for DTH drilling;
- incorrectly calculating the numbers of estimated Level B harassment takes for harbor seals, California sea lions, and harbor porpoises;
- not including a sufficient number of Level B harassment takes for elephant seals and northern fur seals to account for the possibility of those species being present in the project area more than once⁶;
- not proposing to authorize Level A harassment takes for harbor seals when the basic take calculation estimated that two takes could occur and that species has the potential to occur in the Level A harassment zone in even greater numbers; and
- not specifying the number of PSOs that would be required to monitor during the various activities.

The Commission notes that these types of general issues have been ongoing in NMFS's proposed incidental harassment authorizations. In this instance, many of the issues should have been addressed when either the original application⁷ or the draft *Federal Register* notice was reviewed internally. NMFS has indicated that it plans to include relevant revisions in the final authorization

³ NMFS has since clarified that two PSOs would be required to monitor during the various activities, and takes would be extrapolated to the unobserved portion of the Level B harassment zones.

⁴ Resulting in larger Level A harassment zones, ensonified areas, and shut-down zones.

⁵ Resulting in smaller Level B harassment zones and ensonified areas.

⁶ NMFS would increase the number of Level B harassment takes from one to three for both species.

⁷ During NMFS's early review team (ERT) meetings.

for all issues, except that it still does not plan to authorize Level A harassment takes of harbor seals.

Level A harassment takes of harbor seals are routinely authorized by NMFS for all construction activities involving impact pile driving of 36-in piles in San Francisco Bay. The Commission notes that harbor seals are the most common species observed during construction activities in San Francisco Bay, which is supported by the basic take calculation results. Harbor seals also can easily pop up in the Level A harassment zone without being detected as they approach the zone. If a harbor seal is observed within the Level A harassment zone⁸ before impact driving ceases, that take would be enumerated as a Level A harassment take. The Commission understands that the Port of SF has a strong desire to avoid Level A harassment takes. However, the optics of potentially violating an incidental harassment authorization are worse than being authorized to take a small number of seals by Level A harassment. Given that (1) Level A harassment takes of harbor seals were estimated to occur, (2) the species has the potential to be taken, and (3) implementation of mitigation measures is not 100 percent effective, the Commission recommends that NMFS authorize at least two, if not more, Level A harassment takes of harbor seals.

Bubble curtain efficacy

The Commission previously has commented on the assumptions used by NMFS regarding efficacy of bubble curtains⁹ during impact installation. Over the years, NMFS has been inconsistently applying presumed source level reductions when bubble curtains are used during impact pile driving. In some instances, source level reductions are assumed to be 10 dB (80 Fed. Reg. 48504 and numerous authorizations issued to California Department of Transportation (Caltrans) through 2017) when bubble curtains are to be employed, while 0 dB (83 Fed. Reg. 22640, 81 Fed. Reg. 15082), 6 dB (81 Fed. Reg. 26647), 7 dB (for the proposed authorization), and 8 dB (81 Fed. Reg. 19342) have been used in other instances. In the last few months, NMFS has begun to assume a more standard 7-dB reduction for some authorizations in response to Commission recommendations regarding this matter. However, NMFS continues to assume no reductions for other authorizations as well and such a reduction should be assumed based on the inherent variability in attenuation levels achieved by bubble curtains.

As noted previously, that variability is based on differences in bubble curtain design, site and environmental conditions, and difficulties in properly installing and operating such devices. Installation and operation difficulties could be alleviated with NMFS's proposed requirement for the Port of SF to implement various bubble curtain performance standards¹⁰. However, the main reason bubble curtains do not achieve reduced sound levels consistently is because sound resonates through the ground into the far field beyond the confines of the bubble curtain.

Although NMFS indicated that the assumed 7-dB reduction in source levels was based on average values reported by Caltrans (2015), the Commission contends that that value is invalid for far-field measurements and ultimately for estimating the extents of both Level A and B harassment

⁸ Which is up to 130 m.

⁹ See its [3 January 2017 letter](#).

¹⁰ NMFS is not including these requirements consistently for all incidental take authorizations that include bubble curtains.

zones. That is, near-field source level reductions are irrelevant when the far-field values serve as the basis for both the Level A and B harassment zones. MacGillivray et al. (2007) also indicated that the effectiveness of bubble curtains¹¹ was range-dependent and sound attenuation diminished with range from the pile. Caltrans (2005) also stated that effectiveness of the bubble curtain varied with direction and distance from the pile and under different tidal conditions.

In general, bubble curtains provide the greatest reduction in SPLs in the near field¹². At distances of 400–500 m, SPLs were reduced by only 1 to 2 dB (Caltrans 2005). Although a flood tide may have had some effect on the performance of the bubble curtain, the SPL reductions were still 5 to 10 dB at distances of 45–120 m. This finding confirms that, at greater distances, more of the sound emitted during impact pile driving resonates from the ground than through the water column¹³. Bubble curtains are not designed to, nor can they, attenuate ground-borne sound. Furthermore, Caltrans (2015) stated that, because of uncertainties associated with the degree of attenuation that would be provided by a bubble curtain, an assumed source level reduction should be limited to 5 dB. The Commission continues to assert that even a 5-dB reduction could lead to an underestimation of impacts, particularly since the intent of the bubble curtain is to mitigate peak sound pressure levels (SPL_{peak}) for fish in the near field¹⁴. The Commission is unaware of any proven efficacy of bubble curtains to substantially reduce sound levels in the far field for marine mammals.

Given that Level A harassment is primarily based on thresholds¹⁵ associated with SEL_{cum}, it is the far-field sound that matters—particularly when the estimated ranges to Level A harassment are on the order of 100s¹⁶ to 1,000s¹⁷ of meters. Level B harassment also is estimated to occur at comparable or greater far-field distances. At those distances, bubble curtains have not been shown to consistently produce sound level reductions of 5 dB, let alone 7 dB¹⁸. Therefore, the Commission recommends that NMFS refrain from applying a source level reduction factor when sound attenuation devices are to be implemented during impact pile driving for all relevant incidental take authorizations, including for the Port of SF's authorization.

If and when NMFS determines the appropriate accumulation time associated with its SEL_{cum} thresholds, it could consider using a source level reduction to estimate the ranges to Level A harassment, which would likely be much less than 10 dB. NMFS should then review the related literature on bubble curtain efficacy in concert with estimated ranges to the SEL_{cum} thresholds based on the revised accumulation time to determine what, if any, source level reduction would be appropriate. Source levels should not be reduced when determining the range to Level B harassment.

¹¹ A similar trend was observed for foam temporary noise attenuation piles.

¹² In general, the majority of the sound level measurements have been collected in the near field (well within 100 m) for studies involving unattenuated and attenuated pile driving using a bubble curtain.

¹³ This phenomenon also was noted in Caltrans (2015). If sound was primarily being emitted through the water column, comparable reductions (or greater reductions with increasing water depths) should be produced with increasing distance from the source, not lesser reductions.

¹⁴ Bubble curtains originally were used to minimize both lethal and sub-lethal effects on fish.

¹⁵ NMFS uses dual metrics for determining the range to Level A harassment, SPL_{peak} and SEL_{cum}. However, the ranges to SPL_{peak} are always less than the ranges to SEL_{cum} for impact pile-driving activities.

¹⁶ As referenced in the proposed authorization.

¹⁷ As referenced in 83 Fed. Reg. 18791 and other similar notices.

¹⁸ Which applies to both Level A and B harassment.

Hydroacoustic monitoring plan availability

Port of SF proposed to monitor ambient sound conditions as required by the regional NMFS office and U.S. Army Corps of Engineers. NMFS indicated in the *Federal Register* notice that ambient sound measurements are highly specific to the time and place they are obtained and therefore have limited utility for other projects. The Commission agrees and notes that it is not appropriate to measure ambient conditions at 10, 100, or even 300 m from the source as proposed by Port of SF. Ambient conditions are measured to determine where the various pile-driving activities can no longer be detected, which would occur much farther from the source than 300 m. NMFS further recommended that Port of SF focus its sound monitoring plan on conducting rigorous hydroacoustic monitoring of source levels for DTH drilling given that few measurements exist and a proxy source level had to be used for the proposed authorization. The Commission again agrees with NMFS on its recommendation but contends that NMFS should include a requirement for Port of SF to measure source levels from DTH drilling in the authorization rather than merely recommend that the Port do so. Since the Port would already be conducting sound measurements at 10 m from the source, it should not be cost-prohibitive for it to take additional measurements at the same location when DTH drilling is occurring. The Commission recommends that NMFS require Port of SF to conduct in-situ sound source measurements of DTH drilling in conjunction with the Port's required sound measurements of ambient conditions.

Port of SF has yet to provide NMFS its proposed hydroacoustic monitoring plan, thus the plan's appropriateness cannot be fully assessed. However, the Commission has noted various shortcomings in proposed hydroacoustic monitoring plans that previously have been previously reviewed by NMFS¹⁹. The Commission supports action proponents conducting hydroacoustic monitoring but only if the measurements and resulting analyses are conducted appropriately. Those plans and resulting measurements underpin the proposed mitigation and monitoring requirements under section 101(a)(5)(D) of the MMPA and should be made available for review with authorization applications. The Commission recommends that NMFS require action proponents to provide proposed hydroacoustic monitoring plans when authorization applications are submitted and make those plans available for public comment. If such plans are not provided in a timely manner, NMFS should, at the very least, provide them to the Commission for review sufficiently in advance of issuing the final authorization.

Proposed one-year authorization renewals

NMFS has indicated that it may issue a second one-year²⁰ incidental harassment authorization renewal for this and other future authorizations if various criteria are met (see 83 Fed. Reg. 42489 for details). The Commission agrees that NMFS should take appropriate steps to streamline the authorization process under section 101(a)(5)(D) of the MMPA to the extent possible. However, the Commission is concerned that the renewal process proposed in the *Federal Register* notice is inconsistent with the statutory requirements. Section 101(a)(5)(D) clearly states that proposed authorizations are subject to publication in the *Federal Register* and elsewhere and that there

¹⁹ For example, see the Commission's [17 September 2018](#), [16 April 2018](#), [10 July 2017](#), [3 January 2017](#) and [29 August 2016](#) letters.

²⁰ NMFS informed the Commission that the renewal would be issued as a one-time opportunity, after which time a new authorization application would be required. NMFS has yet to specify this in any *Federal Register* notice detailing the new proposed renewal process but should do so.

be a presumably concurrent opportunity for public review and comment. NMFS's proposed renewal process would bypass the public notice and comment requirements when it is considering the renewal.

The Commission further notes that NMFS recently implemented an abbreviated authorization process by publishing the required information²¹ via an abbreviated *Federal Register* notice and by referencing the relevant documents. The abbreviated process preserves the full opportunity for public review and comment, does not appear to be unduly burdensome on either the applicant or NMFS, and is much preferred over NMFS's proposed renewal process²². Thus, the Commission recommends that NMFS refrain from implementing its proposed renewal process and instead use abbreviated *Federal Register* notices and reference existing documents to streamline the incidental harassment authorization process. If NMFS adopts the proposed renewal process notwithstanding the Commission's recommendation, the Commission further recommends that NMFS provide the Commission and the public with a legal analysis supporting its conclusion that the process is consistent with the requirements under section 101(a)(5)(D) of the MMPA.

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

Sincerely,



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

References

- Caltrans. 2005. San Francisco–Oakland Bay Bridge east span seismic safety project: Hydroacoustic monitoring report. State of California Department of Transportation, Sacramento, California. 244 pages.
- Caltrans. 2015. Technical guidance for assessment and mitigation of the hydroacoustic effects of pile driving on fish. State of California Department of Transportation, Sacramento, California. 532 pages.
- MacGillivray, A., E. Ziegler, and J. Laughlin. 2007. Underwater acoustic measurements from Washington State Ferries 2006 Mukilteo ferry terminal test pile project. JASCO Research, Ltd, Victoria, British Columbia. 27 pages.

²¹ Including any changes to the proposed activities or assumptions made and results from the draft monitoring report.

²² See the Commission's [30 April 2018 letter](#) detailing this matter.