



# MARINE MAMMAL COMMISSION

26 June 2012

Mr. P. Michael Payne, Chief  
Permits and Conservation Division  
Office of Protected Resources  
National Marine Fisheries Service  
1315 East-West Highway  
Silver Spring, MD 20910-3225

Dear Mr. Payne:

The Marine Mammal Commission, in consultation with its Committee of Scientific Advisors on Marine Mammals, has reviewed the application submitted by the America's Cup Event Authority and the Port of San Francisco (the Authority and Port) seeking authorization under section 101(a)(5)(D) of the Marine Mammal Protection Act to take small numbers of marine mammals by harassment. The taking would be incidental to construction activities, helicopter overflights, and firework displays in support of the 34<sup>th</sup> America's Cup in San Francisco, California. The incidental harassment authorization would be valid for a one-year period. The Commission also has reviewed the National Marine Fisheries Service's 1 June 2012 *Federal Register* notice (77 Fed. Reg. 32573) announcing receipt of the application and proposing to issue the authorization, subject to certain conditions.

## RECOMMENDATIONS

The Marine Mammal Commission recommends that the National Marine Fisheries Service issue the incidental harassment authorization but require the Authority and Port to—

- assess and use the average ambient sound level minus two standard deviations down to the 120-dB re 1  $\mu$ Pa threshold as a basis for establishing the Level B harassment zone;
- implement ramp-up procedures after 15 minutes if pile driving was delayed or shut down because of the presence of a marine mammal within or approaching the shut-down zone and observers did not see that marine mammal leave the zone;
- monitor before, during, and after all ramp-ups of vibratory and impact pile-driving to gather the data needed to determine the effectiveness of this technique as a mitigation measure; and
- monitor the Level A and B harassment zones to detect the presence and characterize the behavior of marine mammals during all vibratory and impact pile-driving activities.

## RATIONALE

The Authority and Port plan to install temporary dock facilities in addition to permanent improvements to existing structures to accommodate America's Cup events from July 2012 to September 2013. The actual race would occur within the western central portion of San Francisco Bay, and the Authority and Port have planned numerous projects along the waterfront from Pier 80 to Aquatic Cove. They also propose to use helicopters to support broadcasting and media operations during the races and, in 2013 only, they plan commercial-grade firework displays during

the opening and closing ceremonies. The incidental harassment authorization would be valid for one year. However, the Authority and Port may require an additional authorization for a portion of those activities in 2013.

The Authority and Port would use vibratory hammers to drive 244 18-inch steel piles to support the temporary floating docks at 10 sites. A maximum of eight piles would be installed per day and approximately two weeks would be required to install floating docks at each site. Vibratory pile driving would occur from July to August 2012 and March to June 2013. The Authority and Port also would repair Pier 19, which would require use of an impact hammer to install 224 12-in wood piles. A maximum of eight piles would be installed per day and approximately 28 days would be required for the repair. Impact pile driving would occur sometime between July and December 2012. Only one impact hammer would be used at a given time and only during daylight hours. No more than one vibratory hammer would be used at a given site but it could be used day or night.

Race events would occur during a 9-day period in August and October 2012 and during a 58-day period from July to early September 2013. Race judges would use personal watercraft and rigid inflatable boats. Media outlets would use helicopters to obtain videos and describe the races. One or two helicopters would remain above 122 m altitude, while others would fly between 30 and 122 m to provide closer coverage of the races. A water and air traffic plan would be created for the events. Finally, four firework displays would occur during the opening and closing 2013 events, which may occur outside of the timeframe of the proposed authorization. The displays would be staged from barges near Piers 27 to 29 and would last 30 to 45 minutes each. The fireworks would be launched at altitudes of 60 to 305 m. All firework displays would be approved by the U.S. Coast Guard.

The Service preliminarily has determined that, at most, the proposed activities temporarily would modify the behavior of small numbers of harbor seals, California sea lions, harbor porpoises, and northern elephant seals. If a large whale is observed during a race, the race could be postponed or abandoned depending on the whale's location and direction of travel. The Service anticipates that any impact on the affected species and stocks would be negligible. The Service 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 and monitoring measures. The measures include—

- using a cushion block or similar device to reduce sound pressure levels during impact driving of wood piles;
- using no more than one impact hammer at any given time;
- conducting in-situ sound propagation and ambient sound measurements to verify or adjust the respective Level A and B harassment zones, as necessary;
- using a Service-approved protected species observer to monitor the Level A and B harassment zones 30 minutes prior to, during, and 30 minutes after impact pile driving;
- using delay and shut-down procedures;
- using ramp-up procedures for vibratory and impact pile driving at the beginning of the work day and when hammering ceases for more than 30 minutes;

- using Service-approved protected species observers to monitor the Level B harassment zone for marine mammals during vibratory pile driving for the first two days of representative pile driving at each site and reducing monitoring requirements to no less than one-third of the total pile driving days at each site;
- restricting helicopter overflights to no less than 30 m altitude and avoiding direct overflights of Pier 39;
- using Service-approved protected species observers to monitor pinnipeds at Pier 39 for the first five days of helicopter operations and ceasing monitoring if pinnipeds are not being disturbed or are being disturbed at a much lesser degree than anticipated—if pinnipeds are disturbed as anticipated, monitoring would continue for no less than one-third of the total helicopter operating days;
- limiting firework displays to two 30-minute and two 45-minute events;
- using Service-approved protected species observers to monitor pinnipeds at Pier 39 and marine mammals in the vicinity of the fireworks barge for at least 30 minutes as close to the actual display time as possible and to document any injured or dead marine mammals for at least 30 minutes no later than the morning following each display;
- reporting injured and dead marine mammals to the Service and local stranding network using the Service's phased approach and suspending activities, if appropriate; and
- submitting a final report.

### **Thresholds and in-situ sound measurements**

The Service normally uses 120 dB re 1  $\mu$ Pa as the threshold for Level B harassment for vibratory pile driving (i.e., non-impulsive sound). However, for the purpose of estimating the extent of the Level B harassment zone for the proposed authorization, it used a threshold of 133 dB re 1  $\mu$ Pa based on the average broadband ambient sound levels measured in the outer Oakland Harbor (as reported in California Department of Transportation 2009). The Service believes, and the Commission concurs, that marine mammals in the area likely are acclimated to non-impulsive sound at levels well above 120 dB re 1  $\mu$ Pa. If the authorization is granted, the Authority and Port would then measure the actual ambient sound level in the construction area and use that information to redefine the boundary of the Level B harassment zone. That is, the boundary of that zone would be based on the distance over which pile-driving sound dissipates to the ambient level at the construction site.

However, the Service also noted that ambient sound levels at a specific frequency and location can vary by 10–20 dB from day to day based on a number of factors (Richardson et al. 1995). Any single measure of ambient sound would not account for such variation. Assuming ambient sound levels are distributed normally, the Marine Mammal Commission recommends that the National Marine Fisheries Service require the Authority and the Port to assess and use the average ambient sound level minus two standard deviations down to the 120-dB re 1  $\mu$ Pa threshold as a basis for establishing the Level B harassment zone. This approach is more precautionary because it accounts for daily fluctuations in ambient sound levels and results in a larger Level B harassment zone. It should be conservative 95 percent of the time when ambient sound levels vary daily. If, in future authorizations, the Service plans to use ambient sound levels as the threshold for the Level B harassment zone for non-impulsive sources, then the Commission encourages the

Service to use the above approach (i.e., using the mean ambient sound level minus two standard deviations) for estimating the extent of that zone.

### **Mitigation and monitoring measures**

The Service would require the operators to implement ramp-up procedures only at the beginning of each work day and only when pile-driving activities have ceased for more than 30 minutes. The Service also would require that, if a marine mammal is sighted within or on a path toward a shut-down zone (i.e., based on the Level A harassment zone) during pile driving, operators cease pile driving until that marine mammal has cleared the zone and is on a path away from the zone or 15 minutes has lapsed since the last sighting. Therefore, it appears that pile driving could begin at full power after 15 minutes. The Commission continues to believe that ramp-up procedures should be initiated after extended periods (i.e., after 15 minutes for pinnipeds and small cetaceans) without pile driving based on their respective clearance times when animals are observed within or approaching the shut-down zone. Marine mammals in that zone may not be visible if they are diving, and they may not be observed each time they surface to breathe. For those reasons, the Marine Mammal Commission recommends that the National Marine Fisheries Service require the Authority and Port to implement ramp-up procedures after 15 minutes if pile driving was delayed or shut down because of the presence of a marine mammal within or approaching the shut-down zone and observers did not see that marine mammal leave the zone.

The Commission has noted in previous correspondence that the effectiveness of ramp-up as a mitigation measure has yet to be empirically verified. As with the ramp-up of airguns, the Service should not assume, absent empirical verification, that using ramp-up procedures when driving piles constitutes an effective mitigation method. Such verification may require not only collecting opportunistic data but also designing and conducting studies to test specific hypotheses regarding the utility of ramp-up procedures and analysis of responses of the various species encountered. Because the vibratory hammer has the potential to harass marine mammals and the Service proposes only intermittent monitoring, the Marine Mammal Commission repeats its recommendation that the National Marine Fisheries Service require the Authority and Port to monitor before, during, and after all ramp-ups of vibratory and impact pile-driving to gather the data needed to determine the effectiveness of this technique as a mitigation measure.

The proposed authorization included monitoring by protected species observers to implement shut-down or delay procedures, validate take estimates, and document marine mammal responses. However, the authorization would require such monitoring only for the first two days of representative pile driving at each site and no less than one-third of the total pile driving days at those sites during vibratory pile-driving. The Service has indicated that it would not require continuous observations during vibratory pile driving because it believes that the sound levels from those activities would not cause Level A harassment or mortality, the operators would be able to determine adequately the number of animals taken, and they should be able to determine actual impacts by correcting for observer effort. Failure to use observers also may result in a delay of, or failure to implement, shut-down procedures if marine mammals not covered in the authorization (e.g., gray whales) are within the harassment zones.

For a number of reasons, the Commission believes that protected species observers should be present at the construction sites during all vibratory pile-driving activities. Marine mammal responses to vibratory pile driving are not well studied and continuous monitoring is the only way to ensure that unexpected responses are detected, documented, and evaluated. Intermittent or infrequent observations may be sufficient for characterizing what might be called “normal” responses, but the Service also should want to know if, on occasion, these activities cause stronger and more significant responses. Monitoring the Level A harassment zone on an intermittent basis essentially reduces the effectiveness of that mitigation measure to a corresponding degree. In addition, the operators would be required to shut down or delay pile-driving activities if a marine mammal not included in the authorization enters the Level B harassment zone. In such cases, appropriate reactions are most likely to occur when observers are actively monitoring the harassment zones. Finally, monitoring during all pile-driving activities (i.e., during impact and vibratory hammer use) is the only way for the operators and the Service to be confident that they are causing the least practicable impact. For all of these reasons, the Marine Mammal Commission recommends that the National Marine Fisheries Service require the Authority and Port to monitor the Level A and B harassment zones to detect the presence and characterize the behavior of marine mammals during all vibratory and impact pile-driving activities.

Please contact me if you have questions regarding the Commission’s recommendations and comments.

Sincerely,

A handwritten signature in blue ink that reads "Timothy J. Ragen". The signature is fluid and cursive, with the first name being the most prominent.

Timothy J. Ragen, Ph.D.  
Executive Director

#### References

- California Department of Transportation. 2009. Technical guidance for assessment and mitigation of the hydroacoustic effects of pile driving on fish. Prepared by ICF Jones and Stokes and Illingworth and Rodkin, Inc., 298 pages.
- Richardson, W.J., C.R. Greene, Jr., C.I. Malme, and D.H. Thomson. 1995. Marine Mammals and Noise. Academic Press, San Diego, CA, 576 pages.