19 September 2011

Mr. P. Michael Payne, Chief
Permits, Conservation, and Education 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 Port of Vancouver's application 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 pile driving and removal in association with construction of a bulk potash handling facility on the Columbia River in Vancouver, Washington. The incidental harassment authorization would be valid for one year from the date of issuance. The Commission also has reviewed the National Marine Fisheries Service's 19 August 2011 *Federal Register* notice (76 Fed. Reg. 51947) 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 requested authorization, provided that it—

- requires the Port to measure in-situ sound propagation for driving and removing the various sizes and types of piles using the vibratory hammer, impact hammer, and both hammers concurrently at the beginning of the project and use that information to establish appropriate exclusion and buffer zones;
- requires the presence of Service-approved observers before, during, and after all soft-starts of pile-driving activities, including when the vibratory hammer is used, to gather the data needed to determine the effectiveness of this technique as a mitigation measure;
- requires the Port to monitor the presence and behavior of marine mammals during all impact pile-driving and vibratory pile-driving and pile-removal activities; and
- conditions the incidental harassment authorization to require the Port to (1) immediately report all injured or dead marine mammals to the Service and local stranding network and (2) suspend the construction activities if a marine mammal is seriously injured or killed and the injury or death could have been caused by those activities (e.g., a fresh carcass)—if additional measures are not likely to reduce the risk of additional serious injuries or deaths to a very low level, the Service should require the Port to obtain the necessary authorization for such takings under section 101(a)(5)(A) of the Marine Mammal Protection Act before resuming its construction activities.

RATIONALE

The Port plans to install and remove piles to complete construction of the Terminal 5 Bulk Potash Handling Facility for loading and berthing ships. The facility also will include a new storm-water outfall system. Construction of the facility will require the Port to install 100 91- to 102-cm (36- to 40-in) permanent steel pipe piles, 8 41-cm (16-in) permanent steel H-piles, and 95 46- to 61-cm (18- to 24-in) diameter temporary steel pipe piles. The temporary piles and an additional 177 wood piles at Terminal 2 would be removed before the end of the project. The Port would install the piles using vibratory and impact hammers and would remove the piles using the vibratory hammer, a crane, and/or pneumatic underwater chainsaw. Pile installation and removal could occur simultaneously. The Port would install and remove the various piles during daylight hours only between 1 November 2011 and 28 February 2012. Two permanent piles would be installed per day, with each pile requiring two to three hours of vibratory pile driving and one to two hours of impact pile driving. Temporary piles would be driven and removed using only the vibratory hammer. In addition, the Port may use barges to support the construction activities near Terminal 5.

The Service preliminarily has determined that, at most, the proposed activities temporarily would modify the behavior of small numbers of Steller sea lions, California sea lions, and harbor seals. It also anticipates that any impact on the affected species and stocks would be negligible. The Service 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—

- limiting the proposed in-water activities to 1 November through 28 February to minimize effects on salmonids and avoid the peak time of pinniped migration through the area;
- limiting the proposed in-water activities to daylight hours only;
- using Service-approved observers to monitor the Level A harassment zone 20 minutes prior to, during, and 20 minutes after impact pile driving;
- using ramp-up procedures (i.e., soft-starts) for the vibratory and impact hammers;
- using a bubble curtain or similar sound attenuation device to minimize disturbance from the impact hammer;
- using shut-down procedures, including 15 minutes of clearance time, if a sighted pinniped has not been observed leaving the shut-down zone;
- using at least two Service-approved observers to conduct monitoring of the Level B harassment zones at least two days per week to estimate the number of pinnipeds taken and evaluate the impacts of pile driving on pinniped behavior; and
- submitting a final monitoring report.

Uncertainty in determination of exclusion and buffer zones

Exclusion zones are intended to protect marine mammals that are close enough to a sound source to be injured (i.e., Level A harassment) or killed by exposure to the sound. Buffer zones are used to delineate the area in which Level B harassment may occur and to estimate the number of

marine mammals that may be taken. Both zones are established based on the generation and propagation of sound from the source and general assumptions about the responses of marine mammals to sounds at specific sound pressure levels, the latter being based on limited observations of marine mammal responses under known conditions.

The Port based its exclusion and buffer zones on in-situ measurements from pile-driving activities in Port Townsend, Washington, and Alameda, California, rather than in Vancouver. It based its proposed zones for impact pile driving on equipment that is similar to, but not the same as, the equipment to be used. It assumed that sound attenuated at a rate of 4.5 dB per doubling of distance out to 1 km and then at a rate of 10 dB per doubling of distance at 1 km and beyond (Washington State Department of Transportation 2010). The 4.5-dB attenuation rate probably is appropriate for an area in which neither purely spherical nor cylindrical spreading (i.e., attenuation rates of 6 and 3 dB per doubling of distance, respectively) occurs. However, the Commission cannot locate the discussion or calculation within the reference cited for the 10-dB attenuation rate. The Service should provide a detailed justification for the use of 10 dB per doubling of distance at 1 km based on the frequency of sound emitted from the hammers and the water depth at the Port. Furthermore, the Service has indicated that the Port may use the impact and vibratory hammers at the same time but the proposed zones are based on use of only one of these hammers at a time. Finally, the Port does not propose to measure in-situ sound propagation to verify and, if necessary, re-establish the exclusion and buffer zones, which the Service has required for other pile-driving and -removal projects. To address these concerns, the Marine Mammal Commission recommends that the National Marine Fisheries Service require the Port to measure in-situ sound propagation for driving and removing the various sizes and types of piles using the impact hammer, vibratory hammer, and both hammers concurrently at the beginning of the project and use that information to establish appropriate exclusion and buffer zones.

Mitigation measures

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 soft-starts when pile driving 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 soft-starts and analysis of responses of the various species encountered. In addition, the Service appears to be requiring visual monitoring only during soft-starts of the impact hammer. The Commission is not sure why the Service is not requiring observers to monitor during all soft-starts, irrespective of the type of hammer used. Because the vibratory hammer has the potential to harass marine mammals, the Marine Mammal Commission repeats its recommendation that the National Marine Fisheries Service require the presence of Service-approved observers before, during, and after all soft-starts of pile-driving activities, including when the vibratory hammer is used, to gather the data needed to determine the effectiveness of this technique as a mitigation measure.

Monitoring measures

Protected species observers will monitor the Level A harassment zones 20 minutes before, during, and 20 minutes after impact pile-driving activities. However, during vibratory pile driving, the observers will conduct intermittent behavioral observations only (i.e., two or more times per week). The Service has indicated that it will not require continuous observations during vibratory pile driving, because it believes that the sound levels from this activity at this site will not cause Level A harassment.

For a number of reasons, the Commission believes that it would be prudent to monitor behavior during all vibratory pile driving and removal. Marine mammal responses to vibratory pile driving are not well studied and thus it is unclear how some marine mammals may react. Continuous monitoring is the only way to ensure that unexpected reactions are detected, documented, and evaluated. In contrast, intermittent and infrequent observations may not provide the data needed for accurate evaluation of the full effects of pile driving. For example, if monitoring does not occur when marine mammals are most likely to be present, then the resulting observations may not be indicative of actual impacts and the number of takes may be underestimated. Finally, monitoring during all pile-driving and pile-removal activities (i.e., during impact and vibratory hammer use) is the only way for the applicant 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 Port to monitor the presence and behavior of marine mammals during all impact pile-driving and vibratory pile-driving and pile-removal activities.

Level A harassment and mortality

The Port is not seeking authorization to take marine mammals by serious injury or mortality. However, the *Federal Register* notice does not indicate if the Port would report any injured or dead marine mammals to the Service—a standard monitoring and reporting measure. The Marine Mammal Commission therefore recommends that the National Marine Fisheries Service condition the incidental harassment authorization to require the Port to (1) immediately report all injured or dead marine mammals to the Service and local stranding network and (2) suspend the construction activities if a marine mammal is seriously injured or killed and the injury or death could have been caused by those activities (e.g., a fresh carcass). The Service should investigate the incident to assess the cause and full impact (e.g., the types of injuries, the number of animals involved) and to determine what modifications in construction activities are needed to avoid additional injuries or deaths. Full investigation of such incidents is essential to provide information regarding the potential impact of pile driving and removal on marine mammals. If additional measures are not likely to reduce the risk of additional serious injuries or deaths to a very low level, the Service should require the Port to obtain the necessary authorization for such takings under section 101(a)(5)(A) of the Marine Mammal Protection Act before resuming its construction activities.

Please contact me if you have questions about the Commission's recommendations or rationale.

Sincerely,

Timothy J. Ragen, Ph.D.
Executive Director

Reference

Washington State Department of Transportation. 2010. Biological assessment preparation–Advanced training manual version 02-2010.