



MARINE MAMMAL COMMISSION

28 February 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 U.S. Navy'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 a test program to evaluate pile driving, loading, and removal in Hood Canal at Naval Base Kitsap in Bangor, Washington. The Navy would conduct the tests between 16 July and 31 October 2011. The Commission also has reviewed the National Marine Fisheries Service's 25 January 2011 *Federal Register* notice (76 Fed. Reg. 4300) announcing receipt of the application and proposing to issue the authorization, subject to certain conditions.

RECOMMENDATION

The Marine Mammal Commission recommends that the National Marine Fisheries Service—

- require the Navy to make careful observations in conjunction with in-air propagation information in order to add to the miniscule dataset so that in the future thresholds can be set based on a more robust dataset;
- require the Navy to provide a full description of the survey methods used, including how the Navy searched for animals, if and how it corrected its estimate for sighting probability, and if and how it corrected its estimate for decreasing sighting probability with distance from the observer;
- require the Navy to (1) explain why it used the anticipated area of ensonification rather than surveyed area to estimate sea lion density and (2) correct the density estimates unless the Navy has a reasoned basis for not making such corrections;
- require the Navy to re-estimate the expected number of in-water and in-air takes using the overall density of harbor seals in Hood Canal (i.e., 3.74 animals/km²);
- if the Navy does not request authorization for in-air takes of harbor seals, require the Navy to shut down activities whenever a harbor seal is within the in-air Level B harassment zone (i.e., within a radius of 501 m);
- encourage the Navy to consult with experts at the National Marine Mammal Laboratory to review and revise the Navy's survey methods as needed to make them scientifically sound;
- require the Navy to record distances to and behavioral observations of animals sighted within the entirety of the in-water Level B harassment zone that would be established for vibratory pile driving and removal activities; and

- complete an analysis of the impact of the proposed activities together with the cumulative impacts of all the other pertinent risk factors (including the Navy's concurrent wharf repair project) affecting marine mammals in the Hood Canal area before issuing the authorization.

RATIONALE

Proposed Activities, Preliminary Finding, and Mitigation and Monitoring Measures

The Navy plans to install, test, and remove piles to gather the geotechnical and sound data needed to validate its design for a new wharf. The Navy needs the wharf to load and unload explosives. The information gathered also could be of use for future waterfront projects at the base.

During this project, the applicant would use vibratory and impact hammers to install 29 temporary piles with diameters of 0.8 to 1.5 m. It would conduct lateral and tension-load tests on a subset of the piles and then remove them using a vibratory hammer. The process from installation to removal of each pile would take about 2 hours, but the impact hammer would be used for no more than 15 minutes per pile. The activities would occur only during daylight hours, and the full program would be completed in 40 days, of which no more than 15 days would involve pile driving and removal, weather permitting.

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, Dall's porpoises, and transient killer whales. 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 temporary or permanent hearing impairment will be at the least practicable level because of the proposed mitigation and monitoring measures. The measures include—

- (1) timing activities to avoid periods when Steller sea lions might be in the area;
- (2) completing pile driving, load testing, and removal during a period from two hours after sunrise to two hours before sunset;
- (3) using an underwater sound attenuation device (i.e., Gunderboom Sound Attenuation System or bubble curtain) for impact pile driving;
- (4) testing the underwater sound attenuation device for use during vibratory pile driving;
- (5) measuring in-water and in-air sound propagation during pile driving to verify and, if needed, modify the proposed shutdown and buffer zones (based on Level A and B harassment, respectively);
- (6) using shutdown procedures, including 30 minutes of clearance time, if a sighted animal has not been observed leaving the shutdown zone;
- (7) using qualified protected species observers, both land- and vessel-based, to monitor the safety zones for 30 minutes before, during, and for 30 minutes after activities; and
- (8) ceasing heavy machinery work, other than pile driving and removal, if any marine mammal comes within 50 m of the vessel or equipment.

The Commission supports the use of those measures, which reflect considerable effort by the Navy to avoid adverse impacts. The following comments are intended to address shortcomings in the application of those methods and thereby support the Navy's efforts to mitigate and monitor possible impacts of the proposed activities.

In-air Thresholds

The principal means of taking would be by exposure to sound from the vibratory and impact hammers. Because pinnipeds occur in the action area, taking may be by exposure to sound underwater and in air. For in-air exposures, the Navy and Service plan to use thresholds of 90 and 100 dB re 20 μ Pa (unweighted rms) for harbor seals and sea lions, respectively, as the basis for establishing the buffer zones and for estimating the number of Level B takes. However, to set such thresholds, it seems that (1) the data are very limited and the best scientific information available (Southall et al.) does not provide much guidance, (2) the Service is choosing these threshold levels based on that limited information, and (3) those levels are not unreasonable within the context of the current information. However, because the information is so limited, the Marine Mammal Commission recommends that the National Marine Fisheries Service require the Navy to make careful observations in conjunction with in-air propagation information in order to add to the miniscule dataset so in the future thresholds can be set based on a more robust dataset. In addition, the Commission would welcome the opportunity to consult with the Service to (1) identify the kinds of activities that require in-air thresholds, (2) determine the best scientific basis for selecting particular thresholds, and (3) develop research strategies for gathering the information needed to set more reliable thresholds.

Pinniped Densities

California sea lions: The Navy estimated the density of sea lions in the project area using the average number observed from July through October during several years of land-based surveys along the base's waterfront (about 5.6 km). The surveys generally covered the length of the waterfront and included sea lions that were hauled out or visible in the water. The surveys may provide the only site-specific information regarding sea lions, but the Navy did not fully describe the survey methods and, without that information, the Commission cannot judge their reliability (accuracy and precision).

For reasons that are not clear to the Commission, the Navy did not use the size of the area surveyed as a basis for estimating sea lion density. Instead, it appears that the Navy used the area that it expects to ensonify at the 120 dB re 1 μ Pa threshold during pile driving—a total of 41.5 km². The area surveyed is likely smaller than that, which means that the estimated density of sea lions in the area (i.e., number per area) is likely biased low. Using the area surveyed would produce a more reliable estimate of density. For example, if the surveyors covered the entire waterfront and could detect sea lions reliably out to a distance of 2.5 km, then the total area surveyed would be about 24 km². If that were the case and if all sea lions in the surveyed area were detected, then the density of sea lions would be underestimated by about 40 percent. However, it also is not clear that all the sea lions in the area were detected. That is, if the probability of detecting a sea lion significantly decreases at increasing distances from the observer, then the number of animals present (the

numerator in the density calculation) again would be underestimated, and the bias in the density estimate would be even greater.

If the estimates of density are biased low, then the total take estimate also will be biased low. The reader cannot judge the likelihood of such sources of bias because the application does not provide a full description of the survey methods. To address these shortcomings, the Marine Mammal Commission recommends that the National Marine Fisheries Service require the Navy to provide a full description of the survey methods used, including how the Navy searched for animals, if and how it corrected its estimate for sighting probability, and if and how it corrected its estimate for decreasing sighting probability with distance from the observer. The Marine Mammal Commission further recommends that the Service require the Navy to (1) explain why it used the anticipated area of ensonification rather than surveyed area to estimate sea lion density and (2) correct the density estimates unless the Navy has a reasoned basis for not making such corrections.

Harbor seals: To estimate the potential number of in-water takes of harbor seals, the Navy reduced the estimated harbor seal density in Hood Canal by deducting the proportion of seals expected to be hauled out at a given time, effectively decreasing the in-water density estimate from 3.74 to 1.31 animals per km². The deduction may provide a reasonable estimate of the number of seals in the water at any given instant. However, the proposed activities will be conducted up to 12 hours per day, and it is likely that virtually all of the harbor seals will be in the water at some time while those activities are conducted. Thus, virtually all of them could be subject to taking on a daily basis. Here again, the Navy's estimate of the total number that could be taken during the course of a day is biased low. To correct for this bias, the Navy should be estimating takes based on the total number of animals in the water each day during the proposed activities, which likely would be the entire population. Therefore, the Marine Mammal Commission recommends that the National Marine Fisheries Service require the Navy to re-estimate the expected number of in-water and in-air takes using the overall density of harbor seals in Hood Canal (i.e., 3.74 animals/km²).

The Navy contends that harbor seals do not haul out in the vicinity of the project and that in-air takes are not expected. However, harbor seals swim through the area and could be taken by in-air sound when they are at the surface. Thus, the Commission believes that the Navy should be requesting authorization to take harbor seals by in-water and in-air disturbance. If the Navy does not request authorization for in-air takes of harbor seals, then the Marine Mammal Commission recommends that the National Marine Fisheries Service require the Navy to shut down activities whenever a harbor seal is within the in-air Level B harassment zone (i.e., within a radius of 501 m).

The Commission notes that the Service's National Marine Mammal Laboratory is located in Seattle and that personnel at the laboratory have considerable expertise in survey methods. The Commission believes that the estimates of take for this and related projects could be substantially improved with relatively little effort if the Navy and the Service collaborated to improve the Navy's marine mammal surveys. To that end, the Marine Mammal Commission recommends that the National Marine Fisheries Service encourage the Navy to consult with experts at the National Marine Mammal Laboratory to review and revise the Navy's survey methods as needed to make them scientifically sound.

Effectiveness of Soft-start Procedures

The Commission supports the Service's practice of requiring soft-starts (or ramping up) for mitigating the impacts of all sound-generating activities. In this case, the Commission also commends the Navy because it plans to have observers collect pertinent data during its pile-driving soft-starts. If all of those agencies and industries responsible for activities that introduce sound into the marine environment collected such data, the Commission expects that a reasonably substantial and informative database could be developed in a relatively short time frame (on the order of a few years). Those data then could be used to provide better guidance for managers responsible for making decisions pertaining to soft-starts and ramp-up. As it has indicated in many letters, the Commission would be pleased to assist with review of the collected data and planning for any additional studies needed to resolve this issue.

Visual Monitoring

During the proposed activities, the Navy intends to use observers to monitor visually the proposed buffer zone. The zone, however, is based on the area in which in-water Level B harassment from impact pile driving is anticipated (i.e., a radius of 464 m). The proposed buffer zone for vibratory pile driving and removal (a continuous sound source with a 120-dB re 1 μ Pa threshold) is much larger (i.e., the width of Hood Canal) than that for impact pile driving (an impulsive sound source with a 160-dB re 1 μ Pa threshold). The Navy does not plan to monitor beyond a distance of 464 m, although it notes that sightings beyond that distance would be recorded as a take. The Navy justifies its proposed monitoring constraints by stating that it would be impractical and less effective to monitor the area beyond 464 m. The Commission does not understand the basis for concluding that it would be impractical to monitor beyond that distance. There are numerous ways to position observers so that they can monitor the area in which Level B takes are expected to occur (e.g., using elevated platforms, stationing the observers on watercraft). Given the readily available options for such monitoring, the reluctance on the Navy's part also is inconsistent with the monitoring requirements in the Marine Mammal Protection Act. Therefore, the Marine Mammal Commission recommends that the National Marine Fisheries Service require the Navy to record distances to and behavioral observations of animals sighted within the entirety of the in-water Level B harassment zone that would be established for vibratory pile driving and removal activities.

Cumulative Impacts

The potential cumulative impact of the proposed activities on marine mammals has been examined in the relevant analyses conducted under the National Environmental Policy Act. The Commission believes that the same information needs to be factored into the Service's determination under the Marine Mammal Protection Act. That is, the significance of incidental takes of a species during a particular operation must be judged based not only on the nature of the activity and takes that may occur but also on the species' vulnerability to those takes. In turn, the species' vulnerability depends, at least in part, on the additional impact of other operations in the area. In this instance, the Navy plans to conduct additional pile-driving and pile-removal activities to repair a

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wharf at the same time and in the same general area as the activities that would be covered by this requested authorization. The Navy is seeking to have those activities authorized under a separate incidental harassment authorization (see 76 Fed. Reg. 6406). Unless the Service and/or the Navy analyzes the cumulative impacts of these and other activities, the Commission does not see how the Service can make an informed decision as to whether the impacts of the proposed activities will be negligible. To do so without considering cumulative impacts would be to ignore the context in which the proposed activities are to occur. Therefore, the Marine Mammal Commission recommends that, prior to issuing the proposed incidental harassment authorization, the National Marine Fisheries Service complete an analysis of the impact of the proposed activities together with the cumulative impacts of all the other pertinent risk factors (including the Navy's concurrent wharf repair project) affecting marine mammals in the Hood Canal area. Doing so should provide a more informed basis for judging whether the impacts of the proposed activities are, in fact, negligible.

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

Sincerely,



Timothy J. Ragen, Ph.D.
Executive Director

References

Southall, B.L., A.E. Bowles, W.T. Ellison, J.J. Finneran, R.L. Gentry, C.R. Greene Jr., D. Kastak, D.R. Ketten, J.H. Miller, P.E. Nachtigall, W.J. Richardson, J.A. Thomas, and P.L. Tyack. 2007. Marine mammal noise exposure criteria: Initial scientific recommendation. *Aquatic Mammals* 33(4):411–521.