



# MARINE MAMMAL COMMISSION

27 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 U.S. Navy's application seeking authorization under section 101(a)(5)(D) of the Marine Mammal Protection Act to take marine mammals by harassment. The taking would be incidental to pile driving and removal in association with a wharf construction project in Hood Canal at Naval Base Kitsap in Bangor, Washington. The authorization would be in effect from 16 July 2012 to 15 July 2013. The Commission also has reviewed the National Marine Fisheries Service's 21 December 2011 notice (76 Fed. Reg. 79410) announcing receipt of the application and proposing to issue the authorization, subject to certain conditions. The Commission has commented on previous incidental harassment authorizations for pile driving and removal at Naval Base Kitsap. In 2011, the Navy removed and installed piles to complete necessary repairs and maintenance at the Explosive Handling Wharf #1 (EHW-1) at Naval Base Kitsap. In addition, the Navy installed, tested, and removed piles (i.e., the test pile program) to gather geotechnical and sound data needed to validate its design for the new Explosive Handling Wharf #2 (EHW-2).

## RECOMMENDATIONS

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

- require the Navy to measure in-air sound levels as a function of distance from the vibratory and impact hammers and make concurrent observations of marine mammal behavioral responses to in-air sound produced by pile-driving and -removal activities;
- require the Navy to re-estimate the number of in-water and in-air takes using the overall density of harbor seals in Hood Canal (i.e., 3.74 animals/km<sup>2</sup>)—if new data (marine mammal surveys at Naval Base Kitsap in 2008 and 2009-10 or monitoring reports from pile driving activities at Naval Base Kitsap in 2011) indicate that the density estimate of 3.74 seals/km<sup>2</sup> is incorrect, then refine the density estimate based on those data rather than using the Navy's biased estimate;
- require the Navy to measure in-situ sound levels for 30 days after the initiation of major pile-driving scenarios and then provide the analytical results (i.e., sound levels as a function of distance) to the Service within an additional 15 days; if the Navy is unable to meet the 15-day analysis deadline, then require the Navy to use maximum distances to the Level A harassment thresholds of 190 dB re 1  $\mu$ Pa (i.e., 20 m for 36- and 48-in piles) and 180 dB re 1  $\mu$ Pa (i.e., 200 m for 36-in and 120 m for 48-in piles) from the test pile program until the in-

- situ sound measurement data have been analyzed and the distances to thresholds verified for EHW-2;
- require the Navy to conduct in-situ sound measurements if and when vibratory hammers are used concurrently and to use that information to ensure that it (1) expands appropriately the size of the Level B harassment zone for in-water sounds, (2) monitors the entire expanded zone, and (3) estimates the resulting number of takes accurately;
  - require the Navy to implement soft-start procedures after 15 minutes if pile driving or removal was delayed or shut down because of the presence of a marine mammal within or approaching the shut-down zone;
  - require the Navy to develop a monitoring strategy that ensures it will be able to detect and characterize marine mammal responses to the pile-driving and -removal activities as a function of sound levels and distance from the pile-driving and -removal sites;
  - complete an analysis of the impact of the proposed activities together with the cumulative impacts of all the other pertinent risk factors (including but not limited to the Navy's concurrent EHW-1 repair project) impacting marine mammals in the Hood Canal area prior to issuing the proposed incidental harassment authorization;
  - encourage the Navy to combine future requests for incidental harassment authorizations for all activities that would occur in the same general area and within the same year rather than segmenting those activities and their associated impacts by requesting separate authorizations; and
  - adopt a policy to provide an additional opportunity for public review and comment before amending authorizations if any substantive changes are made to them after they have been issued or if the information on which a negligible impact determination is based is significantly changed in a way that indicates the likelihood of an increased level of taking or impacts not originally considered.

## **RATIONALE**

The Navy plans to install and remove piles during construction of the new EHW-2 at Naval Base Kitsap. The project would continue for multiple years. However, the requested incidental harassment authorization would be valid for one year only and the Navy will seek renewal for subsequent years. During the project, the Navy would install 1,250 permanent steel piles ranging in size from 24 to 48 inches in diameter. It also would install and then remove up to 150 18- to 24-in falsework steel piles that would be used to help guide the permanent piles into their proper location. The Navy could use up to three vibratory hammers and one impact hammer to install and/or remove piles simultaneously. It expects pile installation and removal to take 195 days (weather permitting) between 16 July 2012 and 15 February 2013. It would limit activities to daylight hours only. It would use between two and eight barges and up to two tug boats and six smaller skiffs at any one time to support construction and monitoring requirements.

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, Steller 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 would be at the least practicable level because of the proposed mitigation and monitoring measures. Those measures<sup>1</sup> include—

- restricting in-water activities after 16 February to protect juvenile salmon;
- installing and removing piles using a vibratory hammer during the period between sunrise and sunset;
- installing piles using an impact hammer during the period between two hours after sunrise to two hours before sunset from 16 July through 15 September to protect breeding marbled murrelets and between sunrise and sunset from 16 September through 15 February;
- using an underwater sound attenuation device (e.g., bubble curtain or other sound attenuation device) for impact pile driving that has a demonstrated performance of reducing sound levels by at least 10 dB;
- conducting in-water and in-air empirical sound measurements for a minimum of 30 days to verify and, if need be, modify the proposed shut-down and disturbance zones (based on the Service's thresholds for Level A and B harassment, respectively);
- using soft-start, delay, and shut-down<sup>2</sup> procedures;
- using qualified protected species observers, deployed both on land and on vessels, to monitor the safety zones for 15 minutes before, during, and for 30 minutes after pile driving and removal activities;
- ceasing other heavy machinery work (i.e., activities other than pile driving and removal) if any marine mammal comes within 10 m of the vessel or equipment;
- reporting injured and dead marine mammals to the Service and local stranding network using the Service's phased reporting approach and suspending activities, if appropriate; and
- submitting draft and final acoustic and monitoring reports to the Service.

In addition, the Navy plans to remove piles during the continued repair and maintenance of the EHW-1 (77 Fed. Reg. 25408), which is just north of the EHW-2 site. Those activities are subject to a separate proposed incidental harassment authorization. The in-water activities at EHW-1 would occur for 47 days between 16 July 2012 and 15 February 2013. The Navy could use a vibratory hammer and pneumatic chipper simultaneously during EHW-1 construction.

### **In-air thresholds and takes**

The principal means of taking marine mammals would be by exposure to sound from the vibratory and impact hammers. Pinnipeds may be taken by in-air as well as in-water sounds. In fact, pinnipeds taken underwater also are likely to be taken in air when at the surface (i.e., when swimming with their heads above the water or when hauled out on the floating security fence). That being the case, it may not make sense to separate in the authorization taking that occurs in water and in air. For that reason, the Commission encourages the Service simply to specify that the authorized

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<sup>1</sup> Some of the proposed mitigation and monitoring measures have been amended since publication of the *Federal Register* notice in December 2011. The listed measures are based on more recent correspondence between the Service and the Commission.

<sup>2</sup> The shut-down zones would be (1) 10 m during impact pile driving of 36-in piles and 15 m during impact pile driving of 48-in piles for pinnipeds and (2) 40 m during impact pile driving of 36- and 48-in piles for cetaceans.

number of takes of pinnipeds by Level B harassment could occur in the water or in the air when the animals are near the sound source.

For in-air exposures, the Navy and Service plan to use thresholds of 90 and 100 dB re 20  $\mu$ Pa (unweighted rms) for harbor seals and sea lions, respectively, as the basis for establishing the disturbance zones and for estimating the expected number of takes by Level B harassment. Given the current state of knowledge on this topic, those thresholds are reasonable. They are, however, rather subjective because the data to support them are very limited and the best scientific information available (Southall et al. 2007) does not provide much guidance. Therefore, the Marine Mammal Commission recommends that the National Marine Fisheries Service require the Navy to measure in-air sound levels as a function of distance from the vibratory and impact hammers and make concurrent observations of marine mammal behavioral responses to in-air sound produced by pile-driving and -removal activities. The resulting information will be useful for establishing such thresholds in the future. In addition, the Commission would welcome the opportunity to consult with the Service to (1) identify the types of activities that have the potential to take marine mammals by exposure to in-air sounds, (2) determine the best scientific basis for identifying exposure thresholds of concern, and (3) develop research strategies for gathering the information needed to set more reliable thresholds.

### **Harbor seal densities**

To estimate the potential number of in-water and in-air takes of harbor seals, the Navy decreased the estimated harbor seal density in Hood Canal by reducing the proportion of seals expected to be hauled out at a given time, effectively decreasing its density estimate from 3.74 to 1.31 animals per  $\text{km}^2$ . That reduction may provide a reasonable estimate of the number of seals in the water at any given instant. However, the proposed activities would be conducted using up to four hammers from 8 to 15 hours per day. That being the case, virtually all of the harbor seals in the project area would be in the water at some time when sound-producing activities are being conducted and would be taken on a daily basis. As noted above, seals also would be subject to in-air taking when they surface and swim with their heads above the water and when they haul out on the floating security fence. Therefore, the Navy's estimate of the total number of seals that could be taken during the course of a day is a biased fraction of what it should be. To correct this bias, the Navy should be estimating in-water takes based on the total number of seals expected to be in the water at any time during the proposed activities, which likely would be the entire population. The Commission's suggested approach is consistent with the Service's decision to base the number of takes of sea lions on maximum abundance estimates at Kitsap haul-out sites and the assumption that each individual would be taken at some point on any given day. Therefore, the Marine Mammal Commission recommends that the National Marine Fisheries Service require the Navy to re-estimate the number of in-water and in-air takes using the overall density of harbor seals in Hood Canal (i.e., 3.74 animals/ $\text{km}^2$ ). If new data (marine mammal surveys at Naval Base Kitsap in 2008 and 2009-10 or monitoring reports from pile driving activities at Naval Base Kitsap in 2011) indicate that the density estimate of 3.74 seals/ $\text{km}^2$  is incorrect, then the Service should refine the density estimate based on those data rather than using the Navy's biased estimate.

### **In-situ sound measurements**

The Service proposed to require the Navy to conduct in-situ sound measurements during major pile-driving (i.e., impact and vibratory hammering of smaller (24- to 36-in) and larger (48-in) plumb and batter piles) and adjust the Level A and B harassment zones as necessary. With regard to this kind of mitigation measure, the Commission's expectation has been that the measurements and adjustments were completed at the beginning of each project to ensure that the Navy is establishing appropriately sized harassment zones. However, in discussions with the Service, Commission staff has learned that the Navy is not analyzing the data and making adjustments on an immediate basis. For example, in last year's authorization, the Service required the Navy to provide a draft acoustic and marine mammal monitoring report 45 days after completion of its acoustic measurements and marine mammal monitoring. However, the Navy did not submit its report until more than 90 days after acoustic measurements were made and marine mammal monitoring was completed. It is not clear if or when the Navy made any necessary adjustments to its harassment zones. But if it did not make warranted adjustments, its failure to do so undermined one of the main mitigation measures. For the proposed authorization, the Service would require the Navy to take in-situ sound measurements within the first 30 days of pile driving and provide it with a draft acoustic and marine mammal monitoring report no later than 60 days thereafter. Under that schedule, the Service's plan would allow 90 days of pile driving before the Navy informed the Service of the actual sound measurements and distances to various thresholds. That means that the Service would not be able to review the related measurements and adjust, if necessary, the distances to thresholds for three months.

That approach does not require the near real-time adjustments that the Commission believed were or would be occurring. For other recent (e.g., BP Simpson Lagoon, 77 Fed. Reg. 25830; ION Geophysical, June 2012 application) and past activities (e.g., Monterey Bay Aquarium Research Institute cable laying project and the new Sandholdt Bridge construction project, managed by the region), the action proponent would be or has been required to analyze the in-situ sound propagation data and report the findings to the Service from five days to two weeks after the measurements would be or have been taken and adjust its harassment zones at that time. The Commission believes that, as with other action proponents, the Service should be requiring the Navy to make prompt adjustments if its measurements indicate the need to do so. That means reporting the information to the Service in a timely manner so that it can (1) confirm or adjust the extent of the exclusion zones for mitigation purposes and (2) confirm the initial assumptions on which it based its negligible impact determinations and estimates of takes (primarily on the extent of the disturbance zones)—or if the assumptions were not correct, to make adjustments as appropriate.

In this case, the Commission believes that adjustments should be made within 45 days of project initiation. Monitoring for 30 days would provide adequate data for estimating the sound levels resulting from the major pile-driving scenarios and, to make real-time adjustments, the Navy should be able to analyze those data and report the results within an additional 15 days (as is required for other action agencies or proponents). To ensure that is the case, the Marine Mammal Commission recommends that the National Marine Fisheries Service require the Navy to measure in-situ sound levels for 30 days after the initiation of major pile-driving scenarios and then provide the analytical results (i.e., sound levels as a function of distance) to the Service within an additional 15 days. If the Navy is unable to meet the 15-day analysis deadline, then the Commission

recommends that the Service require the Navy to use maximum distances to the Level A harassment thresholds of 190 dB re 1  $\mu$ Pa (i.e., 20 m for 36- and 48-in piles) and 180 dB re 1  $\mu$ Pa (i.e., 200 m for 36-in and 120 m for 48-in piles) from the test pile program until the in-situ sound measurement data have been analyzed and the distances to thresholds verified for EHW-2.

At any given time, the Navy could use up to one impact hammer and three vibratory hammers during EHW-2 activities and an additional vibratory hammer during EHW-1 activities. Because vibratory hammers emit a continuous sound and concurrent use of multiple hammers could increase sound levels, the distance to the 120-dB re 1  $\mu$ Pa threshold also could increase. The Service proposes to require the Navy to conduct in-situ sound measurements, although it is unclear to the Commission whether those measurements would be taken when multiple hammers are being used. That should be the case and, under those circumstances, the Navy will need to modify its mitigation and monitoring efforts accordingly. Therefore, the Marine Mammal Commission recommends that the National Marine Fisheries Service require the Navy to conduct in-situ sound measurements if and when vibratory hammers are used concurrently and to use that information to ensure that it (1) expands appropriately the size of the Level B harassment zone for in-water sounds, (2) monitors the entire expanded zone, and (3) estimates the resulting number of takes accurately.

### **Mitigation and monitoring measures**

The Service would require the Navy to implement soft-start procedures only at the beginning of each work day and when pile-driving or -removal activities have ceased for more 30 minutes. The Service also would require the Navy to cease pile driving or removal if a marine mammal is sighted within or on a path to enter a Level A harassment shut-down zone. The Navy could resume activities when the marine mammal has cleared the zone and is on a path away from the zone or 15 minutes has elapsed since the last sighting of that mammal. The authorization then would allow the Navy to resume pile driving and removal at full power. However, several factors indicate that a soft start is advisable at that point. First, although they probably rarely do so, seals and sea lions are capable of diving for periods approaching 15 minutes. In such cases they are considered not “available” to be observed and it is possible that they are still in the shut-down zone (this is often referred to as an availability bias). Second, even if their dive times are shorter, they may be visible at the surface for a few seconds only while they take a breath and observers may not detect them even if they are available to be seen (this is often referred to as a detection or perception bias). For example, the observer may not detect them at the surface if s/he is not watching the right area at the right time. Third, they are more difficult to detect when sighting conditions are poor (e.g., inclement weather, poor lighting, rough sea surface conditions). That is, poor conditions may increase detection (or perception) bias. In such cases, full starts would pose an excessive risk to marine mammals still in the shut-down zone but not detected there. For that reason, the Commission continues to believe that soft-start procedures should be used to avoid serious injury after a shutdown of 15 minutes for pinnipeds and small- to medium-sized cetaceans). Therefore, the Marine Mammal Commission recommends that the National Marine Fisheries Service require the Navy to implement soft-start procedures after 15 minutes if pile driving or removal was delayed or shut down because of the presence of a marine mammal within or approaching the shut-down zone.

The Navy has indicated that it intends to use observers to monitor (visually) only a portion of the proposed Level B disturbance zone (which has a radius of up to 1.3 km for impact pile

driving and 13.8 km for vibratory pile driving). The observers would monitor out to a distance of about 1 to 2 km from the site of pile-driving and -removal activities. The Navy would station additional observers on the acoustic monitoring vessel to monitor more distant locations for a minimum of 30 days. The Service's proposed authorization incorporates the Navy's planned monitoring strategy, noting that it would be (1) impractical for the Navy to make detailed observations beyond a 500-m zone surrounding each pile and (2) impossible for the Navy to account for all individual marine mammals occurring in the larger zone with any degree of certainty.

The Commission understands that it would be difficult to monitor the entire in-water Level B disturbance zone for vibratory pile driving. However, the key here is not simply to employ a strategy that ensures monitoring out to a certain distance, but rather to employ a strategy that provides the information necessary to determine if the construction activities have adverse effects on marine mammals and to describe the nature and extent of those effects. That being the case, the Navy's monitoring strategy must be sufficient to characterize sound levels as a function of distance from the sound sources (i.e., the construction sites) and to observe and document any changes in marine mammal behavior as a function of those distances and associated sound levels. The Service and the Navy should be evaluating the monitoring strategy based on whether it is or is not adequate for that purpose. In effect, the monitoring strategy should be viewed not simply as a perfunctory check on the proposed activities, but also the best way of learning about the potential effects of the proposed activities. To extend its monitoring capabilities, the Navy can position observers on elevated platforms, along the Hood Canal shoreline, or on additional watercraft). If these options are used effectively then, over time, observers should be able to collect the information needed to assess the effects of the proposed construction activities and guide future monitoring efforts. The results should be to everyone's benefit. Therefore, the Marine Mammal Commission recommends that the National Marine Fisheries Service require the Navy to develop a monitoring strategy that ensures it will be able to detect and characterize marine mammal responses to the pile-driving and -removal activities as a function of sound levels and distance from the pile-driving and -removal sites.

### **Negligible impact determination and cumulative impacts**

In 2011 the Navy applied for and the Service issued two separate incidental harassment authorizations for the Navy's pile driving and removal activities at Naval Base Kitsap (EHW-1 repair project and the test pile program), even though those activities overlapped spatially and temporally. In addition, the Navy prepared two separate environmental review documents under the National Environment Policy Act. In 2012, the Navy again applied for two separate incidental harassment authorizations (construction of EHW-2 and continued repair of EHW-1) and prepared two separate environmental review documents. Although the National Environment Policy Act documents examined the potential cumulative impact of those multiple proposed activities on marine mammals, the Commission believes that the same information also needs to be factored into the Service's negligible impact determination under the Marine Mammal Protection Act. That is, the significance of incidental takes of a species during a particular activity must consider not only the nature of the activity and the type and magnitude of takes that may occur, but also the species' vulnerability to those takes. In turn, the species' vulnerability depends, at least in part, on the additional impact of other activities in the area. In this instance, the Navy again plans to conduct additional construction activities at the same time and in the same area as the activities that would be covered by this proposed authorization. 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 indeed 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 complete an analysis of the impact of the proposed activities together with the cumulative impacts of all the other pertinent risk factors (including but not limited to the Navy's concurrent EHW-1 repair project) affecting marine mammals in the Hood Canal area. Furthermore, the Commission recommends that the Service encourage the Navy to combine future requests for incidental harassment authorizations for all activities that would occur in the same general area and within the same year rather than segmenting those activities and their associated impacts by requesting separate authorizations.

### **Public review and comment period**

The incidental harassment authorizations issued in 2011 authorized the taking of up to 15 harbor porpoises incidental to the test pile program and up to 35 harbor porpoises incidental to the EHW-1 repair project. Those numbers reflected the information contained in the Navy's applications and referenced in the *Federal Register* notices announcing the proposed authorizations. The applications and proposed authorizations used a density estimate of 0.014 harbor porpoise/km<sup>2</sup> in the project area. However, the Navy's monitoring teams observed harbor porpoises in the area much more frequently than originally predicted. Initial results from subsequent line transect surveys indicated a density of 0.250 animals/km<sup>2</sup>. Based on that new information, the Service determined that the Navy was at risk of exceeding the authorized numbers of incidental takes of harbor porpoises for both projects. On 24 October 2011, the Service approved an increase in the allowable take from 15 to 49 for the test pile program and from 35 to 64 for the EHW-1 repair project. However, in authorizing increased numbers of takes, the Service did not provide any public notice or opportunity for additional public comment.

The Commission believes that by more than doubling the requested and authorized level of taking—and more than tripling the number of harbor porpoise takes authorized incidental to the test pile program—the Service fundamentally altered the original authorization. As such, it should have instituted a new public notice and comment process in accordance with section 101(d)(iii) and (vii) before increasing the number of authorized takes. The Service is using the new density information to estimate the number of harbor porpoise in the project area and that might be taken incidentally, so that density should be considered the best available information for this authorization. Nevertheless, the Marine Mammal Commission recommends that the National Marine Fisheries Service adopt a policy to provide an additional opportunity for public review and comment before amending authorizations if any substantive changes are made to them after they have been issued or if the information on which a negligible impact determination is based is significantly changed in a way that indicates the likelihood of an increased level of taking or impacts not originally considered.



Mr. P. Michael Payne  
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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 written in a cursive style with a horizontal line above the first name.

Timothy J. Ragen, Ph.D.  
Executive Director

### **Reference**

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.