



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Silver Spring, MD 20910

Department Of Commerce
National Oceanic and Atmospheric Administration
National Marine Fisheries Service

INCIDENTAL HARASSMENT AUTHORIZATION
As modified, October 18, 2011

The U.S. Navy (Navy), Naval Base Kitsap Bangor, Washington, is hereby authorized under section 101(a)(5)(D) of the Marine Mammal Protection Act (MMPA; 16 U.S.C. 1371(a)(5)(D)) to harass marine mammals incidental to a test pile program in the Hood Canal, Washington.

1. This Incidental Harassment Authorization (IHA) is valid from July 16, 2011 through October 31, 2011.
2. This IHA is valid only for pile driving activities, including driving and removal of 29 test piles, associated with the test pile program in the Hood Canal, Washington.
3. General Conditions
 - (a) A copy of this IHA must be in the possession of the Navy, its designees, and work crew personnel operating under the authority of this IHA.
 - (b) The species authorized for taking are the harbor seal (*Phoca vitulina*), California sea lion (*Zalophus californianus*), killer whale (transient only) (*Orcinus orca*), Dall's porpoise (*Phocoenoides dalli*), and the harbor porpoise (*Phocoena phocoena*).
 - (c) The taking, by Level B harassment only, is limited to the species listed in condition 3(b). See Table 1 (attached) for numbers of take authorized.
 - (d) The taking by Level A harassment, injury or death of any of the species listed in item 3(b) of the Authorization or the taking by harassment, injury or death of any other species of marine mammal is prohibited and may result in the modification, suspension, or revocation of this IHA.
 - (e) The Navy shall conduct briefings between construction supervisors and crews, marine mammal monitoring team, acoustical monitoring team, and Navy staff prior to the start of all pile driving activity, and when new personnel join the work, in order to explain responsibilities, communication procedures, marine mammal monitoring protocol, and operational procedures.
 - (f) The Navy shall comply with applicable equipment noise standards of the U.S. Environmental Protection Agency and ensure that all construction equipment has noise control devices no less effective than those provided on the original equipment.



- (g) In the unanticipated event that any cases of pinniped injury or mortality are judged to result from these activities, the holder of this Authorization must immediately cease operations and report the incident, within 48 hours, to the Assistant Regional Administrator (ARA) for Protected Resources, Northwest Regional Office, National Marine Fisheries Service (NMFS), phone (503) 230-5400 and to the Chief, Permits, Conservation, and Education Division, Office of Protected Resources, NMFS, phone (301) 713-2289.
 - (i) In such case, Navy shall postpone operations until NMFS is able to review the incident and determine whether steps can be taken to avoid further injury or mortality or until such taking can be authorized under regulations promulgated under section 101(a)(5)(A) of the MMPA.

4. Cooperation

The holder of this Authorization is required to cooperate with NMFS and any other federal, state, or local agency authorized to monitor the impacts of the activity on marine mammals.

5. Mitigation Measures

In order to ensure the least practicable impact on the species listed in condition 3(b), the holder of this Authorization is required to implement the following mitigation measures:

- (a) The Navy shall implement a minimum shutdown zone of 50 m (164 ft) radius around all in-water activity, including pile driving and other construction work. If a marine mammal comes within 50 m, operations shall cease and vessels shall reduce speed to the minimum level required to maintain steerage and safe working conditions.
- (b) The Navy shall establish buffer zones and exclusion (shutdown) zones for pile driving that correspond with the appropriate Level B and Level A harassment criteria, respectively. At the start of pile driving work, these zones shall correspond to predicted distances, excepting Level A harassment zones that are predicted as having radii less than the minimum 50 m. For vibratory pile driving and extraction, the modeled buffer zone is of sufficient size to make comprehensive monitoring impracticable, although Navy monitoring personnel shall be aware of the location and boundaries of the modeled zone and shall record any observations made within this zone as takes. The initial, fully monitored buffer zone for these activities shall have a radius of 2,400 m, corresponding to the width of the Hood Canal at the project site and the maximum area that is practicable for the Navy to effectively monitor. For impact pile driving, the buffer zone shall include all areas where the underwater sound pressure levels are anticipated to equal or exceed the 160-dB (rms) harassment isopleths. The modeled radius of this zone will be 464 m (1,522 ft) at the start of pile driving work.
- (c) All buffer and shutdown zones shall initially be based on the distances from the source that are predicted for each threshold level. However, in-situ acoustic monitoring shall be utilized to determine the actual distances to these threshold zones, and the size of the shutdown and buffer zones shall be adjusted accordingly based on

received sound pressure levels. The minimum shutdown zone shall remain 50 m, regardless of hydroacoustic monitoring data.

- (d) The shutdown and buffer zones shall be monitored throughout the time required to drive a pile. If a marine mammal is observed entering the buffer zone, a take shall be recorded and behavior documented. Although it may not be possible to record all takes of marine mammals entering the buffer zone for vibratory pile driving, or to record behavioral observations for observed animals, the Navy shall make reasonable effort to do so. If a marine mammal approaches or enters the shutdown zone, all pile driving activities shall be halted.
- (e) Monitoring of buffer and shutdown zones shall take place from thirty minutes prior to initiation of pile driving activity through thirty minutes post-completion of pile driving activity. Prior to the start of pile driving activity, the shutdown and buffer zones shall be monitored for thirty minutes to ensure that they are clear of marine mammals. Pile driving may commence only once observers have declared the shutdown zone clear of marine mammals; animals shall be allowed to remain in the buffer zone (i.e., must leave of their own volition) and their behavior shall be monitored and documented.
- (f) If pile driving is halted or delayed due to the presence of a marine mammal, the activity may not commence or resume until either the animal has voluntarily left and been visually confirmed beyond the shutdown zone or thirty minutes have passed without re-detection of the animal.
- (g) Monitoring shall be conducted by qualified observers. Trained observers shall be placed from the best vantage point(s) practicable to monitor for marine mammals and implement shut-down or delay procedures when applicable through communication with the hammer operator.
- (h) Approved sound attenuation devices shall be utilized during impact pile driving operations. Exception from this requirement is allowed in order to test performance of sound attenuation devices. The maximum amount of unmitigated impact driving that may occur is sixty seconds for each of seven piles, with no more than one unmitigated pile driven per day.
- (i) The Navy shall use soft-start techniques recommended by NMFS for impact and vibratory pile driving. The soft-start requires contractors to initiate noise from vibratory hammers for fifteen seconds at reduced energy followed by a one minute waiting period. This procedure shall be repeated two additional times. For impact driving, contractors shall be required to provide an initial set of three strikes from the impact hammer at forty percent energy, followed by a one minute waiting period, then two subsequent three strike sets.
- (j) Pile driving and removal shall only be conducted during daylight hours.

6. Monitoring

The holder of this Authorization is required to conduct acoustic and marine mammal monitoring during pile driving and removal activity and to avoid direct interaction with marine mammals during all other in-water construction activities:

- (a) The Navy shall collect sighting data and behavioral responses to construction for marine mammal species observed in the region of activity during the period of activity. All observers shall be trained in marine mammal identification and behaviors, and shall have no other construction related tasks while conducting monitoring.
- (b) During all observation periods, observers shall use binoculars and the naked eye to search continuously for marine mammals.
- (c) To verify the required monitoring distances, relevant zones shall be clearly marked with buoys or other suitable aquatic markers.
- (d) If the relevant zones are obscured by fog or poor lighting conditions, pile driving shall not be initiated until all zones are visible.
- (e) For all marine mammal monitoring, the following information shall be recorded:
 - i. Date and time that pile driving begins or ends;
 - ii. Construction activities occurring during each observation period;
 - iii. Weather parameters identified in the acoustic monitoring plan (e.g., wind, humidity, temperature);
 - iv. Tide state and water currents;
 - v. Visibility;
 - vi. Species, numbers, and, if possible, sex and age class of marine mammals;
 - vii. Marine mammal behavior patterns observed, including bearing and direction of travel, and if possible, the correlation to sound pressure levels;
 - viii. Whether an animal remains in the project area following a Level B taking, and, if so, what behavior patterns are observed;
 - ix. Distance from pile driving activities to marine mammals and distance from the marine mammals to the observation point;
 - x. Locations of all marine mammal observations; and
 - xi. Other human activity in the area.
- (f) The Navy shall conduct acoustic monitoring for pile driving in order to determine the actual distances to the 190-, 180-, 160-, and 120-dB (re 1 μ Pa rms) isopleths and to determine the relative effectiveness of sound attenuation devices.

- (g) For acoustic monitoring, the following protocols shall be in place, at minimum:
- i. A stationary hydrophone shall be placed at mid-water depth and 10 m (33 ft) from the source pile to measure the effectiveness of the bubble curtain system; appropriate measures shall be taken to accurately determine depth and distance.
 - ii. All hydrophones shall be calibrated at the start of the action and shall be checked at the beginning of each day of monitoring activity.
 - iii. For each monitored location, a two-hydrophone setup shall be used, with the first hydrophone at mid-depth and the second hydrophone at approximately 1 m (3.3 ft) from the bottom, or as close to that depth as is practicable.
 - iv. In addition to determining the area encompassed by the 190-, 180-, 160-, and 120-db rms isopleths for marine mammals, hydrophones shall also be placed at other distances as appropriate to accurately capture spreading loss occurring at the test pile project area.
 - v. Ambient conditions, both airborne and underwater, shall be measured at the project site in the absence of construction activities to determine background sound levels. Ambient levels shall be recorded over the frequency range from 10 Hz to 20 kHz. Ambient conditions shall be recorded for one minute every hour of the work day, for one week of each month of the test pile program.
 - vi. Sound levels associated with soft-start techniques shall be measured.
 - vii. Underwater sound pressure levels shall be continuously monitored during the entire duration of each pile being driven. Sound pressure levels shall be monitored in real time. Sound levels shall be measured in Pascals.
 - viii. Airborne levels shall be recorded as unweighted, as well as in dBA, and the distance to marine mammal thresholds shall be measured.
 - ix. The effectiveness of using a bubble curtain system with a vibratory hammer shall be tested during the vibratory driving of, at minimum, one pile of each size used during the test pile program.
 - x. Environmental data shall be collected, including, but not limited to: wind speed and direction, air temperature, humidity, surface water temperature, water depth, wave height, weather conditions and other factors that could contribute to influencing the airborne and underwater sound levels (e.g., aircraft, boats).
 - xi. The chief inspector shall supply the acoustics specialist with the substrate composition, hammer model and size, hammer energy settings and any changes to those settings during the piles being monitored, depth of the pile being driven, and blows per foot for the piles monitored.

- xii. Post-analysis of the sound level signals shall include determination of absolute peak overpressure and under pressure levels recorded for each pile, rms value for each absolute peak pile strike, rise time, average duration of each pile strike, number of strikes per pile, SEL of the absolute peak pile strike, mean SEL, and cumulative SEL (accumulated SEL = single strike SEL + $10 \cdot \log$ (number of hammer strikes) and a frequency spectrum both with and without mitigation, between 10-20,000 Hz for up to eight successive strikes with similar sound levels.

7. Reporting

The holder of this Authorization is required to:

- (a) Submit a draft report to NMFS within 45 days of the completion of acoustic measurements and marine mammal monitoring. Acoustic results shall be summarized in graphical form and include summary statistics and time histories of impact sound values for each pile. A final report shall be prepared and submitted to NMFS within thirty days following receipt of comments on the draft report from NMFS. This report must contain the following information, at minimum:
 - (i) Size and type of piles;
 - (ii) A detailed description of sound attenuation systems used, including design specifications;
 - (iii) The impact or vibratory hammer force used to drive and extract the piles;
 - (iv) A description of the monitoring equipment;
 - (v) The distance between hydrophone(s) and pile;
 - (vi) The depth of the hydrophone(s);
 - (vii) The depth of water in which the pile was driven;
 - (viii) The depth into the substrate that the pile was driven;
 - (ix) The physical characteristics of the bottom substrate into which the piles were driven;
 - (x) The ranges and means for peak, rms, and SELs for each pile;
 - (xi) The results of the acoustic measurements, including the frequency spectrum, peak and rms SPLs, and single-strike and cumulative SEL with and without the attenuation system;
 - (xii) The results of the airborne noise measurements including dBA and unweighted levels;

- (xiii) A description of any observable marine mammal behavior in the immediate area and, if possible, the correlation to underwater sound levels occurring at that time;
- (xiv) Results, including the detectability of marine mammals, species and numbers observed, sighting rates and distances, behavioral reactions within and outside of safety zones; and
- (xv) A refined take estimate based on the number of marine mammals observed in the safety and buffer zones. This may be reported as one or both of the following: a rate of take (number of marine mammals per unit time), or take based on density (number of individuals within the area).

8. This Authorization may be modified, suspended or withdrawn if the holder fails to abide by the conditions prescribed herein, or if the authorized taking is having more than a negligible impact on the species or stock of affected marine mammals.

Waudall
James H. Lecky,
Director, Office of Protected Resources,
National Marine Fisheries Service.

24 October 2011
Date

Table 1. Authorized take numbers, by species

Species	Authorized Take
Harbor seal (<i>Phoca vitulina</i>)	832
California sea lion (<i>Zalophus californianus</i>)	270
Killer whale (<i>Orcinus orca</i>)	39
Dall's porpoise (<i>Phocoenoides dalli</i>)	31
Harbor porpoise (<i>Phocoena phocoena</i>)	49