**DEPARTMENT OF COMMERCE**

**National Oceanic and Atmospheric Administration**

**RIN 0648–XD393**

## Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to a Pier Maintenance Project

**AGENCY:** National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

**ACTION:** Notice; proposed incidental harassment authorization; request for comments.

**SUMMARY:** NMFS has received a request from the U.S. Navy (Navy) for authorization to take marine mammals incidental to construction activities as part of a pier maintenance project. Pursuant to the Marine Mammal Protection Act (MMPA), NMFS is requesting comments on its proposal to issue an incidental harassment authorization (IHA) to the Navy to incidentally take marine mammals, by Level B Harassment only, during the specified activity.

**DATES:** Comments and information must be received no later than September 5, 2014.

**ADDRESSES:** Comments on the application should be addressed to Jolie Harrison, Chief, Permits and Conservation Division, Office of Protected Resources, National Marine Fisheries Service. Physical comments should be sent to 1315 East-West Highway, Silver Spring, MD 20910 and electronic comments should be sent to *ITP.Laws@noaa.gov.*

Instructions: NMFS is not responsible for comments sent by any other method, to any other address or individual, or received after the end of the comment period. Comments received electronically, including all attachments, must not exceed a 25-megabyte file size. Attachments to electronic comments will be accepted in Microsoft Word or Excel or Adobe PDF file formats only. All comments received are a part of the public record and will generally be posted to the Internet at *www.nmfs.noaa.gov/pr/permits/incidental.htm* without change. All personal identifying information (e.g., name, address) voluntarily submitted by the commenter may be publicly accessible. Do not submit confidential business information or otherwise sensitive or protected information.

**FOR FURTHER INFORMATION CONTACT:** Ben Laws, Office of Protected Resources, NMFS, (301) 427–8401.

**SUPPLEMENTARY INFORMATION:**

### Availability

An electronic copy of the Navy's application and supporting documents, as well as a list of the references cited in this document, may be obtained by visiting the Internet at: *www.nmfs.noaa.gov/pr/permits/incidental.htm.* In case of problems accessing these documents, please call the contact listed above.

### National Environmental Policy Act (NEPA)

The Navy prepared an Environmental Assessment (EA; 2013) for this project. We subsequently adopted the EA and signed our own Finding of No Significant Impact (FONSI) prior to issuing the first IHA for this project, in accordance with NEPA and the regulations published by the Council on Environmental Quality. Information in the Navy's application, the Navy's EA, and this notice collectively provide the environmental information related to proposed issuance of this IHA for public review and comment. All documents are available at the aforementioned Web site. We will review all comments submitted in response to this notice as we complete the NEPA process, including a decision of whether to reaffirm the existing FONSI, prior to a final decision on the incidental take authorization request.

### Background

Sections 101(a)(5)(A) and (D) of the MMPA (16 U.S.C. 1361 *et seq.*) direct the Secretary of Commerce to allow, upon request by U.S. citizens who engage in a specified activity (other than commercial fishing) within a specified area, the incidental, but not intentional, taking of small numbers of marine mammals, providing that certain findings are made and the necessary prescriptions are established.

The incidental taking of small numbers of marine mammals may be allowed only if NMFS (through authority delegated by the Secretary) finds that the total taking by the specified activity during the specified time period will (i) have a negligible impact on the species or stock(s) and (ii) not have an unmitigable adverse impact on the availability of the species or stock(s) for subsistence uses (where relevant). Further, the permissible methods of taking and requirements pertaining to the mitigation, monitoring and reporting of such taking must be set forth, either in specific regulations or in an authorization.

The allowance of such incidental taking under section 101(a)(5)(A), by harassment, serious injury, death, or a combination thereof, requires that regulations be established. Subsequently, a Letter of Authorization may be issued pursuant to the prescriptions established in such regulations, providing that the level of taking will be consistent with the findings made for the total taking allowable under the specific regulations. Under section 101(a)(5)(D), NMFS may authorize such incidental taking by harassment only, for periods of not more than one year, pursuant to requirements and conditions contained within an IHA. The establishment of prescriptions through either specific regulations or an authorization requires notice and opportunity for public comment.

NMFS has defined ''negligible impact'' in 50 CFR 216.103 as ''. . . an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival.'' Except with respect to certain activities not pertinent here, section 3(18) of the MMPA defines ''harassment'' as: ''. . . any act of pursuit, torment, or annoyance which (i) has the potential to injure a marine mammal or marine mammal stock in the wild [Level A harassment]; or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering [Level B harassment].''

### Summary of Request

On June 16, 2014, we received a request from the Navy for authorization to take marine mammals incidental to pile driving and removal associated with the Pier 6 pile replacement project at Naval Base Kitsap Bremerton, WA (NBKB). Hereafter, it may be assumed that use of the generic term ''pile driving'' refers to both pile driving and removal unless referring specifically to pile installation. The Navy submitted a revised version of the request on July 29, 2014, which we deemed adequate and complete. In-water work associated with the project would be conducted over three years and would occur only during the approved in-water work window from June 15 to March 1 of any year. This proposed IHA covers only the second year (in-water work window) of the project, and would be valid from October 1, 2014, through March 1, 2015.

The use of both vibratory and impact pile driving is expected to produce underwater sound at levels that have the potential to result in behavioral harassment of marine mammals. Species with the expected potential to be present during all or a portion of the in-water work window include the Steller sea lion (*Eumetopias jubatus monteriensis*), California sea lion (*Zalophus californianus*), and harbor seal (*Phoca vitulina richardii*). All of these species may be present throughout the proposed period of validity for this IHA.

This would be the second such IHA, if issued, following the IHA issued effective from December 1, 2013, through March 1, 2014 (78 FR 69825). A monitoring report, provided as Appendix D of the Navy's application, is available on the Internet at *www.nmfs.noaa.gov/pr/permits/incidental.htm* and provides environmental information related to proposed issuance of this IHA for public review and comment.

**Description of the Specified Activity**

*Overview*

NBKB serves as the homeport for a nuclear aircraft carrier and other Navy vessels and as a shipyard capable of overhauling and repairing all types and sizes of ships. Other significant capabilities include alteration, construction, deactivation, and dry-docking of naval vessels. Pier 6 was completed in 1926 and requires substantial maintenance to maintain readiness. Over the length of the entire project, the Navy proposes to remove up to 400 deteriorating fender piles and to replace them with up to 330 new pre-stressed concrete fender piles.

*Dates and Duration*

The allowable season for in-water work, including pile driving, at NBKB is June 15 through March 1, a window established by the Washington Department of Fish and Wildlife in coordination with NMFS and the U.S. Fish and Wildlife Service (USFWS) to protect fish. The total three-year project is expected to require 25 days of vibratory pile removal and 77 days of impact pile driving. Under the proposed action—which includes only the portion of the project that would be completed under this proposed IHA—a maximum of sixty pile driving days would occur. The Navy proposes to conduct 15 days of vibratory pile removal and 45 days of pile installation with an impact hammer. Either type of pile driving may occur on any day during the proposed period of validity, including concurrent pile removal and installation. Pile driving would occur only during daylight hours.

*Specific Geographic Region*

NBKB is located on the north side of Sinclair Inlet in Puget Sound (see Figures 1–1 and 2–1 of the Navy's application). Sinclair Inlet, an estuary of Puget Sound extending 3.5 miles southwesterly from its connection with the Port Washington Narrows, connects to the main basin of Puget Sound through Port Washington Narrows and then Agate Pass to the north or Rich Passage to the east. Sinclair Inlet has been significantly modified by development activities. Fill associated with transportation, commercial, and residential development of NBKB, the City of Bremerton, and the local ports of Bremerton and Port Orchard has resulted in significant changes to the shoreline. The area surrounding Pier 6 is industrialized, armored and adjacent to railroads and highways. Sinclair Inlet is also the receiving body for a wastewater treatment plant located just west of NBKB. Sinclair Inlet is relatively shallow and does not flush fully despite freshwater stream inputs.

*Detailed Description of Activities*

The Navy plans to remove deteriorated fender piles at Pier 6 and replace them with prestressed concrete piles. The entire project calls for the removal of 380 12-in diameter creosoted timber piles and twenty 12-in steel pipe piles. These would be replaced with 240 18-in square concrete piles and ninety 24-in square concrete piles. It is not possible to specify accurately the number of piles that might be installed or removed in any given work window, due to various delays that may be expected during construction work and uncertainty inherent to estimating production rates. The Navy assumes a notional production rate of sixteen piles per day (removal) and four piles per day (installation) in determining the number of days of pile driving expected, and scheduling—as well as exposure analyses—is based on this assumption.

All piles are planned for removal via vibratory driver. The driver is suspended from a barge-mounted crane and positioned on top of a pile. Vibration from the activated driver loosens the pile from the substrate. Once the pile is released, the crane raises the driver and pulls the pile from the sediment. Vibratory extraction is expected to take approximately 5–30 minutes per pile. If piles break during removal, the remaining portion may be removed via direct pull or with a clamshell bucket. Replacement piles would be installed via impact driver and would require approximately 15–60 minutes of driving time per pile, depending on subsurface conditions. Impact driving and/or vibratory removal could occur on any work day during the period of the proposed IHA. Only one pile driving rig is planned for operation at any given time.

*Description of Work Accomplished*—During the first in-water work season, the contractor completed installation of two concrete piles, on two separate days. Please see the Navy's report in Appendix D of their application. The Navy initially estimated that 200 work days would be required to complete the project, but has revised that estimate downwards to 102 total days. Therefore, if the Navy completes sixty days of in-water work during year two of the project, we would anticipate that the project would be completed in a third year, with forty additional work days.

**Description of Marine Mammals in the Area of the Specified Activity**

There are five marine mammal species with records of occurrence in waters of Sinclair Inlet in the action area. These are the California sea lion, harbor seal, Steller sea lion, gray whale (*Eschrichtius robustus*), and killer whale (*Orcinus orca*). The harbor seal is a year-round resident of Washington inland waters, including Puget Sound, while the sea lions are absent for portions of the summer. For the killer whale, both transient (west coast stock) and resident (southern stock) animals have occurred in the area. However, southern resident animals are known to have occurred only once, with the last confirmed sighting from 1997 in Dyes Inlet. A group of 19 whales from the L–25 subpod entered and stayed in Dyes Inlet, which connects to Sinclair Inlet northeast of NBKB, for 30 days. Dyes Inlet may be reached only by traversing from Sinclair Inlet through the Port Washington Narrows, a narrow connecting body that is crossed by two bridges, and it was speculated at the time that the whales' long stay was the result of a reluctance to traverse back through the Narrows and under the two bridges. There is one other unconfirmed report of a single southern resident animal occurring in the project area, in January 2009. Of these stocks, the southern resident killer whale is listed (as endangered) under the Endangered Species Act (ESA).

An additional seven species have confirmed occurrence in Puget Sound, but are considered rare to extralimital in Sinclair Inlet and the surrounding waters. These species—the humpback whale (*Megaptera novaeangliae*), minke whale (*Balaenoptera acutorostrata scammoni*), Pacific white-sided dolphin (*Lagenorhynchus obliquidens*), harbor porpoise (*Phocoena phocoena vomerina*), Dall's porpoise (*Phocoenoides dalli dalli*), and northern elephant seal (*Mirounga angustirostris*)—along with the southern resident killer whale, are considered extremely unlikely to occur in the action area or to be affected by the specified activities, and are not considered further in this document. A review of sightings records available from the Orca Network (*www.orcanetwork.org;* accessed July 14, 2014) confirms that there are no recorded observations of these species in the action area (with the exception of the southern resident sightings described above).

We have reviewed the Navy's detailed species descriptions, including life history information, for accuracy and completeness and refer the reader to Sections 3 and 4 of the Navy's application instead of reprinting the information here. Please also refer to NMFS' Web site (*www.nmfs.noaa.gov/pr/species/mammals*) for generalized species accounts and to the Navy's Marine Resource Assessment for the Pacific Northwest, which documents and describes the marine resources that occur in Navy operating areas of the Pacific Northwest, including Puget Sound (DoN, 2006). The document is publicly available at *www.navfac.navy.mil/products_and_services/ev/products_and_services/marine_resources/marine_resource_assessments.html* (accessed May 2, 2014).

Table 1 lists the marine mammal species with expected potential for occurrence in the vicinity of NBKB during the project timeframe and summarizes key information regarding stock status and abundance. Taxonomically, we follow Committee on Taxonomy (2014). Please see NMFS' Stock Assessment Reports (SAR), available at *www.nmfs.noaa.gov/pr/sars,* for more detailed accounts of these stocks' status and abundance. The harbor seal, California sea lion, and gray whale are addressed in the Pacific SARs (e.g., Carretta *et al.,* 2013a), while the Steller sea lion and transient killer whale are treated in the Alaska SARs (e.g., Allen and Angliss, 2013a).

In the species accounts provided here, we offer a brief introduction to the species and relevant stock as well as available information regarding population trends and threats, and describe any information regarding local occurrence.

TABLE 1—MARINE MAMMALS POTENTIALLY PRESENT IN THE VICINITY OF NBKB

| Species | Stock | ESA/MMPA status; Strategic (Y/N)[1] | Stock abundance (CV, $N_{min}$, most recent abundance survey)[2] | PBR[3] | Annual M/SI[4] | Relative occurrence in sinclair inlet; season of occurrence |
|---|---|---|---|---|---|---|
| **Order Cetartiodactyla—Cetacea—Superfamily Mysticeti (baleen whales)** | | | | | | |
| Family Eschrichtiidae:. | | | | | | |
| Gray whale | Eastern North Pacific | −; N | 19,126 (0.071; 18,017; 2007) | 558 | 127[11] | Rare; year-round |
| **Superfamily Odontoceti (toothed whales, dolphins, and porpoises)** | | | | | | |
| Family Delphinidae: | | | | | | |
| Killer whale | West coast transient[5,6] | −; N | 243 (n/a; 2006) | 2.4 | 0 | Rare; year-round |
| Order Carnivora—Superfamily Pinnipedia: | | | | | | |
| Family Otariidae (eared seals and sea lions): | | | | | | |
| California sea lion | U.S. | −; N | 296,750 (n/a; 153, 337; 2008) | 9,200 | ≥431 | Common; year-round (excluding July) |
| Steller sea lion | Eastern U.S.[5] | −; N[8] | 63,160–78,198 (n/a; 57,966; 2008–11)[9] | 1,552[10] | 65.1 | Occasional/seasonal; Oct–May |
| Family Phocidae (earless seals): | | | | | | |
| Harbor seal | Washington inland waters[7]. | −; N | 14,612 (0.15; 12,844; 1999) | 771 | 13.4 | Common; year-round |

[1] ESA status: Endangered (E), Threatened (T)/MMPA status: Depleted (D). A dash (−) indicates that the species is not listed under the ESA or designated as depleted under the MMPA. Under the MMPA, a strategic stock is one for which the level of direct human-caused mortality exceeds PBR (see footnote 3) or which is determined to be declining and likely to be listed under the ESA within the foreseeable future. Any species or stock listed under the ESA is automatically designated under the MMPA as depleted and as a strategic stock.

[2] CV is coefficient of variation; $N_{min}$ is the minimum estimate of stock abundance. In some cases, CV is not applicable. For killer whales, the abundance values represent direct counts of individually identifiable animals; therefore there is only a single abundance estimate with no associated CV. For certain stocks of pinnipeds, abundance estimates are based upon observations of animals (often pups) ashore multiplied by some correction factor derived from knowledge of the specie's (or similar species') life history to arrive at a best abundance estimate; therefore, there is no associated CV. In these cases, the minimum abundance may represent actual counts of all animals ashore.

[3] Potential biological removal, defined by the MMPA as the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population size (OSP).

[4] These values, found in NMFS' SARs, represent annual levels of human-caused mortality plus serious injury from all sources combined (e.g., commercial fisheries, subsistence hunting, ship strike). Annual M/SI often cannot be determined precisely and is in some cases presented as a minimum value. All values presented here are from the draft 2013 SARs (*www.nmfs.noaa.gov/pr/sars/draft.htm*).

[5] Abundance estimates (and resulting PBR values) for these stocks are new values presented in the draft 2013 SARs. This information was made available for public comment and is currently under review and therefore may be revised prior to finalizing the 2013 SARs. However, we consider this information to be the best available for use in this document.

[6] The abundance estimate for this stock includes only animals from the "inner coast" population occurring in inside waters of southeastern Alaska, British Columbia, and Washington—excluding animals from the "outer coast" subpopulation, including animals from California—and therefore should be considered a minimum count. For comparison, the previous abundance estimate for this stock, including counts of animals from California that are now considered outdated, was 354.

[7] Abundance estimates for these stocks are greater than eight years old and are therefore not considered current. PBR is considered undetermined for these stocks, as there is no current minimum abundance estimate for use in calculation. We nevertheless present the most recent abundance estimates and PBR values, as these represent the best available information for use in this document.

[8] The eastern distinct population segment of the Steller sea lion, previously listed under the ESA as threatened, was delisted on December 4, 2013 (78 FR 66140; November 4, 2013). Because this stock is not below its OSP size and the level of direct human-caused mortality does not exceed PBR, this delisting action implies that the stock is no longer designated as depleted or as a strategic stock under the MMPA.

[9] Best abundance is calculated as the product of pup counts and a factor based on the birth rate, sex and age structure, and growth rate of the population. A range is presented because the extrapolation factor varies depending on the vital rate parameter resulting in the growth rate (i.e., high fecundity or low juvenile mortality).

[10] PBR is calculated for the U.S. portion of the stock only (excluding animals in British Columbia) and assumes that the stock is not within its OSP. If we assume that the stock is within its OSP, PBR for the U.S. portion increases to 2,069.

[11] Includes annual Russian harvest of 123 whales.

*Steller Sea Lion*

Steller sea lions are distributed mainly around the coasts to the outer continental shelf along the North Pacific rim from northern Hokkaido, Japan through the Kuril Islands and Okhotsk Sea, Aleutian Islands and central Bering Sea, southern coast of Alaska and south to California (Loughlin *et al.,* 1984). Based on distribution, population response, and phenotypic and genotypic data, two separate stocks of Steller sea lions are recognized within U.S. waters, with the population divided into western and eastern distinct population segments (DPS) at 144°W (Cape Suckling, Alaska) (Loughlin, 1997). The eastern DPS extends from California to Alaska, including the Gulf of Alaska, and is the only stock that may occur in the Hood Canal.

According to NMFS' recent status review (NMFS, 2013), the best available information indicates that the overall abundance of eastern DPS Steller sea lions has increased for a sustained period of at least three decades while pup production has also increased significantly, especially since the mid-1990s. Johnson and Gelatt (2012) provided an analysis of growth trends of the entire eastern DPS from 1979–2010, indicating that the stock increased during this period at an annual rate of 4.2 percent (90% CI 3.7–4.6). Most of the overall increase occurred in the northern portion of the range (southeast Alaska and British Columbia), but pup counts in Oregon and California also increased significantly (e.g., Merrick *et al.,* 1992; Sease *et al.,* 2001; Olesiuk and Trites, 2003; Fritz *et al.* 2008; Olesiuk, 2008; NMFS, 2008, 2013). In Washington, Pitcher *et al.* (2007) reported that Steller sea lions, presumably immature animals and non-breeding adults, regularly used four haul-outs, including two ''major'' haul-outs (>50 animals). The same study reported that the numbers of sea lions counted between 1989 and 2002 on Washington haul-outs increased significantly (average annual rate of 9.2 percent) (Pitcher *et al.,* 2007). Although the stock size has increased, its status relative to OSP size is unknown. However, the consistent long-term estimated annual rate of increase may indicate that the stock is reaching OSP size (Allen and Angliss, 2013a).

Data from 2005–10 show a total mean annual mortality rate of 5.71 (CV = 0.23) sea lions per year from observed fisheries and 11.25 reported takes per year that could not be assigned to specific fisheries, for an approximate total from all fisheries of 17 eastern Steller sea lions (Allen and Angliss, 2013a). In addition, opportunistic observations and stranding data indicate that an additional 32 animals are killed or seriously injured each year through interaction with commercial and recreational troll fisheries and by entanglement (Allen and Angliss, 2013b). The annual average take for subsistence harvest in Alaska was 11.9 individuals in 2004–08 (Allen and Angliss, 2013a). Data on community subsistence harvests is no longer being collected, and this average is retained as an estimate for current and future subsistence harvest. Sea lion deaths are also known to occur because of illegal shooting, vessel strikes, or capture in research gear and other traps, totaling 4.2 animals per year from 2007–11 (Allen and Angliss, 2013b). The total annual human-caused mortality is a minimum estimate because takes via fisheries interactions and subsistence harvest in Canada are poorly known, although are believed to be small.

The eastern stock breeds in rookeries located in southeast Alaska, British Columbia, Oregon, and California. There are no known breeding rookeries in Washington (Allen and Angliss, 2013a) but eastern stock Steller sea lions are present year-round along the outer coast of Washington, including immature animals or non-breeding adults of both sexes. In 2011, the minimum count for Steller sea lions in Washington was 1,749 (Allen and Angliss, 2013b), up from 516 in 2001 (Pitcher *et al.,* 2007). In Washington, Steller sea lions primarily occur at haul-out sites along the outer coast from the Columbia River to Cape Flattery and in inland waters sites along the Vancouver Island coastline of the Strait of Juan de Fuca (Jeffries *et al.,* 2000; Olesiuk and Trites, 2003; Olesiuk, 2008). Numbers vary seasonally in Washington waters with peak numbers present during the fall and winter months (Jeffries *et al.,* 2000). More recently, five winter haul-out sites used by adult and subadult Steller sea lions have been identified in Puget Sound (see Figure 4–2 of the Navy's application). Numbers of animals observed at all of these sites combined were less than 200 individuals. The closest haul-out, with approximately 30 to 50 individuals near the Navy's Manchester Fuel Depot, occurs approximately 6.5 mi from the project site but is physically separated by various land masses and waterways. However, one Steller sea lion was observed hauled out on the floating security barrier at NBKB in November 2012. No permanent haul-out has been identified in the project area and Steller sea lion presence is considered to be rare and seasonal.

*Harbor Seal*

Harbor seals inhabit coastal and estuarine waters and shoreline areas of the northern hemisphere from temperate to polar regions. The eastern North Pacific subspecies is found from Baja California north to the Aleutian Islands and into the Bering Sea. Multiple lines of evidence support the existence of geographic structure among harbor seal populations from California to Alaska (e.g., O'Corry-Crowe *et al.,* 2003; Temte, 1986; Calambokidis *et al.,* 1985; Kelly, 1981; Brown, 1988; Lamont, 1996; Burg, 1996). Harbor seals are generally non-migratory, and analysis of genetic information suggests that genetic differences increase with geographic distance (Westlake and O'Corry-Crowe, 2002). However, because stock boundaries are difficult to meaningfully draw from a biological perspective, three separate harbor seal stocks are recognized for management purposes along the west coast of the continental U.S.: (1) Inland waters of Washington (including Hood Canal, Puget Sound, and the Strait of Juan de Fuca out to Cape Flattery), (2) outer coast of Oregon and Washington, and (3) California (Carretta *et al.,* 2013a). Multiple stocks are recognized in Alaska. Samples from Washington, Oregon, and California demonstrate a high level of genetic diversity and indicate that the harbor seals of Washington inland waters possess unique haplotypes not found in seals from the coasts of Washington, Oregon, and California (Lamont *et al.,* 1996). Only the Washington inland waters stock may be found in the project area.

Recent genetic evidence suggests that harbor seals of Washington inland waters may have sufficient population structure to warrant division into multiple distinct stocks (Huber *et al.,* 2010, 2012). Based on studies of pupping phenology, mitochondrial DNA, and microsatellite variation, Carretta *et al.* (2013b) suggest division of the Washington inland waters stock into three new populations, and present these as prospective stocks: (1) Southern Puget Sound (south of the Tacoma Narrows Bridge); (2) Washington northern inland waters (including Puget Sound north of the Tacoma Narrows Bridge, the San Juan Islands, and the Strait of Juan de Fuca); and (3) Hood Canal. Until this stock structure is accepted, we consider a single Washington inland waters stock.

The best available abundance estimate was derived from aerial surveys of harbor seals in Washington conducted during the pupping season in 1999, during which time the total numbers of hauled-out seals (including pups) were counted (Jeffries *et al.,* 2003). Radio-tagging studies conducted at six locations collected information on harbor seal haul-out patterns in 1991–92, resulting in a pooled correction factor (across three coastal and three inland sites) of 1.53 to account for animals in the water which are missed during the aerial surveys (Huber *et al.,* 2001), which, coupled with the aerial survey counts, provides the abundance estimate (see Table 2).

Harbor seal counts in Washington State increased at an annual rate of six percent from 1983–96, increasing to ten percent for the period 1991–96 (Jeffries *et al.,* 1997). The population is thought to be stable, and the Washington inland waters stock is considered to be within its OSP size (Jeffries *et al.,* 2003).

Data from 2007–11 indicate that a minimum of four harbor seals are killed annually in Washington inland waters commercial fisheries, while mean annual mortality for recreational fisheries is one seal (Carretta *et al.,* 2013b). Animals captured east of Cape Flattery are assumed to belong to this stock. The estimate is considered a minimum because there are likely additional animals killed in unobserved fisheries and because not all animals stranding as a result of fisheries interactions are likely to be recorded. Another 8.4 harbor seals per year are estimated to be killed as a result of various non-fisheries human interactions (Carretta *et al.,* 2013b). Tribal subsistence takes of this stock may occur, but no data on recent takes are available.

Harbor seal numbers increase from January through April and then decrease from May through August as the harbor seals move to adjacent bays on the outer coast of Washington for the pupping season. From April through mid-July, female harbor seals haul out on the outer coast of Washington at pupping sites to give birth. Harbor seals are expected to occur in Sinclair Inlet and NBKB at all times of the year. No permanent haul-out has been identified at NBKB. The nearest known haul-outs are along the south side of Sinclair Inlet on log breakwaters at several marinas in Port Orchard, approximately one mile from Pier 6. An additional haul-out location in Dyes Inlet, approximately 8.5 km north and west (shoreline distance), was believed to support less than 100 seals (Jeffries *et al.,* 2000). Please see Figure 4–2 of the Navy's application.

*California Sea Lion*

California sea lions range from the Gulf of California north to the Gulf of Alaska, with breeding areas located in the Gulf of California, western Baja California, and southern California. Five genetically distinct geographic populations have been identified: (1) Pacific temperate, (2) Pacific subtropical, and (3–5) southern, central, and northern Gulf of California (Schramm *et al.,* 2009). Rookeries for the Pacific temperate population are found within U.S. waters and just south of the U.S.-Mexico border, and animals belonging to this population may be found from the Gulf of Alaska to Mexican waters off Baja California. For management purposes, a stock of California sea lions comprising those animals at rookeries within the U.S. is defined (i.e., the U.S. stock of California sea lions) (Carretta *et al.,* 2013a). Pup production at the Coronado Islands rookery in Mexican waters is considered an insignificant contribution to the overall size of the Pacific temperate population (Lowry and Maravilla-Chavez, 2005).

Trends in pup counts from 1975 through 2008 have been assessed for four rookeries in southern California and for haul-outs in central and northern California. During this time period counts of pups increased at an annual rate of 5.4 percent, excluding six El Nino years when pup production declined dramatically before quickly rebounding (Carretta *et al.,* 2013a). The maximum population growth rate was 9.2 percent when pup counts from the El Niño years were removed. There are indications that the California sea lion may have reached or is approaching carrying capacity, although more data are needed to confirm that leveling in growth persists (Carretta *et al.,* 2013a).

Data from 2003–09 indicate that a minimum of 337 (CV = 0.56) California sea lions are killed annually in commercial fisheries. In addition, a summary of stranding database records for 2005–09 shows an annual average of 65 such events, which is likely a gross underestimate because most carcasses are not recovered. California sea lions may also be removed because of predation on endangered salmonids (seventeen per year, 2008–10) or incidentally captured during scientific research (three per year, 2005–09) (Carretta *et al.,* 2013a). Sea lion mortality has also been linked to the algal-produced neurotoxin domoic acid (Scholin *et al.,* 2000). Future mortality may be expected to occur, due to the sporadic occurrence of such harmful algal blooms. There is currently an Unusual Mortality Event (UME) declaration in effect for California sea lions. Beginning in January 2013, elevated strandings of California sea lion pups have been observed in southern California, with live sea lion strandings nearly three times higher than the historical average. Findings to date indicate that a likely contributor to the large number of stranded, malnourished pups was a change in the availability of sea lion prey for nursing mothers, especially sardines. The causes and mechanisms of this UME remain under investigation (*www.nmfs.noaa.gov/pr/health/mmume/californiasealions2013.htm;* accessed May 8, 2014).

An estimated 3,000 to 5,000 California sea lions migrate northward along the coast to central and northern California, Oregon, Washington, and Vancouver Island during the non-breeding season from September to May (Jeffries *et al.,* 2000) and return south the following spring (Mate, 1975; Bonnell *et al.,* 1983). Peak numbers of up to 1,000 California sea lions occur in Puget Sound (including Hood Canal) during this time period (Jeffries *et al.,* 2000).

California sea lions were not recorded in Puget Sound until approximately 1979 (Steiger and Calambokidis, 1986). Everitt *et al.* (1980) reported the initial occurrence of large numbers in northern Puget Sound in the spring of that year. Similar sightings and increases in numbers were documented throughout the region after the initial sighting (Steiger and Calambokidis 1986), including urbanized areas such as Elliot Bay near Seattle and heavily used areas of central Puget Sound (Gearin *et al.,* 1986). California sea lions now use haul-out sites within all regions of Washington inland waters (Jeffries *et al.,* 2000). California sea lions migrate northward along the coast to central and northern California, Oregon, Washington, and Vancouver Island during the non-breeding season from September to May and return south the following spring (Mate, 1975; Bonnell *et al.,* 1983). Jeffries *et al.* (2000) estimated that 3,000 to 5,000 individuals make this trip, with peak numbers of up to 1,000 occurring in Puget Sound during this time period. The California sea lion population has grown substantially, and it is likely that the numbers migrating to Washington inland waters have increased as well.

Occurrence in Puget Sound is typically between September and June with peak abundance between September and May. During summer months (June through August) and associated breeding periods, California sea lions are largely returning to rookeries in California and are not present in large numbers in Washington inland waters. They are known to utilize a diversity of man-made structures for hauling out (Riedman, 1990) and, although there are no regular California sea lion haul-outs known within Sinclair Inlet (Jeffries *et al.,* 2000), they are frequently observed hauled out at several opportune areas at NBKB (e.g., floating security fence; see Figures 4–1 and 4–2 of the Navy's application). The next nearest recorded haul-outs are navigation buoys and net pens in Rich Passage, approximately 10 km east of NBKB (Jeffries *et al.,* 2000).

*Killer Whale*

Killer whales are one of the most cosmopolitan marine mammals, found in all oceans with no apparent restrictions on temperature or depth, although they do occur at higher densities in colder, more productive waters at high latitudes and are more common in nearshore waters (Leatherwood and Dahlheim, 1978; Forney and Wade, 2006). Killer whales are found throughout the North Pacific, including the entire Alaska coast, in British Columbia and Washington inland waterways, and along the outer coasts of Washington, Oregon, and California. On the basis of differences in morphology, ecology, genetics, and behavior, populations of killer whales have largely been classified as ''resident'', ''transient'', or ''offshore'' (e.g., Dahlheim *et al.,* 2008). Several studies have also provided evidence that these ecotypes are genetically distinct, and that further genetic differentiation is present between subpopulations of the resident and transient ecotypes (e.g., Barrett-Lennard, 2000). The taxonomy of killer whales is unresolved, with expert opinion generally following one of two lines: Killer whales are either (1) a single highly variable species, with locally differentiated ecotypes representing recently evolved and relatively ephemeral forms not deserving species status, or (2) multiple species, supported by the congruence of several lines of evidence for the distinctness of sympatrically occurring forms (Krahn *et al.,* 2004). Resident and transient whales are currently considered to be unnamed subspecies (Committee on Taxonomy, 2014).

The resident and transient populations have been divided further into different subpopulations on the basis of genetic analyses, distribution, and other factors. Recognized stocks in the North Pacific include Alaska residents; northern residents; southern residents; Gulf of Alaska, Aleutian Islands, and Bering Sea transients; and west coast transients, along with a single offshore stock. See Allen and Angliss (2013a) for more detail about these stocks. West coast transient killer whales, which occur from California through southeastern Alaska, are the only type expected to potentially occur in the project area.

It is thought that the stock grew rapidly from the mid-1970s to mid-1990s as a result of a combination of high birth rate, survival, as well as greater immigration of animals into the nearshore study area (DFO, 2009). The rapid growth of the population during this period coincided with a dramatic increase in the abundance of the whales' primary prey, harbor seals, in nearshore waters. Population growth began slowing in the mid-1990s and has continued to slow in recent years (DFO, 2009). Population trends and status of this stock relative to its OSP level are currently unknown. Analyses in DFO (2009) estimated a rate of increase of about six percent per year from 1975 to 2006, but this included recruitment of non-calf whales into the population.

Although certain commercial fisheries are known to have potential for interaction with killer whales and other mortality, resulting from shooting, ship strike, or entanglement, has been of concern in the past, the estimated level of human caused mortality and serious injury is currently considered to be zero for this stock (Allen and Angliss, 2013a). However, this could represent an underestimate as regards total fisheries-related mortality due to a lack of data concerning marine mammal interactions in Canadian commercial fisheries known to have potential for interaction with killer whales. Any such interactions are thought to be few in number (Allen and Angliss, 2013a). No ship strikes have been reported for this stock, and shooting of transients is thought to be minimal because their diet is based on marine mammals rather than fish. There are no reports of a subsistence harvest of killer whales in Alaska or Canada.

Transient occurrence in inland waters appears to peak during August and September which is the peak time for harbor seal pupping, weaning, and post-weaning (Baird and Dill, 1995). The number of west coast transients in Washington inland waters at any one time was considered likely to be fewer than twenty individuals by Wiles (2004), although more recent information (2004–10) suggests that transient use of inland waters has increased, possibly due to increasing prey abundance (Houghton *et al.,* in prep.). However, Sinclair Inlet is a shallow bay located approximately eight miles through various waterways from the main open waters of Puget Sound, where killer whales occur more frequently, and killer whale occurrence in Sinclair Inlet is uncommon. From December 2002 to June 2014, there were two reports of transient killer whales transiting through the area around NBKB, with both reports occurring in May (a group of up to twelve in 2004 and a group of up to five in 2012; *www.orcanetwork.org*).

*Gray Whale*

Gray whales are found in shallow coastal waters, migrating between summer feeding areas in the north and winter breeding areas in the south. Gray whales were historically common throughout the northern hemisphere but are now found only in the Pacific, where two populations are recognized, Eastern and Western North Pacific (ENP and WNP). ENP whales breed and calve primarily in areas off Baja California and in the Gulf of California. From February to May, whales typically migrate northbound to summer/fall feeding areas in the Chukchi and northern Bering Seas, with the southbound return to calving areas typically occurring in November and December. WNP whales are known to feed in the Okhotsk Sea and off of Kamchatka before migrating south to poorly known wintering grounds, possibly in the South China Sea.

The two populations have historically been considered geographically isolated from each other; however, recent data from satellite-tracked whales indicates that there is some overlap between the stocks. Two WNP whales were tracked from Russian foraging areas along the Pacific rim to Baja California (Mate *et al.,* 2011), and, in one case where the satellite tag remained attached to the whale for a longer period, a WNP whale was tracked from Russia to Mexico and back again (IWC, 2012). Between 22–24 WNP whales are known to have occurred in the eastern Pacific through comparisons of ENP and WNP photo-identification catalogs (IWC, 2012; Weller *et al.,* 2011; Burdin *et al.,* 2011), and WNP animals comprised 8.1 percent of gray whales identified during a recent field season off of Vancouver Island (Weller *et al.,* 2012). In addition, two genetic matches of WNP whales have been recorded off of Santa Barbara, CA (Lang *et al.,* 2011a). Therefore, a portion of the WNP population is assumed to migrate, at least in some years, to the eastern Pacific during the winter breeding season. However, no WNP whales are known to have occurred in Washington inland waters. The likelihood of any gray whale being exposed to project sound to the degree considered in this document is already low, given the uncommon occurrence of gray whales in the project area. In the event that a gray whale did occur in the project area, it is extremely unlikely that it would be one of the approximately twenty WNP whales that have been documented in the eastern Pacific (less than one percent probability). The WNP population is listed as endangered under the ESA and depleted under the MMPA as a foreign stock; however, the likelihood that a WNP whale would be present in the action area is insignificant and discountable.

In addition, recent studies provide new information on gray whale stock structure within the ENP, with emphasis on whales that feed during summer off the Pacific coast between northern California and southeastern Alaska, occasionally as far north as Kodiak Island, Alaska (Gosho *et al.,* 2011). These whales, collectively known as the Pacific Coast Feeding Group (PCFG), are a trans-boundary population with the U.S. and Canada and are defined by the International Whaling Commission (IWC) as follows: Gray whales observed between June 1 to November 30 within the region between northern California and northern Vancouver Island (from 41° N to 52° N) and photo-identified within this area during two or more years (Carretta *et al.,* 2013). Photo-identification and satellite tagging studies provide data on abundance, population structure, and movements of PCFG whales (Calambokidis *et al.,* 2010; Mate *et al;* 2010; Gosho *et al.,* 2011). These data in conjunction with genetic studies (e.g., Frasier *et al.,* 2011; Lang *et al.,* 2011b) indicate that the PCFG may be a demographically distinct feeding aggregation, and may warrant consideration as a distinct stock (Carretta *et al.,* 2013). It is unknown whether PCFG whales would be encountered in Washington inland waters. Here, we consider only a single stock of ENP whales.

The ENP population of gray whales, which is managed as a stock, was removed from ESA protection in 1994, is not currently protected under the ESA, and is not listed as depleted under the MMPA. Punt and Wade (2010) estimated the ENP population was at 91 percent of carrying capacity and at 129 percent of the maximum net productivity level and therefore within the range of its optimum sustainable population. The estimated annual rate of increase from 1967–88, based on a revised abundance time series from Laake *et al.* (2009), is 3.2 percent (Punt and Wade, 2010), and the population size of the ENP gray whale stock has been increasing over the past several decades despite a west coast UME from 1999–2001. It is likely that oceanographic factors limited food availability (LeBouef *et al.,* 2000; Moore *et al.,* 2001; Minobe, 2002; Gulland *et al.,* 2005), with resulting declines in survival rates of adults (Punt and Wade, 2012). The population has recovered to levels seen prior to the UME (Carretta *et al.,* 2013b).

As noted above, gray whale numbers were significantly reduced by whaling, becoming extirpated from the Atlantic by the early 1700s and listed as an endangered species in the Pacific. Gray whales remain subject to occasional fisheries-related mortality and death from ship strikes. Based on stranding network data for the period 2007–11, there are an average of 2.4 deaths per year from the former and 2.0 per year from the latter. In addition, subsistence hunting of gray whales by hunters in Russia and the U.S. is approved by the IWC, although none is currently authorized in the U.S. From 2007–11, the annual Russian subsistence harvest was 123 whales (Carretta *et al.,* 2013). Climate change is considered a significant habitat concern for gray whales, as prey composition and distribution is likely to be altered and human activity in the whales' summer feeding grounds increases (Carretta *et al.,* 2013).

Gray whales generally migrate southbound past Washington in late December and January, and transit past Washington on the northbound return in March to May. Gray whales do not generally make use of Washington inland waters, but have been observed in certain portions of those waters in all months of the year, with most records occurring from March through June (Calambokidis *et al.,* 2010; *www.orcanetwork.org*) and associated with regular feeding areas. Usually fewer than twenty gray whales visit the inner marine waters of Washington and British Columbia beginning in about January, with some staying until summer. Six to ten of these are PCFG whales that return most years to feeding sites near Whidbey and Camano Islands in northern Puget Sound. The remaining individuals occurring in any given year generally appear unfamiliar with feeding areas, often arrive emaciated, and commonly die of starvation (WDFW, 2012). From December 2002 to June 2014, the Orca Network sightings database reports four occurrences of gray whales in the project area during the in-water work window (*www.orcanetwork.org*). Three sightings occurred during the winter of 2008–09, and one stranding was reported in January 2013. The necropsy of the whale indicated that it was a juvenile male in poor nutritional health. Two other strandings have been recorded in the project area, in May 2005 and July 2011.

**Potential Effects of the Specified Activity on Marine Mammals**

This section includes a summary and discussion of the ways that components of the specified activity may impact marine mammals. This discussion also includes reactions that we consider to rise to the level of a take and those that we do not consider to rise to the level of a take (for example, with acoustics, we may include a discussion of studies that showed animals not reacting at all to sound or exhibiting barely measurable avoidance). This section is intended as a background of potential effects and does not consider either the specific manner in which this activity will be carried out or the mitigation that will be implemented, and how either of those will shape the anticipated impacts from this specific activity. The ''Estimated Take by Incidental Harassment'' section later in this document will include a quantitative analysis of the number of individuals that are expected to be taken by this activity. The ''Negligible Impact

Analysis'' section will include the analysis of how this specific activity will impact marine mammals and will consider the content of this section, the ''Estimated Take by Incidental Harassment'' section, the ''Proposed Mitigation'' section, and the ''Anticipated Effects on Marine Mammal Habitat'' section to draw conclusions regarding the likely impacts of this activity on the reproductive success or survivorship of individuals and from that on the affected marine mammal populations or stocks. In the following discussion, we provide general background information on sound and marine mammal hearing before considering potential effects to marine mammals from sound produced by vibratory and impact pile driving.

*Description of Sound Sources*

Sound travels in waves, the basic components of which are frequency, wavelength, velocity, and amplitude. Frequency is the number of pressure waves that pass by a reference point per unit of time and is measured in hertz (Hz) or cycles per second. Wavelength is the distance between two peaks of a sound wave; lower frequency sounds have longer wavelengths than higher frequency sounds and attenuate (decrease) more rapidly in shallower water. Amplitude is the height of the sound pressure wave or the 'loudness' of a sound and is typically measured using the decibel (dB) scale. A dB is the ratio between a measured pressure (with sound) and a reference pressure (sound at a constant pressure, established by scientific standards). It is a logarithmic unit that accounts for large variations in amplitude; therefore, relatively small changes in dB ratings correspond to large changes in sound pressure. When referring to sound pressure levels (SPLs; the sound force per unit area), sound is referenced in the context of underwater sound pressure to 1 microPascal (μPa). One pascal is the pressure resulting from a force of one newton exerted over an area of one square meter. The source level (SL) represents the sound level at a distance of 1 m from the source (referenced to 1 μPa). The received level is the sound level at the listener's position. Note that all underwater sound levels in this document are referenced to a pressure of 1 μPa and all airborne sound levels in this document are referenced to a pressure of 20 μPa.

Root mean square (rms) is the quadratic mean sound pressure over the duration of an impulse. Rms is calculated by squaring all of the sound amplitudes, averaging the squares, and then taking the square root of the average (Urick, 1983). Rms accounts for both positive and negative values; squaring the pressures makes all values positive so that they may be accounted for in the summation of pressure levels (Hastings and Popper, 2005). This measurement is often used in the context of discussing behavioral effects, in part because behavioral effects, which often result from auditory cues, may be better expressed through averaged units than by peak pressures.

When underwater objects vibrate or activity occurs, sound-pressure waves are created. These waves alternately compress and decompress the water as the sound wave travels. Underwater sound waves radiate in all directions away from the source (similar to ripples on the surface of a pond), except in cases where the source is directional. The compressions and decompressions associated with sound waves are detected as changes in pressure by aquatic life and man-made sound receptors such as hydrophones.

Even in the absence of sound from the specified activity, the underwater environment is typically loud due to ambient sound. Ambient sound is defined as environmental background sound levels lacking a single source or point (Richardson *et al.,* 1995), and the sound level of a region is defined by the total acoustical energy being generated by known and unknown sources. These sources may include physical (e.g., waves, earthquakes, ice, atmospheric sound), biological (e.g., sounds produced by marine mammals, fish, and invertebrates), and anthropogenic sound (e.g., vessels, dredging, aircraft, construction). A number of sources contribute to ambient sound, including the following (Richardson *et al.,* 1995):

- Wind and waves: The complex interactions between wind and water surface, including processes such as breaking waves and wave-induced bubble oscillations and cavitation, are a main source of naturally occurring ambient noise for frequencies between 200 Hz and 50 kHz (Mitson, 1995). In general, ambient sound levels tend to increase with increasing wind speed and wave height. Surf noise becomes important near shore, with measurements collected at a distance of 8.5 km from shore showing an increase of 10 dB in the 100 to 700 Hz band during heavy surf conditions.
- Precipitation: Sound from rain and hail impacting the water surface can become an important component of total noise at frequencies above 500 Hz, and possibly down to 100 Hz during quiet times.
- Biological: Marine mammals can contribute significantly to ambient noise levels, as can some fish and shrimp. The frequency band for biological contributions is from approximately 12 Hz to over 100 kHz.
- Anthropogenic: Sources of ambient noise related to human activity include transportation (surface vessels and aircraft), dredging and construction, oil and gas drilling and production, seismic surveys, sonar, explosions, and ocean acoustic studies. Shipping noise typically dominates the total ambient noise for frequencies between 20 and 300 Hz. In general, the frequencies of anthropogenic sounds are below 1 kHz and, if higher frequency sound levels are created, they attenuate rapidly (Richardson *et al.,* 1995). Sound from identifiable anthropogenic sources other than the activity of interest (e.g., a passing vessel) is sometimes termed background sound, as opposed to ambient sound.

The sum of the various natural and anthropogenic sound sources at any given location and time—which comprise ''ambient'' or ''background'' sound—depends not only on the source levels (as determined by current weather conditions and levels of biological and shipping activity) but also on the ability of sound to propagate through the environment. In turn, sound propagation is dependent on the spatially and temporally varying properties of the water column and sea floor, and is frequency-dependent. As a result of the dependence on a large number of varying factors, ambient sound levels can be expected to vary widely over both coarse and fine spatial and temporal scales. Sound levels at a given frequency and location can vary by 10–20 dB from day to day (Richardson *et al.,* 1995). The result is that, depending on the source type and its intensity, sound from the specified activity may be a negligible addition to the local environment or could form a distinctive signal that may affect marine mammals.

The underwater acoustic environment in Sinclair Inlet is likely to be dominated by noise from day-to-day port and vessel activities. Normal port activities include vessel traffic from large ships, submarines, support vessels, and security boats, and loading and maintenance operations. Other sources of human-generated underwater sound in the area are recreational vessels, industrial ship noise, and ferry traffic at the adjacent Washington State Ferry Terminal. In 2009, the average broadband (100 Hz–20 kHz) underwater noise level at NBK Bangor in the Hood Canal was measured at 114 dB (Slater, 2009), which is within the range of levels reported for a number of sites within the greater Puget Sound region

(95–135 dB; e.g., Carlson *et al.,* 2005; Veirs and Veirs, 2006). Measurements near ferry terminals in Puget Sound, such as the Bremerton terminal adjacent to NBKB, resulted in median noise levels (50% cumulative distribution function) between 106 and 133 dB (Laughlin, 2012). Although no specific measurements have been made at NBKB, it is reasonable to believe that levels may generally be higher than at NBK Bangor as there is a greater degree of activity, that levels periodically exceed the 120-dB threshold and, therefore, that the high levels of anthropogenic activity in the area create an environment far different from quieter habitats where behavioral reactions to sounds around the 120-dB threshold have been observed (e.g., Malme *et al.,* 1984, 1988).

Known sound levels and frequency ranges associated with anthropogenic sources similar to those that would be used for this project are summarized in Table 2. Details of the source types are described in the following text.

TABLE 2—REPRESENTATIVE SOUND LEVELS OF ANTHROPOGENIC SOURCES

| Sound source | Frequency range (Hz) | Underwater sound level | Reference |
|---|---|---|---|
| Small vessels | 250–1,000 | 151 dB rms at 1 m | Richardson *et al.,* 1995. |
| Tug docking gravel barge | 200–1,000 | 149 dB rms at 100 m. | Blackwell and Greene, 2002. |
| Vibratory driving of 72-in steel pipe pile | 10–1,500 | 180 dB rms at 10 m. | Reyff, 2007. |
| Impact driving of 36-in steel pipe pile | 10–1,500 | 195 dB rms at 10 m. | Laughlin, 2007. |
| Impact driving of 66-in cast-in-steel-shell (CISS) pile | 10–1,500 | 195 dB rms at 10 m. | Reviewed in Hastings and Popper, 2005. |

In-water construction activities associated with the project would include impact pile driving and vibratory pile driving (removal only). The sounds produced by these activities fall into one of two general sound types: Pulsed and non-pulsed (defined in the following). The distinction between these two sound types is important because they have differing potential to cause physical effects, particularly with regard to hearing (e.g., Ward, 1997 in Southall *et al.,* 2007). Please see Southall *et al.,* (2007) for an in-depth discussion of these concepts.

Pulsed sound sources (e.g., explosions, gunshots, sonic booms, impact pile driving) produce signals that are brief (typically considered to be less than one second), broadband, atonal transients (ANSI, 1986; Harris, 1998; NIOSH, 1998; ISO, 2003; ANSI, 2005) and occur either as isolated events or repeated in some succession. Pulsed sounds are all characterized by a relatively rapid rise from ambient pressure to a maximal pressure value followed by a rapid decay period that may include a period of diminishing, oscillating maximal and minimal pressures, and generally have an increased capacity to induce physical injury as compared with sounds that lack these features.

Non-pulsed sounds can be tonal, narrowband, or broadband, brief or prolonged, and may be either continuous or non-continuous (ANSI, 1995; NIOSH, 1998). Some of these non-pulsed sounds can be transient signals of short duration but without the essential properties of pulses (e.g., rapid rise time). Examples of non-pulsed sounds include those produced by vessels, aircraft, machinery operations such as drilling or dredging, vibratory pile driving, and active sonar systems (such as those used by the U.S. Navy). The duration of such sounds, as received at a distance, can be greatly extended in a highly reverberant environment.

Impact hammers operate by repeatedly dropping a heavy piston onto a pile to drive the pile into the substrate. Sound generated by impact hammers is characterized by rapid rise times and high peak levels, a potentially injurious combination (Hastings and Popper, 2005). Vibratory hammers install piles by vibrating them and allowing the weight of the hammer to push them into the sediment. Vibratory hammers produce significantly less sound than impact hammers. Peak SPLs may be 180 dB or greater, but are generally 10 to 20 dB lower than SPLs generated during impact pile driving of the same-sized pile (Oestman *et al.,* 2009). Rise time is slower, reducing the probability and severity of injury, and sound energy is distributed over a greater amount of time (Nedwell and Edwards, 2002; Carlson *et al.,* 2005).

*Marine Mammal Hearing*

Hearing is the most important sensory modality for marine mammals, and exposure to sound can have deleterious effects. To appropriately assess these potential effects, it is necessary to understand the frequency ranges marine mammals are able to hear. Current data indicate that not all marine mammal species have equal hearing capabilities (e.g., Richardson *et al.,* 1995; Wartzok and Ketten, 1999; Au and Hastings, 2008). To reflect this, Southall *et al.* (2007) recommended that marine mammals be divided into functional hearing groups based on measured or estimated hearing ranges on the basis of available behavioral data, audiograms derived using auditory evoked potential techniques, anatomical modeling, and other data. The lower and/or upper frequencies for some of these functional hearing groups have been modified from those designated by Southall *et al.* (2007). The functional groups and the associated frequencies are indicated below (note that these frequency ranges do not necessarily correspond to the range of best hearing, which varies by species):

- Low-frequency cetaceans (mysticetes): Functional hearing is estimated to occur between approximately 7 Hz and 30 kHz (extended from 22 kHz; Watkins, 1986; Au *et al.,* 2006; Lucifredi and Stein, 2007; Ketten and Mountain, 2009; Tubelli *et al.,* 2012);
- Mid-frequency cetaceans (larger toothed whales, beaked whales, and most delphinids): Functional hearing is estimated to occur between approximately 150 Hz and 160 kHz;
- High-frequency cetaceans (porpoises, river dolphins, and members of the genera *Kogia* and *Cephalorhynchus;* now considered to include two members of the genus *Lagenorhynchus* on the basis of recent echolocation data and genetic data [May-Collado and Agnarsson, 2006; Kyhn *et al.* 2009, 2010; Tougaard *et al.* 2010]): Functional hearing is estimated to occur between approximately 200 Hz and 180 kHz; and
- Pinnipeds in water: Functional hearing is estimated to occur between

approximately 75 Hz to 100 kHz for Phocidae (true seals) and between 100 Hz and 40 kHz for Otariidae (eared seals), with the greatest sensitivity between approximately 700 Hz and 20 kHz. The pinniped functional hearing group was modified from Southall *et al.* (2007) on the basis of data indicating that phocid species have consistently demonstrated an extended frequency range of hearing compared to otariids, especially in the higher frequency range (Hemilä *et al.,* 2006; Kastelein *et al.,* 2009; Reichmuth *et al.,* 2013).

There are five marine mammal species (two cetacean and three pinniped [two otariid and one phocid] species) with expected potential to co-occur with Navy construction activities. Please refer to Table 1. Of the two cetacean species that may be present, the killer whale is classified as mid-frequency and the gray whale is classified as low-frequency.

*Acoustic Effects, Underwater*

*Potential Effects of Pile Driving Sound*—The effects of sounds from pile driving might result in one or more of the following: Temporary or permanent hearing impairment, non-auditory physical or physiological effects, behavioral disturbance, and masking (Richardson *et al.,* 1995; Gordon *et al.,* 2004; Nowacek *et al.,* 2007; Southall *et al.,* 2007). The effects of pile driving on marine mammals are dependent on several factors, including the size, type, and depth of the animal; the depth, intensity, and duration of the pile driving sound; the depth of the water column; the substrate of the habitat; the standoff distance between the pile and the animal; and the sound propagation properties of the environment. Impacts to marine mammals from pile driving activities are expected to result primarily from acoustic pathways. As such, the degree of effect is intrinsically related to the received level and duration of the sound exposure, which are in turn influenced by the distance between the animal and the source. The further away from the source, the less intense the exposure should be. The substrate and depth of the habitat affect the sound propagation properties of the environment. Shallow environments are typically more structurally complex, which leads to rapid sound attenuation. In addition, substrates that are soft (e.g., sand) would absorb or attenuate the sound more readily than hard substrates (e.g., rock) which may reflect the acoustic wave. Soft porous substrates would also likely require less time to drive the pile, and possibly less forceful equipment, which would ultimately decrease the intensity of the acoustic source.

In the absence of mitigation, impacts to marine species would be expected to result from physiological and behavioral responses to both the type and strength of the acoustic signature (Viada *et al.,* 2008). The type and severity of behavioral impacts are more difficult to define due to limited studies addressing the behavioral effects of impulsive sounds on marine mammals. Potential effects from impulsive sound sources can range in severity from effects such as behavioral disturbance or tactile perception to physical discomfort, slight injury of the internal organs and the auditory system, or mortality (Yelverton *et al.,* 1973).

*Hearing Impairment and Other Physical Effects*—Marine mammals exposed to high intensity sound repeatedly or for prolonged periods can experience hearing threshold shift (TS), which is the loss of hearing sensitivity at certain frequency ranges (Kastak *et al.,* 1999; Schlundt *et al.,* 2000; Finneran *et al.,* 2002, 2005). TS can be permanent (PTS), in which case the loss of hearing sensitivity is not recoverable, or temporary (TTS), in which case the animal's hearing threshold would recover over time (Southall *et al.,* 2007). Marine mammals depend on acoustic cues for vital biological functions, (e.g., orientation, communication, finding prey, avoiding predators); thus, TTS may result in reduced fitness in survival and reproduction. However, this depends on the frequency and duration of TTS, as well as the biological context in which it occurs. TTS of limited duration, occurring in a frequency range that does not coincide with that used for recognition of important acoustic cues, would have little to no effect on an animal's fitness. Repeated sound exposure that leads to TTS could cause PTS. PTS constitutes injury, but TTS does not (Southall *et al.,* 2007). The following subsections discuss in somewhat more detail the possibilities of TTS, PTS, and non-auditory physical effects.

*Temporary Threshold Shift*—TTS is the mildest form of hearing impairment that can occur during exposure to a strong sound (Kryter, 1985). While experiencing TTS, the hearing threshold rises, and a sound must be stronger in order to be heard. In terrestrial mammals, TTS can last from minutes or hours to days (in cases of strong TTS). For sound exposures at or somewhat above the TTS threshold, hearing sensitivity in both terrestrial and marine mammals recovers rapidly after exposure to the sound ends. Few data on sound levels and durations necessary to elicit mild TTS have been obtained for marine mammals, and none of the published data concern TTS elicited by exposure to multiple pulses of sound. Available data on TTS in marine mammals are summarized in Southall *et al.* (2007).

Given the available data, the received level of a single pulse (with no frequency weighting) might need to be approximately 186 dB re 1 μPa$^2$-s (i.e., 186 dB sound exposure level [SEL] or approximately 221–226 dB p-p [peak]) in order to produce brief, mild TTS. Exposure to several strong pulses that each have received levels near 190 dB rms (175–180 dB SEL) might result in cumulative exposure of approximately 186 dB SEL and thus slight TTS in a small odontocete, assuming the TTS threshold is (to a first approximation) a function of the total received pulse energy.

The above TTS information for odontocetes is derived from studies on the bottlenose dolphin (*Tursiops truncatus*) and beluga whale (*Delphinapterus leucas*). There is no published TTS information for other species of cetaceans. However, preliminary evidence from a harbor porpoise exposed to pulsed sound suggests that its TTS threshold may have been lower (Lucke *et al.,* 2009). As summarized above, data that are now available imply that TTS is unlikely to occur unless odontocetes are exposed to pile driving pulses stronger than 180 dB re 1 μPa rms.

*Permanent Threshold Shift*—When PTS occurs, there is physical damage to the sound receptors in the ear. In severe cases, there can be total or partial deafness, while in other cases the animal has an impaired ability to hear sounds in specific frequency ranges (Kryter, 1985). There is no specific evidence that exposure to pulses of sound can cause PTS in any marine mammal. However, given the possibility that mammals close to a sound source might incur TTS, there has been further speculation about the possibility that some individuals might incur PTS. Single or occasional occurrences of mild TTS are not indicative of permanent auditory damage, but repeated or (in some cases) single exposures to a level well above that causing TTS onset might elicit PTS.

Relationships between TTS and PTS thresholds have not been studied in marine mammals but are assumed to be similar to those in humans and other terrestrial mammals. PTS might occur at a received sound level at least several decibels above that inducing mild TTS if the animal were exposed to strong sound pulses with rapid rise time.

Based on data from terrestrial mammals, a precautionary assumption is that the PTS threshold for impulse sounds (such as pile driving pulses as received close to the source) is at least 6 dB higher than the TTS threshold on a peak-pressure basis and probably greater than 6 dB (Southall *et al.,* 2007). On an SEL basis, Southall *et al.* (2007) estimated that received levels would need to exceed the TTS threshold by at least 15 dB for there to be risk of PTS. Thus, for cetaceans, Southall *et al.* (2007) estimate that the PTS threshold might be an M-weighted SEL (for the sequence of received pulses) of approximately 198 dB re 1 μPa$^2$-s (15 dB higher than the TTS threshold for an impulse). Given the higher level of sound necessary to cause PTS as compared with TTS, it is considerably less likely that PTS could occur.

Measured source levels from impact pile driving can be as high as 214 dB rms. Although no marine mammals have been shown to experience TTS or PTS as a result of being exposed to pile driving activities, captive bottlenose dolphins and beluga whales exhibited changes in behavior when exposed to strong pulsed sounds (Finneran *et al.,* 2000, 2002, 2005). The animals tolerated high received levels of sound before exhibiting aversive behaviors. Experiments on a beluga whale showed that exposure to a single watergun impulse at a received level of 207 kPa (30 psi) p-p, which is equivalent to 228 dB p-p, resulted in a 7 and 6 dB TTS in the beluga whale at 0.4 and 30 kHz, respectively. Thresholds returned to within 2 dB of the pre-exposure level within four minutes of the exposure (Finneran *et al.,* 2002). Although the source level of pile driving from one hammer strike is expected to be much lower than the single watergun impulse cited here, animals being exposed for a prolonged period to repeated hammer strikes could receive more sound exposure in terms of SEL than from the single watergun impulse (estimated at 188 dB re 1 μPa$^2$-s) in the aforementioned experiment (Finneran *et al.,* 2002). However, in order for marine mammals to experience TTS or PTS, the animals have to be close enough to be exposed to high intensity sound levels for a prolonged period of time. Based on the best scientific information available, these SPLs are far below the thresholds that could cause TTS or the onset of PTS.

*Non-auditory Physiological Effects*—Non-auditory physiological effects or injuries that theoretically might occur in marine mammals exposed to strong underwater sound include stress, neurological effects, bubble formation, resonance effects, and other types of organ or tissue damage (Cox *et al.,* 2006; Southall *et al.,* 2007). Studies examining such effects are limited. In general, little is known about the potential for pile driving to cause auditory impairment or other physical effects in marine mammals. Available data suggest that such effects, if they occur at all, would presumably be limited to short distances from the sound source and to activities that extend over a prolonged period. The available data do not allow identification of a specific exposure level above which non-auditory effects can be expected (Southall *et al.,* 2007) or any meaningful quantitative predictions of the numbers (if any) of marine mammals that might be affected in those ways. Marine mammals that show behavioral avoidance of pile driving, including some odontocetes and some pinnipeds, are especially unlikely to incur auditory impairment or non-auditory physical effects.

*Disturbance Reactions*

Disturbance includes a variety of effects, including subtle changes in behavior, more conspicuous changes in activities, and displacement. Behavioral responses to sound are highly variable and context-specific and reactions, if any, depend on species, state of maturity, experience, current activity, reproductive state, auditory sensitivity, time of day, and many other factors (Richardson *et al.,* 1995; Wartzok *et al.,* 2003; Southall *et al.,* 2007).

Habituation can occur when an animal's response to a stimulus wanes with repeated exposure, usually in the absence of unpleasant associated events (Wartzok *et al.,* 2003). Animals are most likely to habituate to sounds that are predictable and unvarying. The opposite process is sensitization, when an unpleasant experience leads to subsequent responses, often in the form of avoidance, at a lower level of exposure. Behavioral state may affect the type of response as well. For example, animals that are resting may show greater behavioral change in response to disturbing sound levels than animals that are highly motivated to remain in an area for feeding (Richardson *et al.,* 1995; NRC, 2003; Wartzok *et al.,* 2003).

Controlled experiments with captive marine mammals showed pronounced behavioral reactions, including avoidance of loud sound sources (Ridgway *et al.,* 1997; Finneran *et al.,* 2003). Observed responses of wild marine mammals to loud pulsed sound sources (typically seismic guns or acoustic harassment devices, but also including pile driving) have been varied but often consist of avoidance behavior or other behavioral changes suggesting discomfort (Morton and Symonds, 2002; Thorson and Reyff, 2006; see also Gordon *et al.,* 2004; Wartzok *et al.,* 2003; Nowacek *et al.,* 2007). Responses to continuous sound, such as vibratory pile installation, have not been documented as well as responses to pulsed sounds.

With both types of pile driving, it is likely that the onset of pile driving could result in temporary, short term changes in an animal's typical behavior and/or avoidance of the affected area. These behavioral changes may include (Richardson *et al.,* 1995): Changing durations of surfacing and dives, number of blows per surfacing, or moving direction and/or speed; reduced/increased vocal activities; changing/cessation of certain behavioral activities (such as socializing or feeding); visible startle response or aggressive behavior (such as tail/fluke slapping or jaw clapping); avoidance of areas where sound sources are located; and/or flight responses (e.g., pinnipeds flushing into water from haul-outs or rookeries). Pinnipeds may increase their haul-out time, possibly to avoid in-water disturbance (Thorson and Reyff, 2006).

The biological significance of many of these behavioral disturbances is difficult to predict, especially if the detected disturbances appear minor. However, the consequences of behavioral modification could be expected to be biologically significant if the change affects growth, survival, or reproduction. Significant behavioral modifications that could potentially lead to effects on growth, survival, or reproduction include:

- Drastic changes in diving/surfacing patterns (such as those thought to cause beaked whale stranding due to exposure to military mid-frequency tactical sonar);
- Habitat abandonment due to loss of desirable acoustic environment; and
- Cessation of feeding or social interaction.

The onset of behavioral disturbance from anthropogenic sound depends on both external factors (characteristics of sound sources and their paths) and the specific characteristics of the receiving animals (hearing, motivation, experience, demography) and is difficult to predict (Southall *et al.,* 2007).

*Auditory Masking*

Natural and artificial sounds can disrupt behavior by masking, or interfering with, a marine mammal's ability to hear other sounds. Masking occurs when the receipt of a sound is interfered with by another coincident sound at similar frequencies and at similar or higher levels. Chronic exposure to excessive, though not high-intensity, sound could cause masking at particular frequencies for marine mammals that utilize sound for vital biological functions. Masking can interfere with detection of acoustic signals such as communication calls, echolocation sounds, and environmental sounds important to marine mammals. Therefore, under certain circumstances, marine mammals whose acoustical sensors or environment are being severely masked could also be impaired from maximizing their performance fitness in survival and reproduction. If the coincident (masking) sound were man-made, it could be potentially harassing if it disrupted hearing-related behavior. It is important to distinguish TTS and PTS, which persist after the sound exposure, from masking, which occurs during the sound exposure. Because masking (without resulting in TS) is not associated with abnormal physiological function, it is not considered a physiological effect, but rather a potential behavioral effect.

The frequency range of the potentially masking sound is important in determining any potential behavioral impacts. Because sound generated from in-water pile driving is mostly concentrated at low frequency ranges, it may have less effect on high frequency echolocation sounds made by porpoises. However, lower frequency man-made sounds are more likely to affect detection of communication calls and other potentially important natural sounds such as surf and prey sound. It may also affect communication signals when they occur near the sound band and thus reduce the communication space of animals (e.g., Clark *et al.,* 2009) and cause increased stress levels (e.g., Foote *et al.,* 2004; Holt *et al.,* 2009).

Masking has the potential to impact species at the population or community levels as well as at individual levels. Masking affects both senders and receivers of the signals and can potentially have long-term chronic effects on marine mammal species and populations. Recent research suggests that low frequency ambient sound levels have increased by as much as 20 dB (more than three times in terms of SPL) in the world's ocean from pre-industrial periods, and that most of these increases are from distant shipping (Hildebrand, 2009). All anthropogenic sound sources, such as those from vessel traffic, pile driving, and dredging activities, contribute to the elevated ambient sound levels, thus intensifying masking.

The most intense underwater sounds in the proposed action are those produced by impact pile driving. Given that the energy distribution of pile driving covers a broad frequency spectrum, sound from these sources would likely be within the audible range of marine mammals present in the project area. Impact pile driving activity is relatively short-term, with rapid pulses occurring for approximately fifteen minutes per pile. The probability for impact pile driving resulting from this proposed action masking acoustic signals important to the behavior and survival of marine mammal species is likely to be negligible. Vibratory pile driving is also relatively short-term, with rapid oscillations occurring for approximately one and a half hours per pile. It is possible that vibratory pile driving resulting from this proposed action may mask acoustic signals important to the behavior and survival of marine mammal species, but the short-term duration and limited affected area would result in insignificant impacts from masking. Any masking event that could possibly rise to Level B harassment under the MMPA would occur concurrently within the zones of behavioral harassment already estimated for vibratory and impact pile driving, and which have already been taken into account in the exposure analysis.

*Acoustic Effects, Airborne*

Marine mammals that occur in the project area could be exposed to airborne sounds associated with pile driving that have the potential to cause harassment, depending on their distance from pile driving activities. Airborne pile driving sound would have less impact on cetaceans than pinnipeds because sound from atmospheric sources does not transmit well underwater (Richardson *et al.,* 1995); thus, airborne sound would only be an issue for pinnipeds either hauled-out or looking with heads above water in the project area. Most likely, airborne sound would cause behavioral responses similar to those discussed above in relation to underwater sound. For instance, anthropogenic sound could cause hauled-out pinnipeds to exhibit changes in their normal behavior, such as reduction in vocalizations, or cause them to temporarily abandon their habitat and move further from the source. Studies by Blackwell *et al.* (2004) and Moulton *et al.* (2005) indicate a tolerance or lack of response to unweighted airborne sounds as high as 112 dB peak and 96 dB rms.

**Anticipated Effects on Habitat**

The proposed activities at NBKB would not result in permanent impacts to habitats used directly by marine mammals, such as haul-out sites, but may have potential short-term impacts to food sources such as forage fish and salmonids. The proposed activities could also affect acoustic habitat (see masking discussion above), but this is unlikely given the existing conditions at the project site (see previous discussion of acoustic environment under ''Description of Sound Sources'' above). There are no rookeries or major haul-out sites, no known foraging hotspots, or other ocean bottom structure of significant biological importance to marine mammals present in the marine waters in the vicinity of the project area. Therefore, the main impact issue associated with the proposed activity would be temporarily elevated sound levels and the associated direct effects on marine mammals, as discussed previously in this document. The most likely impact to marine mammal habitat occurs from pile driving effects on likely marine mammal prey (i.e., fish) near NBKB and minor impacts to the immediate substrate during installation and removal of piles during the pier maintenance project.

*Pile Driving Effects on Potential Prey*

Construction activities would produce both pulsed (i.e., impact pile driving) and continuous (i.e., vibratory pile driving) sounds. Fish react to sounds which are especially strong and/or intermittent low-frequency sounds. Short duration, sharp sounds can cause overt or subtle changes in fish behavior and local distribution. Hastings and Popper (2005) identified several studies that suggest fish may relocate to avoid certain areas of sound energy. Additional studies have documented effects of pile driving on fish, although several are based on studies in support of large, multiyear bridge construction projects (e.g., Scholik and Yan, 2001, 2002; Popper and Hastings, 2009). Sound pulses at received levels of 160 dB may cause subtle changes in fish behavior. SPLs of 180 dB may cause noticeable changes in behavior (Pearson *et al.,* 1992; Skalski *et al.,* 1992). SPLs of sufficient strength have been known to cause injury to fish and fish mortality. The most likely impact to fish from pile driving activities at the project area would be temporary behavioral avoidance of the area. The duration of fish avoidance of this area after pile driving stops is unknown, but a rapid return to normal recruitment, distribution and behavior is anticipated.

In general, impacts to marine mammal prey species are expected to be minor and temporary due to the short timeframe for the project. However, adverse impacts may occur to a few species of fish which may still be present in the project area despite operating in a reduced work window in an attempt to avoid important fish spawning time periods.

*Pile Driving Effects on Potential Foraging Habitat*

The area likely impacted by the project is relatively small compared to the available habitat in inland waters in the region. Avoidance by potential prey (i.e., fish) of the immediate area due to the temporary loss of this foraging habitat is also possible. The duration of fish avoidance of this area after pile driving stops is unknown, but a rapid return to normal recruitment, distribution and behavior is anticipated. Any behavioral avoidance by fish of the disturbed area would still leave significantly large areas of fish and marine mammal foraging habitat in the nearby vicinity.

In summary, given the short daily duration of sound associated with individual pile driving events and the relatively small areas being affected, pile driving activities associated with the proposed action are not likely to have a permanent, adverse effect on any fish habitat, or populations of fish species. The area around NBKB, including the adjacent ferry terminal and nearby marinas, is heavily altered with significant levels of industrial and recreational activity, and is unlikely to harbor significant amounts of forage fish. Thus, any impacts to marine mammal habitat are not expected to cause significant or long-term consequences for individual marine mammals or their populations.

## Proposed Mitigation

In order to issue an IHA under Section 101(a)(5)(D) of the MMPA, NMFS must set forth the permissible methods of taking pursuant to such activity, and other means of effecting the least practicable impact on such species or stock and its habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of such species or stock for taking for certain subsistence uses.

Measurements from similar pile driving events were coupled with practical spreading loss to estimate zones of influence (ZOI; see ''Estimated Take by Incidental Harassment''); these values were used to develop mitigation measures for pile driving activities at NBKB. The ZOIs effectively represent the mitigation zone that would be established around each pile to prevent Level A harassment to marine mammals, while providing estimates of the areas within which Level B harassment might occur. In addition to the specific measures described later in this section, the Navy would conduct briefings between construction supervisors and crews, marine mammal 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.

*Monitoring and Shutdown for Pile Driving*

The following measures would apply to the Navy's mitigation through shutdown and disturbance zones:

*Shutdown Zone*—For all pile driving activities, the Navy will establish a shutdown zone intended to contain the area in which SPLs equal or exceed the 190 dB rms acoustic injury criteria. The purpose of a shutdown zone is to define an area within which shutdown of activity would occur upon sighting of a marine mammal (or in anticipation of an animal entering the defined area), thus preventing injury of marine mammals (as described previously under ''Potential Effects of the Specified Activity on Marine Mammals'', serious injury or death are unlikely outcomes even in the absence of mitigation measures). Modeled radial distances for shutdown zones are shown in Table 5. However, a minimum shutdown zone of 10 m (which is larger than the maximum predicted injury zone) will be established during all pile driving activities, regardless of the estimated zone. Vibratory pile driving activities are not predicted to produce sound exceeding the 190-dB Level A harassment threshold, but these precautionary measures are intended to prevent the already unlikely possibility of physical interaction with construction equipment and to further reduce any possibility of acoustic injury.

*Disturbance Zone*—Disturbance zones are the areas in which SPLs equal or exceed 160 and 120 dB rms (for impulse and continuous sound, respectively). Disturbance zones provide utility for monitoring conducted for mitigation purposes (i.e., shutdown zone monitoring) by establishing monitoring protocols for areas adjacent to the shutdown zones. Monitoring of disturbance zones enables observers to be aware of and communicate the presence of marine mammals in the project area but outside the shutdown zone and thus prepare for potential shutdowns of activity. However, the primary purpose of disturbance zone monitoring is for documenting incidents of Level B harassment; disturbance zone monitoring is discussed in greater detail later (see ''Proposed Monitoring and Reporting''). Nominal radial distances for disturbance zones are shown in Table 5.

In order to document observed incidences of harassment, monitors record all marine mammal observations, regardless of location. The observer's location, as well as the location of the pile being driven, is known from a GPS. The location of the animal is estimated as a distance from the observer, which is then compared to the location from the pile. It may then be estimated whether the animal was exposed to sound levels constituting incidental harassment on the basis of predicted distances to relevant thresholds in post-processing of observational and acoustic data, and a precise accounting of observed incidences of harassment created. This information may then be used to extrapolate observed takes to reach an approximate understanding of actual total takes.

*Monitoring Protocols*—Monitoring would be conducted before, during, and after pile driving activities. In addition, observers shall record all incidents of marine mammal occurrence, regardless of distance from activity, and shall document any behavioral reactions in concert with distance from piles being driven. Observations made outside the shutdown zone will not result in shutdown; that pile segment would be completed without cessation, unless the animal approaches or enters the shutdown zone, at which point all pile driving activities would be halted. Monitoring will take place from fifteen minutes prior to initiation through thirty minutes post-completion of pile driving activities. Pile driving activities include the time to install or remove a single pile or series of piles, as long as the time elapsed between uses of the pile driving equipment is no more than thirty minutes. Please see the Monitoring Plan (Appendix C in the Navy's application), developed by the Navy in agreement with NMFS, for full details of the monitoring protocols.

The following additional measures apply to visual monitoring:

(1) Monitoring will be conducted by qualified observers, who will be placed at the best vantage point(s) practicable to monitor for marine mammals and implement shutdown/delay procedures when applicable by calling for the

shutdown to the hammer operator. Qualified observers are trained biologists, with the following minimum qualifications:

• Visual acuity in both eyes (correction is permissible) sufficient for discernment of moving targets at the water's surface with ability to estimate target size and distance; use of binoculars may be necessary to correctly identify the target;

• Advanced education in biological science or related field (undergraduate degree or higher required);

• Experience and ability to conduct field observations and collect data according to assigned protocols (this may include academic experience);

• Experience or training in the field identification of marine mammals, including the identification of behaviors;

• Sufficient training, orientation, or experience with the construction operation to provide for personal safety during observations;

• Writing skills sufficient to prepare a report of observations including but not limited to the number and species of marine mammals observed; dates and times when in-water construction activities were conducted; dates and times when in-water construction activities were suspended to avoid potential incidental injury from construction sound of marine mammals observed within a defined shutdown zone; and marine mammal behavior; and

• Ability to communicate orally, by radio or in person, with project personnel to provide real-time information on marine mammals observed in the area as necessary.

(2) Prior to the start of pile driving activity, the shutdown zone will be monitored for fifteen minutes to ensure that it is clear of marine mammals. Pile driving will only commence once observers have declared the shutdown zone clear of marine mammals; animals will be allowed to remain in the shutdown zone (i.e., must leave of their own volition) and their behavior will be monitored and documented. The shutdown zone may only be declared clear, and pile driving started, when the entire shutdown zone is visible (i.e., when not obscured by dark, rain, fog, etc.). In addition, if such conditions should arise during impact pile driving that is already underway, the activity would be halted.

(3) If a marine mammal approaches or enters the shutdown zone during the course of pile driving operations, activity will be halted and delayed until either the animal has voluntarily left and been visually confirmed beyond the shutdown zone or fifteen minutes have passed without re-detection of the animal. Monitoring will be conducted throughout the time required to drive a pile.

*Special Conditions*

The Navy has not requested the authorization of incidental take for killer whales or gray whales (see discussion below in ''Estimated Take by Incidental Harassment''). Therefore, shutdown would be implemented in the event that either of these species is observed in the vicinity, prior to entering the defined disturbance zone. As described later in this document, we believe that occurrence of these species during the in-water work window would be uncommon and that the occurrence of an individual or group would likely be highly noticeable and would attract significant attention in local media and with local whale watchers and interested citizens.

Prior to the start of pile driving on any day, the Navy would contact and/or review the latest sightings data from the Orca Network and/or Center for Whale Research to determine the location of the nearest marine mammal sightings. The Orca Sightings Network consists of a list of over 600 residents, scientists, and government agency personnel in the U.S. and Canada, and includes passive acoustic detections. The presence of a killer whale or gray whale in the southern reaches of Puget Sound would be a notable event, drawing public attention and media scrutiny. With this level of coordination in the region of activity, the Navy should be able to effectively receive real-time information on the presence or absence of whales, sufficient to inform the day's activities. Pile driving would not occur if there was the risk of incidental harassment of a species for which incidental take was not authorized.

During vibratory pile removal, four land-based observers will monitor the area; these would be positioned with two at the pier work site, one at the eastern extent of the ZOI in the Manette neighborhood of Bremerton, and one at the southern extent of the ZOI near the Annapolis ferry landing in Port Orchard (please see Figure 1 of Appendix C in the Navy's application). Additionally, one vessel-based observer will travel through the monitoring area, completing an entire loop approximately every thirty minutes. If any killer whales or gray whales are detected, activity would not begin or would shut down.

*Timing Restrictions*

In the project area, designated timing restrictions exist to avoid in-water work when salmonids and other spawning forage fish are likely to be present. The in-water work window is June 15–March 1. All in-water construction activities would occur only during daylight hours (sunrise to sunset).

*Soft Start*

The use of a soft start procedure is believed to provide additional protection to marine mammals by warning or providing a chance to leave the area prior to the hammer operating at full capacity, and typically involves a requirement to initiate sound from the hammer at reduced energy followed by a waiting period. This procedure is repeated two additional times. It is difficult to specify the reduction in energy for any given hammer because of variation across drivers and, for impact hammers, the actual number of strikes at reduced energy will vary because operating the hammer at less than full power results in ''bouncing'' of the hammer as it strikes the pile, resulting in multiple ''strikes.'' The pier maintenance project will utilize soft start techniques for both impact and vibratory pile driving. We require the Navy to initiate sound from vibratory hammers for fifteen seconds at reduced energy followed by a thirty-second waiting period, with the procedure repeated two additional times. For impact driving, we require an initial set of three strikes from the impact hammer at reduced energy, followed by a thirty-second waiting period, then two subsequent three strike sets. Soft start will be required at the beginning of each day's pile driving work and at any time following a cessation of pile driving of thirty minutes or longer.

We have carefully evaluated the Navy's proposed mitigation measures and considered their effectiveness in past implementation to preliminarily determine whether they are likely to effect the least practicable impact on the affected marine mammal species and stocks and their habitat. Our evaluation of potential measures included consideration of the following factors in relation to one another: (1) The manner in which, and the degree to which, the successful implementation of the measure is expected to minimize adverse impacts to marine mammals, (2) the proven or likely efficacy of the specific measure to minimize adverse impacts as planned; and (3) the practicability of the measure for applicant implementation.

Any mitigation measure(s) we prescribe should be able to accomplish, have a reasonable likelihood of accomplishing (based on current science), or contribute to the accomplishment of one or more of the general goals listed below:

(1) Avoidance or minimization of injury or death of marine mammals wherever possible (goals 2, 3, and 4 may contribute to this goal).

(2) A reduction in the number (total number or number at biologically important time or location) of individual marine mammals exposed to stimuli expected to result in incidental take (this goal may contribute to 1, above, or to reducing takes by behavioral harassment only).

(3) A reduction in the number (total number or number at biologically important time or location) of times any individual marine mammal would be exposed to stimuli expected to result in incidental take (this goal may contribute to 1, above, or to reducing takes by behavioral harassment only).

(4) A reduction in the intensity of exposure to stimuli expected to result in incidental take (this goal may contribute to 1, above, or to reducing the severity of behavioral harassment only).

(5) Avoidance or minimization of adverse effects to marine mammal habitat, paying particular attention to the prey base, blockage or limitation of passage to or from biologically important areas, permanent destruction of habitat, or temporary disturbance of habitat during a biologically important time.

(6) For monitoring directly related to mitigation, an increase in the probability of detecting marine mammals, thus allowing for more effective implementation of the mitigation.

Based on our evaluation of the Navy's proposed measures, as well as any other potential measures that may be relevant to the specified activity, we have preliminarily determined that the proposed mitigation measures provide the means of effecting the least practicable impact on marine mammal species or stocks and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance.

## Proposed Monitoring and Reporting

In order to issue an IHA for an activity, Section 101(a)(5)(D) of the MMPA states that NMFS must set forth ''requirements pertaining to the monitoring and reporting of such taking''. The MMPA implementing regulations at 50 CFR 216.104(a)(13) indicate that requests for incidental take authorizations must include the suggested means of accomplishing the necessary monitoring and reporting that will result in increased knowledge of the species and of the level of taking or impacts on populations of marine mammals that are expected to be present in the proposed action area.

Any monitoring requirement we prescribe should improve our understanding of one or more of the following:

- Occurrence of marine mammal species in action area (e.g., presence, abundance, distribution, density).
- Nature, scope, or context of likely marine mammal exposure to potential stressors/impacts (individual or cumulative, acute or chronic), through better understanding of: (1) Action or environment (e.g., source characterization, propagation, ambient noise); (2) Affected species (e.g., life history, dive patterns); (3) Co-occurrence of marine mammal species with the action; or (4) Biological or behavioral context of exposure (e.g., age, calving or feeding areas).
- Individual responses to acute stressors, or impacts of chronic exposures (behavioral or physiological).
- How anticipated responses to stressors impact either: (1) Long-term fitness and survival of an individual; or (2) Population, species, or stock.
- Effects on marine mammal habitat and resultant impacts to marine mammals.
- Mitigation and monitoring effectiveness.

The Navy submitted a marine mammal monitoring plan as part of the IHA application for year one of this project. It will be carried forward for year two of this project and can be found as Appendix C of the Navy's application, on the Internet at *www.nmfs.noaa.gov/pr/permits/incidental.htm.*

### *Acoustic Monitoring*

The Navy will implement a sound source level verification study during the specified activities. Data will be collected in order to estimate airborne and underwater source levels for vibratory removal of timber piles and impact driving of concrete piles, with measurements conducted for ten piles of each type. Monitoring will include one underwater and one airborne monitoring position. These exact positions will be determined in the field during consultation with Navy personnel, subject to constraints related to logistics and security requirements. Reporting of measured sound level signals will include the average, minimum, and maximum rms value and frequency spectra for each pile monitored. Please see section 11.4.4 of the Navy's application for details of the Navy's acoustic monitoring plan.

### *Visual Marine Mammal Observations*

The Navy will 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 will be trained in marine mammal identification and behaviors and are required to have no other construction-related tasks while conducting monitoring. The Navy will monitor the shutdown zone and disturbance zone before, during, and after pile driving, with observers located at the best practicable vantage points. Based on our requirements, the Navy would implement the following procedures for pile driving:

- MMOs would be located at the best vantage point(s) in order to properly see the entire shutdown zone and as much of the disturbance zone as possible.
- During all observation periods, observers will use binoculars and the naked eye to search continuously for marine mammals.
- If the shutdown zones are obscured by fog or poor lighting conditions, pile driving at that location will not be initiated until that zone is visible. Should such conditions arise while impact driving is underway, the activity would be halted.
- The shutdown and disturbance zones around the pile will be monitored for the presence of marine mammals before, during, and after any pile driving or removal activity.

During vibratory pile removal, four observers would be deployed as described under Proposed Mitigation, including four land-based observers and one-vessel-based observer traversing the extent of the Level B harassment zone. During impact driving, one observer would be positioned at or near the pile to observe the much smaller disturbance zone.

Individuals implementing the monitoring protocol will assess its effectiveness using an adaptive approach. Monitoring biologists will use their best professional judgment throughout implementation and seek improvements to these methods when deemed appropriate. Any modifications to protocol will be coordinated between NMFS and the Navy.

### *Data Collection*

We require that observers use approved data forms. Among other pieces of information, the Navy will record detailed information about any implementation of shutdowns, including the distance of animals to the pile and description of specific actions that ensued and resulting behavior of the animal, if any. In addition, the Navy will attempt to distinguish between the number of individual animals taken and the number of incidents of take. We require that, at a minimum, the following information be collected on the sighting forms:

- Date and time that monitored activity begins or ends;
- Construction activities occurring during each observation period;
- Weather parameters (e.g., percent cover, visibility);
- Water conditions (e.g., sea state, tide state);
- Species, numbers, and, if possible, sex and age class of marine mammals;
- Description of any observable marine mammal behavior patterns, including bearing and direction of travel and distance from pile driving activity;
- Distance from pile driving activities to marine mammals and distance from the marine mammals to the observation point;
- Description of implementation of mitigation measures (e.g., shutdown or delay).
- Locations of all marine mammal observations; and
- Other human activity in the area.

*Reporting*

A draft report would be submitted to NMFS within 45 days of the completion of marine mammal monitoring, or sixty days prior to the issuance of any subsequent IHA for this project, whichever comes first. The report will include marine mammal observations pre-activity, during-activity, and post-activity during pile driving days, and will also provide descriptions of any behavioral responses to construction activities by marine mammals and a complete description of all mitigation shutdowns and the results of those actions and an extrapolated total take estimate based on the number of marine mammals observed during the course of construction. A final report must be submitted within thirty days following resolution of comments on the draft report.

*Monitoring Results From Previously Authorized Activities*

The Navy complied with the mitigation and monitoring required under the previous authorization for this project. Marine mammal monitoring occurred before, during, and after each pile driving event. During the course of these activities, the Navy did not exceed the take levels authorized under the IHA.

In accordance with the 2013 IHA, the Navy submitted a monitoring report (Appendix D of the Navy's application). The Navy's specified activity in relation to the 2013 IHA included a total of 65 pile driving days; however, only a limited program of test pile driving actually took place. Pile driving occurred on only two days, with a total of only two piles driven (both impact-driven concrete piles). The only species observed was the California sea lion. A total of 24 individuals were observed within the defined Level B harassment zone, but all were hauled-out on port security barrier floats outside of the defined Level B harassment zone for airborne sound. Therefore, no take of marine mammals occurred incidental to project activity under the year one IHA.

**Estimated Take by Incidental Harassment**

Except with respect to certain activities not pertinent here, section 3(18) of the MMPA defines ''harassment'' as: ''. . . any act of pursuit, torment, or annoyance which (i) has the potential to injure a marine mammal or marine mammal stock in the wild [Level A harassment]; or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering [Level B harassment].''

All anticipated takes would be by Level B harassment resulting from vibratory and impact pile driving and involving temporary changes in behavior. The proposed mitigation and monitoring measures are expected to minimize the possibility of injurious or lethal takes such that take by Level A harassment, serious injury, or mortality is considered discountable. However, it is unlikely that injurious or lethal takes would occur even in the absence of the planned mitigation and monitoring measures.

If a marine mammal responds to a stimulus by changing its behavior (e.g., through relatively minor changes in locomotion direction/speed or vocalization behavior), the response may or may not constitute taking at the individual level, and is unlikely to affect the stock or the species as a whole. However, if a sound source displaces marine mammals from an important feeding or breeding area for a prolonged period, impacts on animals or on the stock or species could potentially be significant (e.g., Lusseau and Bejder, 2007; Weilgart, 2007). Given the many uncertainties in predicting the quantity and types of impacts of sound on marine mammals, it is common practice to estimate how many animals are likely to be present within a particular distance of a given activity, or exposed to a particular level of sound. This practice potentially overestimates the numbers of marine mammals taken. In addition, it is often difficult to distinguish between the individuals harassed and incidences of harassment. In particular, for stationary activities, it is more likely that some smaller number of individuals may accrue a number of incidences of harassment per individual than for each incidence to accrue to a new individual, especially if those individuals display some degree of residency or site fidelity and the impetus to use the site (e.g., because of foraging opportunities) is stronger than the deterrence presented by the harassing activity.

The project area is not believed to be particularly important habitat for marine mammals, nor is it considered an area frequented by marine mammals, although harbor seals may be present year-round and sea lions are known to haul-out on man-made objects at the NBKB waterfront. Sightings of other species are rare. Therefore, behavioral disturbances that could result from anthropogenic sound associated with these activities are expected to affect only a relatively small number of individual marine mammals, although those effects could be recurring over the life of the project if the same individuals remain in the project vicinity.

The Navy has requested authorization for the incidental taking of small numbers of Steller sea lions, California sea lions, and harbor seals in Sinclair Inlet and nearby waters that may result from pile driving during construction activities associated with the pier maintenance project described previously in this document. In order to estimate the potential incidents of take that may occur incidental to the specified activity, we must first estimate the extent of the sound field that may be produced by the activity and then consider in combination with information about marine mammal density or abundance in the project area. We first provide information on applicable sound thresholds for determining effects to marine mammals before describing the information used in estimating the sound fields, the available marine mammal density or abundance information, and the method of estimating potential incidents of take.

*Sound Thresholds*

We use generic sound exposure thresholds to determine when an activity that produces sound might result in impacts to a marine mammal such that a take by harassment might occur. To date, no studies have been conducted that explicitly examine impacts to marine mammals from pile driving sounds or from which empirical sound thresholds have been established. These thresholds (Table 3) are used to estimate when harassment may occur (i.e., when an animal is exposed to levels equal to or exceeding the relevant criterion) in specific contexts; however, useful contextual information that may inform our assessment of effects is typically lacking and we consider these thresholds as step functions. NMFS is working to revise these acoustic guidelines; for more information on that process, please visit *www.nmfs.noaa.gov/pr/acoustics/guidelines.htm*.

TABLE 3—CURRENT ACOUSTIC EXPOSURE CRITERIA

| Criterion | Definition | Threshold |
|---|---|---|
| Level A harassment (underwater) | Injury (PTS—any level above that which is known to cause TTS). | 180 dB (cetaceans)/190 dB (pinnipeds) (rms) |
| Level B harassment (underwater) | Behavioral disruption | 160 dB (impulsive source)/120 dB (continuous source) (rms) |
| Level B harassment (airborne) | Behavioral disruption | 90 dB (harbor seals)/100 dB (other pinnipeds) (unweighted) |

*Distance to Sound Thresholds*

*Underwater Sound Propagation Formula*—Pile driving generates underwater noise that can potentially result in disturbance to marine mammals in the project area. Transmission loss (TL) is the decrease in acoustic intensity as an acoustic pressure wave propagates out from a source. TL parameters vary with frequency, temperature, sea conditions, current, source and receiver depth, water depth, water chemistry, and bottom composition and topography. The general formula for underwater TL is:

$$TL = B * \log_{10}(R_1/R_2),$$

Where

$R_1$ = the distance of the modeled SPL from the driven pile, and

$R_2$ = the distance from the driven pile of the initial measurement.

This formula neglects loss due to scattering and absorption, which is assumed to be zero here. The degree to which underwater sound propagates away from a sound source is dependent on a variety of factors, most notably the water bathymetry and presence or absence of reflective or absorptive conditions including in-water structures and sediments. Spherical spreading occurs in a perfectly unobstructed (free-field) environment not limited by depth or water surface, resulting in a 6 dB reduction in sound level for each doubling of distance from the source (20*log[range]). Cylindrical spreading occurs in an environment in which sound propagation is bounded by the water surface and sea bottom, resulting in a reduction of 3 dB in sound level for each doubling of distance from the source (10*log[range]). A practical spreading value of fifteen is often used under conditions, such as Sinclair Inlet, where water increases with depth as the receiver moves away from the shoreline, resulting in an expected propagation environment that would lie between spherical and cylindrical spreading loss conditions. Practical spreading loss (4.5 dB reduction in sound level for each doubling of distance) is assumed here.

*Underwater Sound*—The intensity of pile driving sounds is greatly influenced by factors such as the type of piles, hammers, and the physical environment in which the activity takes place. However, a limited quantity of literature is available for consideration regarding SPLs recorded from pile driving projects similar to the Navy's activity (i.e., impact-driven concrete piles and vibratory pile removal). In order to determine reasonable SPLs and their associated effects on marine mammals that are likely to result from pile driving at NBKB, studies with similar properties to the specified activity were evaluated, and are displayed in Table 4.

TABLE 4—SUMMARY OF PROXY MEASURED UNDERWATER SPLS

| Location | Method | Pile size and material | Measured SPLs |
|---|---|---|---|
| Berth 22, Port of Oakland [1] | Impact | 24-in concrete | 176 dB at 10 m. |
| Mad River Slough, CA [1] | Vibratory | 13-in steel pipe | 155 dB at 10 m. |
| Port Townsend, WA [2] | Vibratory (removal) | 12-in timber | 150 dB at 16 m. |

Sources: [1] Caltrans, 2012; [2] Laughlin, 2011

We consider the values presented in Table 4 to be representative of SPLs that may be produced by impact driving of concrete piles, vibratory removal of steel piles, and vibratory removal of timber piles, respectively. The value from Berth 22 was selected as representative of the largest concrete pile size to be installed and may be conservative when smaller concrete piles are driven. The value from Mad River Slough is for vibratory installation and would likely be conservative when applied to vibratory extraction, which would be expected to produce lower SPLs than vibratory installation of same-sized piles. All calculated distances to and the total area encompassed by the marine mammal sound thresholds are provided in Table 5.

TABLE 5—DISTANCES TO RELEVANT SOUND THRESHOLDS AND AREAS OF ENSONIFICATION, UNDERWATER

| Description | Distance to threshold (m) and associated area of ensonification (km²) | | | |
|---|---|---|---|---|
| | 190 dB | 180 dB | 160 dB | 120 dB |
| Concrete piles, impact | 1.2, <0.0001 | 5.4, 0.0001 | 117, 0.04 | n/a |

TABLE 5—DISTANCES TO RELEVANT SOUND THRESHOLDS AND AREAS OF ENSONIFICATION, UNDERWATER—Continued

| Description | Distance to threshold (m) and associated area of ensonification ($km^2$) | | | |
|---|---|---|---|---|
| | 190 dB | 180 dB | 160 dB | 120 dB |
| Steel piles, vibratory | 0 | 0 | n/a | 2,154 [2], 7.5 |
| Timber piles, vibratory | 0 | 0 | n/a | 1,585; 5.0 |

[1] SPLs used for calculations were: 191 dB for impact driving, 170 dB for vibratory removal of steel piles, and 168 dB for vibratory removal of timber piles.
[2] Areas presented take into account attenuation and/or shadowing by land. Please see Figures B–1 and B–2 in the Navy's application.

Sinclair Inlet does not represent open water, or free field, conditions. Therefore, sounds would attenuate according to the shoreline topography. Distances shown in Table 5 are estimated for free-field conditions, but areas are calculated per the actual conditions of the action area. See Figures B–1 and B–2 of the Navy's application for a depiction of areas in which each underwater sound threshold is predicted to occur at the project area due to pile driving.

*Airborne Sound*—Pile driving can generate airborne sound that could potentially result in disturbance to marine mammals (specifically, pinnipeds) which are hauled out or at the water's surface. As was discussed for underwater sound from pile driving, the intensity of pile driving sounds is greatly influenced by factors such as the type of piles, hammers, and the physical environment in which the activity takes place. As before, measured values from other studies were used as proxy values to determine reasonable airborne SPLs and their associated effects on marine mammals that might result from pile driving at NBKB. There are no measurements known for unweighted airborne sound from either impact driving of concrete piles or for vibratory driving of timber piles. A spherical spreading loss model (i.e., 6 dB reduction in sound level for each doubling of distance from the source), in which there is a perfectly unobstructed (free-field) environment not limited by depth or water surface, is appropriate for use with airborne sound and was used to estimate the distance to the airborne thresholds.

TABLE 6—SUMMARY OF PROXY MEASURED AIRBORNE SPLS

| Location | Method | Pile size and material | Measured SPLs |
|---|---|---|---|
| Test Pile Program, Hood Canal [1] | Impact | 24-in steel pipe | 89 dB at 15 m. |
| Wahkiakum Ferry Terminal, WA [2] | Vibratory | 18-in steel pipe | 87.5 dB at 15 m. |

Sources: [1] Illingworth & Rodkin, 2012; [2] Laughlin, 2010

Steel piles generally produce louder source levels than do similarly sized concrete or timber piles. Similarly, the value shown here for the larger steel piles (18-in) would likely be louder than smaller steel piles or timber piles. Therefore, these values will likely overestimate the distances to relevant thresholds. Based on these values and the assumption of spherical spreading loss, distances to relevant thresholds and associated areas of ensonification are presented in Table 7; these areas are depicted in Figure B–3 of the Navy's application.

TABLE 7—DISTANCES TO RELEVANT SOUND THRESHOLDS AND AREAS OF ENSONIFICATION, AIRBORNE

| Group | Distance to threshold (m) and associated area of ensonification ($m^2$) | |
|---|---|---|
| | Impact driving | Vibratory driving |
| Harbor seals | 13, 169 | 11, 121 |
| Sea lions | 5, 25 | 4, 16 |

[1] SPLs used for calculations were: 112.5 dB for impact driving and 111 dB for use of a vibratory hammer.

However, because there are no regular haul-outs within such a small area around the site of proposed pile driving activity, we believe that incidents of incidental take resulting solely from airborne sound are unlikely. In particular, the zones for sea lions are within the minimum shutdown zone defined for underwater sound, and the zones for harbor seals are only slightly larger. It is extremely unlikely that any structure would be available as a haul-out opportunity within these zones, or that an animal would haul out in such close proximity to pile driving activity. There is a remote possibility that an animal could surface in-water, but with head out, within one of the defined zones and thereby be exposed to levels of airborne sound that we associate with harassment, but any such occurrence would likely be accounted for in our estimation of incidental take from underwater sound.

In summary, we generally recognize that pinnipeds occurring within an estimated airborne harassment zone, whether in the water or hauled out, could be exposed to airborne sound that may result in behavioral harassment. However, any animal exposed to airborne sound above the behavioral harassment threshold is likely to also be exposed to underwater sound above relevant thresholds (which are typically in all cases larger zones than those associated with airborne sound). Thus, the behavioral harassment of these animals is already accounted for in these estimates of potential take. Multiple incidents of exposure to sound above NMFS' thresholds for behavioral harassment are not believed to result in increased behavioral disturbance, in either nature or intensity of disturbance reaction. Therefore, we do not believe that authorization of incidental take resulting from airborne sound for pinnipeds is warranted, and airborne sound is not discussed further here.

*Marine Mammal Densities*

For all species, the best scientific information available was considered for use in the marine mammal take assessment calculations. The Navy has developed, with input from regional marine mammal experts, estimates of marine mammal densities in Washington inland waters for the Navy Marine Species Density Database (NMSDD). A technical report (Hanser et al., 2014) describes methodologies and available information used to derive these densities, which are generally based upon the best available information for Washington inland waters, except where specific local abundance information is available.

At NBKB, the Navy began collecting opportunistic observational data of animals hauled-out on the floating security barrier. These surveys began in February 2010 and have been conducted approximately monthly from September 2010 through present (DoN, 2013). In addition, the Washington State Department of Transportation (WSDOT) recently conducted in-water pile driving over the course of multiple work windows as part of the Manette Bridge construction project in the nearby Port Washington Narrows. WSDOT conducted required marine mammal monitoring as part of this project (WSDOT, 2011, 2012; Rand, 2011). Here, we considered NMSDD density information for all five species we believe to have the potential for occurrence in the project area, but determined it most appropriate to use local abundance data for the three pinniped species. Density information is shown in Table 8; see Hanser *et al.* (2014) for descriptions of how the densities were derived. That document is publicly available on the Internet at *http://nwtteis.com/DocumentsandReferences/NWTTDocuments/SupportingTechnicalDocuments.aspx* (accessed June 20, 2014). See below for discussion of gray whale and killer whale.

*Description of Take Calculation*

The following assumptions are made when estimating potential incidences of take:

- All marine mammal individuals potentially available are assumed to be present within the relevant area, and thus incidentally taken;
- An individual can only be taken once during a 24-h period;
- There were will be sixty total days of activity; and,
- Exposures to sound levels at or above the relevant thresholds equate to take, as defined by the MMPA.

The estimation of marine mammal takes typically uses the following calculation:

Exposure estimate = (n * ZOI) * days of total activity

Where:

n = density estimate used for each species/season

ZOI = sound threshold ZOI area; the area encompassed by all locations where the SPLs equal or exceed the threshold being evaluated

n * ZOI produces an estimate of the abundance of animals that could be present in the area for exposure, and is rounded to the nearest whole number before multiplying by days of total activity.

The ZOI impact area is estimated using the relevant distances in Table 5, taking into consideration the possible affected area due to topographical constraints of the action area (i.e., radial distances to thresholds are not always reached). When local abundance is the best available information, in lieu of the density-area method described above, we may simply multiply some number of animals (as determined through counts of animals hauled-out) by the number of days of activity, under the assumption that all of those animals will be present and incidentally taken on each day of activity.

There are a number of reasons why estimates of potential incidents of take may be conservative, assuming that available density or abundance estimates and estimated ZOI areas are accurate. We assume, in the absence of information supporting a more refined conclusion, that the output of the calculation represents the number of individuals that may be taken by the specified activity. In fact, in the context of stationary activities such as pile driving and in areas where resident animals may be present, this number more realistically represents the number of incidents of take that may accrue to a smaller number of individuals. While pile driving can occur any day throughout the in-water work window, and the analysis is conducted on a per day basis, only a fraction of that time (typically a matter of hours on any given day) is actually spent pile driving. The potential effectiveness of mitigation measures in reducing the number of takes is typically not quantified in the take estimation process. For these reasons, these take estimates may be conservative. See Table 8 for total estimated incidents of take.

*Harbor Seal*—While no harbor seal haul-outs are present in the action area or in the immediate vicinity of NBKB, haul-outs are present elsewhere in Sinclair Inlet and in other nearby waters and harbor seals may haul out on available objects opportunistically. Marine mammal monitoring conducted during pile driving work on the Manette Bridge showed variable numbers of harbor seals (but generally greater than indicated by the uncorrected NMSDD density of 1.219 animals/km$^2$). During the first year of construction (in-water work window only), an average of 3.7 harbor seals were observed per day of monitoring with a maximum of 59 observed in October 2011 (WSDOT, 2011; Rand, 2011). During the most recent construction period (July–November 2012), an average of eleven harbor seals per monitoring day was observed, though some animals were likely counted multiple times (WSDOT, 2012). Given the potential for similar occurrence of harbor seals in the vicinity of NBKB during the in-water construction period, we determined it appropriate to use this most recent, local abundance information in the take assessment calculation.

*California Sea Lion*—Similar to harbor seals, it is not likely that use of the NMSDD density value for California sea lions (0.13 animals/km$^2$) would adequately represent their potential occurrence in the project area. California sea lions are commonly observed hauled out on the floating security barrier which is in close proximity to Pier 6; counts from 34 surveys (March 2010–July 2014) showed an average of 45 individuals per survey day (range 0–219; DoN, 2014). These counts represent the best local abundance data available and were used in the take assessment calculation.

*Steller Sea Lion*—No Steller sea lion haul-outs are present within or near the action area, and Steller sea lions have not been observed during Navy waterfront surveys or during monitoring associated with the Manette Bridge construction project. It is assumed that the possibility exists that a Steller sea lion could occur in the project area, but there is no known attractant in Sinclair Inlet, which is a relatively muddy, industrialized area, and the floating security barrier that California sea lions use as an opportunistic haul-out cannot generally accommodate the larger adult Steller sea lions (juveniles could haul-out on the barrier). Use of the NMSDD density estimate (0.037 animals/km$^2$) results in an estimate of zero exposures, and there are no existing data to indicate that Steller sea lions would occur more frequently locally. However, as a precaution and to account for the possibiolity that a Steller sea lion could occur in the project area, we assume that one Steller sea lion could occur per day of activity.

*Killer Whale*—Transient killer whales are rarely observed in the project area, with records since 2002 showing one group transiting through the area in May 2004 and a subsequent, similar observation in May 2010. No other observations have occurred during Navy surveys or during project monitoring for Manette Bridge. Use of the NMSDD density estimate (0.0024 animals/km$^2$) results in an estimate of zero exposures, and there are no existing data to indicate that killer whales would occur more frequently locally. Therefore, the Navy has not requested the authorization of incidental take for transient killer whales and we do not propose such authorization. The Navy would not begin activity or would shut down upon report of a killer whale present within or approaching the relevant ZOI.

*Gray Whale*—Gray whales are rarely observed in the project area, and the majority of in-water work would occur when whales are relatively less likely to occur (i.e., outside of March–May). Since 2002 and during the in-water work window, there are observational records of three whales (all during winter 2008–09) and a stranding record of a fourth whale (January 2013). No other observations have occurred during Navy surveys or during project monitoring for Manette Bridge. Use of the NMSDD density estimate (0.0005 animals/km$^2$) results in an estimate of zero exposures, and there are no existing data to indicate that gray whales would occur more frequently locally. Therefore, the Navy has not requested the authorization of incidental take for gray whales and we do not propose such authorization. The Navy would not begin activity or would shut down upon report of a gray whale present within or approaching the relevant ZOI.

TABLE 8—CALCULATIONS FOR INCIDENTAL TAKE ESTIMATION

| Species | n (animals/km$^2$) [1] | n * ZOI (vibratory steel pile removal) [2] | Abundance [3] | Total proposed authorized takes (% of total stock) |
|---|---|---|---|---|
| California sea lion | 0.1266 | 1 | 45 | 2700 (0.9) |
| Steller sea lion | 0.0368 | 0 | 1 | 60 (0.09) |
| Harbor seal | 1.219 [4] | 9 | 11 | 660 (4.5) |
| Killer whale (transient) | 0.0024 (fall) | 0 | n/a | 0 |
| Gray whale | 0.0005 (winter) | 0 | n/a | 0 |

[1] Best available species- and season-specific density estimate, with season noted in parentheses where applicable (Hanser *et al.,* 2014).
[2] Product of density and largest ZOI (7.5 km$^2$) rounded to nearest whole number; presented for reference only.
[3] Best abundance numbers multiplied by expected days of activity (60) to produce take estimate.
[4] Uncorrected density; presented for reference only.

## Analyses and Preliminary Determinations

### *Negligible Impact Analysis*

NMFS has defined ‘‘negligible impact’’ in 50 CFR 216.103 as ‘‘. . . an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival.’’ A negligible impact finding is based on the lack of likely adverse effects on annual rates of recruitment or survival (i.e., population-level effects). An estimate of the number of Level B harassment takes alone is not enough information on which to base an impact determination. In addition to considering estimates of the number of marine mammals that might be ‘‘taken’’ through behavioral harassment, we consider other factors, such as the likely nature of any responses (e.g., intensity, duration), the context of any responses (e.g., critical reproductive time or location, migration), as well as the number and nature of estimated Level A harassment takes, the number of estimated mortalities, and effects on habitat.

Pile driving activities associated with the pier maintenance project, as outlined previously, have the potential to disturb or displace marine mammals. Specifically, the specified activities may result in take, in the form of Level B harassment (behavioral disturbance) only, from underwater sounds generated from pile driving. Potential takes could occur if individuals of these species are present in the ensonified zone when pile driving is happening.

No injury, serious injury, or mortality is anticipated given the nature of the activity and measures designed to minimize the possibility of injury to marine mammals. The potential for these outcomes is minimized through the construction method and the implementation of the planned mitigation measures. Specifically, piles would be removed via vibratory means—an activity that does not have the potential to cause injury to marine mammals due to the relatively low source levels produced (less than 180 dB) and the lack of potentially injurious source characteristics—and, while impact pile driving produces short, sharp pulses with higher peak levels and much sharper rise time to reach those peaks, only small diameter concrete piles are planned for impact driving. Predicted source levels for such impact driving events are significantly lower than those typical of impact driving of steel piles and/or larger diameter piles. In addition, implementation of soft start and shutdown zones significantly reduces any possibility of injury. Given sufficient ‘‘notice’’ through use of soft start (for impact driving), marine mammals are expected to move away from a sound source that is annoying prior to its becoming potentially injurious. Environmental conditions in Sinclair Inlet are expected to generally be good, with calm sea states, although Sinclair Inlet waters may be more turbid than those further north in Puget Sound or in Hood Canal. Nevertheless, we expect conditions in Sinclair Inlet would allow a high marine mammal detection capability for the trained observers required, enabling a high rate of success in implementation of shutdowns to avoid injury, serious injury, or mortality. In addition, the topography of Sinclair Inlet should allow for placement of observers sufficient to detect cetaceans, should any occur (see Figure 1 of Appendix C in the Navy’s application).

Effects on individuals that are taken by Level B harassment, on the basis of reports in the literature as well as monitoring from other similar activities, will likely be limited to reactions such as increased swimming speeds, increased surfacing time, or decreased foraging (if such activity were occurring) (e.g., Thorson and Reyff, 2006; HDR, Inc., 2012). Most likely, individuals will simply move away from the sound source and be temporarily displaced from the areas of pile driving, although even this reaction has been observed primarily only in association with impact pile driving. The pile driving activities analyzed here are similar to, or less impactful than, numerous other construction activities conducted in San Francisco Bay and in the Puget Sound region, which have taken place with no reported injuries or mortality to marine mammals, and no known long-term adverse consequences from behavioral harassment. Repeated exposures of individuals to levels of sound that may cause Level B harassment are unlikely to result in hearing impairment or to significantly disrupt foraging behavior. Thus, even repeated Level B harassment of some small subset of the overall stock is unlikely to result in any significant realized decrease in viability for the affected individuals, and thus would not result in any adverse impact to the stock as a whole. Level B harassment will be reduced to the level of least practicable impact through use of mitigation measures described herein and, if sound produced by project activities is sufficiently disturbing, animals are likely to simply avoid the area while the activity is occurring.

In summary, this negligible impact analysis is founded on the following factors: (1) The possibility of injury, serious injury, or mortality may reasonably be considered discountable; (2) the anticipated incidences of Level B harassment consist of, at worst, temporary modifications in behavior; (3) the absence of any significant habitat within the project area, including rookeries, significant haul-outs, or known areas or features of special significance for foraging or reproduction; (4) the presumed efficacy of the proposed mitigation measures in reducing the effects of the specified activity to the level of least practicable impact. In addition, these stocks are not listed under the ESA or considered depleted under the MMPA. In combination, we believe that these factors, as well as the available body of evidence from other similar activities, demonstrate that the potential effects of the specified activity will have only short-term effects on individuals. The specified activity is not expected to impact rates of recruitment or survival and will therefore not result in population-level impacts. Based on the analysis contained herein of the likely effects of the specified activity on marine mammals and their habitat, and taking into consideration the implementation of the proposed monitoring and mitigation measures, we preliminarily find that the total marine mammal take from Navy's pier maintenance activities will have a negligible impact on the affected marine mammal species or stocks.

*Small Numbers Analysis*

The number of incidences of take proposed for authorization for these stocks would be considered small relative to the relevant stocks or populations (less than one percent for both sea lion stocks and less than five percent for harbor seals; Table 8) even if each estimated taking occurred to a new individual. This is an extremely unlikely scenario as, for pinnipeds in estuarine/inland waters, there is likely to be some overlap in individuals present day-to-day.

Based on the analysis contained herein of the likely effects of the specified activity on marine mammals and their habitat, and taking into consideration the implementation of the mitigation and monitoring measures, we preliminarily find that small numbers of marine mammals will be taken relative to the populations of the affected species or stocks.

**Impact on Availability of Affected Species for Taking for Subsistence Uses**

There are no relevant subsistence uses of marine mammals implicated by this action. Therefore, we have determined that the total taking of affected species or stocks would not have an unmitigable adverse impact on the availability of such species or stocks for taking for subsistence purposes.

**Endangered Species Act (ESA)**

No marine mammal species listed under the ESA are expected to be affected by these activities. Therefore, we have determined that a section 7 consultation under the ESA is not required.

**National Environmental Policy Act (NEPA)**

In compliance with the National Environmental Policy Act of 1969 (42 U.S.C. 4321 *et seq.*), as implemented by the regulations published by the Council on Environmental Quality (40 CFR parts 1500 through 1508), the Navy prepared an Environmental Assessment (EA) to consider the direct, indirect and cumulative effects to the human environment resulting from the pier maintenance project. NMFS made the Navy's EA available to the public for review and comment, in relation to its suitability for adoption by NMFS in order to assess the impacts to the human environment of issuance of an IHA to the Navy. Also in compliance with NEPA and the CEQ regulations, as well as NOAA Administrative Order 216–6, NMFS has reviewed the Navy's EA, determined it to be sufficient, and adopted that EA and signed a Finding of No Significant Impact (FONSI) on November 8, 2013.

We have reviewed the Navy's application for a renewed IHA for ongoing construction activities for 2014–15 and the 2013–14 monitoring report. Based on that review, we have determined that the proposed action is very similar to that considered in the previous IHA. In addition, no significant new circumstances or information relevant to environmental concerns have been identified. Thus, we have determined preliminarily that the preparation of a new or supplemental NEPA document is not necessary, and will, after review of public comments determine whether or not to reaffirm our 2013 FONSI. The 2013 NEPA documents are available for review at *www.nmfs.noaa.gov/pr/permits/incidental.htm.*

**Proposed Authorization**

As a result of these preliminary determinations, we propose to issue an IHA to the Navy for conducting the described pier maintenance activities in Sinclair Inlet, from October 1, 2014 through March 1, 2015, provided the previously mentioned mitigation, monitoring, and reporting requirements are incorporated. The proposed IHA language is provided next.

This section contains a draft of the IHA itself. The wording contained in this section is proposed for inclusion in the IHA (if issued).

1. This Incidental Harassment Authorization (IHA) is valid from October 1, 2014 through March 1, 2015.

2. This IHA is valid only for pile driving and removal activities associated with the Pier Maintenance Project at Naval Base Kitsap Bangor, 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 richardii*), California sea lion (*Zalophus californianus*), and Steller sea lion (*Eumetopias jubatus monteriensis*).

(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 injury (Level A harassment), serious injury, or death of any of the species listed in condition 3(b) of the Authorization or any taking 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, acoustic 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.

4. Mitigation Measures

The holder of this Authorization is required to implement the following mitigation measures:

(a) For all pile driving, the Navy shall implement a minimum shutdown zone of 10 m radius around the pile. If a marine mammal comes within or approaches the shutdown zone, such operations shall cease.

(b) The Navy shall establish monitoring locations as described below. Please also refer to the Marine Mammal Monitoring Plan (Monitoring Plan; attached).

i. For all vibratory pile removal activities, a minimum of four shore-based observers shall be deployed. Two observers shall be located at the pier work site, with one positioned to achieve optimal monitoring of the shutdown zone and the second positioned to achieve optimal monitoring of surrounding waters of Sinclair Inlet. The two additional observers shall be deployed for optimal monitoring of the further extent of the estimated disturbance zone, with one at the eastern extent in the Manette neighborhood of Bremerton, and one at the southern extent near the Annapolis ferry landing in Port Orchard.

ii. For all vibratory pile removal activities, a minimum of one vessel-based observer shall be deployed and shall conduct regular transits through the estimated disturbance zone for the duration of the activity.

iii. For all impact pile driving activities, a minimum of one shore-based observer shall be located at the pier work site.

iv. These observers shall record all observations of marine mammals, regardless of distance from the pile being driven, as well as behavior and potential behavioral reactions of the animals. If any killer whales or gray whales are detected, activity must not begin or must shut down.

v. All observers shall be equipped for communication of marine mammal observations amongst themselves and to other relevant personnel (e.g., those necessary to effect activity delay or shutdown).

(c) Prior to the start of pile driving on any day, the Navy shall take measures to ensure that no species for which incidental take is not authorized are located within the vicinity of the action area, to include the following:

i. Observers shall scan the floating security barrier to ensure that no Steller sea lions are present.

ii. The Navy shall contact and/or review the latest sightings data from the Orca Network and/or Center for Whale Research, including passive acoustic detections, to determine the location of the nearest marine mammal sightings.

(d) Monitoring shall take place from fifteen minutes prior to initiation of pile driving activity through thirty minutes post-completion of pile driving activity. Pre-activity monitoring shall be conducted for fifteen minutes to ensure that the shutdown zone is clear of marine mammals, and pile driving may commence when observers have declared the shutdown zone clear of marine mammals. In the event of a delay or shutdown of activity resulting from marine mammals in the shutdown zone, animals shall be allowed to remain in the shutdown zone (i.e., must leave of their own volition) and their behavior shall be monitored and documented. Monitoring shall occur throughout the time required to drive a pile. The shutdown zone must be determined to be clear during periods of good visibility (i.e., the entire shutdown zone and surrounding waters must be visible to the naked eye).

(e) If a marine mammal approaches or enters the shutdown zone, all pile driving activities at that location shall be halted. 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 fifteen minutes have passed without re-detection of the animal.

(f) Monitoring shall be conducted by qualified observers, as described in the Monitoring Plan. Trained observers shall be placed from the best vantage point(s) practicable to monitor for marine mammals and implement shutdown or delay procedures when applicable through communication with the equipment operator.

(g) The Navy shall use soft start techniques recommended by NMFS for vibratory and impact pile driving. Soft start for vibratory drivers requires contractors to initiate sound for fifteen seconds at reduced energy followed by a thirty-second waiting period. This procedure is repeated two additional times. Soft start for impact drivers requires contractors to provide an initial set of strikes at reduced energy, followed by a thirty-second waiting period, then two subsequent reduced energy strike sets. Soft start shall be implemented at the start of each day's pile driving and at any time following cessation of pile driving for a period of thirty minutes or longer. Soft start for impact drivers must be implemented at any time following cessation of impact driving for a period of thirty minutes or longer.

(h) Pile driving shall only be conducted during daylight hours.

5. Monitoring

The holder of this Authorization is required to conduct marine mammal monitoring during pile driving activity. Marine mammal monitoring and reporting shall be conducted in accordance with the Monitoring Plan.

(a) The Navy shall collect sighting data and behavioral responses to pile driving 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) For all marine mammal monitoring, the information shall be recorded as described in the Monitoring Plan.

(c) The Navy shall conduct acoustic monitoring sufficient to measure underwater and airborne source levels for vibratory removal of timber piles and impact driving of concrete piles. Minimum requirements include:

i. Measurements shall be taken for a minimum of ten piles of each type.

ii. Each hydrophone (underwater) and microphone (airborne) shall be calibrated prior to the beginning of the project and shall be checked at the beginning of each day of monitoring activity.

iii. Environmental data shall be collected including but not limited to: Wind speed and direction, wave height, water depth, precipitation, and type and location of in-water construction activities, as well other factors that could contribute to influencing the airborne and underwater sound levels measured (e.g. aircraft, boats).

iv. The construction contractor shall supply the Navy and monitoring personnel with an estimate of the substrate condition, hammer model and size, hammer energy settings and any changes to those settings during the piles being monitored.

v. Post-analysis of data shall include the average, minimum, and maximum rms values and frequency spectra for each pile monitored. If equipment used is able to accommodate such a requirement, average, minimum, and maximum peak values shall also be provided.

6. Reporting

The holder of this Authorization is required to:

(a) Submit a draft report on all monitoring conducted under the IHA within 45 days of the completion of marine mammal and acoustic monitoring, or sixty days prior to the issuance of any subsequent IHA for this project, whichever comes first. A final report shall be prepared and submitted within thirty days following resolution of comments on the draft report from NMFS. This report must contain the informational elements described in the Monitoring Plan, at minimum (see attached), and shall also include:

i. Detailed information about any implementation of shutdowns, including the distance of animals to the pile and description of specific actions that ensued and resulting behavior of the animal, if any.

ii. Description of attempts to distinguish between the number of individual animals taken and the number of incidences of take, such as ability to track groups or individuals.

iii. A refined take estimate based on the number of marine mammals observed during the course of construction activities.

iv. Results of acoustic monitoring, including the information described in condition 5(c) of this authorization.

(b) Reporting injured or dead marine mammals:

i. In the unanticipated event that the specified activity clearly causes the take of a marine mammal in a manner prohibited by this IHA, such as an injury (Level A harassment), serious injury, or mortality, Navy shall immediately cease the specified activities and report the incident to the Office of Protected Resources (301–427–8425), NMFS, and the West Coast Regional Stranding Coordinator (206–526–6550), NMFS. The report must include the following information:

A. Time and date of the incident;

B. Description of the incident;

C. Environmental conditions (e.g., wind speed and direction, Beaufort sea state, cloud cover, and visibility);

D. Description of all marine mammal observations in the 24 hours preceding the incident;

E. Species identification or description of the animal(s) involved;

F. Fate of the animal(s); and

G. Photographs or video footage of the animal(s).

Activities shall not resume until NMFS is able to review the circumstances of the prohibited take. NMFS will work with Navy to determine what measures are necessary to minimize the likelihood of further prohibited take and ensure MMPA compliance. Navy may not resume their activities until notified by NMFS.

i. In the event that Navy discovers an injured or dead marine mammal, and the lead observer determines that the cause of the injury or death is unknown and the death is relatively recent (e.g., in less than a moderate state of decomposition), Navy shall immediately report the incident to the Office of Protected Resources, NMFS, and the West Coast Regional Stranding Coordinator, NMFS.

The report must include the same information identified in 6(b)(i) of this IHA. Activities may continue while NMFS reviews the circumstances of the incident. NMFS will work with Navy to determine whether additional mitigation measures or modifications to the activities are appropriate.

ii. In the event that Navy discovers an injured or dead marine mammal, and the lead observer determines that the injury or death is not associated with or related to the activities authorized in the IHA (e.g., previously wounded animal, carcass with moderate to advanced decomposition, scavenger damage), Navy shall report the incident to the Office of Protected Resources, NMFS, and the West Coast Regional Stranding Coordinator, NMFS, within 24 hours of the discovery. Navy shall provide photographs or video footage or other documentation of the stranded animal sighting to NMFS.

7. 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.

## Request for Public Comments

We request comment on our analysis, the draft authorization, and any other aspect of this Notice of Proposed IHA for Navy's pier maintenance activities. Please include with your comments any supporting data or literature citations to help inform our final decision on Navy's request for an MMPA authorization.

Dated: August 1, 2014.

**Donna S. Wieting,**

*Director, Office of Protected Resources, National Marine Fisheries Service.*

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# DEPARTMENT OF DEFENSE

## Office of the Secretary

## Renewal of Department of Defense Federal Advisory Committees

**AGENCY:** DoD.

**ACTION:** Renewal of Federal Advisory Committee.

**SUMMARY:** The Department of Defense (DoD) is publishing this notice to announce that it is renewing the charter for the Advisory Committee on Arlington National Cemetery (''the Committee'').

**FOR FURTHER INFORMATION CONTACT:** Jim Freeman, Advisory Committee Management Officer for the Department of Defense, 703–692–5952.

**SUPPLEMENTARY INFORMATION:** This committee's charter is being renewed pursuant to 10 U.S.C. 4723 and under the provisions of the Federal Advisory Committee Act of 1972 (5 U.S.C. Appendix, as amended), the Government in the Sunshine Act of 1976 (5 U.S.C. 552b) (''the Sunshine Act''), and 41 CFR 102–3.50(d).

The Committee is a non-discretionary Federal advisory committee that shall make periodic reports and recommendations to the Secretary of the Army with respect to the administration of Arlington National Cemetery, the erection of memorials at the cemetery, and master planning for the cemetery. Any and all advice and recommendations shall also be forwarded to the Secretary of Defense or the Deputy Secretary of Defense.

The Secretary of the Army may act upon the Committee's advice and recommendations. Not later than 90 days after receiving a report or recommendations from the Committee, the Secretary of the Army shall submit the report or recommendations to the congressional defense committees and the Committees on Veterans' Affairs of the Senate and House of Representatives and include such comments and recommendations as the Secretary of the Army considers appropriate.

The Department of Defense (DoD), through the Department of the Army, shall provide support deemed necessary for the Committee's performance of its functions and shall ensure compliance with the requirements of the FACA, the