SUPPLEMENTARY INFORMATION:

Authority: 15 U.S.C. 278 and the Federal Advisory Committee Act, as amended, 5 U.S.C. App.

The purpose of this meeting is for the VCAT to review and make recommendations regarding general policy for NIST, its organization, its budget, and its programs within the framework of applicable national policies as set forth by the President and the Congress. The agenda will include an update on NIST and presentations and discussions on NIST's safety metrics, the Advanced Manufacturing Technology Consortia, and NIST's activities related to advanced manufacturing, cybersecurity, forensics, and advanced communications. The meeting will conclude with a wrap-up discussion of action items and plans for the October 2013 VCAT meeting. The agenda may change to accommodate Committee business. The final agenda will be posted on the NIST Web site at *http://www.nist.gov/director/vcat/agenda.cfm.*

Individuals and representatives of organizations who would like to offer comments and suggestions related to the Committee's affairs are invited to request a place on the agenda. On June 12, approximately one-half hour will be reserved in the morning for public comments and speaking times will be assigned on a first-come, first-serve basis. The amount of time per speaker will be determined by the number of requests received, but is likely to be about 3 minutes each. The exact time for public comments will be included in the final agenda that will be posted on the NIST Web site at *http://www.nist.gov/director/vcat/agenda.cfm.* Questions from the public will not be considered during this period. Speakers who wish to expand upon their oral statements, those who had wished to speak, but could not be accommodated on the agenda, and those who were unable to attend in person are invited to submit written statements to VCAT, NIST, 100 Bureau Drive, MS 1060, Gaithersburg, Maryland, 20899, via fax at 301–216–0529 or electronically by email to *gail.ehrlich@nist.gov.*

All visitors to the NIST site are required to pre-register to be admitted. Please submit your name, time of arrival, email address and phone number to Stephanie Shaw by 5:00 p.m. Eastern Time, Wednesday, June 5, 2013. Non-U.S. citizens must also submit their country of citizenship, title, employer/sponsor, and address. Ms. Shaw's email address is *stephanie.shaw@nist.gov* and her phone number is 301–975–2667.

Dated: May 16, 2013.

Willie E. May,

Associate Director for Laboratory Programs.

[FR Doc. 2013–12080 Filed 5–20–13; 8:45 am]

BILLING CODE 3510–13–P

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

RIN 0648–XC646

Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to a Wharf Construction 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 an application from the U.S. Navy (Navy) for an Incidental Harassment Authorization (IHA) to take marine mammals, by harassment, incidental to construction activities as part of a wharf construction project. Pursuant to the Marine Mammal Protection Act (MMPA), NMFS is requesting comments on its proposal to issue an IHA to the Navy to take, by Level B Harassment only, six species of marine mammals during the specified activity.

DATES: Comments and information must be received no later than June 20, 2013.

ADDRESSES: Comments on the application should be addressed to Michael Payne, Chief, Permits and Conservation Division, Office of Protected Resources, National Marine Fisheries Service, 1315 East-West Highway, Silver Spring, MD 20910. The mailbox address for providing email comments is *ITP.Laws@noaa.gov.* NMFS is not responsible for email comments sent to addresses other than the one provided here. Comments sent via email, including all attachments, must not exceed a 10-megabyte file size.

Instructions: All comments received are a part of the public record. 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.

A copy of the application as well as a list of the references used in this document may be obtained by writing to the address specified above, telephoning the contact listed below (see **FOR FURTHER INFORMATION CONTACT**), or visiting the Internet at: *http://www.nmfs.noaa.gov/pr/permits/incidental.htm.* Supplemental documents provided by the U.S. Navy may be found at the same web address. Documents cited in this notice may also be viewed, by appointment only, at the aforementioned physical address.

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

SUPPLEMENTARY INFORMATION:

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, the incidental, but not intentional, taking of small numbers of marine mammals by U.S. citizens who engage in a specified activity (other than commercial fishing) within a specified geographical region if certain findings are made and either regulations are issued or, if the taking is limited to harassment, a notice of a proposed authorization is provided to the public for review.

Authorization for incidental takings shall be granted if NMFS finds that the taking will have a negligible impact on the species or stock(s), will not have an unmitigable adverse impact on the availability of the species or stock(s) for subsistence uses (where relevant), and if the permissible methods of taking and requirements pertaining to the mitigation, monitoring and reporting of such takings are set forth. 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.''

Section 101(a)(5)(D) of the MMPA established an expedited process by which citizens of the U.S. can apply for an authorization to incidentally take small numbers of marine mammals by harassment. Section 101(a)(5)(D) establishes a 45-day time limit for NMFS review of an application followed by a 30-day public notice and comment period on any proposed authorizations for the incidental harassment of marine mammals. Within 45 days of the close of the comment period, NMFS must either issue or deny the authorization. Except with respect to certain activities not pertinent here, 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

We received an application on December 10, 2012, from the Navy for the taking of marine mammals incidental to pile driving and removal in association with a wharf construction project in the Hood Canal at Naval Base Kitsap in Bangor, WA (NBKB). The Navy submitted a revised version of the application on May 6, 2013, which we deemed adequate and complete. The wharf construction project is a multi-year project; this IHA would cover only the second year of the project, from July 16, 2013, through July 15, 2014. Pile driving and removal activities would occur only within an approved in-water work window from July 16-February 15. Six species of marine mammals are expected to be affected by the specified activities: Steller sea lion (*Eumetopias jubatus monteriensis*), California sea lion (*Zalophus californianus californianus*), harbor seal (*Phoca vitulina richardii*), killer whale (transient only; *Orcinus orca*), Dall's porpoise (*Phocoenoides dalli dalli*), and harbor porpoise (*Phocoena phocoena vomerina*). These species may occur year-round in the Hood Canal, with the exception of the Steller sea lion, which is present only from fall to late spring (October to mid-April), and the California sea lion, which is only present from late summer to late spring (August to early June).

NBKB provides berthing and support services to Navy submarines and other fleet assets. The Navy proposes to continue construction of the Explosive Handling Wharf #2 (EHW–2) facility at NBKB in order to support future program requirements for submarines berthed at NBKB. The Navy has determined that construction of EHW–2 is necessary because the existing EHW alone will not be able to support future program requirements. Under the proposed action—which includes only the portion of the project that would be completed under this proposed 1-year IHA—a maximum of 195 pile driving days would occur. All piles would be driven with a vibratory hammer for their initial embedment depths, while select piles may be finished with an impact hammer for proofing, as necessary. Proofing involves striking a driven pile with an impact hammer to verify that it provides the required load-bearing capacity, as indicated by the number of hammer blows per foot of pile advancement. Sound attenuation measures (*i.e.,* bubble curtain) would be used during all impact hammer operations.

For pile driving activities, the Navy used thresholds recommended by NMFS for assessing project impacts, outlined later in this document. The Navy assumed practical spreading loss and used empirically-measured source levels from other 30–72 in diameter pile driving events to estimate potential marine mammal exposures. Predicted exposures are outlined later in this document. The calculations predict that only Level B harassment would occur associated with pile driving or construction activities.

Description of the Specified Activity

NBKB is located on the Hood Canal approximately twenty miles (32 km) west of Seattle, Washington (see Figures 2–1 through 2–4 in the Navy's application). The proposed actions with the potential to cause harassment of marine mammals within the waterways adjacent to NBKB, under the MMPA, are vibratory and impact pile driving operations, as well as vibratory removal of falsework piles, associated with the wharf construction project. The proposed activities that would be authorized by this IHA would occur between July 16, 2013, and July 15, 2014. All in-water construction activities within the Hood Canal are only permitted during July 16-February 15 in order to protect spawning fish populations.

Specific Geographic Region

The Hood Canal is a long, narrow fjord-like basin of the western Puget Sound. Throughout its 67-mile length, the width of the canal varies from one to two miles and exhibits strong depth/elevation gradients and irregular seafloor topography in many areas. Although no official boundaries exist along the waterway, the northeastern section of the canal extending from the mouth of the canal at Admiralty Inlet to the southern tip of Toandos Peninsula is referred to as the northern Hood Canal. NBKB is located within this region (see Figures 2–1 through 2–4 of the Navy's application). Please see Section 2 of the Navy's application for more information about the specific geographic region, including physical and oceanographic characteristics.

Project Description

Development of necessary facilities for handling of explosive materials is part of the Navy's sea-based strategic deterrence mission. The EHW–2 would consist of two components: (1) The wharf proper (or Operations Area), including the warping wharf; and (2) two access trestles. Please see Figures 1–1 and 1–2 of the Navy's application for conceptual and schematic representations of the proposed EHW–2.

The wharf proper would lie approximately 600 ft (183 m) offshore at water depths of 60–100 ft (18–30 m), and would consist of the main wharf, a warping wharf, and lightning protection towers, all pile-supported. It would include a slip (docking area) for submarines, surrounded on three sides by operational wharf area. The access trestles would connect the wharf to the shore. There would be an entrance trestle and an exit trestle; these would be combined over shallow water to reduce overwater area. The trestles would be pile-supported on 24-in (0.6-m) steel pipe piles driven approximately 30 ft (9 m) into the seafloor. Spacing between bents (rows of piles) would be 25 ft (8 m). Concrete pile caps would be cast in place and would support pre-cast concrete deck sections.

For the entire project, a total of up to 1,250 permanent piles ranging in size between 24–48 in (0.6–1.2 m) in diameter would be driven in-water to construct the wharf, with up to three vibratory rigs and one impact driving rig operating simultaneously. Construction would also involve temporary installation of up to 150 falsework piles used as an aid to guide permanent piles to their proper locations. Falsework piles, which would be removed upon installation of the permanent piles, would likely be steel pipe piles and would be driven and removed using a vibratory driver. It has not been determined exactly what parts or how much of the project would be constructed in any given year; however, a maximum of 195 days of pile driving would occur per in-water work window. The analysis contained herein is based upon the maximum of 195 pile driving days, rather than any specific number of piles driven. Table 1 summarizes the number and nature of piles required for the entire project, rather than what subset of piles may be expected to be driven during the second year of construction proposed for this IHA.

TABLE 1—SUMMARY OF PILES REQUIRED FOR WHARF CONSTRUCTION

[In total]

Feature	Quantity
Total number of permanent in-water piles	Up to 1,250.
Size and number of main wharf piles	24-in: 140. 36-in (0.9-m): 157. 48-in: 263.
Size and number of warping wharf piles	24-in: 80. 36-in: 190.
Size and number of lightning tower piles	24-in: 40. 36-in: 90.
Size and number of trestle piles	24-in: 57. 36-in: 233.
Falsework piles	Up to 150, 18- to 24-in.
Maximum pile driving duration	195 days (under 1-year IHA).

Pile installation would utilize vibratory pile drivers to the greatest extent possible, and the Navy anticipates that most piles would be able to be vibratory driven to within several feet of the required depth. Pile drivability is, to a large degree, a function of soil conditions and the type of pile hammer. The soil conditions encountered during geotechnical explorations at NBKB indicate existing conditions generally consist of fill or sediment of very dense glacially overridden soils. Recent experience at two other construction locations along the NBKB waterfront indicates that most piles should be able to be driven with a vibratory hammer to proper embedment depth. However, difficulties during pile driving may be encountered as a result of obstructions that may exist throughout the project area. Such obstructions may consist of rocks or boulders within the glacially overridden soils. If difficult driving conditions occur, increased usage of an impact hammer would occur.

Unless difficult driving conditions are encountered, an impact hammer will only be used to proof the load-bearing capacity of approximately every fourth or fifth pile. The industry standard is to proof every pile with an impact hammer; however, in an effort to reduce blow counts from the impact hammer, the engineer of record has agreed to only proof every fourth or fifth pile. A maximum of 200 strikes would be required to proof each pile. Pile production rates are dependent upon required embedment depths, the potential for encountering difficult driving conditions, and the ability to drive multiple piles without a need to relocate the driving rig. Under best-case scenarios (*i.e.,* shallow piles, driving in optimal conditions, using multiple driving rigs), it may be possible to install enough pilings with the vibratory hammer that proofing may be required for up to five piles in a day. Under this likely scenario, with a single impact hammer used to proof up to five piles per day at 200 strikes per pile, it is estimated that up to a maximum of 1,000 strikes from an impact hammer would be required per day.

If difficult subsurface driving conditions (*i.e.,* cobble/boulder zones) are encountered that cause refusal with the vibratory equipment, it may be necessary to use an impact hammer to drive some piles for the remaining portion of their required depth. The worst-case scenario is that a pile would be driven for its entire length using an impact hammer. Given the uncertainty regarding the types and quantities of boulders or cobbles that may be encountered, and the depth at which they may be encountered, the number of strikes necessary to drive a pile its entire length could be approximately 1,000 to 2,000 strikes per pile. The Navy estimates that a possible worst-case daily scenario would require driving three piles full length (at a worst-case of 2,000 strikes per pile) after the piles have become hung on large boulders early in the installation process, with proofing of an additional two piles (at 200 strikes each) that were able to be installed primarily via vibratory means. This worst-case scenario would therefore result in a maximum of 6,400 strikes per day. All piles driven or struck with an impact hammer would be surrounded by a bubble curtain or other sound attenuation device over the full water column to minimize in-water sound. Up to three vibratory rigs and one impact rig would be used at a time. Pile production rate (number of piles driven per day) is affected by many factors: size, type (vertical vs. angled), and location of piles; weather; number of driver rigs operating; equipment reliability; geotechnical (subsurface) conditions; and work stoppages for security or environmental reasons (such as presence of marine mammals).

Pile driving would typically take place 6 days per week. The allowable season for in-water work, including pile driving, at NBKB is July 16 through February 15, which was established by the Washington Department of Fish and Wildlife in coordination with NMFS and the U.S. Fish and Wildlife Service (USFWS) to protect juvenile salmon. Impact pile driving during the first half of the in-water work window (July 16 to September 15) would only occur between 2 hours after sunrise and 2 hours before sunset to protect breeding marbled murrelets (an ESA-listed bird under the jurisdiction of USFWS). Between September 16 and February 15, construction activities occurring in the water would occur during daylight hours (sunrise to sunset). Other construction (not in-water) may occur between 7:00 a.m. and 10:00 p.m., year-round.

Description of Work Accomplished

During the first in-water work season, the contractor completed installation of 184 piles to support the main segment of the access trestle. Driven piles ranged in size from 24–36 inches in diameter in depths ranging from 0 to 50 ft. A maximum of two vibratory rigs were operated concurrently and only one impact hammer rig was operated at a time. During the second season, installation of pilings for the wharf deck is expected to be completed. The overall intensity of pile driving will remain unchanged from season one. The project is scheduled for completion in January 2016.

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 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 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 SPLs (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 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.

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. Underwater sound levels ('ambient sound') are comprised of multiple sources, including 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). Even in the absence of anthropogenic sound, the sea is typically a loud environment. A number of sources of sound are likely to occur within Hood Canal, 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 noise 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 (5.3 mi) from shore showing an increase of 10 dB in the 100 to 700 Hz band during heavy surf conditions.
- Precipitation noise: Noise 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 noise: 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 noise: 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 (Richardson *et al.,* 1995). 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 will attenuate (decrease) rapidly (Richardson *et al.,* 1995). 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 each of the sources are described in the following text.

TABLE 2—REPRESENTATIVE SOUND LEVELS OF ANTHROPOGENIC SOURCES

Sound source	Frequency range (Hz)	Underwater sound level (dB re 1 μPa)	Reference
Small vessels	250–1,000	151 dB rms at 1 m (3.3 ft)	Richardson *et al.,* 1995.
Tug docking gravel barge	200–1,000	149 dB rms at 100 m (328 ft)	Blackwell and Greene, 2002.
Vibratory driving of 72-in (1.8 m) steel pipe pile.	10–1,500	180 dB rms at 10 m (33 ft)	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 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 and removal. The sounds produced by these activities fall into one of two sound types: pulsed and non-pulsed (defined in next paragraph). The distinction between these two general 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 sounds (*e.g.,* explosions, gunshots, sonic booms, and impact pile driving) are brief, broadband, atonal transients (ANSI, 1986; Harris, 1998) 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 decay period that may include a period of diminishing, oscillating maximal and minimal pressures. Pulsed sounds generally have an increased capacity to induce physical injury as compared with sounds that lack these features.

Non-pulse (intermittent or continuous sounds) can be tonal, broadband, or both. Some of these non-pulse sounds can be transient signals of short duration but without the essential properties of pulses (*e.g.,* rapid rise time). Examples of non-pulse sounds include those produced by vessels, aircraft, machinery operations such as drilling or dredging, vibratory pile driving, and active sonar systems. 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).

Ambient Sound

The underwater acoustic environment consists of ambient sound, defined as environmental background sound levels lacking a single source or point (Richardson *et al.,* 1995). The ambient underwater sound level of a region is defined by the total acoustical energy being generated by known and unknown sources, including sounds from both natural and anthropogenic sources. The sum of the various natural and anthropogenic sound sources at any given location and time 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, the ambient sound levels at a given frequency and location can vary by 10–20 dB from day to day (Richardson *et al.,* 1995).

Underwater ambient noise was measured at approximately 113 dB re 1μPa rms between 50 Hz and 20 kHz during the recent Test Pile Program (TPP) project, approximately 1.85 mi from the project area (Illingworth & Rodkin, Inc., 2012). In 2009, the average broadband ambient underwater noise levels were measured at 114 dB re 1μPa between 100 Hz and 20 kHz (Slater, 2009). Peak spectral noise from industrial activity was noted below the 300 Hz frequency, with maximum levels of 110 dB re 1μPa noted in the 125 Hz band. In the 300 Hz to 5 kHz range, average levels ranged between 83 and 99 dB re 1μPa. Wind-driven wave noise dominated the background noise environment at approximately 5 kHz and above, and ambient noise levels flattened above 10 kHz.

Sound Attenuation Devices

Sound levels can be greatly reduced during impact pile driving using sound attenuation devices. There are several types of sound attenuation devices including bubble curtains, cofferdams, and isolation casings (also called temporary noise attenuation piles [TNAP]), and cushion blocks. The Navy proposes to use bubble curtains, which create a column of air bubbles rising around a pile from the substrate to the water surface. The air bubbles absorb and scatter sound waves emanating from the pile, thereby reducing the sound energy. Bubble curtains may be confined or unconfined. An unconfined bubble curtain may consist of a ring seated on the substrate and emitting air bubbles from the bottom. An unconfined bubble curtain may also consist of a stacked system, that is, a series of multiple rings placed at the bottom and at various elevations around the pile. Stacked systems may be more effective than non-stacked systems in areas with high current and deep water (Oestman *et al.,* 2009).

A confined bubble curtain contains the air bubbles within a flexible or rigid sleeve made from plastic, cloth, or pipe. Confined bubble curtains generally offer higher attenuation levels than unconfined curtains because they may physically block sound waves and they prevent air bubbles from migrating away from the pile. For this reason, the confined bubble curtain is commonly used in areas with high current velocity (Oestman *et al.,* 2009).

Both environmental conditions and the characteristics of the sound attenuation device may influence the effectiveness of the device. According to Oestman *et al.* (2009):

- In general, confined bubble curtains attain better sound attenuation levels in areas of high current than unconfined bubble curtains. If an unconfined device is used, high current velocity may sweep bubbles away from the pile, resulting in reduced levels of sound attenuation.
- Softer substrates may allow for a better seal for the device, preventing leakage of air bubbles and escape of sound waves. This increases the effectiveness of the device. Softer substrates also provide additional attenuation of sound traveling through the substrate.
- Flat bottom topography provides a better seal, enhancing effectiveness of the sound attenuation device, whereas sloped or undulating terrain reduces or eliminates its effectiveness.
- Air bubbles must be close to the pile; otherwise, sound may propagate into the water, reducing the effectiveness of the device.
- Harder substrates may transmit ground-borne sound and propagate it into the water column.

The literature presents a wide array of observed attenuation results for bubble curtains (*e.g.,* Oestman *et al.,* 2009, Coleman, 2011, Caltrans, 2012). The variability in attenuation levels is due to variation in design, as well as differences in site conditions and difficulty in properly installing and operating in-water attenuation devices. As a general rule, reductions of greater than 10 dB cannot be reliably predicted. The TPP reported a range of measured values for realized attenuation mostly within 6 to 12 dB (Illingworth & Rodkin, Inc., 2012). For 36-inch piles the average peak and rms reduction with use of the bubble curtain was 8 dB, where the averages of all bubble-on and bubble-off data were compared. For 48-inch piles, the average SPL reduction with use of a bubble curtain was 6 dB for average peak values and 5 dB for rms values (see Table 3). To avoid loss of attenuation from design and implementation errors, the Navy has required specific bubble curtain design specifications, including testing requirements for air pressure and flow prior to initial impact hammer use, and a requirement for placement on the substrate. We considered TPP measurements (approximately 7 dB overall) and other monitored projects (typically at least 8 dB realized attenuation), and determined that 8 dB may be the best estimate of average SPL (rms) reduction. In looking at other monitored projects prior to completion of the TPP, the Navy determined with our concurrence that an assumption of 10 dB realized attenuation was realistic. Therefore, a 10 dB reduction was used in the Navy's analysis of pile driving noise in the initial environmental analyses for the EHW–2 project, and the Navy included a contract performance requirement to achieve a 10 dB reduction during EHW–2 pile driving. The Navy is currently reviewing acoustical data from the first year of

EHW–2 construction to determine whether the contractor successfully met the requirement. If the data show that the 10 dB assumption is not consistently achievable, this assumption will be changed to 8 dB in assessing the potential effects of pile driving during future years of EHW–2 construction.

Sound Thresholds

NMFS uses 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 examine impacts to marine mammals from pile driving sounds from which empirical sound thresholds have been established. Current NMFS practice (in relation to the MMPA) regarding exposure of marine mammals to sound is that cetaceans and pinnipeds exposed to impulsive sounds of 180 and 190 dB rms or above, respectively, are considered to have been taken by Level A (*i.e.,* injurious) harassment. Behavioral harassment (Level B) is considered to have occurred when marine mammals are exposed to sounds at or above 160 dB rms for impulse sounds (*e.g.,* impact pile driving) and 120 dB rms for continuous sound (*e.g.,* vibratory pile driving), but below injurious thresholds. For airborne sound, pinniped disturbance from haul-outs has been documented at 100 dB (unweighted) for pinnipeds in general, and at 90 dB (unweighted) for harbor seals. NMFS uses these levels as guidelines to estimate when harassment may occur.

Distance to Sound Thresholds

Underwater Sound Propagation Formula—Pile driving would generate underwater noise that potentially could 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 by 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 15 is often used under conditions, such as Hood Canal, 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. A large quantity of literature regarding SPLs recorded from pile driving projects is available for consideration. 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 proposed action were evaluated, including measurements conducted for driving of steel piles at NBKB as part of the TPP (Illingworth & Rodkin, Inc., 2012). During the TPP, SPLs from driving of 24-, 36-, and 48-in piles by impact and vibratory hammers were measured. Sound levels associated with vibratory pile removal are assumed to be the same as those during vibratory installation (Reyff, 2007)—which is likely a conservative assumption—and have been taken into consideration in the modeling analysis. Overall, studies which met the following parameters were considered: (1) Pile size and materials: Steel pipe piles (30–72 in diameter); (2) Hammer machinery: Vibratory and impact hammer; and (3) Physical environment: shallow depth (less than 100 ft [30 m]).

TABLE 3—UNDERWATER SPLS FROM MONITORED CONSTRUCTION ACTIVITIES USING IMPACT HAMMERS

Project and location	Pile size and type	Water depth	Measured SPLs
Eagle Harbor Maintenance Facility, WA [1].	30-in (0.8 m) steel pipe pile	10 m (33 ft)	192 dB re 1 µPa (rms) at 10 m (33 ft).
Friday Harbor Ferry Terminal, WA [2].	30-in steel pipe pile	10 m	196 dB re 1 µPa (rms) at 10 m.
California [3]	36-in steel pipe pile	10 m	193 dB re 1 µPa (rms) at 10 m.
Mukilteo Test Piles, WA [4]	36-in steel pipe pile	7.3 m (24 ft)	195 dB re 1 µPa (rms) at 10 m.
Anacortes Ferry, WA [5]	36-in steel pipe pile	12.8 m (42 ft)	199 dB re 1 µPa (rms) at 10 m.
Carderock Pier, NBKB, WA [6]	42-in steel pipe pile	14–22 m (48–70 ft)	195 dB re 1 µPa (rms) at 10 m.
Russian River, CA [3]	48-in steel pipe pile	2 m (6.6 ft)	195 dB re 1 µPa (rms) at 10 m.
California [3]	60-in cast-in-steel-shell	10 m	195 dB re 1 µPa (rms) at 10 m.
Richmond-San Rafael Bridge, CA [3].	66-in steel pipe pile	4 m (13 ft)	195 dB re 1 µPa (rms) at 10 m.
Test Pile Program, NBKB [7]	36-in steel pipe pile	Avg of mid- and deep-depth	196 dB re 1 µPa (rms) at 10 m.
Test Pile Program, NBKB [7]	48-in steel pipe pile	Avg of mid- and deep-depth	194 dB re 1 µPa (rms) at 10 m.

Sources: [1] MacGillivray and Racca, 2005; [2] Laughlin, 2005; [3] Reyff, 2007; [4] MacGillivray, 2007; [5] Sexton, 2007; [6] Navy, 2009; [7] Illingworth & Rodkin, Inc., 2012.

The tables presented here detail representative pile driving SPLs that have been recorded from similar construction activities in recent years. Due to the similarity of these actions and the Navy's proposed action, these values represent reasonable SPLs which could be anticipated, and which were used in the acoustic modeling and analysis. Table 3 represents SPLs that may be expected during pile installation using an impact hammer. Table 4 represents SPLs that may be expected during pile installation using a vibratory hammer. For impact driving, a source value of 195 dB RMS re 1 μPa at 10 m was the average value reported from the listed studies, and is consistent with measurements from the TPP and Carderock Pier pile driving projects at NBKB, which had similar pile materials (48- and 42-inch hollow steel piles, respectively), water depth, and substrate type as the EHW–2 project site. For vibratory pile driving, the Navy selected the most conservative value (72-inch piles; 180 dB rms re 1 μPa at 10 m) available when initially assessing EHW–2 project impacts, prior to the first year of the project. Since then, data from the TPP have become available that indicate, on average, a lower source level for vibratory pile driving (172 dB rms re 1 μPa for 48-inch steel piles). However, for consistency we have maintained the initial conservative assumption regarding source level for vibratory driving.

TABLE 4—UNDERWATER SPLS FROM MONITORED CONSTRUCTION ACTIVITIES USING VIBRATORY HAMMERS

Project and location	Pile size and type	Water depth	Measured SPLs
Vashon Terminal, WA[1]	30-in (0.8 m) steel pipe pile	6 m	165 dB re 1 μPa (rms) at 11 m.
Keystone Terminal, WA[2]	30-in steel pipe pile	8 m	165 dB re 1 μPa (rms) at 10 m.
California[3]	36-in steel pipe pile	5 m	170 dB re 1 μPa (rms) at 10 m.
California[3]	36-in steel pipe pile	5 m	175 dB re 1 μPa (rms) at 10 m.
California[3]	72-in steel pipe pile	5 m	170 dB re 1 μPa (rms) at 10 m.
California[3]	72-in steel pipe pile	5 m	180 dB re 1 μPa (rms) at 10 m.
Test Pile Program, NBKB[4]	36-in steel pipe pile	Avg of mid- and deep-depth	169 dB re 1 μPa (rms) at 10 m.
Test Pile Program, NBKB[4]	48-in steel pipe pile	Avg of mid- and deep-depth	172 dB re 1 μPa (rms) at 10 m.

Sources: [1] Laughlin, 2010a; [2] Laughlin, 2010b; [3] Reyff, 2007; [4] Illingworth & Rodkin, Inc., 2012.

As described previously in this document, sound attenuation measures, including bubble curtains, can be employed during impact pile driving to reduce the high source pressures. For the wharf construction project, the Navy intends to employ sound reduction techniques during impact pile driving, including the use of sound attenuation systems (*e.g.,* bubble curtain). See ''Proposed Mitigation'', later in this document, for more details on the impact reduction and mitigation measures proposed. The calculations of the distances to the marine mammal sound thresholds were calculated for impact installation with the assumption of a 10 dB reduction in source levels from the use of sound attenuation devices, and the Navy used the mitigated distances for impact pile driving for all analysis in their application.

All calculated distances to and the total area encompassed by the marine mammal sound thresholds are provided in Table 5. The Navy used source values of 185 dB for impact driving (the mean SPL of the values presented in Table 3, less 10 dB of sound attenuation from use of a bubble curtain or similar device) and 180 dB for vibratory driving (the worst-case value from Table 4). Under likely construction scenarios, up to three vibratory drivers would operate simultaneously with one impact driver. Although radial distance and area associated with the zone ensonified to 160 dB (the behavioral harassment threshold for pulsed sounds, such as those produced by impact driving) are presented in Table 5, this zone would be subsumed by the 120 dB zone produced by vibratory driving. Thus, behavioral harassment of marine mammals associated with impact driving is not considered further here. Since the 160 dB threshold and the 120 dB threshold both indicate behavioral harassment, pile driving effects in the two zones are equivalent. Although such a day is not planned, if only the impact driver was operated on a given day, incidental take on that day would likely be lower because the area ensonified to levels producing Level B harassment would be smaller (although actual take would be determined by the numbers of marine mammals in the area on that day). The use of multiple vibratory rigs at the same time would result in a small additive effect with regard to produced SPLs; however, because the sound field produced by vibratory driving would be truncated by land in the Hood Canal, no increase in actual sound field produced would occur. There would be no overlap in the 190/180-dB sound fields produced by rigs operating simultaneously.

TABLE 5—CALCULATED DISTANCE(S) TO AND AREA ENCOMPASSED BY UNDERWATER MARINE MAMMAL SOUND THRESHOLDS DURING PILE INSTALLATION

Threshold	Distance	Area, km^2
Impact driving, pinniped injury (190 dB)	4.9 m	0.0001
Impact driving, cetacean injury (180 dB)	22 m	0.002
Impact driving, disturbance (160 dB)[2]	724 m	1.65
Vibratory driving, pinniped injury (190 dB)	2.1 m	< 0.0001
Vibratory driving, cetacean injury (180 dB)	10 m	0.0003
Vibratory driving, disturbance (120 dB)	13,800 m[3]	41.4

[1] SPLs used for calculations were: 185 dB for impact and 180 dB for vibratory driving.
[2] Area of 160-dB zone presented for reference. Estimated incidental take calculated on basis of larger 120-dB zone.
[3] Hood Canal average width at site is 2.4 km (1.5 mi), and is fetch limited from N to S at 20.3 km (12.6 mi). Calculated range (over 222 km) is greater than actual sound propagation through Hood Canal due to intervening land masses. 13.8 km (8.6 mi) is the greatest line-of-sight distance from pile driving locations unimpeded by land masses, which would block further propagation of sound.

Hood Canal does not represent open water, or free field, conditions. Therefore, sounds would attenuate as they encounter land masses or bends in the canal. As a result, the calculated distance and areas of impact for the 120 dB threshold cannot actually be attained at the project area. See Figure 6–1 of the Navy's application for a depiction of the size 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 a result, the Navy analyzed the potential for pinnipeds hauled out or swimming at the surface near NBKB to be exposed to airborne SPLs that could result in Level B behavioral harassment. NMFS assumes for purposes of the MMPA that behavioral disturbance can occur upon exposure to sounds above 100 dB re 20 µPa rms (unweighted) for all pinnipeds, except harbor seals. For harbor seals, the threshold is 90 dB re 20 µPa rms (unweighted).

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. In order to determine reasonable airborne SPLs and their associated effects on marine mammals that are likely to result from pile driving at NBKB, studies with similar properties to the proposed action, as described previously, were evaluated. Table 6 details representative pile driving activities that have occurred in recent years. Due to the similarity of these actions and the Navy's proposed action, they represent reasonable SPLs which could be anticipated. During the TPP, vibratory driving was measured at 102 dB re 20 µPa rms at 15 m and impact driving at 109 dB re 20 µPa rms at 15 m. The values shown in Table 6 were retained for impact assessment because the value for impact driving, as used in the combined rig scenario, results in a more conservative ZOI than does the TPP measurement.

TABLE 6—AIRBORNE SPLS FROM SIMILAR CONSTRUCTION ACTIVITIES

Project & location	Pile size & type	Method	Water depth	Measured SPLs
Northstar Island, AK [1]	42-in (1.1 m) steel pipe pile.	Impact	Approximately 12 m (40 ft).	97 dB re 20 µPa (rms) at 160 m (525 ft).
Keystone Ferry Terminal, WA [3].	30-in (0.8 m) steel pipe pile.	Vibratory	Approximately 9 m (30 ft).	97 dB re 20 µPa (rms) at 13 m (40 ft).

Sources: Blackwell *et al.,* 2004; Laughlin, 2010b.

Based on these values and the assumption of spherical spreading loss, distances to relevant thresholds and associated areas of ensonification under the multi-rig scenario (*i.e.,* combined impact and vibratory driving) are presented in Table 7. There are no haul-out locations within these zones, which are encompassed by the zones estimated for underwater sound. Protective measures would be in place out to the distances calculated for the underwater thresholds, and the distances for the airborne thresholds would be covered fully by mitigation and monitoring measures in place for underwater sound thresholds. Construction sound associated with the project would not extend beyond the buffer zone for underwater sound that would be established to protect pinnipeds. No haul-outs or rookeries are located within the airborne harassment radii. See Figure 6–2 of the Navy's application for a depiction of the size of areas in which each airborne sound threshold is predicted to occur at the project area due to pile driving. We recognize that pinnipeds in water that are within the area of ensonification for airborne sound could be incidentally taken by either underwater or airborne sound or both. We consider these incidences of harassment to be accounted for in the take estimates for underwater sound.

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

Group	Threshold, re 20 µPa rms (unweighted)	Distance to threshold (m) and associated area of ensonification (km^2); combined rig scenario (worst-case)
Harbor seals	90 dB	361, 0.07
California sea lions	100 dB	114, 0.005

Description of Marine Mammals in the Area of the Specified Activity

There are seven marine mammal species, four cetaceans and three pinnipeds, which may inhabit or transit through the waters nearby NBKB in the Hood Canal. These include the transient killer whale, harbor porpoise, Dall's porpoise, Steller sea lion, California sea lion, harbor seal, and humpback whale (*Megaptera novaeangliae*). The Steller sea lion and humpback whale are the only marine mammals that may occur within the Hood Canal that are listed under the Endangered Species Act (ESA); the humpback whale is listed as endangered and the eastern distinct population segment (DPS) of Steller sea lion is listed as threatened. The humpback whale is not typically present in Hood Canal, with no confirmed sightings found in the literature or the Orca Network database (*http://www.orcanetwork.org/*) prior to January and February 2012, when one individual was observed repeatedly over a period of several weeks. No sightings have been recorded since that time and we consider the humpback whale to be a rare visitor to Hood Canal at most. While the southern resident killer whale is resident to the inland waters of Washington and British Columbia, it has not been observed in the Hood Canal in over 18 years. These two species have therefore been excluded from further analysis.

This section summarizes the population status and abundance of these species. 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. Table 9 lists the marine mammal species with expected potential for occurrence in the vicinity of NBKB during the project timeframe. The following information is summarized largely from NMFS Stock Assessment Reports.

TABLE 8—MARINE MAMMALS PRESENT IN THE HOOD CANAL IN THE VICINITY OF NBKB

Species	Stock abundance[1] (CV, N_{min})	Relative occurrence in Hood Canal	Season of occurrence
Steller sea lion Eastern U.S. DPS	58,334–72,223[2]	Seasonal; Occasional	Fall to late spring (Oct to May).
California sea lion U.S. Stock	296,750 (n/a, 153,337)	Seasonal; Common	Fall to late spring (Aug to early June).
Harbor seal WA inland waters stock.	14,612[2] (0.15, 12,844)	Common	Year-round; resident species in Hood Canal.
Killer whale West Coast transient stock.	354 (n/a)	Rare	Year-round (but last observed in 2005).
Dall's porpoise CA/OR/WA stock	42,000 (0.33, 32,106)	Rare	Year-round (but last observed in 2008)
Harbor porpoise WA inland waters stock.	10,682 (0.38, 7,841)	Possible regular to occasional presence.	Year-round.

[1] NMFS marine mammal stock assessment reports at: *http://www.nmfs.noaa.gov/pr/sars/species.htm.* CV is coefficient of variation; N_{min} is the minimum estimate of stock abundance.
This abundance estimate is greater than eight years old and is therefore not considered current.

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. Based on distribution, population response, 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 (DPSs) 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.

Steller sea lions were listed as threatened range-wide under the ESA in 1990. After division into two stocks, the western stock was listed as endangered in 1997, while the eastern stock remained classified as threatened. NMFS proposed on April 18, 2012, that the eastern stock is recovered and should be delisted. Pending a final decision on that proposal, the stock remains designated as depleted under the MMPA by default due to its threatened status under the ESA. However, the minimum estimated annual level of human-caused mortality (59.1) is significantly less than the calculated potential biological removal (PBR) of 2,378 animals. The stock has shown a consistent, long-term rate of increase, which may indicate that it is reaching optimum sustainable population (OSP) size (Allen and Angliss, 2013).

The most recent population estimate for the eastern stock is estimated to be within the range 58,334 to 72,223 (Allen and Angliss, 2013). Calkins and Pitcher (1982) and Pitcher *et al.,* (2007) concluded that the total Steller sea lion population could be estimated by multiplying pup counts by a factor based on the birth rate, sex and age structure, and growth rate of the population. This range is determined by multiplying the most recent pup counts available by region, from 2006 (British Columbia) and 2009 (U.S.), by pup multipliers of either 4.2 or 5.2 (Pitcher *et al.,* 2007). The pup multipliers varied depending on the vital rate parameter that resulted in the growth rate: As low as 4.2 if it were due to high fecundity, and as high as 5.2 if it were due to low juvenile mortality. These are not minimum population estimates, since they are extrapolated from pup counts from photographs taken in 2006–2009, and demographic parameters are estimated for an increasing population. The minimum population, which is estimated at 52,847 individuals, was calculated by adding the most recent non-pup and pup counts from all sites surveyed; this estimate is not corrected for animals at sea. The most recent minimum count for Steller sea lions in Washington was 516 in 2001 (Pitcher *et al.,* 2007).

The abundance of the Eastern DPS of Steller sea lions is increasing throughout the northern portion of its range (Southeast Alaska and British Columbia; Merrick *et al.,* 1992; Sease *et al.,* 2001; Olesiuk and Trites, 2003; Olesiuk, 2008; NMFS, 2008), and stable or increasing slowly in the central portion (Oregon through central California; NMFS, 2008). In the southern end of its range (Channel Islands in southern California; LeBoeuf *et al.,* 1991), it has declined significantly since the late 1930s, and several rookeries and haul-outs have been abandoned. Changes in ocean conditions (*e.g.,* warmer temperatures) may be contributing to habitat changes that favor California sea lions over Steller sea lions in the southern portion of the Steller's range (NMFS, 2008). Between the 1970s and 2002, the average annual population growth rate of eastern Steller sea lions was 3.1 percent (Pitcher *et al.,* 2007). Pitcher *et al.* (2007) concluded this rate did not represent a maximum rate of increase, though, and the maximum theoretical net productivity rate for pinnipeds (12 percent) is considered appropriate (Allen and Angliss, 2013).

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 a total from all fisheries of 17 eastern Steller sea lions (Allen and Angliss, 2013). In addition, opportunistic observations and stranding data indicate that an additional 28.8 animals are killed or seriously injured each year through interaction with commercial and recreational troll fisheries and by entanglement. For the most recent years from which data are available (2004–08), 11.9 animals were taken per year by subsistence harvest in Alaska. Sea lion deaths are also known to occur because of illegal shooting, vessel strikes, or capture in research gear and other traps, totaling 1.4 animals per year from 2006–

10. 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, 2013) 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 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; COSEWIC, 2003; Olesiuk, 2008). Numbers vary seasonally in Washington waters with peak numbers present during the fall and winter months (Jeffries *et al.,* 2000). At NBKB, Steller sea lions have been observed hauled out on submarines at Delta Pier on several occasions during fall through spring months, beginning in 2008, with up to six individuals observed.

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 (Carretta *et al.,* 2011). 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.,* 2011). 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.

Washington inland waters harbor seals are not protected under the ESA or listed as depleted under the MMPA. Because there is no current abundance estimate for this stock, there is no current estimate of potential biological removal (PBR). However, because annual human-caused mortality (13) is significantly less than the previously calculated PBR (771) the stock is not considered strategic under the MMPA. The stock is considered to be within its optimum sustainable population (OSP) level.

The best abundance estimate of the Washington inland waters stock of harbor seals is 14,612 (CV = 0.15) and the minimum population size of this stock is 12,884 individuals (Carretta *et al.,* 2011). Aerial surveys of harbor seals in Washington were 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 correction factor of 1.53 (CV = 0.065) 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. Because the estimate is greater than eight years old, NMFS does not consider it current. However, it does represent the best available information regarding stock abundance. Harbor seal counts in Washington State increased at an annual rate of ten percent from 1991–96 (Jeffries *et al.,* 1997). However, a logistic model fit to abundance data from 1978–99 resulted in an estimated maximum net productivity rate of 12.6 percent (95% CI = 9.4–18.7%) and the population is thought to be stable (Jeffries *et al.,* 2003).

Historical levels of harbor seal abundance in Washington are unknown. The population was apparently greatly reduced during the 1940s and 1950s due to a state-financed bounty program and remained low during the 1970s before rebounding to current levels (Carretta *et al.,* 2011). Data from 2004–08 indicate that a minimum of 3.8 harbor seals are killed annually in Washington inland waters commercial fisheries (Carretta *et al.,* 2011). 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 9.2 harbor seals per year are estimated to be killed as a result of various non-fisheries human interactions (Carretta *et al.,* 2011). Tribal subsistence takes of this stock may occur, but no data on recent takes are available.

Harbor seals are the most abundant marine mammal in Hood Canal, where they can occur anywhere year-round, and are the only pinniped that breeds in inland Washington waters and the only species of marine mammal that is considered resident in the Hood Canal (Jeffries *et al.,* 2003). They are year-round, non-migratory residents, pup (*i.e.,* give birth) in Hood Canal, and the population is considered closed, meaning that they do not have much movement outside of Hood Canal (London, 2006). Surveys in the Hood Canal from the mid-1970s to 2000 show a fairly stable population between 600–1,200 seals, and the abundance of harbor seals in Hood Canal has likely stabilized at its carrying capacity of approximately 1,000 seals (Jeffries *et al.,* 2003).

Harbor seals were consistently sighted during Navy surveys and were found in all marine habitats including nearshore waters and deeper water, and have been observed hauled out on manmade objects such as buoys. Harbor seals were commonly observed in the water during monitoring conducted for other projects at NBKB in 2011. During most of the year, all age and sex classes (except newborn pups) could occur in the project area throughout the period of construction activity. Since there are no known pupping sites in the vicinity of the project area, harbor seal neonates would not generally be expected to be present during pile driving. Otherwise, during most of the year, all age and sex classes could occur in the project area throughout the period of construction activity. 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. The main haul-out locations for harbor seals in Hood Canal are located on river delta and tidal exposed areas, with the closest haul-out to the project area being approximately ten miles (16 km) southwest of NBKB at Dosewallips River mouth, outside the potential area of effect for this project (London, 2006; see Figure 4–1 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, (3) Southern Gulf of California, (4) Central Gulf of California and (5) 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.,* 2011). 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).

California sea lions are not protected under the ESA or listed as depleted under the MMPA. Total annual human-caused mortality (at least 431) is substantially less than the potential biological removal (PBR, estimated at 9,200 per year); therefore, California sea lions are not considered a strategic stock under the MMPA. 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.,* 2011).

The best abundance estimate of the U.S. stock of California sea lions is 296,750 and the minimum population size of this stock is 153,337 individuals (Carretta *et al.,* 2011). The entire population cannot be counted because all age and sex classes are never ashore at the same time; therefore, the best abundance estimate is determined from the number of births and the proportion of pups in the population, with censuses conducted in July after all pups have been born. Specifically, the pup count for rookeries in southern California from 2008 was adjusted for pre-census mortality and then multiplied by the inverse of the fraction of newborn pups in the population (Carretta *et al.,* 2011). The minimum population size was determined from counts of all age and sex classes that were ashore at all the major rookeries and haul-out sites in southern and central California during the 2007 breeding season, including all California sea lions counted during the July 2007 census at the Channel Islands in southern California and at haul-out sites located between Point Conception and Point Reyes, California (Carretta *et al.,* 2011). An additional unknown number of California sea lions are at sea or hauled out at locations that were not censused and are not accounted for in the minimum population size.

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 Niño years when pup production declined dramatically before quickly rebounding (Carretta *et al.,* 2011). The maximum population growth rate was 9.2 percent when pup counts from the El Niño years were removed. However, the apparent growth rate from the population trajectory underestimates the intrinsic growth rate because it does not consider human-caused mortality occurring during the time series; the default maximum net productivity rate for pinnipeds (12 percent per year) is considered appropriate for California sea lions (Carretta *et al.,* 2011).

Historic exploitation of California sea lions include harvest for food by Native Americans in pre-historic times and for oil and hides in the mid-1800s, as well as exploitation for a variety of reasons more recently (Carretta *et al.,* 2011). There are few historical records to document the effects of such exploitation on sea lion abundance (Lowry *et al.,* 1992). 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 (17 per year, 2008–10) or incidentally captured during scientific research (3 per year, 2005–09) (Carretta *et al.,* 2011). Sea lion mortality has also been linked to the algal-produced neurotoxin domoic acid (Scholin *et al.,* 2000). There is currently an Unusual Mortality Event (UME) declaration in effect for California sea lions. Future mortality may be expected to occur, due to the sporadic occurrence of such harmful algal blooms. 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. The causes of this UME are under investigation (*http://www.nmfs.noaa.gov/pr/health/mmume/californiasealions2013.htm;* accessed April 10, 2013).

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 are present in Hood Canal during much of the year with the exception of mid-June through August, and occur regularly at NBKB, as observed during Navy waterfront surveys conducted from April 2008 through June 2010 (Navy, 2010). 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 the Hood Canal (Jeffries *et al.,* 2000), they are frequently observed hauled out at several opportune areas at NBKB (*e.g.,* submarines, floating security fence, barges). As many as 81 California sea lions have been observed hauled out on a single day at NBKB (Agness and Tannenbaum, 2009a; Tannenbaum *et al.,* 2009a; Navy, 2011). All documented instances of California sea lions hauling out at NBKB have been on submarines docked at Delta Pier, approximately 0.85 mi north of Service Pier, and on pontoons of the security fence. California sea lions have also been observed swimming near the Explosives Handling Wharf on several occasions, approximately 1.85 mi north of Service Pier (Tannenbaum *et al.* 2009; Navy 2010), and likely forage in both nearshore and inland marine deeper water habitats in the vicinity.

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; Allen and Angliss, 2011). 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, 2011).

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. West Coast Transient killer whales, which occur from California through southeastern Alaska, are the only type expected to potentially occur in the project area.

West Coast Transient killer whales are not protected under the ESA or listed as depleted under the MMPA. The estimated annual level of human-caused mortality (0) does not exceed the calculated PBR (3.5); therefore, West Coast Transient killer whales are not considered a strategic stock under the MMPA. 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, as is the actual maximum productivity rate. 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. The default maximum net growth rate for cetaceans (4 percent) is considered appropriate pending additional information (Carretta *et al.,* 2011).

The West Coast transient stock is a trans-boundary stock, with minimum counts for the population of transient killer whales coming from various photographic datasets. Combining these counts of cataloged transient whales gives an abundance estimate of 354 individuals for the West Coast transient stock (Allen and Angliss, 2011). Although this direct count of individually identifiable animals does not necessarily represent the number of live animals, it is considered a conservative minimum estimate (Allen and Angliss, 2011). However, the number in Washington waters at any one time is probably fewer than twenty individuals (Wiles, 2004). The West Coast transient killer whale stock is not designated as depleted under the MMPA or listed under the ESA. The estimated annual level of human-caused mortality and serious injury does not exceed the PBR. Therefore, the West Coast Transient stock of killer whales is not classified as a strategic stock.

The estimated minimum mortality rate incidental to U.S. commercial fisheries is zero animals per year (Allen and Angliss, 2011). 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, 2011). Other mortality, as a result of shootings or ship strikes, has been of concern in the past. However, 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). In 2003 and 2005, small groups of transient killer whales (eleven and six individuals, respectively) were present in Hood Canal for significant periods of time (59 and 172 days, respectively) between the months of January and July. While present, the whales preyed on harbor seals in the subtidal zone of the nearshore marine and inland marine deeper water habitats (London, 2006).

Dall's Porpoise

Dall's porpoises are endemic to temperate waters of the North Pacific, typically in deeper waters between 30–62° N, and are found from northern Baja California to the northern Bering Sea. Stock structure for Dall's porpoises is not well known; because there are no cooperative management agreements with Mexico or Canada for fisheries which may take this species, Dall's porpoises are divided for management purposes into two discrete, noncontiguous areas: (1) waters off California, Oregon, and Washington, and (2) Alaskan waters (Carretta *et al.,* 2011). Only individuals from the CA/OR/WA stock may occur within the project area.

Dall's porpoises are not protected under the ESA or listed as depleted under the MMPA. The minimum estimate of annual human-caused mortality (0.4) is substantially less than the calculated PBR (257); therefore, Dall's porpoises are not considered a strategic stock under the MMPA. The status of Dall's porpoises in California, Oregon and Washington relative to OSP is not known (Carretta *et al.,* 2011).

Dall's porpoise distribution on the U.S. west coast is highly variable between years and appears to be affected by oceanographic conditions (Forney and Barlow, 1998); animals may spend more or less time outside of U.S. waters as oceanographic conditions change. Therefore, a multi-year average of 2005 and 2008 summer/autumn vessel-based line transect surveys of California, Oregon, and Washington waters was used to estimate a best abundance of 42,000 (CV = 0.33) animals (Forney, 2007; Barlow, 2010). The minimum population is considered to be 32,106 animals. Dall's porpoises also occur in the inland waters of Washington, but the most recent estimate was obtained in 1996 (900 animals; CV = 0.40; Calambokidis *et al.,* 1997) and is not included in the overall estimate of abundance for this stock. Because distribution and abundance of this stock is so variable, population trends are not available (Carretta *et al.,* 2011). No information is available regarding productivity rates, and the default maximum net growth rate for cetaceans (4 percent) is considered appropriate (Carretta *et al.,* 2011).

Data from 2002–08, from all fisheries for which mortality data are available, indicate that a minimum of 0.4 animals are killed per year (Carretta *et al.,* 2011). Species-specific information is not available for Mexican fisheries, which could be an additional source of mortality for animals beyond the stock boundaries delineated for management purposes. No other sources of human-caused mortality are known.

In Washington, Dall's porpoises are most abundant in offshore waters where they are year-round residents, although interannual distribution is highly variable (Green *et al.,* 1992). Dall's porpoises are observed throughout the year in the Puget Sound north of Seattle, are seen occasionally in southern Puget Sound, and may also occasionally occur in Hood Canal. However, only a single Dall's porpoise has been observed at NBKB, in deeper water during a 2008 summer survey (Tannenbaum *et al.,* 2009a).

Harbor Porpoise

Harbor porpoises are found primarily in inshore and relatively shallow coastal waters (< 100 m) from Point Barrow to Point Conception. Various genetic analyses and investigation of pollutant loads indicate a low mixing rate for harbor porpoise along the west coast of North America and likely fine-scale geographic structure along an almost continuous distribution from California to Alaska (*e.g.,* Calambokidis and Barlow, 1991; Osmek *et al.,* 1994; Chivers *et al.,* 2002, 2007). However, stock boundaries are difficult to draw because any rigid line is generally arbitrary from a biological perspective. On the basis of genetic data and density discontinuities identified from aerial surveys, eight stocks have been identified in the eastern North Pacific, including northern Oregon/Washington coastal and inland Washington stocks (Carretta *et al.,* 2011). The Washington inland waters stock includes individuals found east of Cape Flattery and is the only stock that may occur in the project area.

Harbor porpoises of Washington inland waters are not protected under the ESA or listed as depleted under the MMPA. Because there is no current abundance estimate for this stock, there is no current estimate of PBR. However, because annual human-caused mortality (2.6) is less than the previously calculated PBR (63) the stock is not considered strategic under the MMPA. The status of harbor porpoises in Washington inland waters relative to OSP is not known (Carretta *et al.,* 2011).

The best estimate of abundance for this stock is derived from aerial surveys of the inland waters of Washington and southern British Columbia conducted during August of 2002 and 2003. When corrected for availability and perception bias, the average of the 2002–03 estimates of abundance for U.S. waters resulted in an estimated abundance for the Washington Inland Waters stock of harbor porpoise of 10,682 (CV = 0.38) animals (Laake *et al.,* 1997; Carretta *et al.,* 2011), with a minimum population estimate of 7,841 animals. Because the estimate is greater than eight years old, NMFS does not consider it current. However, it does represent the best available information regarding stock abundance.

Although long-term harbor porpoise sightings in southern Puget Sound declined from the 1940s through the 1990s, sightings and strandings have increased in Puget Sound and northern Hood Canal in recent years and harbor porpoise are now considered to regularly occur year-round in these waters (Carretta *et al.,* 2011). Reasons for the apparent decline, as well as the apparent rebound, are unknown. Recent observations may represent a return to historical conditions, when harbor porpoises were considered one of the most common cetaceans in Puget Sound (Scheffer and Slipp, 1948). No information regarding productivity is available for this stock and NMFS considers the default maximum net productivity rate for cetaceans (4 percent) to be appropriate.

Data from 2005–09 indicate that a minimum of 2.2 Washington inland waters harbor seals are killed annually in U.S. commercial fisheries (Carretta *et al.,* 2011). Animals captured in waters east of Cape Flattery are assumed to belong to this stock. This estimate is considered a minimum because the Washington Puget Sound Region salmon set/drift gillnet fishery has not been observed since 1994, and because of a lack of knowledge about the extent to which harbor porpoise from U.S. waters frequent the waters of British Columbia and are, therefore, subject to fishery-related mortality. However, harbor porpoise takes in the salmon drift gillnet fishery are unlikely to have increased since the fishery was last observed, when few interactions were recorded, due to reductions in the number of participating vessels and available fishing time. Fishing effort and catch have declined throughout all salmon fisheries in the region due to management efforts to recover ESA-listed salmonids (Carretta *et al.,* 2011). In addition, an estimated 0.4 animals per year are killed by non-fishery human causes (*e.g.,* ship strike, entanglement). In 2006, a UME was declared for harbor porpoises throughout Oregon and Washington, and a total of 114 strandings were reported in 2006–07. The cause of the UME has not been determined and several factors, including contaminants, genetics, and environmental conditions, are still being investigated (Carretta *et al.,* 2011).

Prior to recent construction projects conducted by the Navy at NBKB, harbor porpoises were considered to have only occasional occurrence in the project area. A single harbor porpoise had been sighted in deeper water at NBKB during 2010 field observations (Tannenbaum *et al.,* 2011). However, while implementing monitoring plans for work conducted from July-October, 2011, the Navy recorded multiple sightings of harbor porpoise in the deeper waters of the project area (HDR, Inc., 2012). Following these sightings, the Navy conducted dedicated line transect surveys, recording multiple additional sightings of harbor porpoise, and have revised local density estimates accordingly.

Potential Effects of the Specified Activity on Marine Mammals

We have determined that pile driving, as outlined in the project description, has the potential to result in behavioral harassment of marine mammals present in the project area. Pinnipeds spend much of their time in the water with heads held above the surface and therefore are not subject to underwater noise to the same degree as cetaceans (although they are correspondingly more susceptible to exposure to airborne sound). For purposes of this assessment, however, pinnipeds are conservatively assumed to be available to be exposed to underwater sound 100 percent of the time that they are in the water.

Marine Mammal Hearing

The primary effect on marine mammals anticipated from the specified activities would result from exposure of animals to underwater sound. Exposure to sound can affect marine mammal hearing. When considering the influence of various kinds of sound on the marine environment, it is necessary to understand that different kinds of marine life are sensitive to different frequencies of sound. Based on available behavioral data, audiograms derived using auditory evoked potential techniques, anatomical modeling, and other data, Southall *et al.* (2007) designate functional hearing groups for marine mammals and estimate the lower and upper frequencies of functional hearing of the groups. The functional groups and the associated frequencies are indicated below (though animals are less sensitive to sounds at the outer edge of their functional range and most sensitive to sounds of frequencies within a smaller range somewhere in the middle of their functional hearing range):

- Low frequency cetaceans (thirteen species of mysticetes): functional hearing is estimated to occur between approximately 7 Hz and 22 kHz;
- Mid-frequency cetaceans (32 species of dolphins, six species of larger

toothed whales, and nineteen species of beaked and bottlenose whales): functional hearing is estimated to occur between approximately 150 Hz and 160 kHz;

- High frequency cetaceans (six species of true porpoises, four species of river dolphins, two members of the genus *Kogia,* and four dolphin species of the genus *Cephalorhynchus*): 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 and 75 kHz, with the greatest sensitivity between approximately 700 Hz and 20 kHz.

Three pinniped and three cetacean species could potentially occur in the proposed project area during the project timeframe. Of the cetacean species that may occur in the project area, the killer whale is classified as a mid-frequency cetacean and the two porpoises are classified as high-frequency cetaceans (Southall *et al.,* 2007).

Underwater Sound Effects

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, ranging from effects such as behavioral disturbance, tactile perception, physical discomfort, slight injury of the internal organs and the auditory system, to 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, in the unlikely event that it occurred, would constitute injury, but TTS is not considered injury (Southall *et al.,* 2007). It is unlikely that the project would result in any cases of temporary or especially permanent hearing impairment or any significant non-auditory physical or physiological effects for reasons discussed later in this document. Some behavioral disturbance is expected, but it is likely that this would be localized and short-term because of the short project duration.

Several aspects of the planned monitoring and mitigation measures for this project (see the ''Proposed Mitigation'' and ''Proposed Monitoring and Reporting'' sections later in this document) are designed to detect marine mammals occurring near the pile driving to avoid exposing them to sound pulses that might, in theory, cause hearing impairment. In addition, many cetaceans are likely to show some avoidance of the area where received levels of pile driving sound are high enough that hearing impairment could potentially occur. In those cases, the avoidance responses of the animals themselves would reduce or (most likely) avoid any possibility of hearing impairment. Non-auditory physical effects may also occur in marine mammals exposed to strong underwater pulsed sound. It is especially unlikely that any effects of these types would occur during the present project given the brief duration of exposure for any given individual and the planned monitoring and mitigation measures. 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 pk-pk) in order to produce brief, mild TTS. Exposure to several strong pulses that each have received levels near 190 dB re 1 μPa 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. Levels greater than or equal to 190 dB re 1 μPa rms are expected to be restricted to radii no more than 5 m (16 ft) from the pile driving. For an odontocete closer to the surface, the maximum radius with greater than or equal to 190 dB re 1 µPa rms would be smaller.

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). To avoid the potential for injury, NMFS has determined that cetaceans should not be exposed to pulsed underwater sound at received levels exceeding 180 dB re 1 µPa rms. 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 pile driving activity might incur TTS, there has been further speculation about the possibility that some individuals occurring very close to pile driving 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 re 1 µPa at 1 m (3.3 ft). 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 re 1 µPa, 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.,* 2003/2004; 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.,* 2003/04). 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.,* 2003/04).

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.,* 2003/04; 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). Since pile driving would likely only occur for a few hours a day, over a short period of time, it is unlikely to result in permanent displacement. Any potential impacts from pile driving activities could be experienced by individual marine mammals, but would not be likely to cause population level impacts, or affect the long-term fitness of the species.

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 be causing 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 population, community, or even ecosystem 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. However, the sum of sound from the proposed activities is confined in an area of inland waters (Hood Canal) that is bounded by landmass; therefore, the sound generated is not expected to contribute to increased ocean ambient sound.

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.

Airborne Sound Effects

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 hauled-out pinnipeds 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. There are no rookeries or major haul-out sites within 10 km, foraging hotspots, or other ocean bottom structure of significant biological importance to marine mammals that may be 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 wharf construction project.

Pile Driving Effects on Potential Prey (Fish)

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, 2009) identified several studies that suggest fish may relocate to avoid certain areas of sound energy. Additional studies have documented effects of pile driving (or other types of continuous sounds) 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 re 1 μPa 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 wharf construction project. However, adverse impacts may occur to a few species of rockfish (bocaccio [*Sebastes paucispinis*], yelloweye [*S. ruberrimus*] and canary [*S. pinniger*] rockfish) and salmon (chinook [*Oncorhynchus tshawytscha*] and summer run chum) 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. Impacts to these species could result from potential impacts to their eggs and larvae.

Pile Driving Effects on Potential Foraging Habitat

The area likely impacted by the project is relatively small compared to the available habitat in the Hood Canal. 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 Hood Canal and nearby vicinity.

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. Therefore, pile driving is not likely to have a permanent, adverse effect on marine mammal foraging habitat at the project area.

Proposed Mitigation

In order to issue an incidental take authorization (ITA) under Section 101(a)(5)(D) of the MMPA, we must, where applicable, 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 (where relevant).

Measurements from similar pile driving events were coupled with practical spreading loss to estimate zones of influence (ZOIs; 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. While the ZOIs vary between the different diameter piles and types of installation methods, the Navy is proposing to establish mitigation zones for the maximum ZOI for all pile driving conducted in support of the wharf construction project. In addition to the measures described later in this section, the Navy would employ the following standard mitigation measures:

(a) Conduct briefings between construction supervisors and crews, marine mammal monitoring team, acoustical monitoring team, and Navy staff prior to the start of all pile driving activity, and when new personnel join the work, in order to explain responsibilities, communication procedures, marine mammal monitoring protocol, and operational procedures.

(b) Comply with applicable equipment sound standards and ensure that all construction equipment has sound control devices no less effective than those provided on the original equipment.

(c) For in-water heavy machinery work other than pile driving (using, *e.g.,* standard barges, tug boats, barge-mounted excavators, or clamshell equipment used to place or remove material), if a marine mammal comes within 10 m, operations shall cease and vessels shall reduce speed to the minimum level required to maintain steerage and safe working conditions. This type of work could include the following activities: (1) Movement of the barge to the pile location; (2) positioning of the pile on the substrate via a crane (*i.e.,* stabbing the pile); (3) removal of the pile from the water column/substrate via a crane (*i.e.,* deadpull); or (4) the placement of sound attenuation devices around the piles. For these activities, monitoring would take place from 15 minutes prior to initiation until the action is complete.

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 and removal activities, the Navy will establish a shutdown zone intended to contain the area in which SPLs equal or exceed the 180/190 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, serious injury, or death of marine mammals. Modeled distances for shutdown zones are shown in Table 5. However, during impact pile driving, the Navy would implement a minimum shutdown zone of 85 m radius for cetaceans and 20 m for pinnipeds around all pile driving activity. The modeled injury threshold distances are approximately 22 and 5 m, respectively, but the distances are increased based on in-situ recorded sound pressure levels during the TPP. During vibratory driving, the shutdown zone would be 10 m distance from the source for all animals. These precautionary measures are intended to act conservatively in the implementation of the measure and further reduce any possibility of acoustic injury. In addition, a minimum shutdown zone of 10 m would be in place for other construction activities in order to prevent the possibility of physical interaction. These activities may include (1) The movement of the barge to the pile location, (2) the positioning of the pile on the substrate via a crane (*i.e.,* ''stabbing'' the pile), (3) the removal of the pile from the water column/substrate via a crane (*i.e.* ''deadpull''), or (4) the placement of sound attenuation devices around the piles.

Disturbance Zone—Disturbance zones are the areas in which SPLs equal or exceed 160 and 120 dB rms (for pulsed and non-pulsed 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. Given the size of the disturbance zone for vibratory pile driving, it is impossible to guarantee that all animals would be observed or to make comprehensive observations of fine-scale behavioral reactions to sound, and only a portion of the zone (*e.g.,* what may be reasonably observed by visual observers stationed within the WRA) would be observed. However, these are reasonable measures that will enable the monitoring of take from vibratory pile driving. 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. If acoustic monitoring is being conducted for that pile, a received SPL may be estimated, or the received level may be estimated on the basis of past or subsequent acoustic monitoring. It may then be determined whether the animal was exposed to sound levels constituting incidental harassment in post-processing of observational and acoustic data, and a precise accounting of observed incidences of harassment created. Therefore, although the predicted distances to behavioral harassment thresholds are useful for estimating incidental harassment for purposes of authorizing levels of incidental take, actual take may be determined in part through the use of empirical data. That 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 incidences 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 15 minutes prior to initiation through 15 minutes post-completion of pile driving activities. Pile driving activities include the time to 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 30 minutes.

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, wildlife management, mammalogy, or related fields (bachelor's degree or higher is 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 15 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 15 minutes have passed without re-detection of the animal. Monitoring will be conducted

throughout the time required to drive a pile.

Sound Attenuation Devices

Bubble curtains shall be used during all impact pile driving. The device will distribute air bubbles around 100 percent of the piling perimeter for the full depth of the water column, and the lowest bubble ring shall be in contact with the mudline for the full circumference of the ring. Testing of the device by comparing attenuated and unattenuated strikes is not possible because of requirements in place to protect marbled murrelets (an ESA-listed bird species under the jurisdiction of the USFWS). However, in order to avoid loss of attenuation from design and implementation errors in the absence of such testing, a performance test of the device shall be conducted prior to initial use. The performance test shall confirm the calculated pressures and flow rates at each manifold ring. In addition, the contractor shall also train personnel in the proper balancing of air flow to the bubblers and shall submit an inspection/performance report to the Navy within 72 hours following the performance test.

Timing Restrictions

In Hood Canal, designated exist timing restrictions for pile driving activities to avoid in-water work when salmonids and other spawning forage fish are likely to be present. The in-water work window is July 16–February 15. The initial months (July to September) of the timing window overlap with times when Steller sea lions are not expected to be present within the project area. Until July 16, impact pile driving will only occur starting two hours after sunrise and ending two hours before sunset due to marbled murrelet nesting season. After July 16, in-water construction activities will occur 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 vibratory hammers for fifteen seconds at reduced energy followed by a 30-second waiting period. This procedure is repeated two additional times. However, implementation of soft start for vibratory pile driving during previous pile driving work at NBKB has led to equipment failure and serious human safety concerns. Project staff have reported that, during power down from the soft start, the energy from the hammer is transferred to the crane boom and block via the load fall cables and rigging resulting in unexpected damage to both the crane block and crane boom. This differs from what occurs when the hammer is powered down after a pile is driven to refusal in that the rigging and load fall cables are able to be slacked prior to powering down the hammer, and the vibrations are transferred into the substrate via the pile rather than into the equipment via the rigging. One dangerous incident of equipment failure has already occurred, with a portion of the equipment shearing from the crane and falling to the deck. Subsequently, the crane manufacturer has inspected the crane booms and discovered structural fatigue in the boom lacing and main structural components, which will ultimately result in a collapse of the crane boom. All cranes were new at the beginning of the job. In addition, the vibratory hammer manufacturer has attempted to install dampers to mitigate the problem, without success. As a result of this dangerous situation, the measure will not be required for this project. This information was provided to us after the Navy submitted their request for authorization and is not reflected in that document.

For impact driving, soft start will be required, and contractors will provide an initial set of three strikes from the impact hammer at 40 percent energy, followed by a 30-second waiting period, then two subsequent three strike sets.

We have carefully evaluated the applicant's proposed mitigation measures and considered a range of other measures in the context of ensuring that we prescribe the means of effecting 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, including consideration of personnel safety, and practicality of implementation.

Based on our evaluation of the applicant's proposed measures, as well as other measures considered, 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 ITA for an activity, section 101(a)(5)(D) of the MMPA states that we must, where applicable, 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 ITAs must include the suggested means of accomplishing the necessary monitoring and reporting that would 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.

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 Marine Mammal Monitoring Plan 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.

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 incidences 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 if possible, the correlation to SPLs;
- Distance from pile driving activities to marine mammals and distance from the marine mammals to the observation point;
- Locations of all marine mammal observations; and
- Other human activity in the area.

Reporting

A draft report would be submitted to NMFS within 90 calendar days of the completion of the in-water work window. 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 problems encountered in deploying sound attenuating devices, any adverse responses to construction activities by marine mammals and a complete description of all mitigation shutdowns and the results of those actions and a refined take estimate based on the number of marine mammals observed during the course of construction. A final report would be prepared and submitted within 30 days following resolution of comments on the draft report.

Estimated Take by Incidental Harassment

With respect to the activities described here, 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, 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, as noted earlier, 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 an underwater sound 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 (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 actually subject to disturbance that would correctly be considered a take under the MMPA. For example, during the past ten years, transient killer whales have been observed within the project area twice. On the basis of that information, an estimated amount of potential takes for killer whales is presented here. However, while a pod of killer whales could potentially visit again during the project timeframe, and thus be taken, it is more likely that they would not. Although incidental take of killer whales and Dall's porpoises was authorized for 2011–12 activities at NBKB on the basis of past observations of these species, no such takes were recorded and no individuals of these species were observed. Similarly, estimated actual take levels (observed takes extrapolated to the remainder of unobserved but ensonified area) were significantly less than authorized levels of take for the remaining species.

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 are year-round residents of Hood Canal and sea lions are known to haul-out on submarines and other man-made objects at the NBKB waterfront (although typically at a distance of a mile or greater from the project site). Therefore, behavioral disturbances that could result from anthropogenic sound associated with these activities are expected to affect relatively small numbers 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, harbor seals, transient killer whales, Dall's porpoises, and harbor porpoises in the Hood Canal that may result from pile driving during construction activities associated with the wharf construction project described previously in this document. The takes requested are expected to have no more than a minor effect on individual animals and no effect at the population level for these species. Any effects experienced by individual marine mammals are anticipated to be limited to short-term disturbance of normal behavior or temporary displacement of animals near the source of the sound.

Marine Mammal Densities

The Navy is in the process of developing, 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 will describe methodologies used to derive these densities, which are generally considered the best available information for Washington inland waters, except where specific local abundance information is available. Initial take estimates and impact assessment for the EHW–2 project relied on data available at the time the application was submitted, including survey efforts in the project area. For future projects at NBKB, it is likely that the NMSDD densities will be used in assessing project impacts. However, because the NMSDD report is not complete, and because use of the previous density or abundance information results in more conservative take estimates, the approach to take estimation used for the first year of EHW–2 construction is largely retained here. Please see Appendix B of the Navy's application for more information on the NMSDD information.

For all species, the most appropriate information available was used to estimate the number of potential incidences of take. For harbor seals, this involved published literature describing harbor seal research conducted in Washington and Oregon as well as more specific counts conducted in Hood Canal (Huber *et al.,* 2001; Jeffries *et al.,* 2003). Killer whales are known from two periods of occurrence (2003 and 2005) and are not known to preferentially use any specific portion of the Hood Canal. Therefore, density was calculated as the maximum number of individuals present at a given time during those occurrences (London, 2006), divided by the area of Hood Canal. The best information available for the remaining species in Hood Canal came from surveys conducted by the Navy at the NBKB waterfront or in the vicinity of the project area.

Beginning in April 2008, Navy personnel have recorded sightings of marine mammals occurring at known haul-outs along the NBKB waterfront, including docked submarines or other structures associated with NBKB docks and piers and the nearshore pontoons of the floating security fence. Sightings of marine mammals within the waters adjoining these locations were also recorded. Sightings were attempted whenever possible during a typical work week (*i.e.,* Monday through Friday), but inclement weather, holidays, or security constraints often precluded surveys. These sightings took place frequently, although without a formal survey protocol. During the surveys, staff visited each of the above-mentioned locations and recorded observations of marine mammals. Surveys were conducted using binoculars and the naked eye from shoreline locations or the piers/wharves themselves. Because these surveys consist of opportunistic sighting data from shore-based observers, largely of hauled-out animals, there is no associated survey area appropriate for use in calculating a density from the abundance data. Data were compiled for the period from April 2008 through December 2012 for analysis in this proposed IHA, and these data provide the basis for take estimation for Steller and California sea lions. Other information, including sightings data from other Navy survey efforts at NBKB, is available for these two species, but these data provide the most conservative (*i.e.,* highest) local abundance estimates (and thus the highest estimates of potential take).

In addition, vessel-based marine wildlife surveys were conducted according to established survey protocols during July through September 2008 and November through May 2009–10 (Tannenbaum *et al.,* 2009, 2011). Eighteen complete surveys of the nearshore area resulted in observations of four marine mammal species (harbor seal, California sea lion, harbor porpoise, and Dall's porpoise). These surveys operated along pre-determined transects parallel to the shoreline from the nearshore out to approximately 1,800 ft (549 m) from shoreline, at a spacing of 100 yd, and covered the entire NBKB waterfront (approximately 3.9 km^2 per survey) at a speed of 5 kn or less. Two observers recorded sightings of marine mammals both in the water and hauled out, including date, time, species, number of individuals, age (juvenile, adult), behavior (swimming, diving, hauled out, avoidance dive), and haul-out location. Positions of marine mammals were obtained by recording distance and bearing to the animal with a rangefinder and compass, noting the concurrent location of the boat with GPS, and, subsequently, analyzing these data to produce coordinates of the locations of all animals detected. These surveys resulted in the only observation of a Dall's porpoise near NBKB.

The Navy also conducted vessel-based line transect surveys in Hood Canal on non-construction days during the 2011 TPP in order to collect additional data for species present in Hood Canal. These surveys detected three marine mammal species (harbor seal, California sea lion, and harbor porpoise), and included surveys conducted in both the main body of Hood Canal, near the project area, and baseline surveys conducted for comparison in Dabob Bay, an area of Hood Canal that is not affected by sound from Navy actions at the NBKB waterfront. The surveys operated along pre-determined transects that followed a double saw-tooth pattern to achieve uniform coverage of the entire NBKB waterfront. The vessel traveled at a speed of approximately 5 kn when transiting along the transect lines. Two observers recorded sightings of marine mammals both in the water and hauled out, including the date, time, species, number of individuals, and behavior (swimming, diving, etc.). Positions of marine mammals were obtained by recording the distance and bearing to the animal(s), noting the concurrent location of the boat with GPS, and subsequently analyzing these data to produce coordinates of the locations of all animals detected. Sighting information for harbor porpoises was corrected for detectability ($g(0) = 0.54$; Barlow, 1988; Calambokidis *et al.,* 1993; Carretta *et al.,* 2001). Distance sampling methodologies were used to estimate densities of animals for the data. This information provides the best information for harbor porpoises.

The cetaceans, as well as the harbor seal, appear to range throughout Hood Canal; therefore, the analysis in this proposed IHA assumes that harbor seal, transient killer whale, harbor porpoise, and Dall's porpoise are uniformly distributed in the project area. However, it should be noted that there have been no observations of cetaceans within the floating security barriers at NBKB; these barriers thus appear to effectively prevent cetaceans from approaching the shutdown zones. Although the Navy will implement a precautionary shutdown zone for cetaceans, anecdotal evidence suggests that cetaceans are not at risk of Level A harassment at NBKB even from louder activities (*e.g.,* impact pile driving). The remaining species that occur in the project area, Steller sea lion and California sea lion, do not appear to utilize most of Hood Canal. The sea lions appear to be attracted to the man-made haul-out opportunities along the NBKB waterfront while dispersing for foraging opportunities elsewhere in Hood Canal. California sea lions were not reported during aerial surveys of Hood Canal (Jeffries *et al.,* 2000), and Steller sea lions have only been documented at the NBKB waterfront.

Description of Take Calculation

The take calculations presented here rely on the best data currently available for marine mammal populations in the Hood Canal. The formula was developed for calculating take due to pile driving activity and applied to each group-specific sound impact threshold. The formula is founded on the following assumptions:

- Mitigation measures (*e.g.,* bubble curtain) would be utilized, as discussed previously;
- 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 195 total days of activity;
- Exposure modeling assumes that one impact pile driver and three vibratory pile drivers are operating concurrently; and,
- Exposures to sound levels above the relevant thresholds equate to take, as defined by the MMPA.

The calculation for marine mammal takes is estimated by:

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

Where:

n = density estimate used for each species/season

ZOI = sound threshold ZOI impact 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 the estimated range of impact to the sound criteria. The distances specified in Table 5 were used to calculate ZOIs around each pile. All impact pile driving take calculations were based on the estimated threshold ranges assuming attenuation of 10 dB from use of a bubble curtain. The ZOI impact area took into consideration the possible affected area of the Hood Canal from the pile driving site furthest from shore with attenuation due to land shadowing from bends in the canal. Because of the close proximity of some of the piles to the shore, the narrowness of the canal at the project area, and the maximum fetch, the ZOIs for each threshold are not necessarily spherical and may be truncated.

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. Acoustic monitoring conducted as part of the TPP demonstrated that Level B harassment zones for vibratory pile driving are likely to be significantly smaller than the zones estimated through modeling based on measured source levels and practical spreading loss. Also of note is the fact that the effectiveness of mitigation measures in reducing takes is typically not quantified in the take estimation process. Here, we do explicitly account for an assumed level of efficacy for use of the bubble curtain, but not for the soft start associated with impact driving. In addition, equating exposure with response (*i.e.,* a behavioral response meeting the definition of take under the MMPA) is simplistic and conservative assumption. For these reasons, these take estimates are likely to be conservative.

Airborne Sound—No incidents of incidental take resulting solely from airborne sound are likely, as distances to the harassment thresholds would not reach areas where pinnipeds may haul out. Harbor seals can haul out at a variety of natural or manmade locations, but the closest known harbor seal haul-out is at the Dosewallips River mouth (London, 2006) and Navy waterfront surveys and boat surveys have found it rare for harbor seals to haul out along the NBKB waterfront (Agness and Tannenbaum, 2009; Tannenbaum *et al.,* 2009, 2011; Navy, 2010). Individual seals have occasionally been observed hauled out on pontoons of the floating security fence within the restricted areas of NBKB, but this area is not with the airborne disturbance ZOI. Nearby piers are elevated well above the surface of the water and are inaccessible to pinnipeds, and seals have not been observed hauled out on the adjacent shoreline. Sea lions typically haul out on submarines docked at Delta Pier, approximately one mile from the project site.

We recognize that pinnipeds in the water could be exposed to airborne sound that may result in behavioral harassment when looking with heads above water. However, these animals would previously have been 'taken' as a result of exposure to underwater sound above the behavioral harassment thresholds, which are in all cases larger 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.

California Sea Lion—California sea lions occur regularly in the vicinity of the project site from August through mid-June, as determined by Navy waterfront surveys conducted from April 2008 through December 2011 (Table 9). With regard to the range of this species in Hood Canal and the project area, it is assumed on the basis of waterfront observations (Agness and Tannenbaum, 2009; Tannenbaum *et al.,* 2009, 2011) that the opportunity to haul out on submarines docked at Delta Pier is a primary attractant for California sea lions in Hood Canal, as they are not typically observed elsewhere in Hood Canal. Abundance is calculated as the monthly average of the maximum number observed in a given month, as opposed to the overall average (Table 9). That is, the maximum number of animals observed on any one day in a given month was averaged for 2008–11, providing a monthly average of the maximum daily number observed. The largest monthly average (58 animals) was recorded in November, as was the largest single daily count (81 in 2011). The first California sea lion was observed at NBKB in August 2009, and their occurrence has been increasing since that time (Navy, 2012).

California sea lion density for Hood Canal was calculated to be 0.28 animals/km² for purposes of the Navy Marine Species Density Database (Navy, 2013). However, this density was derived by averaging data collected year-round. This project will occur during the designated in-water work window, so it is more appropriate to use data collected at the NBKB waterfront during those months (July–February). The average of the monthly averages for maximum daily numbers observed (in a given month, during the in-water work window) is 31.2 animals (see Table 9). Exposures were calculated assuming 31 individuals could be present, and therefore exposed to sound exceeding the behavioral harassment threshold, on each day of pile driving. This methodology is conservative in that it assumes that all individuals potentially would be taken on any given day of activity.

TABLE 9—CALIFORNIA SEA LION SIGHTING INFORMATION FROM NBKB, APRIL 2008–DECEMBER 2012

Month	Number of surveys	Number of surveys with animals present	Frequency of presence [1]	Abundance [2]
January	47	36	0.77	31.0
February	50	43	0.86	38.0
March	47	45	0.96	53.3
April	67	55	0.82	45.4
May	72	58	0.81	29.4

TABLE 9—CALIFORNIA SEA LION SIGHTING INFORMATION FROM NBKB, APRIL 2008–DECEMBER 2012—Continued

Month	Number of surveys	Number of surveys with animals present	Frequency of presence [1]	Abundance [2]
June	73	17	0.23	7.4
July	61	1	0.02	0.6
August	65	12	0.18	2.6
September	54	31	0.57	20.4
October	65	61	0.94	51.8
November	56	56	1	60.2
December	54	44	0.81	49.6
Total or average (in-water work season only)	452	284	0.63	31.2

Totals (number of surveys) and averages (frequency and abundance) presented for in-water work season (July–February) only. Information from March–June presented for reference.

[1] Frequency is the number of surveys with California sea lions present/number of surveys conducted.

[2] Abundance is calculated as the monthly average of the maximum daily number observed in a given month.

Steller Sea Lion

Steller sea lions were first documented at the NBKB waterfront in November 2008, while hauled out on submarines at Delta Pier and have been periodically observed from October to April since that time. Based on waterfront observations, Steller sea lions appear to use available haul-outs (typically in the vicinity of Delta Pier, approximately one mile south of the project area) and habitat similarly to California sea lions, although in lesser numbers. On occasions when Steller sea lions are observed, they typically occur in mixed groups with California sea lions also present, allowing observers to confirm their identifications based on discrepancies in size and other physical characteristics.

Vessel-based survey effort in NBKB nearshore waters have not detected any Steller sea lions (Agness and Tannenbaum, 2009; Tannenbaum *et al.,* 2009, 2011). Opportunistic sightings data provided by Navy personnel since April 2008 have continued to document sightings of Steller sea lions at Delta Pier from October through April (Table 10). Steller sea lions have only been observed hauled out on submarines docked at Delta Pier. Delta Pier and other docks at NBKB are not accessible to pinnipeds due to the height above water, although the smaller California sea lions and harbor seals are able to haul out on pontoons that support the floating security barrier. One to two animals are typically seen hauled out with California sea lions; the maximum Steller sea lion group size seen at any given time was six individuals (observed on four occasions).

The calculation for exposure analysis is similar to that used for California sea lions. The average of the monthly averages for maximum daily numbers observed (in a given month, during the in-water work window) is 1.7 animals (see Table 10). Therefore, exposures were calculated assuming that two individuals could be present, and therefore exposed to sound exceeding the behavioral harassment threshold, on each day of pile driving. This methodology is conservative in that Steller sea lions are unlikely to be present on every day of pile driving and because it assumes that all individuals potentially would be taken on any given day of activity.

TABLE 10—STELLER SEA LION SIGHTING INFORMATION FROM NBKB, APRIL 2008–JUNE 2010; OCTOBER 2011

Month	Number of surveys	Number of surveys with animals present	Frequency of presence [1]	Abundance [2]
January	47	12	0.26	1.5
February	50	6	0.12	1.3
March	47	12	0.26	1.8
April	67	21	0.31	2.8
May	72	6	0.08	1.8
June	73	0	0	0
July	61	0	0	0
August	65	0	0	0
September	54	1	0.02	1.0
October	65	26	0.40	2.6
November	56	30	0.54	4.6
December	54	18	0.33	2.6
Total or average (in-water work season only)	452	93	0.21	1.7

Totals (number of surveys) and averages (frequency and abundance) presented for in-water work season (July–February) only. Information from March–June presented for reference.

[1] Frequency is the number of surveys with Steller sea lions present/number of surveys conducted.

[2] Abundance is calculated as the monthly average of the maximum daily number observed in a given month.

Local abundance information, rather than density, was used in estimating take for Steller sea lions. Please see the discussion provided previously for California sea lions. Steller sea lions are known only from haul-outs over one mile from the project area, and would not be subject to harassment from airborne sound. Table 10 depicts the number of estimated behavioral harassments.

Harbor Seal—Jeffries *et al.* (2003) conducted aerial surveys of the harbor seal population in Hood Canal in 1999 for the Washington Department of Fish and Wildlife and reported 711 harbor seals hauled out. The authors adjusted this abundance with a correction factor of 1.53 to account for seals in the water, which were not counted, and estimated that there were 1,088 harbor seals in Hood Canal. The correction factor (1.53) was based on the proportion of time seals spend on land versus in the water over the course of a day, and was derived by dividing one by the percentage of time harbor seals spent on land. These data came from tags (VHF transmitters) applied to harbor seals at six areas (Grays Harbor, Tillamook Bay, Umpqua River, Gertrude Island, Protection/Smith Islands, and Boundary Bay, BC) within two different harbor seal stocks (the coastal stock and the inland waters of WA stock) over four survey years. The Hood Canal population is part of the inland waters stock, and while not specifically sampled, Jeffries *et al.* (2003) found the VHF data to be broadly applicable to the entire stock. The tagging research in 1991 and 1992 conducted by Huber *et al.* (2001) and Jeffries *et al.* (2003) used the same methods for the 1999 and 2000 survey years. These surveys indicated that approximately 35 percent of harbor seals are in the water versus hauled out on a daily basis (Huber *et al.,* 2001; Jeffries *et al.,* 2003). Exposures were calculated using a density derived from the number of harbor seals that are present in the water at any one time (35 percent of 1,088, or approximately 381 individuals), divided by the area of the Hood Canal (358.44 km^2) and the formula presented previously. The aforementioned area of Hood Canal represents a change from that cited previously for authorizations associated with Navy activities in Hood Canal, and represents a correction to our understanding of the methodology used in Jeffries *et al.* (2003).

We recognize that over the course of the day, while the proportion of animals in the water may not vary significantly, different individuals may enter and exit the water. However, fine-scale data on harbor seal movements within the project area on time durations of less than a day are not available. Previous monitoring experience from Navy actions conducted in the same project area has indicated that this density provides an appropriate estimate of potential exposures. The density of harbor seals calculated in this manner (1.06 animals/km^2) is corroborated by results of the Navy's vessel-based marine mammal surveys at NBKB in 2008 and 2009–10, in which an average of five individual harbor seals per survey was observed in the 3.9 km^2 survey area (density = 1.3 animals/km^2) (Tannenbaum *et al.,* 2009, 2011). For this analysis, we retain the previous estimate of 1.3 animals/km^2 (based on the erroneous understanding of the size of the sampling area used by Jeffries *et al.* (2003)), because the use of the older estimate is larger, therefore resulting in a conservative take estimate, and because incorporation of this correction here would result in unnecessary delay.

Killer Whales—Transient killer whales are uncommon visitors to Hood Canal, and may be present anytime during the year. Transient pods (six to eleven individuals per event) were observed in Hood Canal for lengthy periods of time (59–172 days) in 2003 (January–March) and 2005 (February–June), feeding on harbor seals (London, 2006). These whales used the entire expanse of Hood Canal for feeding. West Coast transient killer whales most often travel in small pods (Baird and Dill 1996). Houghton reported to the Navy, from unpublished data, that the most commonly observed group size in Puget Sound (defined as from Admiralty Inlet south and up through Skagit Bay) from 2004–2010 data is six whales.

The density value derived for the Navy Marine Species Density Database is 0.0019 animals/km^2 (Navy, 2013), which would result in a prediction that zero animals would be harassed by the project activities. However, while transient killer whales are rare in the Hood Canal, it is possible that a pod of animals could be present. In the event that this occurred, the animals would not assume a uniform distribution as is implied by the density estimate. For a separate activity occurring at NBKB (the barge mooring project), we conservatively assumed that a single pod of whales (defined as six whales) could be present in the vicinity of the project for the entire duration. However, the duration for that project is only twenty days, whereas the duration for EHW–2 is 195 days. While it is possible that killer whales could be present in Hood Canal for 195 days, we believe that it is unlikely even in the absence of a harassing stimulus on the basis of past observations. Further, in the absence of any overriding contextual element (*e.g.,* NBKB is not important as a breeding area, and provides no unusual concentration of prey), it is reasonable to assume that whales would leave the area if exposed to potentially harassing levels of sound on each day that they were present. In the absence of such potentially harassing stimuli, killer whales were observed in Hood Canal in 2003 and 2005 for a minimum of 59 days. We assume here that a pod of whales would remain present for approximately half the time in the presence of pile driving (*i.e.,* a pod of six whales present for 30 days).

Dall's Porpoise

Dall's porpoises may be present in the Hood Canal year-round and could occur as far south as the project site. Their use of inland Washington waters, however, is mostly limited to the Strait of Juan de Fuca. One individual has been observed by Navy staff in deeper waters of Hood Canal (Tannenbaum *et al.,* 2009, 2011). The Navy Marine Species Density Database assumes a negligible value of 0.001 animals/1,000 km^2 for Dall's porpoises in the Hood Canal, which represents species that have historically been observed in an area but have no regular presence. Use of this density value results in a prediction that zero animals would be exposed to sound above the behavioral harassment threshold. However, given the lengthy project duration it is possible that a Dall's porpoise could be present. While it is unlikely that Dall's porpoise would be present frequently, there is no information to indicate an appropriate proportion of days, and the Navy is requesting authorization for one incidence of incidental take per day for Dall's porpoise.

Harbor Porpoise

During vessel-based line transect surveys on non-construction days during the TPP, harbor porpoises were frequently sighted within several kilometers of the base, mostly to the north or south of the project area, but occasionally directly across from the Bangor waterfront on the far side of Toandos Peninsula. Harbor porpoise presence in the immediate vicinity of the base (*i.e.,* within 1 km) remained low. These data were used to generate a density for Hood Canal. Based on guidance from other line transect surveys conducted for harbor porpoises using similar monitoring parameters (*e.g.,* boat speed, number of observers) (Barlow, 1988; Calambokidis *et al.,* 1993; Carretta *et al.,* 2001), the Navy determined the effective strip width for the surveys to be one kilometer, or a perpendicular distance of 500 m from the transect to the left or right of the vessel. The effective strip width was set at the distance at which the detection probability for harbor porpoises was equivalent to one, which assumes that all individuals on a transect are detected. Only sightings occurring within the effective strip width were used in the density calculation. By multiplying the trackline length of the surveys by the effective strip width, the total area surveyed during the surveys was 471.2 km^2. Thirty-eight individual harbor porpoises were sighted within this area, resulting in a density of 0.0806 animals per km^2. To account for availability bias, or the animals which are unavailable to be detected because they are submerged, the Navy utilized a g(0) value of 0.54, derived from other similar line transect surveys (Barlow, 1988; Calambokidis *et al.,* 1993; Carretta *et al.,* 2001). This resulted in a corrected density of 0.149 harbor porpoises per km^2. For comparison, 274.27 km^2 of trackline survey effort in nearby Dabob Bay produced a corrected density estimate of 0.203 harbor porpoises per km^2. However, the Navy has elected to retain an earlier density estimate, derived from only preliminary data, for the exposure analysis. This estimate is larger than the current best estimate and therefore overestimates the number of potential takes.

Potential takes could occur if individuals of these species move through the area on foraging trips when pile driving is occurring. Individuals that are taken could exhibit behavioral changes such as increased swimming speeds, increased surfacing time, or decreased foraging. Most likely, individuals may move away from the sound source and be temporarily displaced from the areas of pile driving. Potential takes by disturbance would likely have a negligible short-term effect on individuals and not result in population-level impacts.

TABLE 11—NUMBER OF POTENTIAL INCIDENTAL TAKES OF MARINE MAMMALS WITHIN VARIOUS ACOUSTIC THRESHOLD ZONES

Species	Density/ Abundance	Underwater		Airborne	Total proposed authorized takes
		Impact injury threshold [1]	Vibratory disturbance threshold (120 dB) [2]	Impact disturbance threshold [3]	
California sea lion	[4] 28.4	0	6,045	0	6,045
Steller sea lion	[4] 1.1	0	390	0	390
Harbor seal	[5] 1.06	0	10,530	0	10,530
Killer whale	[6] 0.0019	0	180	N/A	180
Dall's porpoise	[6] 0.000001	0	195	N/A	195
Harbor porpoise	[7] 0.149	0	1,950	N/A	1,950

[1] Acoustic injury threshold for impact pile driving is 190 dB for pinnipeds and 180 dB for cetaceans.
[2] The 160–dB acoustic harassment zone associated with impact pile driving would always be subsumed by the 120-dB harassment zone produced by vibratory driving. Therefore, takes are not calculated separately for the two zones.
[3] Acoustic disturbance threshold is 100 dB for sea lions and 90 dB for harbor seals. We do not believe that pinnipeds would be available for airborne acoustic harassment because they are not known to regularly haul-out at locations inside the zone in which airborne acoustic harassment could occur.
[4] Figures presented are abundance numbers, not density, and are calculated as the average of average daily maximum numbers per month. Abundance numbers are rounded to the nearest whole number for take estimation. The Steller sea lion abundance was doubled.
[5] An uncorrected estimate of 1.3 animals/km^2 was used for the exposure analysis.
[6] These densities resulted in zero take estimates. We assumed that a single pod of six killer whales could be present for as many as 30 days of the duration and that one Dall's porpoise could be present on each day of the project.
[7] The preliminary density estimate of 0.250 animals/km^2 was used for the exposure analysis.

Negligible Impact and Small Numbers Analyses and Preliminary Determinations

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.'' In making a negligible impact determination, we consider a variety of factors, including but not limited to: (1) The number of anticipated mortalities; (2) the number and nature of anticipated injuries; (3) the number, nature, intensity, and duration of Level B harassment; and (4) the context in which the take occurs.

Pile driving activities associated with the wharf construction project, as outlined previously, have the potential to disturb or displace marine mammals. Specifically, the proposed activities may result in take, in the form of Level B harassment (behavioral disturbance) only, from airborne or underwater sounds generated from pile driving. No mortality, serious injury, or Level A harassment is anticipated given the methods of installation and measures designed to minimize the possibility of injury to marine mammals and Level B harassment would be reduced to the level of least practicable adverse impact. Specifically, vibratory hammers, which do not have significant potential to cause injury to marine mammals due to the relatively low source levels (less than 190 dB), would be the primary method of installation. Also, no impact pile driving will occur without the use of a sound attenuation system (*e.g.,* bubble curtain), and pile driving will either not start or be halted if marine mammals approach the shutdown zone. The pile driving activities analyzed here are similar to other similar construction activities, including recent projects conducted by the Navy in the Hood Canal as well as work conducted in 2005 for the Hood Canal Bridge (SR–104) by the Washington Department of Transportation, which have taken place with no reported injuries or mortality to marine mammals.

The proposed numbers of animals authorized to be taken for Steller and California sea lions and for Dall's porpoises would be considered small relative to the relevant stocks or populations (each less than two percent) even if each estimated taking occurred to a new individual—an extremely unlikely scenario. For harbor porpoises, the number of incidences of take relative to the stock abundance (approximately eighteen percent) is higher, although still within the bounds of what we consider to be small numbers. Little is known about harbor porpoise use of Hood Canal, and prior to monitoring associated with recent pile driving projects at NBKB it was believed that harbor porpoise were infrequent visitors to the area. It is unclear from the limited information available what relationship harbor porpoise occurrence in Hood Canal may hold to the regional stock or whether similar usage of Hood Canal may be expected to be recurring. It is unknown how many unique individuals are represented by sightings in Hood Canal, although it is unlikely that these animals represent a large proportion of the overall stock. Nevertheless, the estimated take of harbor porpoises is likely an overestimate, as sightings to date have occurred only at significant distance from the project area (both inside and outside of the predicted 120–dB zone).

The proposed numbers of authorized take for harbor seals, transient killer whales, and harbor porpoises are somewhat higher relative to the total stocks. However, these numbers represent the instances of take, not the number of individuals taken. While it is unlikely that all animals in the Hood Canal population would be exposed to sound created by project activities, the approximately 1,088 harbor seals resident in Hood Canal are approximately seven percent of the regional stock, and represent small numbers of Washington inland waters harbor seals. For transient killer whales, we estimate take based on an assumption that a single pod of whales, comprising six individuals, is present in the vicinity of the project area for the entire duration of the project. These six individuals represent a small number of transient killer whales.

For pinnipeds, no rookeries are present in the project area, there are no haul-outs other than those provided opportunistically by man-made objects, and the project area is not known to provide foraging habitat of any special importance. 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, and thus would not result in any adverse impact to the stock as a whole in terms of adverse effects on rates of recruitment or survival. The potential for multiple exposures of a small portion of the overall stock to levels associated with Level B harassment in this area is expected to have a negligible impact on the affected stocks.

We have preliminarily determined that the impact of the previously described project may result, at worst, in a temporary modification in behavior (Level B harassment) of small numbers of marine mammals. No mortality or injuries are anticipated as a result of the specified activity, and none are proposed to be authorized. Additionally, animals in the area are not expected to incur hearing impairment (*i.e.,* TTS or PTS) or non-auditory physiological effects. For pinnipeds, the absence of any major rookeries and only a few isolated and opportunistic haul-out areas near or adjacent to the project site means that potential takes by disturbance would have an insignificant short-term effect on individuals and would not result in population-level impacts. Similarly, for cetacean species the absence of any known regular occurrence adjacent to the project site means that potential takes by disturbance would have an insignificant short-term effect on individuals and would not result in population-level impacts. Due to the nature, degree, and context of behavioral harassment anticipated, the activity is not expected to impact rates of recruitment or survival.

For reasons stated previously in this document, the negligible impact determination is also supported by the likelihood that marine mammals are expected to move away from a sound source that is annoying prior to its becoming potentially injurious, and the likelihood that marine mammal detection ability by trained observers is high under the environmental conditions described for Hood Canal, enabling the implementation of shutdowns to avoid injury, serious injury, or mortality. As a result, no take by injury or death is anticipated, and the potential for temporary or permanent hearing impairment is very low and would be avoided through the incorporation of the proposed mitigation measures.

While the numbers of marine mammals potentially incidentally harassed would depend on the distribution and abundance of marine mammals in the vicinity of the survey activity, the numbers are estimated to be small relative the affected species or population stock sizes, and have been mitigated to the lowest level practicable through incorporation of the proposed mitigation and monitoring measures mentioned previously in this document. This activity is expected to result in a negligible impact on the affected species or stocks. The Eastern DPS of the Steller sea lion is listed as threatened under the ESA; no other species for which take authorization is requested are either ESA-listed or considered depleted under the MMPA. No take would be authorized for humpback whales or southern resident killer whales, and the Navy would take appropriate action to avoid unauthorized incidental take should one of these species be observed in the project area.

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 the proposed barge mooring project would result in the incidental take of small numbers of marine mammals, by Level B harassment only, and that the total taking from the activity would have a negligible impact on the affected species or stocks.

Impact on Availability of Affected Species for Taking for Subsistence Uses

No tribal subsistence hunts are held in the vicinity of the project area; thus, temporary behavioral impacts to individual animals will not affect any subsistence activity. Further, no population or stock level impacts to marine mammals are anticipated or authorized. As a result, no impacts to the availability of the species or stock to the Pacific Northwest treaty tribes are expected as a result of the proposed activities. Therefore, no relevant subsistence uses of marine mammals are implicated by this action.

Endangered Species Act (ESA)

There are two ESA-listed marine mammal species with known occurrence in the project area: The Eastern DPS of the Steller sea lion, listed as threatened, and the humpback whale, listed as endangered. Because of the potential presence of these species, the Navy engaged in a formal consultation with the NMFS Northwest Regional Office (NWR) under Section 7 of the ESA. We also initiated separate consultation with NWR because of our proposal to authorize the incidental take of Steller sea lions under the first IHA for EHW–2 construction. NWR's Biological Opinion, issued on September 29, 2011, concluded that the effects of pile driving activities at NBKB were likely to adversely affect, but not likely to jeopardize the continued existence of the eastern DPS of Steller sea lion. The Steller sea lion does not have critical habitat in the action area. Subsequent to the completion of the biological opinion, NWR prepared an Incidental Take Statement (ITS) to be appended to the opinion.

NWR compared the ITS, as well as the effects analysis and conclusions in the Biological Opinion, with the amount of and conditions on take proposed in the

IHA and determined that the effects of issuing an IHA to the Navy for the taking of Steller sea lions incidental to construction activities are consistent with those described in the opinion. The September 29, 2011 Biological Opinion remains valid and this proposed MMPA authorization provides no new information about the effects of the action, nor does it change the extent of effects of the action, or any other basis to require reinitiation of the opinion. Therefore, the September 29, 2011 Biological Opinion meets the requirements of section 7(a)(2) of the ESA and implementing regulations at 50 CFR 402 for both the Navy construction action, as well as our proposed action to issue an IHA under the MMPA, and no further consultation is required. NWR will issue a new ITS and append it to the 2011 Biological Opinion upon issuance of the IHA, if appropriate.

National Environmental Policy Act (NEPA)

The Navy prepared an Environmental Impact Statement and issued a Record of Decision for this project. We acted as a cooperating agency in the preparation of that document, and reviewed the EIS and the public comments received and determined that preparation of additional NEPA analysis was not necessary. We subsequently adopted the Navy's EIS and issued our own Record of Decision for the issuance of the first IHA on July 6, 2012.

We have reviewed the Navy's application for a renewed IHA for ongoing construction activities for 2013–14 and the 2012–13 monitoring report. Based on that review, we have determined that the proposed action follows closely the previous IHA and does not present any substantial changes, or significant new circumstances or information relevant to environmental concerns which would require preparation of a new or supplemental NEPA document. Therefore, we have preliminarily determined that a new or supplemental Environmental Assessment or EIS is unnecessary, and will, after review of public comments determine whether or not to reaffirm our 2012 ROD. The 2012 NEPA documents are available for review at *http://www.nmfs.noaa.gov/pr/permits/incidental.htm.*

Proposed Authorization

As a result of these preliminary determinations, we propose to authorize the take of marine mammals incidental to the Navy's wharf construction project, provided the previously mentioned mitigation, monitoring, and reporting requirements are incorporated.

Dated: May 16, 2013.

Helen M. Golde,

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

[FR Doc. 2013–12053 Filed 5–20–13; 8:45 am]

BILLING CODE 3510–22–P

CONSUMER PRODUCT SAFETY COMMISSION

[Docket No. CPSC–2013–0020]

Agency Information Collection Activities; Proposed Collection; Comment Request; CPSC National Awareness Survey

AGENCY: Consumer Product Safety Commission.

ACTION: Notice.

SUMMARY: The Consumer Product Safety Commission (CPSC or Commission) is announcing an opportunity for public comment on the proposed collection of certain information by the agency. Under the Paperwork Reduction Act of 1995 (PRA), federal agencies are required to publish notice in the **Federal Register** concerning each proposed collection of information and to allow 60 days for public comment in response to the notice. This notice solicits comments on a generic clearance to conduct national awareness surveys regarding the CPSC and CPSC activities.

DATES: Submit written or electronic comments on the collection of information by July 22, 2013.

ADDRESSES: You may submit comments, identified by Docket No. CPSC–2013–0020, by any of the following methods:

Electronic Submissions: Submit electronic comments to the Federal eRulemaking Portal at: *http://www.regulations.gov.* Follow the instructions for submitting comments. The Commission does not accept comments submitted by electronic mail (email), except through *www.regulations.gov.* The Commission encourages you to submit electronic comments by using the Federal eRulemaking Portal, as described above.

Written Submissions: Submit written submissions in the following way: Mail/Hand delivery/Courier (for paper, disk, or CD–ROM submissions), preferably in five copies, to: Office of the Secretary, Consumer Product Safety Commission, Room 820, 4330 East-West Highway, Bethesda, MD 20814; telephone (301) 504–7923.

Instructions: All submissions received must include the agency name and docket number for this notice. All comments received may be posted without change, including any personal identifiers, contact information, or other personal information provided, to: *http://www.regulations.gov.* Do not submit confidential business information, trade secret information, or other sensitive or protected information that you do not want to be available to the public. If furnished at all, such information should be submitted in writing.

Docket: For access to the docket to read background documents or comments received, go to: *http://www.regulations.gov,* and insert the docket number, CPSC–2013–0020, into the ''Search'' box, and follow the prompts. A copy of the draft survey is available at *http://www.regulations.gov* under Docket No. CPSC–2013–0020, Supporting and Related Materials.

FOR FURTHER INFORMATION CONTACT: For further information contact: Robert H. Squibb, Consumer Product Safety Commission, 4330 East-West Highway, Bethesda, MD 20814; (301) 504–7815, or by email to: *rsquibb@cpsc.gov.*

SUPPLEMENTARY INFORMATION: Under the PRA (44 U.S.C. 3501–3520), federal agencies must obtain approval from the Office of Management and Budget (OMB) for each collection of information they conduct or sponsor. ''Collection of information'' is defined in 44 U.S.C. 3502(3) and 5 CFR 1320.3(c) and includes agency requests or requirements that members of the public submit reports, keep records, or provide information to a third party. Section 3506(c)(2)(A) of the PRA (44 U.S.C. 3506(c)(2)(A)) requires federal agencies to provide a 60-day notice in the **Federal Register** concerning each proposed collection of information before submitting the collection to OMB for approval. Accordingly, the CPSC is publishing notice of the proposed collection of information set forth in this document.

A. National Awareness Survey

The Commission is authorized under section 5(a) of the Consumer Product Safety Act (CPSA), 15 U.S.C. 2054(a), to conduct studies and investigations relating to the causes and prevention of deaths, accidents, injuries, illnesses, other health impairments, and economic losses associated with consumer products. Section 5(b) of the CPSA, 15 U.S.C. 2054(b), further provides that the Commission may conduct research, studies, and investigations on the safety of consumer products or test consumer products and develop product safety test methods and testing devices. To increase awareness about the CPSC and to communicate more effectively and