DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

RIN 0648–XG207

North Pacific Fishery Management Council; Public Meeting

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

ACTION: Notice of public meeting.

SUMMARY: The North Pacific Fishery Management Council's (Council) Legislative Committee will meet on June 5, 2018 in Kodiak, AK.

DATES: The meeting will be held on Tuesday, June 5, 2018, from 8 a.m. to 12 p.m.

ADDRESSES: The meeting will be held in the Katurwik Room at the Kodiak Harbor Convention Center, 236 Rezanof Drive, Kodiak, AK 99615.

Council address: North Pacific Fishery Management Council, 605 W 4th Ave., Suite 306, Anchorage, AK 99501–2252; telephone: (907) 271–2809.

FOR FURTHER INFORMATION CONTACT: David Witherell, Council staff; telephone: (907) 271–2809.

SUPPLEMENTARY INFORMATION:

Agenda

Tuesday, June 5, 2018

The meeting agenda includes: (a) Update on MSA legislation and related bills, including CCC comments, (b) public comment, and (c) recommendations to the Council. The Agenda is subject to change, and the latest version will be posted at *http://www.npfmc.org/*.

Public Comment

Public comment letters will be accepted and should be submitted either electronically to David Witherell, Council staff: *David.witherell@noaa.gov,* or through the mail: North Pacific Fishery Management Council, 605 W 4th Ave., Suite 306, Anchorage, AK 99501–2252. In-person oral public testimony will be accepted at the scheduled place on the agenda.

Special Accommodations

The meeting is physically accessible to people with disabilities. Requests for sign language interpretation or other auxiliary aids should be directed to Shannon Gleason at (907) 271–2809 at least 7 working days prior to the meeting date.

Dated: May 11, 2018.

Tracey L. Thompson,

Acting Deputy Director, Office of Sustainable Fisheries, National Marine Fisheries Service.

[FR Doc. 2018–10449 Filed 5–15–18; 8:45 am]

BILLING CODE 3510–22–P

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

RIN 0648–XG204

Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to the Annapolis Passenger Ferry Dock Project, Puget Sound, Washington

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

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

SUMMARY: NMFS has received a request from Kitsap Transit for authorization to take marine mammals incidental to the Annapolis Passenger Ferry Dock Project in Puget Sound, Washington. Pursuant to the Marine Mammal Protection Act (MMPA), NMFS is requesting comments on its proposal to issue an incidental harassment authorization (IHA) to incidentally take marine mammals during the specified activities. NMFS will consider public comments prior to making any final decision on the issuance of the requested MMPA authorizations and agency responses will be summarized in the final notice of our decision.

DATES: Comments and information must be received no later than June 15, 2018.

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

Instructions: NMFS is not responsible for comments sent by any other method, to any other address or individual, or received after the end of the comment period. Comments received electronically, including all attachments, must not exceed a 25-megabyte file size. Attachments to electronic comments will be accepted in Microsoft Word or Excel or Adobe PDF file formats only. All comments received are a part of the public record and will generally be posted online at *https://www.fisheries.noaa.gov/node/23111* without change. All personal identifying information (*e.g.,* name, address) voluntarily submitted by the commenter may be publicly accessible. Do not submit confidential business information or otherwise sensitive or protected information.

FOR FURTHER INFORMATION CONTACT: Jaclyn Daly, Office of Protected Resources, NMFS, (301) 427–8401. Electronic copies of the application and supporting documents, as well as a list of the references cited in this document, may be obtained online at: *https://www.fisheries.noaa.gov/node/23111.* In case of problems accessing these documents, please call the contact listed above.

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 (as delegated to NMFS) 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.

An 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.

The MMPA states that the term ''take'' means to harass, hunt, capture, kill or attempt to harass, hunt, capture, or kill any marine mammal.

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).

National Environmental Policy Act

To comply with the National Environmental Policy Act of 1969 (NEPA; 42 U.S.C. 4321 *et seq.*) and NOAA Administrative Order (NAO) 216–6A, NMFS must review our proposed action (*i.e.,* the issuance of an incidental harassment authorization) with respect to potential impacts on the human environment.

This action is consistent with categories of activities identified in Categorical Exclusion B4 (incidental harassment authorizations with no anticipated serious injury or mortality) of the Companion Manual for NOAA Administrative Order 216–6A, which do not individually or cumulatively have the potential for significant impacts on the quality of the human environment and for which we have not identified any extraordinary circumstances that would preclude this categorical exclusion. Accordingly, NMFS has preliminarily determined that the issuance of the proposed IHA qualifies to be categorically excluded from further NEPA review.

We will review all comments submitted in response to this notice prior to concluding our NEPA process or making a final decision on the IHA request.

Summary of Request

On March 5, 2018, NMFS received a request from Kitsap Transit for an IHA to take marine mammals incidental to pile driving and removal associated with upgrades to the Annapolis Ferry Terminal, Puget Sound, Washington. Kitsap Transit submitted a revised application on May 3, 2018 which NMFS deemed adequate and complete. Kitsap Transit's request is for take of harbor seal (*Phoca vitulina richardii*), Steller sea lion (*Eumetopias jubatus monteriensis*), California sea lion (*Zalophus californianu*), and harbor porpoise (*Phocoena phocoena vomerina*) by Level B harassment only. Neither Kitsap Transit nor NMFS expects serious injury or mortality to result from this activity and, therefore, an IHA is appropriate.

Description of Proposed Activity

Overview

Kitsap Transit is proposing to upgrade the existing dock at its Annapolis Ferry Terminal to accommodate larger vessels by extending the dock into deeper water and bring the terminal into compliance with American Disability Act (ADA) accessibility standards. The project includes removing 10 existing concrete and steel piles that support the existing pier and float and installing 12 new steel piles to support updated structures. Piles may be removed using a vibratory hammer and new piles may be installed using a vibratory and, if necessary, an impact hammer. The project is anticipated to take 8 weeks to complete and could start as early as July 2, 2018; however, Kitsap Transit anticipates it will take a maximum of 17 days to completed pile-related work.

Dates and Duration

The project would occur for eight weeks between July 1, 2018 and March 2, 2019. Pile removal has been conservatively estimated to occur at a rate of 2 piles removed per day, which would require 5 days to remove 10 piles. Pile installation was conservatively estimated to occur at a rate of 1 pile per day, which would require 12 days to install 12 piles. In total, there would be 17 days (maximum) of pile driving.

Specific Geographic Region

The Annapolis Ferry Terminal is located in Sinclair Inlet across from Navy Base Kitsap (NBK) Bremerton and southwest of Bainbridge Island. Potential areas ensonfied during pile driving include Sinclair Inlet and portions of Port Washington Narrows, Port Orchard Passage and Rich Passage. These waterbodies range up to 130 feet in depth and substrates include silt/mud, sand, gravel, cobbles and rock outcrops. The terminal itself and parking area contains a hardened shoreline comprised of sheet piles.

Detailed Description of Specific Activity

The Annapolis Ferry Terminal is 34 years old with a useful life of 40 years. Kitsap Transit has determined upgrades are necessary to meet ADA requirements and accommodate larger ferry vessels. These improvements are designed to improve the ferry operation, environmental conditions, overall experience for all passengers and provide equal access for elderly and disabled passengers. To make the upgrades, Kitsap Transit is removing a portion of the existing pier, installing a longer gangway, removing the existing float and installing a larger float in deeper water. This work requires removing existing decking with a concrete saw, removing 10 existing piles, and installing 12 new piles. The concrete saw would not cause in-air harassment as no pinnipeds haulout in the immediate vicinity of the dock; therefore, this activity is not discussed further.

Piles would be removed with a vibratory hammer. Piles would be installed using a vibratory hammer to refusal and then ''proofed'' with an impact hammer, if necessary. During impact hammering, Kitsap Transit would use a bubble curtain to reduce underwater sound pressure levels. The exact type and design of bubble curtain is not known.

Kitsap Transit estimates up to four piles could be removed per day and up to two piles would be installed per day. However, to account for unexpected issues, Kitsap Transit recognizes only two piles may be removed and one pile may be installed per day. Pile removal and installation would not occur on the same day. Therefore, the maximum amount of time spent removing 10 piles would be 5 days while the maximum amount of time installing 12 piles would be 12 days for a total of 17 days. The types of piles included in the project and schedule, are included in Table 1.

TABLE 1—DESCRIPTION OF PILES TO BE INSTALLED AND REMOVED DURING THE ANNAPOLIS FERRY DOCK PROJECT

Pile size	Method	Number of piles	Number of days (maximum)
Pile Removal			
16.5-in concrete	Vibratory	4	5
18-in steel	Vibratory	6	

TABLE 1—DESCRIPTION OF PILES TO BE INSTALLED AND REMOVED DURING THE ANNAPOLIS FERRY DOCK PROJECT—Continued

Pile size	Method	Number of piles	Number of days (maximum)
Pile Installation			
12-in steel	Vibratory Impact.	4	12
24-in steel	Vibratory Impact.	8	

Proposed mitigation, monitoring, and reporting measures are described in detail later in this document (please see ''Proposed Mitigation'' and ''Proposed Monitoring and Reporting'').

Description of Marine Mammals in the Area of Specified Activities

Sections 3 and 4 of the application summarize available information regarding status and trends, distribution and habitat preferences, and behavior and life history, of the potentially affected species. Additional information regarding population trends and threats may be found in NMFS's Stock Assessment Reports (SAR; *www.nmfs.noaa.gov/pr/sars/*) and more general information about these species (*e.g.,* physical and behavioral descriptions) may be found on NMFS's website (*https://www.fisheries.noaa.gov/find-species*).

Table 2 lists all species with expected potential for occurrence in Puget Sound and summarizes information related to the population or stock, including regulatory status under the MMPA and ESA and potential biological removal (PBR), where known. For taxonomy, we follow Committee on Taxonomy (2016). PBR is defined by the MMPA as the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population (as described in NMFS's SARs). While no mortality is anticipated or authorized here, PBR and annual serious injury and mortality from anthropogenic sources are included here as gross indicators of the status of the species and other threats.

Marine mammal abundance estimates presented in this document represent the total number of individuals that make up a given stock or the total number estimated within a particular study or survey area. NMFS's stock abundance estimates for most species represent the total estimate of individuals within the geographic area, if known, that comprises that stock. All managed stocks in the specified geographical regions are assessed in either NMFS's U.S. Alaska SARs or U.S. Pacific SARs.

Seven species (comprising eight managed stocks) are considered to have the potential to co-occur with Kitsap Transit's proposed project. While there are several other species or stocks that occur in Washington inland waters, many are not expected to occur in the vicinity of the Annapolis Ferry Terminal due to its position within the Puget Sound. These species, such as Dall's porpoise (*Phocoenoides dalli dalli*) and Northern elephant seals (*Mirounga angustirostris*) occur in more northerly waters of Puget Sound and in the vicinity of the San Juan Islands but have not been observed within the project area. Therefore, they are not discussed further. The sea otter (*Enhydra lutris kenyoni*) is also found in Puget Sound; however, sea otters are managed by the U.S. Fish and Wildlife Service and are not considered further in this document.

All values presented in Table 2 are the most recent available at the time of writing and are available in the draft 2017 SARs (available online at: *www.fisheries.noaa.gov/national/marine-mammal-protection/draft-marine-mammal-stock-assessment-reports*).

TABLE 2—MARINE MAMMAL POTENTIALLY PRESENT IN THE VICINITY OF THE ANNAPOLIS FERRY TERMINAL DURING CONSTRUCTION

Common name	Scientific name	Stock	ESA/MMPA status; Strategic (Y/N)[1]	Stock abundance (CV, N_{min}, most recent abundance survey)[2]	PBR	Annual M/SI[3]
Order Cetartiodactyla—Cetacea—Superfamily Mysticeti (baleen whales)						
Family Eschrichtiidae:						
Gray whale	*Eschrichtius robustus*	Eastern North Pacific	-; N	20,990 (0.05; 20,125; 2011).	624	132
Family Balaenopteridae (rorquals):						
Humpback whale	*Megaptera novaeangliae kuzira*	California/Oregon/Washington (CA/OR/WA).	E/D; Y	1,918 (0.03; 1,876; 2014)	[7] 11	≥9.2
Superfamily Odontoceti (toothed whales, dolphins, and porpoises)						
Family Delphinidae:						
Killer whale	*Orcinus orca*[4]	West Coast Transient[5]	-; N	243 (n/a; 2009)	2.4	0
		Eastern North Pacific Southern Resident.	E/D; Y	83 (n/a; 2016)	0.14	0
Family Phocoenidae (porpoises):						

TABLE 2—MARINE MAMMAL POTENTIALLY PRESENT IN THE VICINITY OF THE ANNAPOLIS FERRY TERMINAL DURING CONSTRUCTION—Continued

Common name	Scientific name	Stock	ESA/MMPA status; Strategic (Y/N)[1]	Stock abundance (CV, N_{min}, most recent abundance survey)[2]	PBR	Annual M/SI[3]
Harbor porpoise	*Phocoena phocoena vomerina*	Washington Inland Waters	-; N	11,233 (0.37; 8,308; 2015).	66	≥7.2
Order Carnivora—Superfamily Pinnipedia						
Family Otariidae (eared seals and sea lions):						
California sea lion	*Zalophus californianus*	United States	-; N	296,750 (n/a; 153,337; 2011).	9,200	389
Steller sea lion	*Eumetopias jubatus monteriensis.*	Eastern U.S.	D; Y	41,638 (n/a; 2015)	2,498	108
Family Phocidae (earless seals):						
Harbor seal	*Phoca vitulina richardii*	Southern Puget Sound[6]	-; N	1,568 (0.15; 1,025; 1999)	Undet.	3.4

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

[2] NMFS marine mammal stock assessment reports at: *www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessments.* CV is coefficient of variation; N_{min} is the minimum estimate of stock abundance. In some cases, CV is not applicable. For two stocks of killer whales, the abundance values represent direct counts of individually identifiable animals; therefore there is only a single abundance estimate with no associated CV. For certain stocks of pinnipeds, abundance estimates are based upon observations of animals (often pups) ashore multiplied by some correction factor derived from knowledge of the species' (or similar species') life history to arrive at a best abundance estimate; therefore, there is no associated CV. In these cases, the minimum abundance may represent actual counts of all animals ashore.

[3] These values, found in NMFS' SARs, represent annual levels of human-caused mortality plus serious injury from all sources combined (*e.g.,* commercial fisheries, subsistence hunting, ship strike). Annual M/SI often cannot be determined precisely and is in some cases presented as a minimum value. All M/SI values are as presented in the draft 2017 SARs.

[4] Transient and resident killer whales are considered unnamed subspecies (Committee on Taxonomy, 2017).

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

[6] Abundance estimates for the Southern Puget Sound harbor seal stock is not considered current. PBR is therefore considered undetermined for these stocks, as there is no current minimum abundance estimate for use in calculation. We nevertheless present the most recent abundance estimates, as these represent the best available information for use in this document.

[7] This stock is known to spend a portion of time outside the U.S. EEZ. Therefore, the PBR presented here is the allocation for U.S. waters only and is a portion of the total. The total PBR for humpback whales is 22 (one half allocation for U.S. waters). Annual M/SI presented for these species is for U.S. waters only.

All species that could potentially occur in the proposed project area are included in Table 2. As described below, all seven species could temporally and spatially co-occur with the activity; however, Kitsap Transit has proposed mitigation measures which eliminate the potential take of three of these species (gray whales, humpback whales, and killer whales). Therefore, Kitsap Transit has requested, and we are proposing to authorize, take of four marine mammal species: harbor seal, California sea lion, Steller sea lion, and harbor porpoise.

Gray Whale

Gray whales are observed in Washington inland waters in all months of the year, with peak numbers from March through June (Calambokidis *et al.,* 2010). Most whales sighted are part of a small regularly occurring group of 6 to 10 whales that use mudflats in the Whidbey Island and Camano Island area as a springtime feeding area (Calambokidis *et al.,* 2010). Observed feeding areas are located in Saratoga Passage between Whidbey and Camano Islands including Crescent Harbor, and in Port Susan Bay located between Camano Island and the mainland north of Everett. Gray whales that are not identified with the regularly occurring feeding group are occasionally sighted in Puget Sound. These whales are not associated with feeding areas and are often emaciated (WDFW, 2012). There are typically from 2 to 10 stranded gray whales per year in Washington (Cascadia Research, 2012).

In Sinclair Inlet and the surrounding waterways (Rich Passage, Dyes Inlet, and Agate Passage), 11 opportunistic sightings of gray whales were reported to the Orca Network (a public marine mammal sightings database) between 2003 and 2012. One stranding occurred at NBK Bremerton in 2013. Gray whales have been sighted in Hood Canal south of the Hood Canal Bridge on six occasions since 1999, including a stranded whale. The most recent report was in 2010.

Humpback Whale

Prior to 2016, humpback whales were listed under the ESA as an endangered species worldwide. Following a 2015 global status review (Bettridge *et al.,* 2015), NMFS established 14 distinct population segments (DPS) with different listing statuses (81 FR 62259; September 8, 2016) pursuant to the ESA. The DPSs that occur in U.S. waters do not necessarily equate to the existing stocks designated under the MMPA and shown in Table 2. Because MMPA stocks cannot be portioned, *i.e.,* parts managed as ESA-listed while other parts managed as not ESA-listed, until such time as the MMPA stock delineations are reviewed in light of the DPS designations, NMFS considers the existing humpback whale stocks under the MMPA to be endangered and depleted for MMPA management purposes (*e.g.,* selection of a recovery factor, stock status).

Within U.S. west coast waters, three current DPSs may occur: The Hawaii DPS (not listed), Mexico DPS (threatened), and Central America DPS (endangered). According to Wade *et al.* (2016), the probability that whales encountered in Washington waters are from a given DPS are as follows: Hawaii, 52.9 percent (CV = 0.15); Mexico, 41.9 percent (0.14); Central America, 5.2 percent (0.91).

Most humpback whale sightings reported since 2003 were in the main basin of Puget Sound with numerous sightings in the waters between Point No Point and Whidbey Island, Possession Sound, and southern Puget Sound in the vicinity of Point Defiance. A few sightings of possible humpback whales were reported by Orca Network in the waters near Navy Base Kitsap (NBK) Bremerton (located across Sinclair Inlet from the Annapolis Ferry Terminal) and Keyport (Rich Passage to Agate Passage area including Sinclair and Dyes Inlet) between 2003 and 2015. Humpback whales were also observed in the vicinity of Manette Bridge in Bremerton in 2016 and 2017, and a carcass was found under a dock at NBK Bremerton in 2016 (Cascadia Research, 2016). In Hood Canal, single humpback whales were observed for several weeks in 2012 and 2015. One sighting was reported in 2016. Review of the 2012 sightings information indicated they were of one individual. Prior to the 2012 sightings, there were no confirmed reports of humpback whales entering Hood Canal.

Harbor Seal

Harbor seals in Washington inland waters have been divided into three stocks: Hood Canal, Northern Inland Waters, and Southern Puget Sound. Animals belonging to the latter stock are ones most likely to occur in the action area during pile driving. Harbor seals are the most common pinniped found in the action area and are present year-round. They haul out on rocks, reefs, beaches, and drifting glacial ice and feed in marine, estuarine, and occasionally fresh waters. Harbor seals generally are non-migratory, with local movements associated with such factors as tides, weather, season, food availability, and reproduction (as reviewed in Carretta *et al.,* 2014). Harbor seals have also displayed strong fidelity for haulout sites.

There are no documented harbor seal haul-out within the immediate vicinity of the ferry terminal and much of the shoreline around the terminal has been armored with sheet-piling, preventing seals from hauling out. The nearest harbor seal haul-out is located in Dyes Inlet with less than 100 estimated individuals, approximately nine nautical miles from the site (Jefferies *et al.,* 2000).

California Sea Lions

California sea lions are typically present most of the year except for mid-June through July in Washington inland waters, with peak abundance numbers between October and May (NMFS, 1997; Jeffries *et al.,* 2000). During summer months and associated breeding periods, the inland waters are not be considered a high-use area by California sea lions, as they are returning to rookeries in California waters.

California sea lions have been documented during shore- and boat-based surveys at NBK Bremerton since 2010, with as many as 315 individuals hauled out at one time (November 2015) on port security barrier floats. On average, 69 sea lions have been observed daily.

Stellar Sea Lion

Steller sea lions are not frequently observed near the action area. Shore-based surveys at NBK Bremerton (directly across Sinclar Inlet from the Annapolis Ferry Terminal) have not detected Steller sea lions since the surveys were initiated in 2010. However, a single Steller sea lion was sighted on the floating security barrier in 2012 and aerial surveys conducted by the Washington Department of Fish and Wildlife (WDFW) in 2013 noted Steller sea lion presence in the action area. WDFW identifies two Steller sea lion haulouts near the Annapolis Ferry Terminal: (1) Navigation buoys and net pen floats in Clam Bay and (2) NBK Bremerton port security barrier (Wiles, 2015). No pupping or breeding areas are present in the project area.

Killer Whale (Transient)

Groups of transient killer whales were observed for lengthy periods in Hood Canal in 2003 (59 days) and 2005 (172 days) (London, 2006), but were not observed again until 2016, when they were seen on a handful of days between March and May (including in Dabob Bay). Transient killer whales have been seen infrequently near NBK Bremerton, including in Dyes Inlet and Sinclair Inlet (*e.g.,* sightings in 2010, 2013, and 2015). Sightings in the vicinity of NBK Keyport have also been infrequent, and no records were found for Rich Passage in the vicinity of NBK Manchester. Transient killer whales have been observed in Possession Sound near NS Everett.

West Coast transient killer whales most often travel in small pods averaging four individuals (Baird and Dill, 1996); however, the most commonly observed group size in Puget Sound (waters east of Admiralty Inlet, including Hood Canal, through South Puget Sound and north to Skagit Bay) from 2004 to 2010 was 6 whales (Houghton *et al.,* 2015).

Killer Whales (Resident)

Critical habitat for southern resident killer whales, designated pursuant to the ESA, includes three specific areas: (1) Summer core area in Haro Strait and waters around the San Juan Islands; (2) Puget Sound; and (3) Strait of Juan de Fuca (71 FR 69054; November 29, 2006). The primary constituent elements essential for conservation of the habitat are: (1) Water quality to support growth and development; (2) Prey species of sufficient quantity, quality, and availability to support individual growth, reproduction, and development, as well as overall population growth; and (3) Passage conditions to allow for migration, resting, and foraging. However, the six naval installations are specifically excluded from the critical habitat designation. A revision to the critical habitat designation is currently under consideration (80 FR 9682; February 24, 2015).

Southern resident killer whales are expected to occur occasionally in the waters surrounding all of the installations except those in Hood Canal, where they have not been reported since 1995 (NMFS, 2006). Southern resident killer whales are rare near NBK Bremerton and Keyport, with the last confirmed sighting in Dyes Inlet in 1997. Southern residents have been observed in Saratoga Passage and Possession Sound near NS Everett.

The stock contains three pods (J, K, and L pods), with pod sizes ranging from approximately 20 (in J pod) to 40 (in L pod) individuals. Group sizes encountered can be smaller or larger if pods temporarily separate or join together. Therefore, some exposure to groups of up to 20 individuals or more could occur over the 5-year duration.

Harbor Porpoise

Harbor porpoises, once very common in Puget Sound, are recovering from a virtual disappearance in the 1970s (Jefferson *et al.,* 2016). Recent opportunistic sightings, strandings, and fisheries bycatches indicate that harbor porpoises have reoccupied much or all of Puget Sound in significant numbers since the 2002–2003. Jefferson *et al.* (2016) conducted aerial surveys throughout Puget Sound from 2013 to 2015 and developed harbor porpoise density estimates for eight stratums. When pooling all seasons, the density of harbor porpoise in southern Puget Sound for the entire year is 0.89 animals/km^2 (see Table 3 in Jefferson *et al.,* 2016).

Marine Mammal Hearing

Hearing is the most important sensory modality for marine mammals underwater, and exposure to anthropogenic sound can have deleterious effects. To appropriately assess the potential effects of exposure to sound, it is necessary to understand the frequency ranges marine mammals are able to hear. Current data indicate that not all marine mammal species have equal hearing capabilities (*e.g.,* Richardson *et al.,* 1995; Wartzok and Ketten, 1999; Au and Hastings, 2008).

To reflect this, Southall *et al.* (2007) recommended that marine mammals be divided into functional hearing groups based on directly measured or estimated hearing ranges on the basis of available behavioral response data, audiograms derived using auditory evoked potential techniques, anatomical modeling, and other data. Note that no direct measurements of hearing ability have been successfully completed for mysticetes (*i.e.,* low-frequency cetaceans). Subsequently, NMFS (2016) described generalized hearing ranges for these marine mammal hearing groups. Generalized hearing ranges were chosen based on the approximately 65 decibel (dB) threshold from the normalized composite audiograms, with the exception for lower limits for low-frequency cetaceans where the lower bound was deemed to be biologically implausible and the lower bound from Southall *et al.* (2007) retained. The functional groups and the associated frequencies are indicated below (note that these frequency ranges correspond to the range for the composite group, with the entire range not necessarily reflecting the capabilities of every species within that group):

- Low-frequency cetaceans (mysticetes): Generalized hearing is estimated to occur between approximately 7 hertz (Hz) and 35 kilohertz (kHz);
- Mid-frequency cetaceans (larger toothed whales, beaked whales, and most delphinids): Generalized hearing is estimated to occur between approximately 150 Hz and 160 kHz;
- High-frequency cetaceans (porpoises, river dolphins, and members of the genera Kogia and Cephalorhynchus; including two members of the genus Lagenorhynchus, on the basis of recent echolocation data and genetic data): Generalized hearing is estimated to occur between approximately 275 Hz and 160 kHz.
- Pinnipeds in water; Phocidae (true seals): Generalized hearing is estimated to occur between approximately 50 Hz to 86 kHz;
- Pinnipeds in water; Otariidae (eared seals): Generalized hearing is estimated to occur between 60 Hz and 39 kHz.

The pinniped functional hearing group was modified from Southall *et al.* (2007) on the basis of data indicating that phocid species have consistently demonstrated an extended frequency range of hearing compared to otariids, especially in the higher frequency range (Hemilä *et al.,* 2006; Kastelein *et al.,* 2009; Reichmuth *et al.,* 2013).

For more detail concerning these groups and associated frequency ranges, please see NMFS (2016) for a review of available information. Seven marine mammal species (four cetacean and three pinniped (two otariid and one phocid) species) have the reasonable potential to co-occur with the proposed survey activities. Please refer to Table 2. Of the cetacean species that may be present, two are classified as low-frequency cetaceans (*i.e.,* all mysticete species), one is classified as mid-frequency cetaceans (*i.e.,* all delphinid and ziphiid species and the sperm whale), and one is classified as high-frequency cetaceans (*i.e.,* harbor porpoise and Kogia spp.).

Potential Effects of Specified Activities on Marine Mammals and Their Habitat

This section includes a summary and discussion of the ways that components of the specified activity may impact marine mammals and their habitat. The ''Estimated Take by Incidental Harassment'' section later in this document includes a quantitative analysis of the number of individuals that are expected to be taken by this activity. The ''Negligible Impact Analysis and Determination'' section considers the content of this section, the ''Estimated Take by Incidental Harassment'' section, and the ''Proposed Mitigation'' section, to draw conclusions regarding the likely impacts of these activities on the reproductive success or survivorship of individuals and how those impacts on individuals are likely to impact marine mammal species or stocks.

Description of Sound Sources

This section contains a brief technical background on sound, on the characteristics of certain sound types, and on metrics used in this proposal inasmuch as the information is relevant to the specified activity and to a discussion of the potential effects of the specified activity on marine mammals found later in this document. For general information on sound and its interaction with the marine environment, please see, *e.g.,* Au and Hastings (2008); Richardson *et al.* (1995); Urick (1983).

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 or corresponding points of a sound wave (length of one cycle). Higher frequency sounds have shorter wavelengths than lower frequency sounds, and typically attenuate (decrease) more rapidly, except in certain cases in shallower water. Amplitude is the height of the sound pressure wave or the ''loudness'' of a sound and is typically described using the relative unit of the dB. A sound pressure level (SPL) in dB is described as the ratio between a measured pressure and a reference pressure (for underwater sound, this is 1 microPascal (μPa)), and is a logarithmic unit that accounts for large variations in amplitude; therefore, a relatively small change in dB corresponds to large changes in sound pressure. The source level (SL) represents the SPL referenced at a distance of 1 meter (m) from the source (referenced to 1 μPa), while the received level is the SPL at the listener's position (referenced to 1 μPa).

Root mean square (rms) is the quadratic mean sound pressure over the duration of an impulse. Root mean square is calculated by squaring all of the sound amplitudes, averaging the squares, and then taking the square root of the average (Urick, 1983). Root mean square 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.

Sound exposure level (SEL; represented as dB re 1 μPa^2-s) represents the total energy in a stated frequency band over a stated time interval or event, and considers both intensity and duration of exposure. The per-pulse SEL is calculated over the time window containing the entire pulse (*i.e.,* 100 percent of the acoustic energy). SEL is a cumulative metric; it can be accumulated over a single pulse, or calculated over periods containing multiple pulses. Cumulative SEL represents the total energy accumulated by a receiver over a defined time window or during an event. Peak sound pressure (also referred to as zero-to-peak sound pressure or 0-pk) is the maximum instantaneous sound pressure measurable in the water at a specified distance from the source, and is represented in the same units as the rms sound pressure.

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 a manner similar to ripples on the surface of a pond and may be either directed in a beam or beams or may radiate in all directions (omnidirectional sources), as is the case for sound produced by the pile driving activity considered here. The compressions and decompressions associated with sound waves are detected as changes in pressure by aquatic life and man-made sound receptors such as hydrophones.

Even in the absence of sound from the specified activity, the underwater environment is typically loud due to ambient sound, which is defined as environmental background sound levels lacking a single source or point (Richardson *et al.,* 1995). The sound level of a region is defined by the total acoustical energy being generated by known and unknown sources. These sources may include physical (*e.g.,* wind and waves, earthquakes, ice, atmospheric sound), biological (*e.g.,* sounds produced by marine mammals, fish, and invertebrates), and anthropogenic (*e.g.,* vessels, dredging, construction) sound. A number of sources contribute to ambient sound, including wind and waves, which are a main source of naturally occurring ambient sound for frequencies between 200 Hz and 50 kHz (Mitson, 1995). In general, ambient sound levels tend to increase with increasing wind speed and wave height. Precipitation can become an important component of total sound at frequencies above 500 Hz, and possibly down to 100 Hz during quiet times. Marine mammals can contribute significantly to ambient sound levels, as can some fish and snapping shrimp. The frequency band for biological contributions is from approximately 12 Hz to over 100 kHz. Sources of ambient sound related to human activity include transportation (surface vessels), dredging and construction, oil and gas drilling and production, geophysical surveys, sonar, and explosions. Vessel noise typically dominates the total ambient sound for frequencies between 20 and 300 Hz. In general, the frequencies of anthropogenic sounds are below 1 kHz and, if higher frequency sound levels are created, they attenuate rapidly.

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

Underwater ambient sound in Puget Sound is comprised of sounds produced by a number of natural and anthropogenic sources and varies both geographically and temporally. Human-generated sound is a significant contributor to the ambient acoustic environment at the installations considered here. The underwater acoustic environment at the Annapolis Ferry Terminal is dependent upon the presence of ferries, other vessel traffic, and construction work occurring at nearby NBK Bremerton and the Manette Bridge. If ferries are approaching or docking, ambient sound levels would be higher than in absence of vessels.

Sounds are often considered to fall into one of two general types: pulsed and non-pulsed (defined in the following). The distinction between these two sound types is important because they have differing potential to cause physical effects, particularly with regard to hearing (*e.g.,* Ward, 1997 in Southall *et al.,* 2007). Please see Southall *et al.* (2007) for an in-depth discussion of these concepts. The distinction between these two sound types is not always obvious, as certain signals share properties of both pulsed and non-pulsed sounds. A signal near a source could be categorized as a pulse, but due to propagation effects as it moves farther from the source, the signal duration becomes longer (*e.g.,* Greene and Richardson, 1988).

Pulsed sound sources (*e.g.,* airguns, explosions, gunshots, sonic booms, impact pile driving) produce signals that are brief (typically considered to be less than one second), broadband, atonal transients (ANSI, 1986, 2005; Harris, 1998; ISO, 2003) and occur either as isolated events or repeated in some succession. Pulsed sounds are all characterized by a relatively rapid rise from ambient pressure to a maximal pressure value followed by a rapid decay period that may include a period of diminishing, oscillating maximal and minimal pressures, and generally have an increased capacity to induce physical injury as compared with sounds that lack these features. Non-pulsed sounds can be tonal, narrowband, or broadband, brief or prolonged, and may be either continuous or intermittent (ANSI, 1995). Some of these non-pulsed sounds can be transient signals of short duration but without the essential properties of pulses (*e.g.,* rapid rise time). Examples of non-pulsed sounds include those produced by vessels, aircraft, machinery operations such as drilling or dredging, vibratory pile driving, and active sonar systems. The duration of such sounds, as received at a distance, can be greatly extended in a highly reverberant environment. The impulsive sound generated by impact hammers is characterized by rapid rise times and high peak levels. Vibratory hammers produce non-impulsive, continuous noise at levels lower than those produced by impact hammers. Further, rise time is not pronounced, reducing the probability and severity of injury, and sound energy is distributed over a greater amount of time (*e.g.,* Nedwell and Edwards, 2002; Carlson *et al.,* 2005).

Acoustic Effects

We previously provided general background information on marine mammal hearing (see *Description of Marine Mammals in the Area of the Specified Activity*). Here, we discuss the potential effects of sound on marine mammals.

Potential Effects of Underwater Sound—Note that, in the following discussion, we refer in many cases to a review article concerning studies of noise-induced hearing loss conducted from 1996–2015 (*i.e.,* Finneran, 2015). For study-specific citations, please see that work. Anthropogenic sounds cover a broad range of frequencies and sound levels and can have a range of highly variable impacts on marine life, from none or minor to potentially severe responses, depending on received levels, duration of exposure, behavioral context, and various other factors. The potential effects of underwater sound from active acoustic sources can potentially result in one or more of the following: temporary or permanent hearing impairment, non-auditory physical or physiological effects, behavioral disturbance, stress, and masking (Richardson *et al.,* 1995; Gordon *et al.,* 2004; Nowacek *et al.,* 2007; Southall *et al.,* 2007; Götz *et al.,* 2009). The degree of effect is intrinsically related to the signal characteristics, received level, distance from the source, and duration of the sound exposure. In general, sudden, high level sounds can cause hearing loss, as can longer exposures to lower level sounds. Temporary or permanent loss of hearing will occur almost exclusively for noise within an animal's hearing range. Below, we describe specific manifestations of acoustic effects before providing discussion specific to pile driving.

Richardson *et al.* (1995) described zones of increasing intensity of effect that might be expected to occur, in relation to distance from a source and assuming that the signal is within an animal's hearing range. First is the area within which the acoustic signal would be audible (potentially perceived) to the animal but not strong enough to elicit any overt behavioral or physiological response. The next zone corresponds with the area where the signal is audible to the animal and of sufficient intensity to elicit behavioral or physiological responsiveness. Third is a zone within which, for signals of high intensity, the received level is sufficient to potentially cause discomfort or tissue damage to auditory or other systems. Overlaying these zones to a certain extent is the area within which masking (*i.e.,* when a sound interferes with or masks the ability of an animal to detect a signal of interest that is above the absolute hearing threshold) may occur; the masking zone may be highly variable in size.

We describe the more severe effects (*i.e.,* certain non-auditory physical or physiological effects) only briefly as we do not expect that there is a reasonable likelihood that pile driving may result in such effects (see below for further discussion). Potential effects from impulsive sound sources can range in severity from effects such as behavioral disturbance or tactile perception to physical discomfort, slight injury of the internal organs and the auditory system, or mortality (Yelverton *et al.,* 1973). Non-auditory physiological effects or injuries that theoretically might occur in marine mammals exposed to high level underwater sound or as a secondary effect of extreme behavioral reactions (*e.g.,* change in dive profile as a result of an avoidance reaction) caused by exposure to sound include neurological effects, bubble formation, resonance effects, and other types of organ or tissue damage (Cox *et al.,* 2006; Southall *et al.,* 2007; Zimmer and Tyack, 2007; Tal *et al.,* 2015). The construction activities considered here do not involve the use of devices such as explosives or mid-frequency tactical sonar that are associated with these types of effects.

NMFS defines threshold shift (TS) as ''a change, usually an increase, in the threshold of audibility at a specified frequency or portion of an individual's hearing range above a previously established reference level'' (NMFS, 2016). Threshold shift can be permanent (PTS) or temporary (TTS). As described in NMFS (2016), there are numerous factors to consider when examining the consequence of TS, including, but not limited to, the signal temporal pattern (*e.g.,* impulsive or non-impulsive), likelihood an individual would be exposed for a long enough duration or to a high enough level to induce a TS, the magnitude of the TS, time to recovery (seconds to minutes or hours to days), the frequency range of the exposure (*i.e.,* spectral content), the hearing and vocalization frequency range of the exposed species relative to the signal's frequency spectrum (*i.e.,* how animal uses sound within the frequency band of the signal; *e.g.,* Kastelein et al. 2014b), and their overlap (*e.g.,* spatial, temporal, and spectral).

Permanent Threshold Shift

NMFS defines PTS as ''a permanent, irreversible increase in the threshold of audibility at a specified frequency or portion of an individual's hearing range above a previously established reference level'' (NMFS, 2016). It is the permanent elevation in hearing threshold resulting from irreparable damage to structures of the inner ear (*e.g.,* sensory hair cells, cochlea) or central auditory system (ANSI, 1995; Ketten 2000). Available data from humans and other terrestrial mammals indicate that a measured 40 dB threshold shift approximates PTS onset (*e.g.,* Kryter *et al.* 1966; Miller 1974; Henderson *et al.* 2008). Unlike TTS, NMFS considers PTS auditory injury and therefore constitutes Level A harassment, as defined in the MMPA.

With the exception of a single study unintentionally inducing PTS in a harbor seal (Kastak *et al.*, 2008), there are no empirical data measuring PTS in marine mammals largely due to the fact that, for various ethical reasons, experiments involving anthropogenic noise exposure at levels inducing PTS are not typically pursued or authorized (NMFS, 2016).

Temporary Threshold Shift

NMFS defines TTS as ''a temporary, reversible increase in the threshold of audibility at a specified frequency or portion of an individual's hearing range above a previously established reference level'' (NMFS, 2016). A TTS of 6 dB is considered the minimum threshold shift clearly larger than any day-to-day or session-to-session variation in a subject's normal hearing ability (Finneran *et al.,* 2000; Finneran *et al.*, 2002, as reviewed in Southall *et al.,* 2007 for a review)). TTS can last from minutes or hours to days (*i.e.,* there is recovery), occur in specific frequency ranges (*i.e.,* an animal might only have a temporary loss of hearing sensitivity between the frequencies of 1 and 10 kHz)), and can be of varying amounts (for example, an animal's hearing sensitivity might be temporarily reduced by only 6 dB or reduced by 30 dB). Depending on the degree (elevation of threshold in dB), duration (*i.e.,* recovery time), and frequency range of TTS, and the context in which it is experienced, TTS can have effects on marine mammals ranging from discountable to serious (similar to those discussed in auditory masking, below). For example, a marine mammal may be able to readily compensate for a brief, relatively small amount of TTS in a non-critical frequency range that takes place during a time when the animal is traveling through the open ocean, where ambient noise is lower and there are not as many competing sounds present. Alternatively, a larger amount and longer duration of TTS sustained during time when communication is critical for successful mother/calf interactions could have more serious impacts. We note that reduced hearing sensitivity as a simple function of aging has been observed in marine mammals, as well as humans and other taxa (Southall *et al.,* 2007), so we can infer that strategies exist for coping with this condition to some degree, though likely not without cost.

Currently, TTS data only exist for four species of cetaceans (bottlenose dolphin (*Tursiops truncatus*), beluga whale (*Delphinapterus leucas*), harbor porpoise, and Yangtze finless porpoise (*Neophocoena asiaeorientalis*)) and three species of pinnipeds (northern elephant seal, harbor seal, and California sea lion) exposed to a limited number of sound sources (*i.e.,* mostly tones and octave-band noise) in laboratory settings (Finneran, 2015). TTS was not observed in trained spotted (*Phoca largha*) and ringed (*Pusa hispida*) seals exposed to impulsive noise at levels matching previous predictions of TTS onset (Reichmuth *et al.,* 2016). In general, harbor seals and harbor porpoises have a lower TTS onset than other measured pinniped or cetacean species (Finneran, 2015). Additionally, the existing marine mammal TTS data come from a limited number of individuals within these species. There are no data available on noise-induced hearing loss for mysticetes. For summaries of data on TTS in marine mammals or for further discussion of TTS onset thresholds, please see Southall *et al.* (2007), Finneran and Jenkins (2012), Finneran (2015), and NMFS (2016).

Behavioral Effects—Behavioral disturbance may include a variety of effects, including subtle changes in behavior (*e.g.,* minor or brief avoidance of an area or changes in vocalizations), more conspicuous changes in similar behavioral activities, and more sustained and/or potentially severe reactions, such as displacement from or abandonment of high-quality habitat. Behavioral responses to sound are highly variable and context-specific and any reactions depend on numerous intrinsic and extrinsic factors (*e.g.,* species, state of maturity, experience, current activity, reproductive state, auditory sensitivity, time of day), as well as the interplay between factors (*e.g.,* Richardson *et al.,* 1995; Wartzok *et al.,* 2003; Southall *et al.,* 2007; Weilgart, 2007; Archer *et al.,* 2010). Behavioral reactions can vary not only among individuals but also within an individual, depending on previous experience with a sound source, context, and numerous other factors (Ellison *et al.,* 2012), and can vary depending on characteristics associated with the sound source (*e.g.,* whether it is moving or stationary, number of sources, distance from the source). Please see Appendices B–C of Southall *et al.* (2007) for a review of studies involving marine mammal behavioral responses to sound.

Habituation can occur when an animal's response to a stimulus wanes with repeated exposure, usually in the absence of unpleasant associated events (Wartzok *et al.,* 2003). Animals are most likely to habituate to sounds that are predictable and unvarying. It is important to note that habituation is appropriately considered as a ''progressive reduction in response to stimuli that are perceived as neither aversive nor beneficial,'' rather than as, more generally, moderation in response to human disturbance (Bejder *et al.,* 2009). 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. As noted, behavioral state may affect the type of response. For example, animals that are resting may show greater behavioral change in response to disturbing sound levels than animals that are highly motivated to remain in an area for feeding (Richardson *et al.,* 1995; NRC, 2003; Wartzok *et al.,* 2003). Controlled experiments with captive marine mammals have 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 airguns or acoustic harassment devices) have been varied but often consist of avoidance behavior or other behavioral changes suggesting discomfort (Morton and Symonds, 2002; see also Richardson *et al.,* 1995; Nowacek *et al.,* 2007). However, many delphinids approach low-frequency airgun source vessels with no apparent discomfort or obvious behavioral change (*e.g.,* Barkaszi *et al.,* 2012), indicating the importance of frequency output in relation to the species' hearing sensitivity.

Available studies show wide variation in response to underwater sound; therefore, it is difficult to predict specifically how any given sound in a particular instance might affect marine mammals perceiving the signal. If a marine mammal does react briefly to an underwater sound by changing its behavior or moving a small distance, the impacts of the change are unlikely to be significant to the individual, let alone the stock or population. However, if a sound source displaces marine mammals from an important feeding or breeding area for a prolonged period, impacts on individuals and populations could be significant (*e.g.,* Lusseau and Bejder, 2007; Weilgart, 2007; NRC, 2005). However, there are broad categories of potential response, which we describe in greater detail here, that include alteration of dive behavior, alteration of foraging behavior, effects to breathing, interference with or alteration of vocalization, avoidance, and flight.

Changes in dive behavior can vary widely and may consist of increased or decreased dive times and surface intervals as well as changes in the rates of ascent and descent during a dive (*e.g.,* Frankel and Clark, 2000; Costa *et al.,* 2003; Ng and Leung, 2003; Nowacek *et al.,* 2004; Goldbogen *et al.,* 2013a, 2013b). Variations in dive behavior may reflect interruptions in biologically significant activities (*e.g.,* foraging) or they may be of little biological significance. The impact of an alteration to dive behavior resulting from an acoustic exposure depends on what the animal is doing at the time of the exposure and the type and magnitude of the response.

Disruption of feeding behavior can be difficult to correlate with anthropogenic sound exposure, so it is usually inferred by observed displacement from known foraging areas, the appearance of secondary indicators (*e.g.,* bubble nets or sediment plumes), or changes in dive behavior. As for other types of behavioral response, the frequency, duration, and temporal pattern of signal presentation, as well as differences in species sensitivity, are likely contributing factors to differences in response in any given circumstance (*e.g.,* Croll *et al.,* 2001; Nowacek *et al.,* 2004; Madsen *et al.,* 2006; Yazvenko *et al.,* 2007). A determination of whether foraging disruptions incur fitness consequences would require information on or estimates of the energetic requirements of the affected individuals and the relationship between prey availability, foraging effort and success, and the life history stage of the animal.

Variations in respiration naturally vary with different behaviors and alterations to breathing rate as a function of acoustic exposure can be expected to co-occur with other behavioral reactions, such as a flight response or an alteration in diving. However, respiration rates in and of themselves may be representative of annoyance or an acute stress response. Various studies have shown that respiration rates may either be unaffected or could increase, depending on the species and signal characteristics, again highlighting the importance in understanding species differences in the tolerance of underwater noise when determining the potential for impacts resulting from anthropogenic sound exposure (*e.g.,* Kastelein *et al.,* 2001, 2005, 2006; Gailey *et al.,* 2007; Gailey *et al.,* 2016).

Marine mammals vocalize for different purposes and across multiple modes, such as whistling, echolocation click production, calling, and singing. Changes in vocalization behavior in response to anthropogenic noise can occur for any of these modes and may result from a need to compete with an increase in background noise or may reflect increased vigilance or a startle response. For example, in the presence of potentially masking signals, humpback whales and killer whales have been observed to increase the length of their songs (Miller *et al.,* 2000; Fristrup *et al.,* 2003; Foote *et al.,* 2004), while right whales have been observed to shift the frequency content of their calls upward while reducing the rate of calling in areas of increased anthropogenic noise (Parks *et al.,* 2007). In some cases, animals may cease sound production during production of aversive signals (Bowles *et al.,* 1994).

Avoidance is the displacement of an individual from an area or migration path as a result of the presence of a sound or other stressors, and is one of the most obvious manifestations of disturbance in marine mammals (Richardson *et al.,* 1995). For example, gray whales are known to change direction—deflecting from customary migratory paths—in order to avoid noise from airgun surveys (Malme *et al.,* 1984). Avoidance may be short-term, with animals returning to the area once the noise has ceased (*e.g.,* Bowles *et al.,* 1994; Goold, 1996; Stone *et al.,* 2000; Morton and Symonds, 2002; Gailey *et al.,* 2007). Longer-term displacement is possible, however, which may lead to changes in abundance or distribution patterns of the affected species in the affected region if habituation to the presence of the sound does not occur (*e.g.,* Blackwell *et al.,* 2004; Bejder *et al.,* 2006; Teilmann *et al.,* 2006).

A flight response is a dramatic change in normal movement to a directed and rapid movement away from the perceived location of a sound source. The flight response differs from other avoidance responses in the intensity of the response (*e.g.,* directed movement, rate of travel). Relatively little information on flight responses of marine mammals to anthropogenic signals exist, although observations of flight responses to the presence of predators have occurred (Connor and Heithaus, 1996). The result of a flight response could range from brief, temporary exertion and displacement from the area where the signal provokes flight to, in extreme cases, marine mammal strandings (Evans and England, 2001). However, it should be noted that response to a perceived predator does not necessarily invoke flight (Ford and Reeves, 2008), and whether individuals are solitary or in groups may influence the response.

Behavioral disturbance can also impact marine mammals in more subtle ways. Increased vigilance may result in costs related to diversion of focus and attention (*i.e.,* when a response consists of increased vigilance, it may come at the cost of decreased attention to other critical behaviors such as foraging or resting). These effects have generally not been demonstrated for marine mammals, but studies involving fish and terrestrial animals have shown that increased vigilance may substantially reduce feeding rates (*e.g.,* Beauchamp and Livoreil). In addition, chronic disturbance can cause population declines through reduction of fitness (*e.g.,* decline in body condition) and subsequent reduction in reproductive success, survival, or both (*e.g.,* Harrington and Veitch, 1992; Daan *et al.,* 1996; Bradshaw *et al.,* 1998). However, Ridgway *et al.* (2006) reported that increased vigilance in bottlenose dolphins exposed to sound over a five-day period did not cause any sleep deprivation or stress effects.

Many animals perform vital functions, such as feeding, resting, traveling, and socializing, on a diel cycle (24-hour cycle). Disruption of such functions resulting from reactions to stressors such as sound exposure are more likely to be significant if they last more than one diel cycle or recur on subsequent days (Southall *et al.,* 2007). Consequently, a behavioral response lasting less than one day and not recurring on subsequent days is not considered particularly severe unless it could directly affect reproduction or survival (Southall *et al.,* 2007). Note that there is a difference between multi-day substantive behavioral reactions and multi-day anthropogenic activities. For example, just because an activity lasts for multiple days does not necessarily mean that individual animals are either exposed to activity-related stressors for multiple days or, further, exposed in a manner resulting in sustained multi-day substantive behavioral responses.

Stress Responses—An animal's perception of a threat may be sufficient to trigger stress responses consisting of some combination of behavioral responses, autonomic nervous system responses, neuroendocrine responses, or immune responses (*e.g.,* Seyle, 1950; Moberg, 2000). In many cases, an animal's first and sometimes most economical (in terms of energetic costs) response is behavioral avoidance of the potential stressor. Autonomic nervous system responses to stress typically involve changes in heart rate, blood pressure, and gastrointestinal activity. These responses have a relatively short duration and may or may not have a significant long-term effect on an animal's fitness.

Neuroendocrine stress responses often involve the hypothalamus-pituitary-adrenal system. Virtually all neuroendocrine functions that are affected by stress—including immune competence, reproduction, metabolism, and behavior—are regulated by pituitary hormones. Stress-induced changes in the secretion of pituitary hormones have been implicated in failed reproduction, altered metabolism, reduced immune competence, and behavioral disturbance (*e.g.,* Moberg, 1987; Blecha, 2000). Increases in the circulation of glucocorticoids are also equated with stress (Romano *et al.,* 2004).

The primary distinction between stress (which is adaptive and does not normally place an animal at risk) and ''distress'' is the cost of the response. During a stress response, an animal uses glycogen stores that can be quickly replenished once the stress is alleviated. In such circumstances, the cost of the stress response would not pose serious fitness consequences. However, when an animal does not have sufficient energy reserves to satisfy the energetic costs of a stress response, energy resources must be diverted from other functions. This state of distress will last until the animal replenishes its energetic reserves sufficient to restore normal function.

Relationships between these physiological mechanisms, animal behavior, and the costs of stress responses are well-studied through controlled experiments and for both laboratory and free-ranging animals (*e.g.,* Holberton *et al.,* 1996; Hood *et al.,* 1998; Jessop *et al.,* 2003; Krausman *et al.,* 2004; Lankford *et al.,* 2005). Stress responses due to exposure to anthropogenic sounds or other stressors and their effects on marine mammals have also been reviewed (Fair and Becker, 2000; Romano *et al.,* 2002b) and, more rarely, studied in wild populations (*e.g.,* Romano *et al.,* 2002a). For example, Rolland *et al.* (2012) found that noise reduction from reduced ship traffic in the Bay of Fundy was associated with decreased stress in North Atlantic right whales. These and other studies lead to a reasonable expectation that some marine mammals will experience physiological stress responses upon exposure to acoustic stressors and that it is possible that some of these would be classified as ''distress.'' In addition, any animal experiencing TTS would likely also experience stress responses (NRC, 2003).

Auditory Masking—Sound can disrupt behavior through masking, or interfering with, an animal's ability to detect, recognize, or discriminate between acoustic signals of interest (*e.g.,* those used for intraspecific communication and social interactions, prey detection, predator avoidance, navigation) (Richardson *et al.,* 1995; Erbe *et al.,* 2016). Masking occurs when the receipt of a sound is interfered with by another coincident sound at similar frequencies and at similar or higher intensity, and may occur whether the sound is natural (*e.g.,* snapping shrimp, wind, waves, precipitation) or anthropogenic (*e.g.,* shipping, sonar, seismic exploration) in origin. The ability of a noise source to mask biologically important sounds depends on the characteristics of both the noise source and the signal of interest (*e.g.,* signal-to-noise ratio, temporal variability, direction), in relation to each other and to an animal's hearing abilities (*e.g.,* sensitivity, frequency range, critical ratios, frequency discrimination, directional discrimination, age or TTS hearing loss), and existing ambient noise and propagation conditions.

Under certain circumstances, marine mammals experiencing significant masking could also be impaired from maximizing their performance fitness in survival and reproduction. Therefore, when the coincident (masking) sound is man-made, it may be considered harassment when disrupting or altering critical behaviors. 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. For example, low-frequency signals may have less effect on high-frequency echolocation sounds produced by odontocetes but are more likely to affect detection of mysticete communication calls and other potentially important natural sounds such as those produced by surf and some prey species. The masking of communication signals by anthropogenic noise may be considered as a reduction in the communication space of animals (*e.g.,* Clark *et al.,* 2009) and may result in energetic or other costs as animals change their vocalization behavior (*e.g.,* Miller *et al.,* 2000; Foote *et al.,* 2004; Parks *et al.,* 2007; Di Iorio and Clark, 2009; Holt *et al.,* 2009). Masking can be reduced in situations where the signal and noise come from different directions (Richardson *et al.,* 1995), through amplitude modulation of the signal, or through other compensatory behaviors (Houser and Moore, 2014). Masking can be tested directly in captive species (*e.g.,* Erbe, 2008), but in wild populations it must be either modeled or inferred from evidence of masking compensation. There are few studies addressing real-world masking sounds likely to be experienced by marine mammals in the wild (*e.g.,* Branstetter *et al.,* 2013).

Masking affects both senders and receivers of acoustic signals and can potentially have long-term chronic effects on marine mammals at the population level as well as at the individual level. 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, with most of the increase from distant commercial shipping (Hildebrand, 2009). All anthropogenic sound sources, but especially chronic and lower-frequency signals (*e.g.,* from vessel traffic), contribute to elevated ambient sound levels, thus intensifying masking.

Potential Effects of the Activity—As described previously (see ''Description of Active Acoustic Sound Sources''), the Navy proposes to conduct pile driving, including impact and vibratory driving. 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. 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 behavioral patterns and/or avoidance of the affected area.

These behavioral changes may include 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 (Richardson *et al.,* 1995).

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 lead to effects on growth, survival, or reproduction, such as drastic changes in diving/surfacing patterns or significant habitat abandonment are extremely unlikely in this area (*i.e.,* shallow waters in modified industrial areas).

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).

Whether impact or vibratory driving, sound sources would be active for relatively short durations, with relation to potential for masking. The frequencies output by pile driving activity are lower than those used by most species expected to be regularly present for communication or foraging. We expect insignificant impacts from masking, and 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.

Anticipated Effects on Marine Mammal Habitat

The proposed activities would not result in permanent impacts to habitats used directly by marine mammals, but may have potential short-term impacts to food sources such as forage fish. The proposed activities could also affect acoustic habitat (see masking discussion above), but meaningful impacts are unlikely. There are no known foraging hotspots, or other ocean bottom structures of significant biological importance to marine mammals present in the marine waters in the vicinity of the project areas. 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 preamble. The most likely impact to marine mammal habitat occurs from pile driving effects on likely marine mammal prey (*i.e.,* fish) near the six installations. Impacts to the immediate substrate during installation and removal of piles are anticipated, but these would be limited to minor, temporary suspension of sediments, which could impact water quality and visibility for a short amount of time, but which would not be expected to have any effects on individual marine mammals. Impacts to substrate are therefore not discussed further.

Effects to Prey—Sound may affect marine mammals through impacts on the abundance, behavior, or distribution of prey species (*e.g.,* crustaceans, cephalopods, fish, zooplankton). Marine mammal prey varies by species, season, and location and, for some, is not well documented. Here, we describe studies regarding the effects of noise on known marine mammal prey.

Fish utilize the soundscape and components of sound in their environment to perform important functions such as foraging, predator avoidance, mating, and spawning (*e.g.,* Zelick *et al.,* 1999; Fay, 2009). Depending on their hearing anatomy and peripheral sensory structures, which vary among species, fishes hear sounds using pressure and particle motion sensitivity capabilities and detect the motion of surrounding water (Fay *et al.,* 2008). The potential effects of noise on fishes depends on the overlapping frequency range, distance from the sound source, water depth of exposure, and species-specific hearing sensitivity, anatomy, and physiology. Key impacts to fishes may include behavioral responses, hearing damage, barotrauma (pressure-related injuries), and mortality.

Fish react to sounds which are especially strong and/or intermittent low-frequency sounds, and behavioral responses such as flight or avoidance are the most likely effects. Short duration, sharp sounds can cause overt or subtle changes in fish behavior and local distribution. The reaction of fish to noise depends on the physiological state of the fish, past exposures, motivation (*e.g.,* feeding, spawning, migration), and other environmental factors. Hastings and Popper (2005) identified several studies that suggest fish may relocate to avoid certain areas of sound energy. Additional studies have documented effects of pile driving on fish, although several are based on studies in support of large, multiyear bridge construction projects (*e.g.,* Scholik and Yan, 2001, 2002; Popper and Hastings, 2009). Several studies have demonstrated that impulse sounds might affect the distribution and behavior of some fishes, potentially impacting foraging opportunities or increasing energetic costs (*e.g.,* Fewtrell and McCauley, 2012; Pearson *et al.,* 1992; Skalski *et al.,* 1992; Santulli *et al.,* 1999; Paxton *et al.,* 2017). However, some studies have shown no or slight reaction to impulse sounds (*e.g.,* Pena *et al.,* 2013; Wardle *et al.,* 2001; Jorgenson and Gyselman, 2009; Cott *et al.,* 2012). More commonly, though, the impacts of noise on fish are temporary.

SPLs of sufficient strength have been known to cause injury to fish and fish mortality. However, in most fish species, hair cells in the ear continuously regenerate and loss of auditory function likely is restored when damaged cells are replaced with new cells. Halvorsen *et al.* (2012a) showed that a TTS of 4 to 6 dB was recoverable within 24 hours for one species. Impacts would be most severe when the individual fish is close to the source and when the duration of exposure is long. Injury caused by barotrauma can range from slight to severe and can cause death, and is most likely for fish with swim bladders. Barotrauma injuries have been documented during controlled exposure to impact pile driving (Halvorsen *et al.,* 2012b; Casper *et al.,* 2013).

The most likely impact to fish from pile driving activities at the project areas would be temporary behavioral avoidance of the area. The duration of fish avoidance of an 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 expected short daily duration of individual pile driving events and the relatively small areas being affected. It is also not expected that the industrial environment around the terminal and nearby Naval installation provides important fish habitat or harbors significant amounts of forage fish.

The area likely impacted by the activities is relatively small compared to the available habitat in inland waters in the region. Any behavioral avoidance by fish of the disturbed area would still leave significantly large areas of fish and marine mammal foraging habitat in the nearby vicinity. As described in the preceding, the potential for Navy construction to affect the availability of prey to marine mammals or to meaningfully impact the quality of physical or acoustic habitat is considered to be insignificant. Effects to habitat will not be discussed further in this document.

Estimated Take

This section provides an estimate of the number of incidental takes proposed for authorization through this IHA, which will inform both NMFS' consideration of ''small numbers'' and the negligible impact determination.

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

Authorized takes would be by Level B harassment only, in the form of disruption of behavioral patterns for individual marine mammals resulting from exposure to pile driving. Based on the nature of the activity and the anticipated effectiveness of the mitigation measures (*i.e.,* shutdown measures—discussed in detail below in Proposed Mitigation section), Level A harassment is neither anticipated nor proposed to be authorized.

As described previously, no mortality is anticipated or proposed to be authorized for this activity. Below we describe how the take is estimated.

Described in the most basic way, we estimate take by considering: (1) Acoustic thresholds above which NMFS believes the best available science indicates marine mammals will be behaviorally harassed or incur some degree of permanent hearing impairment; (2) the area or volume of water that will be ensonified above these levels in a day; (3) the density or occurrence of marine mammals within these ensonified areas; and, (4) and the number of days of activities. Below, we describe these components in more detail and present the proposed take estimate.

Acoustic Thresholds

Using the best available science, NMFS has developed acoustic thresholds that identify the received level of underwater sound above which exposed marine mammals would be reasonably expected to be behaviorally harassed (equated to Level B harassment) or to incur PTS of some degree (equated to Level A harassment).

Level B Harassment for non-explosive sources—Though significantly driven by received level, the onset of behavioral disturbance from anthropogenic noise exposure is also informed to varying degrees by other factors related to the source (*e.g.,* frequency, predictability, duty cycle), the environment (*e.g.,* bathymetry), and the receiving animals (hearing, motivation, experience, demography, behavioral context) and can be difficult to predict (Southall *et al.,* 2007, Ellison *et al.,* 2011). Based on what the available science indicates and the practical need to use a threshold based on a factor that is both predictable and measurable for most activities, NMFS uses a generalized acoustic threshold based on received level to estimate the onset of behavioral harassment. NMFS predicts that marine mammals are likely to be behaviorally harassed in a manner we consider Level B harassment when exposed to underwater anthropogenic noise above received levels of 120 dB re 1 μPa (rms) for continuous (*e.g.*, vibratory pile-driving, drilling) and above 160 dB re 1 μPa (rms) for non-explosive impulsive (*e.g.,* seismic airguns) or intermittent (*e.g.,* scientific sonar) sources. For in-air sounds, NMFS predicts that phocids and otariids exposed above received levels of 90 dB and 100 dB re 20 μPa (rms), respectively, may be behaviorally harassed.

Kitsap Transit's project includes the use of continuous (vibratory pile driving) and impulsive (impact pile driving) sources, and therefore the 120 and 160 dB re 1 μPa (rms) are applicable.

Level A harassment for non-explosive sources—NMFS' Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (Technical Guidance, 2016) identifies dual criteria to assess auditory injury (Level A harassment) to five different marine mammal groups (based on hearing sensitivity) as a result of exposure to noise from two different types of sources (impulsive or non-impulsive). Kitsap Transit's proposed activity includes the use of impulsive (impact pile driving) and non-impulsive (vibratory pile driving) sources.

These thresholds are provided in Table 3. The references, analysis, and methodology used in the development of the thresholds are described in NMFS 2016 Technical Guidance, which may be accessed at: *http://www.nmfs.noaa.gov/pr/acoustics/guidelines.htm.*

TABLE 3—THRESHOLDS IDENTIFYING THE ONSET OF PERMANENT THRESHOLD SHIFT

Hearing group	PTS onset acoustic thresholds * (received level)	
	Impulsive	Non-impulsive
Low-Frequency (LF) Cetaceans	*Cell 1:* $L_{pk,flat}$: 219 dB; $L_{E,LF,24h}$: 183 dB	*Cell 2:* $L_{E,LF,24h}$: 199 dB.
Mid-Frequency (MF) Cetaceans	*Cell 3:* $L_{pk,flat}$: 230 dB; $L_{E,MF,24h}$: 185 dB	*Cell 4:* $L_{E,MF,24h}$: 198 dB.
High-Frequency (HF) Cetaceans	*Cell 5:* $L_{pk,flat}$: 202 dB; $L_{E,HF,24h}$: 155 dB	*Cell 6:* $L_{E,HF,24h}$: 173 dB.
Phocid Pinnipeds (PW) (Underwater)	*Cell 7:* $L_{pk,flat}$: 218 dB; $L_{E,PW,24h}$: 185 dB	*Cell 8:* $L_{E,PW,24h}$: 201 dB.
Otariid Pinnipeds (OW) (Underwater)	*Cell 9:* $L_{pk,flat}$: 232 dB; $L_{E,OW,24h}$: 203 dB	*Cell 10:* $L_{E,OW,24h}$: 219 dB.

* Dual metric acoustic thresholds for impulsive sounds: Use whichever results in the largest isopleth for calculating PTS onset. If a non-impulsive sound has the potential of exceeding the peak sound pressure level thresholds associated with impulsive sounds, these thresholds should also be considered.

Note: Peak sound pressure (L_{pk}) has a reference value of 1 μPa, and cumulative sound exposure level (L_E) has a reference value of 1 μPa^2s. In this Table, thresholds are abbreviated to reflect American National Standards Institute standards (ANSI 2013). However, peak sound pressure is defined by ANSI as incorporating frequency weighting, which is not the intent for this Technical Guidance. Hence, the subscript "flat" is being included to indicate peak sound pressure should be flat weighted or unweighted within the generalized hearing range. The subscript associated with cumulative sound exposure level thresholds indicates the designated marine mammal auditory weighting function (LF, MF, and HF cetaceans, and PW and OW pinnipeds) and that the recommended accumulation period is 24 hours. The cumulative sound exposure level thresholds could be exceeded in a multitude of ways (*i.e.*, varying exposure levels and duration, duty cycle). When possible, it is valuable for action proponents to indicate the conditions under which these acoustic thresholds will be exceeded.

Ensonified Area

Here, we describe operational and environmental parameters of the activity that will feed into identifying the area ensonified above the acoustic thresholds.

Sound Propagation—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:

B = transmission loss coefficient (assumed to be 15)

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

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

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

Sound Source Levels—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. There are source level measurements available for certain pile types and sizes from the specific environment of several of the installations considered here (*i.e.,* NBK Bangor and NBK Bremerton), but not from all. Numerous studies have examined sound pressure levels (SPLs) recorded from underwater pile driving projects in California (*e.g.,* Caltrans, 2015) and elsewhere in Washington. In order to determine reasonable SPLs and their associated effects on marine mammals that are likely to result from pile driving at the six installations, studies with similar properties to the specified activity were evaluated.

No direct pile driving measurements at the Annapolis Ferry Dock are available. Therefore, Kitsap Transit reviewed available values from multiple nearshore marine projects obtained from the California Department of Transportation (Caltrans) using similar type of piles (*e.g.,* size and material) and water depth (Caltrans, 2015). NMFS also evaluated the proposed source levels with respected to pile driving measurements made by the Washington Department of Transportation (WSDOT) at other ferry terminals in Puget Sound as well as measurements collected by the Navy in Puget Sound.

TABLE 4—ESTIMATED PILE DRIVING SOURCE LEVELS

Method	Pile size (inches)	Sound pressure (dB re: 1 µPa)		
		SPL [1] (peak)	SPL (rms) [1]	SEL [1]
Impact	12	192	177	167
	24	207	194	178
Vibratory	12	171	155	155
	24	178	165	165
Vibratory Removal	16.5–18	175	160	160

[1] Source levels presented at standard distance of 10 m from the driven pile. Peak source levels are not typically evaluated for vibratory pile driving, as vibratory driving does not present rapid rise times. SEL source levels for vibratory driving are equivalent to SPL (rms) source levels.

The source levels presented in Table 4 are those proposed by Kitsap Transit and correspond with those found in Caltrans (2015). However, because NMFS recently proposed regulations for the U.S. Navy at multiple sites throughout Puget Sound, including NBK Bremerton located across Sinclair Inlet, NMFS also evaluated source levels used in that proposed rule. The source level provided in the Navy's proposed rule (83 FR 9366; March 5, 2018) for impact pile driving 24-in steel piles is slightly higher than that being used for this proposed IHA. Kitsap Transit proposed a source level of 178 dB SEL for impact pile driving 24-in steel piles in their application while the Navy proposed (and NMFS included in the proposed rule) a source level of 181 dB SEL. However, we accept Kitsap Transit's proposed source levels for two reasons. First, the Navy excluded three projects for which data from 24-in pile driving was available due to a low number of pile strikes and because these projects produced lower SEL values than the two projects considered in the proposed rule. Overall, the mean SEL per any one pile for the two projects considered by the Navy (Bainbridge Island and Friday Harbor) ranged from 176 to 185 dB; however, the three projects not considered (Bangor Test Pile Program, Conoco-Phillips dock, and Deep Water-Tongue Point Facility Pier Repairs) produced SELs ranging from 168 to 177 dB SEL. Second, we accept Kitsap Transit's proposed source levels because they would employ bubble curtains during all impact pile driving which is known to reduce noise levels but we are not accounting for that attenuation in this proposed IHA. Kitsap Transit's proposed source levels for impact pile driving 12-in steel piles and all vibratory pile driving and pile removal correspond to or are slightly greater than those in Caltrans (2015) and the Navy's proposed rule; therefore, we apply them here.

When NMFS Technical Guidance (2016) was published, in recognition of the fact that ensonified area/volume could be more technically challenging to predict because of the duration component in the new thresholds, we developed a User Spreadsheet that includes tools to help predict a simple isopleth that can be used in conjunction with marine mammal density or occurrence to help predict takes. We note that because of some of the assumptions included in the methods used for these tools, we anticipate that isopleths produced are typically going to be overestimates of some degree, which will result in some degree of overestimate of Level A take. However, these tools offer the best way to predict appropriate isopleths when more sophisticated 3D modeling methods are not available, and NMFS continues to develop ways to quantitatively refine these tools, and will qualitatively address the output where appropriate. For stationary sources such as pile driving, NMFS User Spreadsheet predicts the closest distance at which, if a marine mammal remained at that distance the whole duration of the activity, it would not incur PTS. A description of inputs used in the User Spreadsheet, and the resulting isopleths are reported below.

Kitsap Transit estimates it will take a maximum of six hours, per day, to install or remove piles using a vibratory hammer (up to four piles per day). For steel piles that are ''proofed,'' Kitsap Transit estimated approximately 1,000 hammer strikes per pile would be required with two piles installed per day. If piles can be installed completely with the vibratory hammer, Kitsap Transit would not use an impact hammer; however, it is included here as a possibility. A practical spreading model (15logR) was used for all calculation. NMFS considered these inputs when using the NMFS user spreadsheet (Table 5).

TABLE 5—NMFS USER SPREADSHEET INPUTS

Input parameter	Vibratory pile driving	Impact pile driving
Weighting Factor Adjustment [1]	2.5 kHz	2 kHz.
Source Level (SL)	See Table 4 (rms values)	See Table 4 (SEL values).
Duration	6 hours	n/a.
Strikes per pile	n/a	1,000.
Piles per day	n/a	2.
Transmission loss coefficient	15	15.
Distance from SL measurement	10 m	10 m.

[1] For those applicants who cannot fully apply auditory weighting functions associated with the SEL_{cum} metric, NMFS has recommended the default, single frequency weighting factor adjustments (WFAs) provided here. As described in Appendix D of NMFS' Technical Guidance (NMFS, 2016), the intent of the WFA is to broadly account for auditory weighting functions below the 95 frequency contour percentile. Use of single frequency WFA is likely to over-predict Level A harassment distances.

As described above, the Level B harassment threshold for impulsive noise (*e.g.,* impact pile driving) is 160 dB rms. The Level B harassment threshold for continuous noise (*e.g.,* vibratory pile driving) is 120 dB rms.

Distances corresponding to received levels reaching NMFS harassment thresholds are provided in Table 6.

These distances represent the distance at which an animal would have to remain for the entire duration considered (*i.e.,* 6 hours of vibratory pile driving, 2,000 hammer strikes) for the potential onset of PTS to occur. These results do not consider the time it takes to re-set between piles; therefore, it is highly unlikely any species would remain at these distances for the entire duration of pile driving within a day. As a result, these distances represent the calculated outputs of the User Spreadsheet but, in reality, do not reflect a likely scenario for the potential onset of Level A harassment. Regardless, Kitsap Transit has proposed to implement shut-down zones mirroring these calculated outputs to avoid Level A harassment. We have slightly modified them and believe these modifications woulwhile we have proposed simWe Table 6 have also provided the area ensonified to the Level B harassment threshold in Table 6; these areas have been truncated to account for land.

TABLE 6—DISTANCES TO LEVEL A AND B HARASSMENT THRESHOLDS AND AREA ENSONIFIED

Method	Pile size (inches)	Distance to Level A (meters)					Level B (meters)	Level B area (km^2)
		LF cetaceans	MF cetaceans	HF cetaceans	Phocids	Otariids		
Impact (install)	12	136	4.8	162.0	72.8	5.3	136	0.1
	24	735.8	26.2	876.4	393.8	28.7	1,848	5.5
Vibratory (install)	12	9.0	0.8	13.3	5.5	0.4	2,154	6.5
	24	41.7	3.7	61.6	25.3	1.8	10,000	19.2
Vibratory (removal)	16.5–18	19.3	1.7	28.6	11.8	0.8	4,612	14.3

Marine Mammal Occurrence

In this section we provide the information about the presence, density, or group dynamics of marine mammals that will inform the take calculations.

Available information regarding marine mammal occurrence in the vicinity of the Annapolis Ferry Terminal includes density information aggregated in the Navy's Marine Mammal Species Density Database (NMSDD; Navy, 2015) or site-specific survey information from particular installations (*e.g.,* local pinniped counts). More recent density estimates for harbor porpoise are available in Jefferson *et al.* (2016).

Specifically, a density-based analysis is used for the harbor porpoise, Dall's porpoise, and Steller sea lion, while data from site-specific abundance surveys is used for the California sea lion and harbor seal (Table 7).

TABLE 7—DENSITY OR PINNIPED COUNT DATA, BY SPECIES

Species	Density (animals/km^2)	Average daily pinniped count
Harbor seal	1.22	n/a
Steller sea lion	0.036	n/a
California sea lion	n/a	69
Harbor Porpoise	0.89	n/a

Take Calculation and Estimation

Here we describe how the information provided above is brought together to produce a quantitative take estimate.

Kitsap Transit did not request, and we are not proposing, to authorize Level A take of any species. The User Spreadsheet does calculate distances at which Level A take could occur for all pile activity. The largest resulting distances are for the installation of 24-in piles. The calculated distance represents the distance at which an animal would have to remain while exposed to the installation of two piles (with time in between to reset the hammer to the next pile) at 1,000 strikes per pile. In addition, only eight 24-in piles are to be installed for the project. The harbor porpoise Level A harassment distance is 876 m; however, harbor porpoise are likely transiting through the area, if present at all. Harbor seals may remain in the area. Therefore, with the incorporation of the proposed mitigation measures, we do not believe there is a likely potential for Level A take for any species. Further, no take (either Level A or Level B) of humpback whales, gray whales, and killer whales was requested or is proposed to be authorized due to the short duration of the project (17 days), the small amount of piles installed (12) and removed (5), and the incorporation of the proposed mitigation and monitoring measures (see *Mitigation and Monitoring* sections).

The take calculation for harbor seal, Steller sea lion, and harbor porpoise exposures is derived using the following equation: *Level B exposure estimate = species density (see Table 7)* × *ensonified area (based on pile size)* × *number of pile driving days.* Because there would be 5 days of pile removal, four 12 in. piles installed over four days (maximum), and eight 24 in. piles installed over eight days (maximum), we summed each product together to produce a total take estimate. When impact and vibratory hammer use would occur on the same day, the larger Level B ensonifed zone for that day was used. For example, harbor seal exposures due to 12 inch pile driving are calculated as 1.22 animals/$km^2 \times 6.5$ $km^2 \times 4$ days = 32 exposures. Harbor seal exposures due to installing 24 in. piles is 1.22 animals/$km^2 \times 19.2$ $km^2 \times$ 8 days = 187 exposures. Finally, harbor seal exposures due to pile removal is 1.22 animals/$km^2 \times 14.3$ $km^2 \times 5$ days = 87 exposures. Although we anticipate some seals may be exposed more than once, we consider each exposure to constitute a take. Therefore, total estimated take is 306 harbor seals. This process was repeated for Steller sea lions and harbor porpoise using their respective densities (see Table 7).

The calculation for California sea lion exposures is estimated by the following equation: *Level B Exposure estimate = N (estimated animals/day)* × *number of pile driving days.* Because density is not used for this species, we simply assumed 69 sea lions could be taken on any given day of pile driving. Therefore, 69 California sea lion/day × 17 days = 1,173 California sea lion takes.

The total estimated take for all species incidental to 17 days of pile driving is provided in Table 8.

TABLE 8—ESTIMATED TAKE, BY SPECIES AND STOCK, INCIDENTAL TO PILE DRIVING

Species	Stock	Total take (Level B)	Percent of stock
Harbor seal	Southern Puget Sound	306	19.5
Steller sea lion	Eastern DPS	10	0.01
California sea lion	U.S	1,173	0.4
Harbor Porpoise	Washington Inland Waters	224	2.0

Proposed Mitigation

In order to issue an IHA under Section 101(a)(5)(D) of the MMPA, NMFS must set forth the permissible methods of taking pursuant to such activity, and other means of effecting the least practicable impact on such species or stock and its habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of such species or stock for taking for certain subsistence uses (latter not applicable for this action). NMFS regulations require applicants for incidental take authorizations to include information about the availability and feasibility (economic and technological) of equipment, methods, and manner of conducting such activity or other means of effecting the least practicable adverse impact upon the affected species or stocks and their habitat (50 CFR 216.104(a)(11)).

In evaluating how mitigation may or may not be appropriate to ensure the least practicable adverse impact on species or stocks and their habitat, as well as subsistence uses where applicable, we carefully consider two primary factors:

(1) The manner in which, and the degree to which, the successful implementation of the measure(s) is expected to reduce impacts to marine mammals, marine mammal species or stocks, and their habitat. This considers the nature of the potential adverse impact being mitigated (likelihood, scope, range). It further considers the likelihood that the measure will be effective if implemented (probability of accomplishing the mitigating result if implemented as planned) the likelihood of effective implementation (probability implemented as planned). and;

(2) the practicability of the measures for applicant implementation, which may consider such things as cost, impact on operations, and, in the case of a military readiness activity, personnel safety, practicality of implementation, and impact on the effectiveness of the military readiness activity.

Mitigation for Marine Mammals and Their Habitat

Kitsap Transit has proposed a number of mitigation measures designed to minimize the impacts of the project on marine mammals and their habitat. Below is a description of these measures which can also be found in the draft proposed IHA text provided at the end of this document.

For in-water heavy machinery work (*e.g.,* barges, tug boats), a minimum 10 m shutdown zone shall be implemented. If a marine mammal comes within 10 m of such operations, operations shall cease and vessels shall reduce speed to the minimum level required to maintain steerage and safe working conditions.

Kitsap Transit proposes to shut down pile driving if marine mammals for which they requested take enter the Level A harassment zones as calculated in Table 6. However, these distances represent a very long duration (6 hours for pile driving plus an unknown amount of time to re-set piles) during vibratory pile driving. Therefore, we have adjusted the shutdown zones to a more practicable level. We also incorporate the shutdown zones corresponding to Level B harassment for humpback whales, gray whales, and killer whales. Kitsap Transit shall implement shutdown zones as identified in Table 9 to avoid Level A take of seals, sea lions, and harbor porpoise as well as Level A and Level B take of humpback whales, gray whales, and killer whales. Kitsap Transit shall also implement a minimum shutdown zone of a 10 m radius around the pile.

TABLE 9—SHUTDOWN ZONES TO AVOID HEAVY EQUIPMENT INJURY, LEVEL A HARASSMENT, OR LEVEL B HARASSMENT

Species	Shutdown zones (m)				
	Impact 12″	Impact 24″	Vibratory 12″	Vibratory 24″	Vibratory removal
Humpback whale, Gray whale, Killer whale	136	1,848	2,154	10,000	4,612
Harbor porpoise	160	875	13	60	28
Harbor seal	73	390	[1] 10	25	11
Steller sea lion, California sea lion	[1] 10	29	[1] 10	[1] 10	[1] 10

[1] NMFS is proposing a minimum 10 m shutdown zone to avoid potential injury from equipment.

Pre-activity monitoring shall take place from 30 minutes prior to initiation of pile driving activity and post-activity monitoring shall continue through 30 minutes post-completion of pile driving activity. Pile driving may commence at the end of the 30-minute pre-activity monitoring period, provided observers have determined that the shutdown zone (see Table 6) is clear of marine mammals, which includes delaying start of pile driving activities if a marine mammal is sighted in the shutdown zone. A determination that the shutdown zone is clear must be made during a period of good visibility (*i.e.,* the entire shutdown zone and surrounding waters must be visible to the naked eye).

If a marine mammal approaches or enters the shutdown zone during activities or pre-activity monitoring, all pile driving activities at that location shall be halted or delayed, respectively. If pile driving is halted or delayed due to the presence of a marine mammal, the activity may not resume or commence until either the animal has voluntarily left and been visually confirmed beyond the shutdown zone and 15 minutes have passed without re-detection of the animal. Pile driving activities include the time to install or remove a single pile or series of piles, as long as the time elapsed between uses of the pile driving equipment is no more than thirty minutes.

Kitsap Transit shall use soft start techniques when impact pile driving. Soft start requires contractors to provide an initial set of strikes at reduced energy, followed by a thirty-second waiting period, then two subsequent reduced energy strike sets. Soft start shall be implemented at the start of each day's impact pile driving and at any time following cessation of impact pile driving for a period of thirty minutes or longer.

If a species for which authorization has not been granted (including humpback whales, gray whales, and killer whales), or a species for which authorization has been granted but the authorized takes are met, is observed approaching or within the Level B Isopleth (Table 6 and 9), pile driving and removal activities must shut down immediately using delay and shut-down procedures. Activities must not resume until the animal has been confirmed to have left the area or the observation time period has elapsed.

Kitsap Transit shall use a bubble curtain during all impact pile driving. We note the estimated source levels used to calculate Level A harassment zones did not consider any reduction in noise from use of this bubble curtain (*i.e.,* the Level A harassment isopleths consider unattenuated impact pile driving source levels).

Kitsap Transit shall access the Orca Network website each morning prior to in-water construction activities and if pile removal or installation ceases for more than two hours. If marine mammals for which take is not authorized (*e.g.,* killer whales, humpback whales, gray whales) are observed and on a path towards the Level B harassment zone, pile driving shall be delayed until animals are confirmed outside of and on a path away from the Level B harassment zone or if one hour passes with no subsequent sightings.

Kitsap Transit shall implement the use of best management practices (*e.g.,* erosion and sediment control, spill prevention and control) to minimize impacts to marine mammal habitat.

Based on our evaluation of the applicant's proposed measures, NMFS has preliminarily determined that the proposed mitigation measures provide the means effecting the least practicable impact on the affected species or stocks and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance.

Proposed Monitoring and Reporting

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

Monitoring and reporting requirements prescribed by NMFS should contribute to improved understanding of one or more of the following:

- Occurrence of marine mammal species or stocks in the area in which take is anticipated (*e.g.,* presence, abundance, distribution, density).
- Nature, scope, or context of likely marine mammal exposure to potential stressors/impacts (individual or cumulative, acute or chronic), through better understanding of: (1) Action or environment (*e.g.,* source characterization, propagation, ambient noise); (2) affected species (*e.g.,* life history, dive patterns); (3) co-occurrence of marine mammal species with the action; or (4) biological or behavioral context of exposure (*e.g.,* age, calving or feeding areas).
- Individual marine mammal responses (behavioral or physiological) to acoustic stressors (acute, chronic, or cumulative), other stressors, or cumulative impacts from multiple stressors.
- How anticipated responses to stressors impact either: (1) Long-term fitness and survival of individual marine mammals; or (2) populations, species, or stocks.
- Effects on marine mammal habitat (*e.g.,* marine mammal prey species, acoustic habitat, or other important physical components of marine mammal habitat).
- Mitigation and monitoring effectiveness.

For all pile driving activities, at least one protected species observer (PSOs) shall be stationed at the on-shore vantage point at the outer portion of the pier to be retained to monitor and implement shutdown or delay procedures, when applicable, through communication with the equipment operator.

If water conditions exceed a Beaufort level 2, or if visibility is limited by rain or fog, an additional on-shore observer will be positioned at the Bremerton Marina and/or a monitor will patrol the monitoring zone in a boat.

Monitoring of pile driving shall be conducted by qualified PSOs (see below), who shall have no other assigned tasks during monitoring periods. Kitsap Transit shall adhere to the following conditions when selecting observers:

- Independent, dedicated PSOs shall be used (*i.e.,* not construction personnel).
- At least one PSO must have prior experience working as a marine mammal observer during construction activities.
- Other PSOs may substitute education (degree in biological science or related field) or training for experience.
- Where a team of three or more PSOs are required, a lead observer or monitoring coordinator shall be designated. The lead observer must have prior experience working as a marine mammal observer during construction.
- The Kitsap Transit shall submit PSO CVs for approval by NMFS.

Kitsap Transit shall ensure that observers have the following additional qualifications:

- Ability to conduct field observations and collect data according to assigned protocols.
- 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, times, and reason for implementation of mitigation (or why mitigation was not implemented when required); and marine mammal behavior.
- 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.

Kitsap Transit would also be required to submit an annual report summarizing their monitoring efforts, number of animals taken, any implementation of mitigation measures (*e.g.,* shut downs) and abide by reporting requirements contained within the draft IHA at the end of this document.

Negligible Impact Analysis and Determination

NMFS has defined negligible impact 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 (50 CFR 216.103). A negligible impact finding is based on the lack of likely adverse effects on annual rates of recruitment or survival (*i.e.,* population-level effects). An estimate of the number of takes alone is not enough information on which to base an impact determination. In addition to considering estimates of the number of marine mammals that might be ''taken'' through harassment, NMFS considers other factors, such as the likely nature of any responses (*e.g.,* intensity, duration), the context of any responses (*e.g.,* critical reproductive time or location, migration), as well as effects on habitat, and the likely effectiveness of the mitigation. We also assess the number, intensity, and context of estimated takes by evaluating this information relative to population status. Consistent with the 1989 preamble for NMFS's implementing regulations (54 FR 40338; September 29, 1989), the impacts from other past and ongoing anthropogenic activities are incorporated into this analysis via their impacts on the environmental baseline (*e.g.,* as reflected in the regulatory status of the species, population size and growth rate where known, ongoing sources of human-caused mortality, or ambient noise levels).

Pile driving activities associated with the Annapolis Ferry Terminal Project, as described previously, have the potential to disturb or displace marine mammals. Specifically, the specified activities may result in take, in the form of Level B harassment (behavioral disturbance) only from underwater sounds generated from pile driving. Potential takes could occur if individual marine mammals are present in the ensonified zone when pile driving is happening. No serious injury or mortality would be expected even in the absence of the proposed mitigation measures. Further, while Level A harassment potential is calculated, it is based on long exposure durations (6 hours of vibratory pile driving and 2,000 pile strikes); therefore, the true Level A harassment distances, if any, are likely closer than those provided in Table 6. Further, the potential for injury is s is expected to be essentially eliminated through implementation of the planned mitigation measures—use of the bubble curtain for impact driving steel piles, soft start (for impact driving), and shutdown zones. Impact driving, as compared with vibratory driving, has source characteristics (short, sharp pulses with higher peak levels and much sharper rise time to reach those peaks) that are potentially injurious or more likely to produce severe behavioral reactions. Given sufficient notice through use of soft start, marine mammals are expected to move away from a sound source that is annoying prior to its becoming potentially injurious or resulting in more severe behavioral reactions. Environmental conditions in inland waters are expected to generally be good, with calm sea states, and we expect conditions would allow a high marine mammal detection capability, enabling a high rate of success in implementation of shutdowns to avoid injury.

We anticipate individuals exposed to pile driving noise generated at the Annapolis Ferry Terminal will, at most, simply move away from the sound source and be temporarily displaced from the areas of pile driving. The pile driving activities analyzed here are similar to, or less impactful than, numerous other construction activities conducted in the Puget Sound region, which have taken place with no known long-term adverse consequences from behavioral harassment. No pupping or breeding areas are present within the action area. Further, animals are likely somewhat habituated to noise-generating human activity given the proximity to Seattle-Bremerton and Port Orchard ferry lanes, recent construction at NBK Bremerton and the Manette Bridge (both of which involve pile driving), and general recreational, commercial and military vessel traffic. Monitoring reports from the Manette Bridge and NBK Bremerton demonstrate no discernable individual or population level impacts from similar pile driving activities.

In summary and as described above, the following factors primarily support our preliminary determination that the impacts resulting from this activity are not expected to adversely affect the species or stock through effects on annual rates of recruitment or survival:

- No mortality is anticipated or authorized;
- As a result of the nature of the activity in concert with the planned mitigation requirements, injury is not anticipated for any species;
- The anticipated incidents of Level B harassment consist of, at worst, temporary modifications in behavior;
- There is no significant habitat within the industrialized project areas, including known areas or features of special significance for foraging or reproduction; and
- The proposed mitigation measures reduce the effects of the specified activity to the level of least practicable adverse impact.

Based on the analysis contained herein of the likely effects of the specified activity on marine mammals and their habitat, and taking into consideration the implementation of the proposed monitoring and mitigation measures, NMFS preliminarily finds that the total marine mammal take from the proposed activity will have a negligible impact on all affected marine mammal species or stocks.

Small Numbers

As noted above, only small numbers of incidental take may be authorized under Section 101(a)(5)(D) of the MMPA for specified activities other than military readiness activities. The MMPA does not define small numbers and so, in practice, where estimated numbers are available, NMFS compares the number of individuals taken to the most appropriate estimation of abundance of the relevant species or stock in our determination of whether an authorization is limited to small numbers of marine mammals. Additionally, other qualitative factors may be considered in the analysis, such as the temporal or spatial scale of the activities.

We propose to authorize incidental take of four marine mammal stocks. The total amount of taking proposed for authorization is less than 2 percent of the stock of Steller sea lions, California sea lions, and harbor porpoise and less than 20 percent for harbor seals (see Table X). We note that harbor seals takes likely represent multiple exposures of fewer individuals. The amount of take proposed is considered relatively small percentages and we preliminarily find are small numbers of marine mammals relative to the estimated overall population abundances for those stocks.

Based on the analysis contained herein of the proposed activity (including the proposed mitigation and monitoring measures) and the anticipated take of marine mammals, NMFS preliminarily finds that small numbers of marine mammals will be taken relative to the population size of the affected species or stocks.

Unmitigable Adverse Impact Analysis and Determination

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

Endangered Species Act (ESA)

Section 7(a)(2) of the Endangered Species Act of 1973 (ESA: 16 U.S.C. 1531 *et seq.*) requires that each Federal agency insure that any action it authorizes, funds, or carries out is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of designated critical habitat. To ensure ESA compliance for the issuance of IHAs, NMFS consults internally, in this case with the West Coast Region Protected Resources Division Office, whenever we propose to authorize take for endangered or threatened species.

No incidental take of ESA-listed species is proposed for authorization or expected to result from this activity. On April 5, 2018, NMFS WCR issued a Biological Opinion to the Federal Transit Administration concluding the project is not likely to adversely affect Southern Resident killer whales and the Western North Pacific and Central American humpback whale distinct population segments (DPSs). Therefore, NMFS has determined that formal consultation under section 7 of the ESA is not required for this action.

Proposed Authorization

As a result of these preliminary determinations, NMFS proposes to issue an IHA to Kitsap Transit for conducting pile driving and removal in Puget Sound over the course of 17 days, provided the previously mentioned mitigation, monitoring, and reporting requirements are incorporated. This section contains a draft of the IHA itself. The wording contained in this section is proposed for inclusion in the IHA (if issued).

This Incidental Harassment Authorization (IHA) is valid for a period of one year from the date of issuance.

This IHA is valid only for pile driving associated with the Annapolis Ferry Dock Project, Puget Sound.

A copy of this IHA must be in the possession of Kitsap Transit, its designees, and work crew personnel operating under the authority of this IHA.

The species authorized for taking are the harbor seal (*Phoca vitulina richardii*), Steller sea lion (*Eumetopias jubatus monteriensis*), California sea lion (*Zalophus californianu*), and harbor porpoise (*Phocoena phocoena vomerina*).

The taking, by Level B harassment only, is limited to the species listed in Table 8. See Table 8 for numbers of take authorized.

The taking by injury (Level A harassment), serious injury, or death of any of the species listed in condition 3(b) of the Authorization or any taking of any other species of marine mammal is prohibited and may result in the modification, suspension, or revocation of this IHA. Kitsap Transit shall conduct briefings between construction supervisors and crews, marine mammal monitoring team, acoustical monitoring team, and Kitsap Transit staff prior to the start of all pile driving, and when new personnel join the work, in order to explain responsibilities, communication procedures, marine mammal monitoring protocol, and operational procedures.

Mitigation Measures

For in-water heavy machinery work (*e.g.,* barges, tug boats), a minimum 10 m shutdown zone shall be implemented. If a marine mammal comes within 10 m of such operations, operations shall cease and vessels shall reduce speed to the minimum level required to maintain steerage and safe working conditions.

For all pile driving activity, Kitsap Transit shall implement shutdown zones as described in Table 9.

For all pile driving activity, Kitsap Transit shall implement a minimum shutdown zone of a 10 m radius around the pile.

Pre-activity monitoring shall take place from 30 minutes prior to initiation of pile driving activity and post-activity monitoring shall continue through 30 minutes post-completion of pile driving activity. Pile driving may commence at the end of the 30-minute pre-activity monitoring period, provided observers have determined that the shutdown zone (see Table 6) is clear of marine mammals, which includes delaying start of pile driving activities if a marine mammal is sighted in the shutdown zone.

A determination that the shutdown zone is clear must be made during a period of good visibility (*i.e.,* the entire shutdown zone and surrounding waters must be visible to the naked eye).

If a marine mammal approaches or enters the shutdown zone during activities or pre-activity monitoring, all pile driving activities at that location shall be halted or delayed, respectively. If pile driving is halted or delayed due to the presence of a marine mammal, the activity may not resume or commence until either the animal has voluntarily left and been visually confirmed beyond the shutdown zone and 15 minutes have passed without re-detection of the animal. Pile driving activities include the time to install or remove a single pile or series of piles, as long as the time elapsed between uses of the pile driving equipment is no more than thirty minutes.

Kitsap Transit shall use soft start techniques when impact pile driving. Soft start requires contractors to provide an initial set of strikes at reduced energy, followed by a thirty-second waiting period, then two subsequent reduced energy strike sets. Soft start shall be implemented at the start of each day's impact pile driving and at any time following cessation of impact pile driving for a period of thirty minutes or longer.

Kitsap Transit shall access the Orca Network website each morning prior to in-water construction activities and if pile removal or installation ceases for more than two hours. If marine mammals for which take is not authorized (*e.g.,* killer whales, humpback whales, gray whales) are observed and on a path towards the Level B harassment zone, pile driving shall be delayed until animals are confirmed outside of and on a path away from the Level B harassment zone or if one hour passes with no subsequent sightings.

Kitsap Transit shall reduce the transmission of impulsive noise into the marine environment by using a bubble curtain during all impact pile driving.

If a species for which authorization has not been granted, or a species for which authorization has been granted but the authorized takes are met, is observed approaching or within the Level B isopleth, pile driving and removal activities must shut down immediately using delay and shut-down procedures. Activities must not resume until the animal has been confirmed to have left the area or the observation time period has elapsed.

Monitoring and Reporting Measures

Monitoring of pile driving shall be conducted by qualified PSOs (see below), who shall have no other assigned tasks during monitoring periods.

For all pile driving activities, at least one protected species observer (PSOs) shall be stationed at the on-shore vantage point at the outer portion of the pier to be retained to monitor and implement shutdown or delay procedures, when applicable, through communication with the equipment operator.

If water conditions exceed a Beaufort level 2, or if visibility is limited by rain or fog, an additional on-shore observer will be positioned at the Bremerton Marina and/or a monitor will patrol the monitoring zone in a boat.

The PSO shall access the Orca Network each morning prior to in-water construction activities that may produce noise levels above the disturbance threshold and if pile removal or installation ceases for more than two hours.

Kitsap Transit shall adhere to the following conditions when selecting observers:

Independent PSOs shall be used (*i.e.,* not construction personnel).

The PSO must have prior experience working as a marine mammal observer during construction activities.

Kitsap Transit shall submit PSO CVs for approval by NMFS.

Kitsap Transit shall ensure that observers have the following additional qualifications:

Ability to conduct field observations and collect data according to assigned protocols.

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, times, and reason for implementation of mitigation (or why mitigation was not implemented when required); and marine mammal behavior.

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.

In the unanticipated event that the specified activity clearly causes the take of a marine mammal in a manner prohibited by this IHA, such as an serious injury, or mortality, Kitsap Transit shall immediately cease the specified activities and report the incident to the Office of Protected Resources (301–427–8401), NMFS, and the West Coast Region Stranding Coordinator (1–866–767–6114), NMFS. The report must include the following information:

Time and date of the incident;

Description of the incident;

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

Description of all marine mammal observations and active sound source use in the 24 hours preceding the incident;

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

Fate of the animal(s); and

Photographs or video footage of the animal(s).

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

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

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

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

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

Renewals—On a case-by-case basis, NMFS may issue a second one-year IHA without additional notice when (1) another year of identical or nearly identical activities as described in the Specified Activities section is planned or (2) the activities would not be completed by the time the IHA expires and a second IHA would allow for completion of the activities beyond that described in the Dates and Duration section, provided all of the following conditions are met:

A request for renewal is received no later than 60 days prior to expiration of the current IHA.

The request for renewal must include the following:

An explanation that the activities to be conducted beyond the initial dates either are identical to the previously analyzed activities or include changes so minor (*e.g.,* reduction in pile size) that the changes do not affect the previous analyses, take estimates, or mitigation and monitoring requirements.

A preliminary monitoring report showing the results of the required monitoring to date and an explanation showing that the monitoring results do not indicate impacts of a scale or nature not previously analyzed or authorized.

Upon review of the request for renewal, the status of the affected species or stocks, and any other pertinent information, NMFS determines that there are no more than minor changes in the activities, the mitigation and monitoring measures remain the same and appropriate, and the original findings remain valid.

Request for Public Comments

We request comment on our analyses, the proposed authorization, and any other aspect of this Notice of Proposed IHA for Kitsap Transit's proposed Annapolis Ferry Terminal upgrades. We also request comment on the potential for renewal of this proposed IHA as described in the paragraph below. Please include with your comments any supporting data or literature citations to help inform our final decision on the request for MMPA authorization.

On a case-by-case basis, NMFS may issue a second one-year IHA without additional notice when (1) another year of identical or nearly identical activities as described in the Specified Activities section is planned or (2) the activities would not be completed by the time the IHA expires and a second IHA would allow for completion of the activities beyond that described in the *Dates and*

Duration section, provided all of the following conditions are met:

• A request for renewal is received no later than 60 days prior to expiration of the current IHA.

• The request for renewal must include the following:

(1) An explanation that the activities to be conducted beyond the initial dates either are identical to the previously analyzed activities or include changes so minor (*e.g.,* reduction in pile size) that the changes do not affect the previous analyses, take estimates, or mitigation and monitoring requirements.

(2) A preliminary monitoring report showing the results of the required monitoring to date and an explanation showing that the monitoring results do not indicate impacts of a scale or nature not previously analyzed or authorized.

• Upon review of the request for renewal, the status of the affected species or stocks, and any other pertinent information, NMFS determines that there are no more than minor changes in the activities, the mitigation and monitoring measures remain the same and appropriate, and the original findings remain valid.

Dated: May 10, 2018.

Elaine T. Saiz,

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

[FR Doc. 2018–10385 Filed 5–15–18; 8:45 am]

BILLING CODE 3510–22–P

DEPARTMENT OF EDUCATION

Applications for New Award; Center To Improve Social and Emotional Learning and School Safety—Cooperative Agreement

AGENCY: Office of Elementary and Secondary Education, Department of Education.

ACTION: Notice.

SUMMARY: The Department of Education (Department) is issuing a notice inviting applications for a new award for fiscal year (FY) 2018 for the Center To Improve Social and Emotional Learning and School Safety (Center)—Cooperative Agreement, Catalog of Federal Domestic Assistance (CFDA) number 84.424B.

DATES:

Applications Available: May 16, 2018.

Deadline for Transmittal of Applications: July 2, 2018.

Deadline for Intergovernmental Review: August 29, 2018.

ADDRESSES: For the addresses for obtaining and submitting an application, please refer to our Common Instructions for Applicants to Department of Education Discretionary Grant Programs, published in the **Federal Register** on February 12, 2018 (83 FR 6003) and available at *www.gpo.gov/fdsys/pkg/FR-2018-02-12/pdf/2018-02558.pdf.*

FOR FURTHER INFORMATION CONTACT: Eve Birge, U.S. Department of Education, 400 Maryland Avenue SW, Room 3C147, Washington, DC 20202–6450. Telephone: (202) 453–6717. Email: *eve.birge@ed.gov.*

If you use a telecommunications device for the deaf (TDD) or a text telephone (TTY), call the Federal Relay Service (FRS), toll free, at 1–800–877–8339.

SUPPLEMENTARY INFORMATION:

Full Text of Announcement

I. Funding Opportunity Description

Purpose of Program: The purpose of the Center is to provide technical assistance to support States and districts in the implementation of social and emotional learning evidence-based (as defined in this notice) programs and practices. The Center will enhance the capacity of (1) State educational agencies (SEAs) to support their local educational agencies (LEAs) and (2) LEAs to support their schools.

Background: The Center will be supported by funds reserved for Title IV, Part A technical assistance and capacity building, pursuant to section 4103(a)(3) of the Elementary and Secondary Education Act of 1965 (ESEA).[1]

Positive social and emotional skills and abilities help students attain and apply knowledge and attitudes that enhance personal development, social relationships, and ethical behavior.[2] These skills and abilities help inform how students relate to each other and adults.

Research shows that how students interact with their peers and teachers, approach their schoolwork, and form beliefs about learning has implications on how they perform in the classroom.[3] Evidence-based programs and practices (EBPPs) designed to foster social and emotional learning (SEL) are associated with positive outcomes ranging from better test scores and higher graduation rates to improved social behavior.[4]

A recent meta-study of 82 school-based, universal SEL interventions involving nearly 100,000 students found that SEL benefits youth development, including improved social and emotional skills, attitudes, indicators of well-being, and increased graduation rates.[5] Benefits were similar regardless of students' race, socioeconomic background, or school location.

Another study analyzed the economic impact of six SEL programs and found that on average, every dollar invested yields $11 in long-term benefits, ranging from improved mental and physical health, reduced juvenile crime, and higher lifetime earnings.[6]

But implementation is not always consistent. When there is not adequate training or understanding by implementers, assessment of efficacy, or accountability, it can jeopardize positive student impacts.[7] The technical assistance described in this notice will support States and districts by enhancing their capacity to successfully implement EBPPs.

For the purpose of this notice inviting applications, SEL includes developing and maintaining positive relationships with peers and adults; using self-control; building social skills, including recognizing and managing emotions in oneself; understanding others' emotions and perspectives; making responsible

[1] In December 2015, Congress enacted the Every Student Succeeds Act (ESSA), which reauthorized the ESEA. Therefore, for purposes of this notice, unless otherwise indicated, all references to the ''ESEA'' are to the ''ESEA, as amended by the ESSA.''

[2] Weissberg, R.P., & O'Brien, M.U. (2004). What works in school-based social and emotional learning programs for positive youth development. *The ANNALS of the American Academy of Political and Social Science, 591(1),* 86–97.

[3] Durlak, J.A., Weissberg, R.P., Dymnicki, A.B., Taylor, R.D. & Schellinger, K.B. (2011). The impact of enhancing students' social and emotional learning: A meta-analysis of school-based universal interventions. Child Development, January/February 2011, Volume 82, Number 1, 405–432. Retrieved at: *www.casel.org/wp-content/uploads/2016/06/meta-analysis-child-development-1.pdf.*

[4] Payton, J., Weissberg, R.P., Durlak, J.A., Dymnicki, A.B., Taylor, R.D., Schellinger, K.B., & Pachan, M. (2008). The positive impact of social and emotional learning for kindergarten to eighth-grade students: Findings from three scientific reviews. Chicago, IL: Collaborative for Academic, Social, and Emotional Learning. Retrieved at: *www.casel.org/wp-content/uploads/2016/08/PDF-4-the-positive-impact-of-social-and-emotional-learning-for-kindergarten-to-eighth-grade-students-executive-summary.pdf.*

[5] Taylor, R.D., *Oberle, E., Durlak, J.A.,* & *Weissberg, R.P.* (2017). Promoting positive youth development through school-based social and emotional learning interventions: A meta-analysis of follow-up effects. *Child Development,* 88(4):1156–1171. doi: 10.1111/cdev.12864.

[6] Belfield, C., Bowden, B., Klapp, A., Levin, H., Shand, R., & Zander, S. (2015). *The Economic Value of Social and Emotional Learning.* New York, NY: Center for Benefit-Cost Studies in Education. Retrieved at: *http://cbcse.org/wordpress/wp-content/uploads/2015/02/SEL-Revised.pdf.*

[7] Evans, R., Murphy, S., & Scourfield, J. Implementation of a school-based social and emotional learning intervention: Understanding diffusion processes within complex systems. *Prevention Science.* 2015;16(5):754–764. doi:10.1007/s11121–015–0552–0.