accordance with sections 751(a)(1) and 777(i) of the Act and 19 CFR 351.221(b)(5).

Dated: October 30, 2019.

Jeffrey I. Kessler,

Assistant Secretary for Enforcement and Compliance.

Appendix

List of Topics Discussed in the Issues and Decision Memorandum

[FR Doc. 2019–24219 Filed 11–5–19; 8:45 am]

BILLING CODE 3510–DS–P

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

RIN 0648–XR043

Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to Astoria Waterfront Bridge Replacement Phase 2 Project

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

ACTION: Notice; proposed incidental harassment authorization; request for comments on proposed authorization and possible renewal.

SUMMARY: NMFS has received a request from the City of Astoria (City) for authorization to take marine mammals incidental to pile driving and construction work in Astoria, OR. 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 is also requesting comments on a possible one-year renewal that could be issued under certain circumstances and if all requirements are met, as described in *Request for Public Comments* at the end of this notice. 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 December 6, 2019.

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.Davis@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/national/marine-mammal-protection/incidental-take-authorizations-construction-activities* 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: Leah Davis, 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/national/marine-mammal-protection/incidental-take-authorizations-construction-activities.* In case of problems accessing these documents, please call the contact listed above.

SUPPLEMENTARY INFORMATION:

Background

The MMPA prohibits the ''take'' of marine mammals, with certain exceptions. 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 incidental take authorization may be provided to the public for review.

Authorization for incidental takings shall be granted if NMFS finds that the taking will have a negligible impact on the species or stock(s) and will not have an unmitigable adverse impact on the availability of the species or stock(s) for taking for subsistence uses (where relevant). Further, NMFS must prescribe the permissible methods of taking and other ''means of effecting the least practicable adverse impact'' on the affected species or stocks and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of such species or stocks for taking for certain subsistence uses (referred to in shorthand as ''mitigation''); and requirements pertaining to the mitigation, monitoring and reporting of such takings are set forth.

The definitions of all applicable MMPA statutory terms cited above are included in the relevant sections below.

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 June 3, 2019 NMFS received a request from the City of Astoria (City) for an IHA to take marine mammals incidental to pile driving and construction work in Astoria, Oregon. The application was deemed adequate and complete on October 17, 2019. The

City's request is for take of a small number of California sea lion (*Zalophus californianus*) and harbor seal (*Phoca vitulina richardii*) by Level A and Level B harassment, and a small number of Steller sea lion (*Eumetopias jubatus*) by Level B harassment only. Neither the City nor NMFS expects serious injury or mortality to result from this activity, and, therefore, an IHA is appropriate.

This proposed IHA would cover one year of a larger, two-year project that involves removal and replacement of six bridges on the Astoria, Oregon waterfront. NMFS previously issued an IHA to the City for removal and replacement of three bridges (83 FR 19243, May 2, 2018). The City complied with all the requirements (*e.g.,* mitigation, monitoring, and reporting) of the previous IHA and information regarding their monitoring results may be found in the Proposed Monitoring and Mitigation Section. The monitoring report exposed the need for clarification of monitoring requirements, specifically those involving Protected Species Observer (PSO) coverage of Level A and Level B zones. NMFS has clarified those requirements with the applicant.

Description of Proposed Activity

Overview

The City of Astoria, Oregon proposes to remove and replace three bridges connecting 6th, 8th, and 10th Streets with waterfront piers near the mouth of the Columbia River. The bridges are currently supported by decayed timber piles. Among all three bridges, an estimated 150 timber piles will be removed as will other timber structural elements and concrete footings. 65 temporary 36-inch steel casings will be installed to help guide the installation of 65 permanent 24-inch steel piles. Pile driving and removal activities will be conducted using a vibratory and impact hammer. The contractor may need to conduct preboring inside of the temporary casings using a vibratory hammer and a 14-inch H-pile to prepare the new pile sites. In the event that preboring is not effective, the contractor may conduct down-the-hole drilling inside of the 36-inch piles to prepare the site for the permanent piles. It is unlikely that the contractor will need to conduct down-the-hole drilling, as it was not necessary during Phase 1. The roadway and railway superstructures will also be replaced, and a temporary, above-water work platform will be created for the construction. The use of vibratory and impact hammers for pile driving and site preparation is expected to produce underwater sound at levels that may result in behavioral harassment or auditory injury of marine mammals. Human presence and use of general construction equipment may also lead to behavioral harassment of sea lions hauled out along the riverbank below the bridges.

The impacted area extends outward from the three bridge sites to a maximum distance of 21.54 km (13.28 mi). The project will occur over one year beginning in December 2019, with in-water activities expected to occur over an estimated 21 days during the months of November through April.

Dates and Duration

The IHA will be effective from December 2019 to October 2020. Project work is expected to begin in November 2019 with concurrent above-water and in-water demolition activities. In-water activities will be conducted during the Oregon Department of Fish and Wildlife-prescribed in-water work period (IWWP) for the Lower Columbia River (November–February). The IWWP is imposed to protect the following species: MAR (various marine species of fish), SHL (various marine shell fish), CHF (Chinook salmon, fall), CHS (Chinook salmon, spring), SS (sockeye salmon), CO (coho salmon), STW (steelhead winter), STS (steelhead summer), CT (cutthroat trout—including sea run). It is possible that the City will request an IWWP extension through April. In-water construction activities will occur intermittently over the entire proposed IWWP, and above-water work is expected to occur during the IWWP and over the remainder of the IHA period. Work will take place over approximately 21 in-water work days, and 11 days per month for over-water activities.

Specific Geographic Region

The project site is located in the Baker Bay-Columbia River sub-watershed near the mouth of the Columbia River. This section of the lower Columbia River represents the most saline portion of the river's estuarine environment. Tidal influence extends 146 miles upriver to the Bonneville Dam (LCEP, 2016). The Columbia River is over nine miles wide in the area around Astoria and contains multiple islands, buoys, and sandbars that marine mammals utilize to haul out. The upland portions of the region of activity have been highly altered by human activities, with substantial shoreline development and remnants of historical development. This includes thousands of timber piles, overwater buildings, a railroad trestle, and vehicular bridges. The downtown Astoria waterfront is a busy area for pedestrians, vehicles, and boats. In addition to onshore development, the lower Columbia River is utilized by various types of vessels, including cargo ships, dredging vessels, fishing vessels, trawlers, pollution control vessels, and search and rescue vessels, among others. The remainder of the region of activity is located within the river channel within the intertidal and subtidal zones. The substrate in this area is primarily made up of historical rip rap and other rocks/cobbles.

All in-water construction will occur in the intertidal and subtidal zones. Some piles may be removed and installed completely in the dry while others may be in water more than 75 percent of the time.

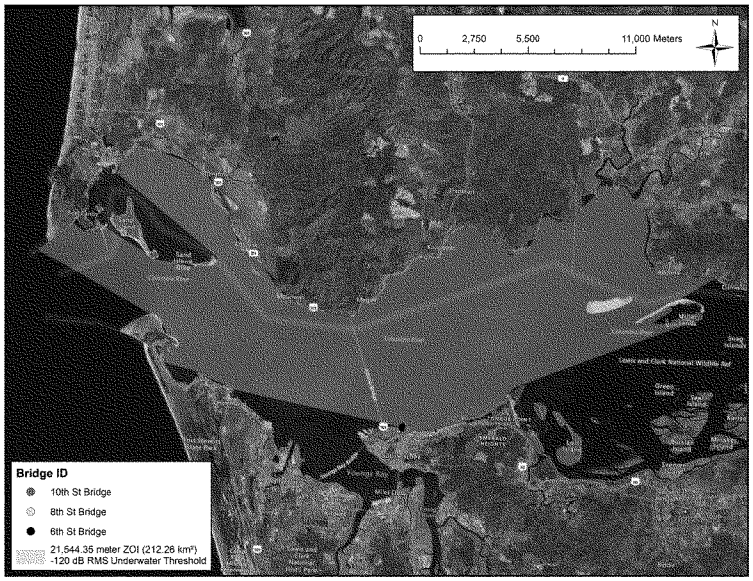

Figure 1: Project footprint in the lower Columbia River.

Detailed Description of Specific Activity

Phase two of the project involves the removal and replacement of three bridges connecting 6th, 8th, and 10th Streets to waterfront piers.

Demolition Activities—Demolition of the existing bridge crossings will require the removal of the bridge decks and other above-ground components for the trestle crossings and roadway approaches. Demolition of the superstructures will likely be accomplished using standard roadway and bridge construction equipment, including an excavator, backhoe, jackhammer, and concrete and chain saws, as well as a crane will be used to remove larger timber elements. Source levels for these equipment are included in Table 1. Source levels are mostly based on acoustic data collected during the City of San Diego Lifeguard Station Demolition and Construction Monitoring project. All equipment will be operated from the existing roadway, trestle, and upland areas, and removed materials will be hauled off-site to an approved upland location for disposal.

TABLE 1—SUPERSTRUCTURE CONSTRUCTION EQUIPMENT SOUND SOURCE LEVELS

Equipment	Peak source level (dB root mean squared (RMS)) at 20 meters)	Reference
Air Compressor	78	WSDOT, 2016.
Backhoe	78	Hanan & Associates, 2014.
Chain Saw	78	
Concrete Saw	93	
Crane	89	
Excavator	91	
Generator Powered Jackhammer	87	
Hand Tools	85	

Construction activities associated with removal of the roadway approach superstructures will be situated away from the river. Buildings and other above-grade structures will reduce noise by physically blocking it and reflecting it away from the river, due to structural noise reduction (FHWA, 2011). The pier structures will also block noise from reaching the river and bank areas by deflecting it upwards. Based on the sound levels produced by the proposed equipment, existing site conditions, the likely location of the pinnipeds within the area in relation to the associated construction activities, and Phase 1 monitoring, removal of the roadway approach superstructures is not expected to disturb nearby marine mammals, and will not be considered further.

At each of the three bridge sites, the City will remove approximately 50 existing 14-inch timber piles (Table 2) using a vibratory hammer and via direct pull. Abandoned, cutoff timber piles that are located within close proximity to proposed pile locations will also be removed. Old pilings are often in very poor condition near and above the ground surface, making attachment to the pilings for extraction very difficult. Old vertical piles and other obstructions encountered near the surface may need to be extracted or cut below the ground surface elevation per Federal Aid Highway Program (FAHP) programmatic criteria. Due to uncertainty in the precise timing of extraction, and therefore the tidal state, all piles are assumed to be in-water during removal in effort to conduct a conservative analysis of the project impacts.

The City estimates it will remove approximately 15 additional structural elements at each bridge site, consisting of the timber columns, bottom plates, lower braces and/or cross bracings. These elements will be removed during low tides and will not require the use of a vibratory hammer. Standard construction equipment will be used to remove these elements.

In addition to the timber substructures, an estimated seven concrete footings will need to be extracted, two at the 8th Street bridge, and five at the 10th Street bridge. It is anticipated that the contractor will use an excavator, positioned on the existing roadway or adjacent gravel/asphalt parking areas, to reach down and remove the concrete footings. If the vertical or horizontal distance makes a footing unreachable, the contractor will likely drill an anchor into the concrete then attach the crane to the anchor with a chain and pull upwards to extract the concrete. The existing concrete footings are located just below/above the MHHW elevation, so this work is likely to occur in the dry during low tides.

The contractor will set up temporary work containment systems to catch debris during demolition activities. Selection of the appropriate equipment and design of the work containment systems is the responsibility of the contractor; however, additional pilings to support these structures are not anticipated as the contractor will utilize the existing substructure to support them.

Site Preparation for New Bridges—A total of 65 permanent, 24-inch steel piles are proposed for this project, as well as installation and removal of 65 temporary 36-inch steel casings (Table 2). The contractor is likely to create a template to facilitate pile installation. The template will consist of a grid pattern in-line with the existing boardwalk grade comprised of steel H-piles and steel angle iron/channels, among other materials. The template will guide the vibratory installation of 36-inch temporary casings at the locations of all new 24-inch steel piles.

A variety of large debris and fill may be present at the pile sites, given the history of the area, results from the preliminary geotechnical investigation during which most of the borings encountered riprap, and Phase 1 construction. To avoid inducing unacceptable vibration levels on adjacent structures, the contractor may predrill the piling locations to an elevation of about ±3 feet below mean sea level (msl); though the need to predrill will be determined on-site once the contractor has identified the exact pile locations. Predrilling work, also referred to as down-the-hole drilling, would be conducted inside the 36-inch temporary casings, and no sediment will be removed from within the temporary casing during this site preparation activity. The source level for down-the-hole drilling (166.2dB RMS SPL, Denes *et al.,* 2016) is below the source level for vibratory installation of 36″ piles (Table 6). Predrilling was not required during Phase 1 of the project, and the applicant considers it unlikely for this phase; therefore, the analysis for vibratory installation of 36-inch piles was used to estimate the Level B harassment zone for potential down-the-hole drilling, and the impact installation of 24-inch piles was used to estimate the Level A harassment zone. (See additional explanation in the *Ensonified Area* section below.) If pre-drilling is not required, the contractor may use a 14-inch H-pile equipped with a torched point at the end to break up the ground at each piling location using the vibratory hammer. The H-pile site preparation was used in Phase 1. The contractor may also manually remove riprap and other obstructions from the riverbed and banks, if such materials prohibit the installation of the temporary casings and permanent pilings.

Bridge Design—The 6th Street Bridge will require a total of 21 plumb piles. Estimated pile depths range from −74 to −77 feet below msl. The trestle crossing will consist of two end bents and one interior bent each consisting of three piles. The trolley bridge will be constructed using precast concrete tee beams. The roadway approach will consist of two bents supported by a total of 12 steel piles, with a pre-cast prestressed slab bridge.

The 8th Street Bridge will consist of a total of 23 plumb piles. Estimated pile depths range from 84 to −85 feet below msl. The trestle crossing will consist of two end bents, one comprised of four piles and the other composed of three piles, and one interior bent comprised of four piles. The trolley bridge will be constructed using precast concrete tee beams. The roadway approach will consist of two bents supported by a total of 12 steel piles, with a pre-cast prestressed slab bridge.

The 10th Street Bridge will consist of a total of 21 plumb piles. Estimated pile depth is -64 feet below msl. The trestle crossing will consist of two end bents and one interior bent each comprised of three piles. The trolley bridge will be constructed using precast concrete tee beams. The roadway approach will consist of two bents, each constructed on six piles for a total of 12 piles, with a pre-cast prestressed slab bridge.

Bridge Construction—The contractor will install a temporary 36-inch casing at the site of each of the 65 permanent, 24-inch piles. The temporary casings will be installed to a depth of approximately 7 feet below the ground surface elevation using a vibratory hammer. The permanent piles will be installed inside the casings, and will be driven open-ended into very soft siltstone and mudstone to develop the required axial resistance using a vibratory hammer followed by a diesel impact hammer. It is estimated that the contractor will be able to advance the permanent piles to roughly 80 percent of the desired depth using the vibratory hammer, then will use the diesel hammer to seat the piles at the desired depths.

TABLE 2—PILINGS EXPECTED TO BE REMOVED AND INSTALLED AT EACH BRIDGE

Bridge	Timber piles removed	36-inch temporary steel casings (each installed and removed)	24-inch steel piles to be installed
6th Street Bridge	50	21	21
8th Street Bridge	50	23	23
10th Street Bridge	50	21	21
Total	150	65	65

The contractor has six temporary casings on-site, so they will need to remove the casing once the permanent 24-inch piles are advanced to a low enough depth with the vibratory hammer that the casing prohibits driving the 24-inch pile with the diesel impact hammer. Removal of the temporary casings will be completed using a vibratory hammer. The removed pile will then be positioned elsewhere within the template to guide additional pile installation. All bridge construction equipment will be operated from the existing roadway and upland areas.

It is anticipated that the contractor may employ two crews during construction. These crews would work concurrently at two different bridge sites to keep the project on schedule. Implications for project analysis and potential take are discussed in the *Ensonified Area* section, below.

Abutment Wingwalls—Wingwalls will need to be constructed at the 10th Street crossing to help contain the roadway approach fill. The wingwalls will be cast-in-place concrete retaining walls. Construction of the wingwalls will require the operation of general construction equipment (see Table 1 for source levels). The contractor will first excavate existing ground to the desired elevation using an excavator and dump truck positioned on the existing roadway. Then the contractor will frame the wall using pneumatic tools or hammer and nails. Once framed, concrete will be poured into the frame and allowed to cure. It is anticipated that the contractor will be able to do this work in the dry; however, the contractor will install isolation measures when necessary. All equipment will be operated from the existing roadway and upland areas.

Superstructures—The rail superstructures are comprised of precast, prestressed slabs with a 2-inch wearing surface. Possible construction equipment includes a crane, excavator, concrete saw, and concrete mixer. Source levels are included in Table 1.

Roadway improvements will consist of curb and sidewalk construction, asphalt paving, inlet construction, and utility relocates. The roadway work will be completed using standard roadway construction equipment, such as excavators and backhoes, dump trucks, pavers, and rollers. Other equipment that may be employed includes air compressors, jack hammers, concrete pumps and mixers, and pneumatic tools. (See Table 1 for above-water equipment source levels). The work will be conducted landward of the trolley crossings, will not require IWW, and equipment will be operated away from the river. In-air noise produced by roadway construction equipment will range from 78 dB RMS to 93 dB RMS at 20 meters from the source (Hanan & Associates, 2014).

Buildings and other above-grade structures will reduce noise during roadway construction by physically blocking it and reflecting it away from the river, due to structural noise reduction (FHWA, 2011). The pier structures will also block noise from reaching the river and bank areas by deflecting it upwards. Additionally, noise levels from much of the construction equipment used for removal of the existing superstructures are no different than many of the existing noise sources in the area. Based on the sound levels produced by the proposed equipment, existing site conditions, the likely location of the pinnipeds within the area in relation to the associated construction activities, and Phase 1 monitoring, roadway improvements are not expected to disturb nearby marine mammals, and will not be considered further.

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 (SARs; *https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessments*) 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 3 lists all species with expected potential for occurrence in Astoria 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. For some species, this geographic area may extend beyond U.S. waters. For Steller sea lion (*Eumetopias jubatus*) the stock abundance is the best estimate of pup and non-pup counts, which have not been corrected to account for animals at sea during abundance surveys. All managed stocks in this region are assessed in NMFS's U.S. 2018 SARs (*e.g.,* Caretta *et al.* 2019). All values presented in Table 3 are the most recent available at the time of publication and are available in the 2018 SARs (Caretta *et al.* 2019, Muto *et al.* 2019).

TABLE 3—SPECIES WITH EXPECTED POTENTIAL FOR OCCURRENCE IN ASTORIA

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 Balaenopteridae (rorquals)						
Humpback whale	*Megaptera novaeangliae.*	*Central North Pacific*	*-, -, Y*	*10,103 (0.300, 7,891, 2006).*	*83*	*26*

TABLE 3—SPECIES WITH EXPECTED POTENTIAL FOR OCCURRENCE IN ASTORIA—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]
Humpback whale	*Megaptera novaeangliae*.	*California/Oregon/ Washington*.	*-, -, Y*	*2,900 (0.05, 2,784, 2014)*.	*16.7*	*>= 40.2*
Order Carnivora—Superfamily Pinnipedia						
Family Otariidae (eared seals and sea lions)						
California sea lion	*Zalophus californianus*.	U.S	-, -, N	257,606 (N/A, 233,515, 2014).	14,011	>=321
Steller sea lion	*Eumetopias jubatus*	Eastern U.S	-, -, N	41,638 (See SAR, 41,638, 2015).	2498	108
Family Phocidae (earless seals)						
Pacific harbor seal	*Phoca vitulina richardii*.	Oregon/Washington Coast.	-, -, N	Unknown (Unknown, Unknown, 1999).	Undetermined	10.6

[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 online at: *www.nmfs.noaa.gov/pr/sars/*. CV is coefficient of variation; Nmin is the minimum estimate of stock abundance. In some cases, CV is not applicable [explain if this is the case].

[3] These values, found in NMFS's SARs, represent annual levels of human-caused mortality plus serious injury from all sources combined (*e.g.,* commercial fisheries, ship strike). Annual M/SI often cannot be determined precisely and is in some cases presented as a minimum value or range. A CV associated with estimated mortality due to commercial fisheries is presented in some cases.

Note—Italicized species are not expected to be taken or proposed for authorization.

All species that could potentially occur in the proposed survey areas are included in Table 3. However, the temporal and spatial occurrence of humpback whales is such that take is not expected to occur, and they are not discussed further beyond the explanation provided here. Humpback whales occasionally enter the Columbia River to feed (Calambokidis, *et al.,* 2017), however their presence is rare. They were not observed during Phase 1 of the City's project (OBEC Consulting Engineers. 2019), and are not expected during Phase 2.

California sea lions

California sea lions are distributed throughout the Eastern North Pacific from central Mexico to southeast Alaska, with breeding areas restricted primarily to island areas off southern California (the Channel Islands), Baja California, and in the Gulf of California (Wright *et al.,* 2010). There are five genetically distinct geographic populations of California sea lions in U.S. waters (Schramm *et al.,* 2009). In Oregon, California sea lions are from the Pacific Temperate population, and commonly occur in Oregon from September through May (ODFW, 2015). The estimated net productivity rate for the species is 7 percent annually (Laake *et al.,* 2018). Threats to this species include incidental catch and entanglement in fishing gear, such as gillnets; gunshot wounds and other human-caused injuries; entanglement in marine debris; and oil exposure (Caretta *et al.,* 2019).

Almost all California sea lions in the Pacific Northwest are sub-adult or adult males (NMFS, 2008). California sea lions feed in the Columbia River and adjacent nearshore marine areas, and have been observed near several bridge crossings within the project site. They are often seen swimming around underneath the existing structures, and commonly use these areas when transiting from known temporary haul-outs and foraging sites in the river channel. A small group haul out at the Buoy Beer facility near the 8th Street bridge location. However, their primary haulout in Astoria is the East Mooring Basin, which is located over one mile (1.6km) upstream from the project site.

The bulk of the construction activities coincide with the season of lowest California sea lion abundance in the Columbia River basin. However, the in-water work period includes the tail end of peak usage of the lower Columbia River by California sea lions. Additionally, construction of the new rail superstructures will be partially above the high mean tide elevation which is directly above the river banks where California sea lions may be temporarily hauled-out.

Steller sea lions

The Steller sea lion range extends along the Pacific Rim, from northern Japan to central California (Loughlin *et al.,* 1984). Steller sea lions inhabiting U.S. waters are divided into two stocks, the Western U.S. stock and the Eastern U.S. stock. Steller sea lions that occur within the Lower Columbia River are part of the Eastern U.S. sock. The Eastern U.S. stock was de-listed in 2013 following a population growth from 18,000 in 1979 to 70,000 in 2010 (and an estimated annual growth of 4.18 percent) (NMFS, 2013). Threats to Steller sea lions include: Boat/ship strikes, contaminants/pollutants, habitat degradation, illegal hunting/shooting, offshore oil and gas exploration, and interactions (direct and indirect) with fisheries (NOAA, 2016b).

Steller sea lions are present year-round at the mouth of the Columbia River, and they are at their peak in the lower river from September through March. The primary haulout point is on the top of South Jetty (ten miles downstream from the project site). At the South Jetty, typical single day counts are approximately 100 individuals, while at Phoca Rock/ Bonneville Dam, there are approximately 40 individuals in a single day (Susan Riemer, pers. comm., 2016). Steller sea lions feed in both the Columbia River and adjacent nearshore marine areas. The timing of this

construction project coincides with peak presence of Steller sea lions but they are not known to haul out near the project site. Steller sea lions may be swimming past the project site in the main channel of the river, however, no Steller sea lions were observed within the region of activity during Phase 1 construction.

Harbor seals

On the U.S. west coast, Pacific harbor seals (*Phoca vitulina richardii*) range from Alaska to Baja California, Mexico (ODFW, 2015). Three separate harbor seal populations are recognized on the U.S. west coast: California Stock, Washington Inland Waters Stock, and Oregon/Washington Coast Stock (Caretta *et al.,* 2019). In 1999, the Oregon/Washington Coast stock abundance was estimated to be 24,732. However, the data used to publish that abundance was eight years old at the time and no more recent stock abundance estimates exist (Caretta *et al.,* 2019). The Oregon/Washington Coast stock of harbor seals is not listed under the ESA nor are they considered depleted or strategic under the MMPA.

Harbor seals utilize specific shoreline locations on a regular basis as haulouts including beaches, rocks, floats, and buoys. They must rest at haulout locations to regulate body temperature, interact with one another, and sleep (NOAA, 2016a). Harbor seals are present throughout the year at the mouth of the Columbia River and adjacent nearshore marine areas. They are infrequently present at the Astoria Mooring Basin, but they are known to transit through the main river channel past the project site. Their closest haulout and pupping area is Desdemona Sands which is downstream of the Astoria-Megler Bridge. Pupping occurs from Mid-April to July, outside of the proposed project work period (Susan Riemer, pers. comm., 2016). Due to their year-round occurrence in the Columbia River, harbor seals are likely to be found transiting the area during in-water construction.

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 (2018) 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. Marine mammal hearing groups and their associated hearing ranges are provided in Table 4.

TABLE 4—MARINE MAMMAL HEARING GROUPS

[NMFS, 2018]

Hearing group	Generalized hearing range *
Low-frequency (LF) cetaceans (baleen whales)	7 Hz to 35 kHz.
Mid-frequency (MF) cetaceans (dolphins, toothed whales, beaked whales, bottlenose whales)	150 Hz to 160 kHz.
High-frequency (HF) cetaceans (true porpoises, *Kogia,* river dolphins, cephalorhynchid, *Lagenorhynchus cruciger* & *L. australis*).	275 Hz to 160 kHz.
Phocid pinnipeds (PW) (underwater) (true seals)	50 Hz to 86 kHz.
Otariid pinnipeds (OW) (underwater) (sea lions and fur seals)	60 Hz to 39 kHz.

* Represents the generalized hearing range for the entire group as a composite (*i.e.,* all species within the group), where individual species' hearing ranges are typically not as broad. Generalized hearing range chosen based on ~65 dB threshold from normalized composite audiogram, with the exception for lower limits for LF cetaceans (Southall et al. 2007) and PW pinniped (approximation).

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 and Holt, 2013).

For more detail concerning these groups and associated frequency ranges, please see NMFS (2018) for a review of available information. Three marine mammal species (all pinnipeds) have the reasonable potential to co-occur with the proposed construction activities. Of those pinniped species, two are otariids (Steller sea lion and California sea lion) and one is a phocid (harbor seal). Please refer to Table 3.

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

Sound travels in waves, the basic components of which are frequency, wavelength, velocity, and amplitude. Frequency is the number of pressure waves that pass by a reference point per unit of time and is measured in hertz (Hz) or cycles per second. Wavelength is the distance between two peaks of a sound wave; lower frequency sounds have longer wavelengths than higher frequency sounds. Amplitude is the

height of the sound pressure wave or the 'loudness' of a sound and is typically measured using the decibel (dB) scale. A dB is the ratio between a measured pressure (with sound) and a reference pressure (sound at a constant pressure, established by scientific standards). It is a logarithmic unit that accounts for large variations in amplitude; therefore, relatively small changes in dB ratings correspond to large changes in sound pressure. When referring to sound pressure levels (SPLs; the sound force per unit area), sound is referenced in the context of underwater sound pressure to 1 microPascal (µPa). One Pascal is the pressure resulting from a force of one Newton exerted over an area of one square meter. The source level (SL) represents the sound level at a distance of 1 m from the source (referenced to 1 µPa). The received level is the sound level at the listener's position. Note that all underwater sound levels in the document are referenced to a pressure of 1 µPa and all airborne sound levels in this document are referenced to a pressure of 20 µPa.

Root mean square (rms) is the quadratic mean sound pressure over the duration of an impulse. Rms is calculated by squaring all of the sound amplitudes, averaging the squares, and then taking the square root of the average (Urick 1983). Rms accounts for both positive and negative values; squaring the pressures makes all values positive so that they may be accounted for in the summation of pressure levels (Hastings and Popper, 2005). This measurement is often used in the context of discussing behavioral effects, in part because behavioral effects, which often result from auditory cues, may be better expressed through averaged units than by peak pressures. When underwater objects vibrate or activity occurs, sound-pressure waves are created. These waves alternately compress and decompress the water as the sound wave travels. Underwater sound waves radiate in all directions away from the source (similar to ripples on the surface of a pond), except in cases where the source is directional. The compressions and decompressions associated with sound waves are detected as changes in pressure by aquatic life and man-made sound receptors such as hydrophones.

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

A number of sources contribute to ambient sound, including the following (Richardson *et al.,* 1995):

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

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

In-water construction activities associated with the Project include impact pile driving, vibratory pile removal and driving, potential down-the-hole drilling (included in vibratory pile removal and driving analysis), and potential preboring using an H-pile. The sounds produced by these activities fall into one of two general sound types: pulsed and non-pulsed (defined in the following). The distinction between these two sound types is important because they have differing potential to cause physical effects, particularly with regard to hearing (*e.g.,* Ward 1997 in Southall *et al.,* 2007). Please see Southall *et al.,* (2007) for an in-depth discussion of these concepts. Pulsed sound sources (*e.g.,* impact pile driving) produce signals that are brief (typically considered to be less than one second), broadband, atonal transients (ANSI 1986; Harris 1998; NIOSH 1998; ISO 2003; ANSI 2005) and occur either as isolated events or repeated in some succession. Pulsed sounds are all characterized by a relatively rapid rise from ambient pressure to a maximal pressure value followed by a rapid decay period that may include a period of diminishing, oscillating maximal and minimal pressures, and generally have an increased capacity to induce physical injury as compared with sounds that lack these features. Non-pulsed sounds can be tonal, narrowband or broadband, brief or prolonged, and may be continuous or non-continuous (ANSI 1995; NIOSH 1998). Some of these non-pulsed sounds can be transient signals of short duration without the essential properties of pulses (*e.g.,* rapid rise time). Examples of non-pulsed sounds include those produced by vessels, aircraft, machinery operations such as drilling or dredging, vibratory pile driving, and active sonar systems (such as those used by the U.S. Navy). The duration of such sounds, as received at a distance, can be greatly extended in a highly reverberant environment. Impact

hammers operate by repeatedly dropping a heavy piston onto a pile to drive the pile into the substrate.

Sound generated by impact hammers is characterized by rapid rise times and high peak levels, a potentially injurious combination (Hastings and Popper, 2005). Vibratory hammers install piles by vibrating them and allowing the weight of the hammer to push them into the sediment. Vibratory hammers produce significantly less sound than impact hammers. Peak SPLs may be 180 dB or greater, but are generally 10 to 20 dB lower than SPLs generated during impact pile driving of the same-sized pile (Oestman *et al.,* 2009). Rise time is slower, reducing the probability and severity of injury, and sound energy is distributed over a greater amount of time (Nedwell and Edwards, 2002; Carlson *et al.,* 2005). Drilling would be conducted inside of the hollow 36-inch casings. The pulsing sounds produced by the down-the-hole drilling methods are continuous, however, this method likely increases sound attenuation because the noise is primarily contained within the steel pile and below ground, rather than impact hammer driving methods which occur at the top of the pile (R&M, 2016).

The likely or possible impacts of the City's proposed activity on marine mammals could involve both non-acoustic and acoustic stressors. Potential non-acoustic stressors could result from the physical presence of the equipment and personnel; however, any impacts to marine mammals are expected to primarily be acoustic in nature. Acoustic stressors include effects of heavy equipment operation during site preparation and pile installation and removal, and use of above-water construction equipment.

Acoustic Impacts

The introduction of anthropogenic noise into the aquatic environment from pile driving and removal is the primary means by which marine mammals may be harassed from the City's specified activity. In general, animals exposed to natural or anthropogenic sound may experience physical and psychological effects, ranging in magnitude from none to severe (Southall *et al.,* 2007). In general, exposure to pile driving and drilling noise has the potential to result in auditory threshold shifts and behavioral reactions (*e.g.,* avoidance, temporary cessation of foraging and vocalizing, changes in dive behavior). Exposure to anthropogenic noise can also lead to non-observable physiological responses such an increase in stress hormones. Additional noise in a marine mammal's habitat can mask acoustic cues used by marine mammals to carry out daily functions such as communication and predator and prey detection. The effects of pile driving and drilling noise on marine mammals are dependent on several factors, including, but not limited to, sound type (*e.g.,* impulsive vs. non-impulsive), the species, age and sex class (*e.g.,* adult male vs. mom with calf), duration of exposure, the distance between the pile and the animal, received levels, behavior at time of exposure, and previous history with exposure (Wartzok *et al.,* 2004; Southall *et al.,* 2007). Here we discuss physical auditory effects (threshold shifts) followed by behavioral effects and potential impacts on habitat.

NMFS defines a noise-induced 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, 2018). The amount of threshold shift is customarily expressed in dB. A TS can be permanent or temporary. As described in NMFS (2018), 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 (Kastelein *et al.,* 2014)), and the overlap between the animal and the source (*e.g.,* spatial, temporal, and spectral).

Permanent Threshold Shift (PTS)—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 2018). Available data from humans and other terrestrial mammals indicate that a 40 dB threshold shift approximates PTS onset (see Ward *et al.,* 1958, 1959; Ward 1960; Kryter *et al.,* 1966; Miller, 1974; Ahroon *et al.,* 1996; Henderson *et al.,* 2008). PTS levels for marine mammals are estimates, as 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, 2018).

Temporary Threshold Shift (TTS)—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, 2018). Based on data from cetacean TTS measurements (see Southall *et al.,* 2007), 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 (Schlundt *et al.,* 2000; Finneran *et al.,* 2000, 2002). As described in Finneran (2015), marine mammal studies have shown the amount of TTS increases with cumulative sound exposure level (SEL_{cum}) in an accelerating fashion: At low exposures with lower SEL_{cum}, the amount of TTS is typically small and the growth curves have shallow slopes. At exposures with higher SEL_{cum}, the growth curves become steeper and approach linear relationships with the noise SEL.

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 (*Phocoena phocoena*), and Yangtze finless porpoise (*Neophocoena asiaeorientalis*)) and five species of pinnipeds 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. No data are 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 Table 5 in NMFS (2018). Installing piles requires a combination of impact pile driving and vibratory pile driving. For the project, these activities would not occur at the same time and there would likely be pauses in activities producing the sound during each day. Given these pauses and that many marine mammals are likely moving through the action area and not remaining for extended periods of time, the potential for TS declines.

Behavioral Harassment—Exposure to noise from site preparation activities and pile driving and removal also has the potential to behaviorally disturb marine mammals. 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).

Disturbance may result in 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. Pinnipeds may increase their haul out time, possibly to avoid in-water disturbance (Thorson and Reyff, 2006). 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). In general, pinnipeds seem more tolerant of, or at least habituate more quickly to, potentially disturbing underwater sound than do cetaceans, and generally seem to be less responsive to exposure to industrial sound than most cetaceans. Please see Appendices B–C of Southall *et al.* (2007) for a review of studies involving marine mammal behavioral responses to sound.

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.

During Phase 1 of the Astoria Waterfront Bridge Replacement project, the City documented observations of marine mammals during construction activities (*i.e.,* pile driving and removal) at the bridge sites (see 83 FR 19243 for Final IHA **Federal Register** notice). In the marine mammal monitoring report, 604 California sea lions were observed within the behavioral disturbance zone (4204 takes when extrapolated across unobserved construction days) during pile driving activities (*i.e.,* documented as Level B harassment take). Behavioral reactions were observed in only five percent of the observed California sea lions, and included travel towards and away from construction activities. 53 harbor seals were also observed within the behavioral disturbance zone (323 takes when extrapolated across unobserved construction days), however very few behavioral reactions were observed by protected species observers (PSOs). Given that the projects sites in Phase 2 are adjacent to those in Phase 1, and the fact the same species are involved, we expect similar behavioral responses of marine mammals to the specified activity. That is, disturbance, if any, is likely to be temporary and localized (*e.g.,* small area movements).

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). 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.,* pile driving, 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. Masking of natural sounds can result when human activities produce high levels of background sound at frequencies important to marine mammals. Conversely, if the background level of underwater sound is high (*e.g.,* on a day with strong wind and high waves), an anthropogenic sound source would not be detectable as far away as would be possible under quieter conditions and would itself be masked. The Lower Columbia River is used by various types of vessels, including cargo ships, dredging vessels, fishing vessels, and pollution control vessels, among others; therefore, background sound levels in the area are sometimes already elevated.

Airborne Acoustic Effects—Pinnipeds that occur near the project site could be exposed to airborne sounds associated

with pile driving and removal that have the potential to cause behavioral harassment, depending on their distance from pile driving activities. Cetaceans are not expected to be exposed to airborne sounds that would result in harassment as defined under the MMPA.

Airborne noise is primarily an issue for pinnipeds that are swimming or hauled out near the project site within the range of noise levels exceeding the acoustic thresholds. We recognize that pinnipeds in the water could be exposed to airborne sound that may result in behavioral harassment when looking with their heads above water. Most likely, airborne sound would cause behavioral responses similar to those discussed above in relation to underwater sound. For instance, anthropogenic sound could cause hauled-out pinnipeds to exhibit changes in their normal behavior, such as reduction in vocalizations, or cause them to temporarily abandon the area and move further from the source. During in-water activities, these animals would previously have been 'taken' because of exposure to underwater sound above the behavioral harassment thresholds, which are, in all cases, larger than those associated with airborne sound. However, this project includes above-water work that occurs near California sea lion haulouts, and there is potential for above-water work to result in behavioral harassment of these hauled out animals.

Marine Mammal Habitat Effects

The City's construction activities could have localized, temporary impacts on marine mammal habitat by increasing in-water sound pressure levels and slightly decreasing water quality. In-water construction activities are of short duration and would likely have temporary impacts on marine mammal habitat through increases in underwater sound and minor visual disturbance due to the construction. Increased noise levels may affect acoustic habitat (see masking discussion above) and adversely affect marine mammal prey in the vicinity of the project area (see discussion below). During impact pile driving and potential site preparation activities, elevated levels of underwater noise would ensonify the river where both fish and mammals may occur and could affect foraging success.

In-water pile driving and pile removal would also cause short-term effects on water quality due to increased turbidity. The City would employ standard construction best management practices, thereby reducing any impacts. Considering the nature and duration of the effects, combined with the measures to reduce turbidity, the impact from increased turbidity levels is expected to be discountable.

In-Water Construction Effects on Potential Foraging Habitat

The area likely impacted by the project is relatively small compared to the available habitat in the surrounding waters of the Columbia River and Pacific Ocean. Pile installation and removal may temporarily increase turbidity resulting from suspended sediments. Any increases would be temporary, localized, and minimal. In general, turbidity associated with pile installation is localized to about a 25-foot radius around the pile (Everitt *et al.,* 1980). Based on monitoring results from Phase 1, pinnipeds in the project area would likely be traveling through and could avoid localized areas of turbidity. Therefore, the impact from increased turbidity levels is expected to be discountable to marine mammals. Furthermore, pile driving and removal at the project site would not obstruct movements or migration of marine mammals.

Avoidance by potential prey (*i.e.,* fish) of the immediate area due to the temporary loss of this foraging habitat is also possible. The duration of fish avoidance of this area after pile driving stops is unknown, but a rapid return to normal recruitment, distribution and behavior is anticipated. Any behavioral avoidance by fish of the disturbed area would still leave significantly large areas of fish and marine mammal foraging habitat in the nearby vicinity. Impacts to habitat and prey are expected to be temporary and minimal based on the short duration of activities.

In-Water Construction Effects on Potential Prey (Fish)

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

The most likely impact to fish from pile driving and drilling activities at the project area would be temporary behavioral avoidance of the area. The duration of fish avoidance of this area after pile driving stops is unknown, but a rapid return to normal recruitment, distribution and behavior is anticipated. In general, impacts to marine mammal prey species are expected to be minor and temporary due to the short timeframe for the project. Uncertainty regarding direct and indirect effects on prey species will be mitigated due to the seasonal presence of salmonids and other prey present in the area, and the mitigation measures in place to reduce impacts to fish under Federal Aid Highway Program (FAHP). Further, it is anticipated that some of the pile driving activities will occur in the dry, despite the conservative project analysis that assumes all pile driving would occur in-water. Sound attenuation devices will be installed for in-water pile driving.

Construction activities, in the form of increased turbidity, have the potential to adversely affect fish in the project area. Increased turbidity is expected to occur in the immediate vicinity (on the order of 10 feet or less) of construction activities. However, suspended sediments and particulates are expected to dissipate quickly within a single tidal cycle. Given the limited area affected and high tidal dilution rates, any effects on fish are expected to be minor or negligible. In addition, best management practices would be in effect, which would limit the extent of turbidity to the immediate project area.

In summary, given the large areas of fish and marine mammal foraging habitat in the Columbia River outside of the ensonified area, and the anticipated rapid return to the project area following cessation of in-water work, pile driving and site preparation activities associated with the proposed action are not likely to have a permanent, adverse effect on any fish habitat, or populations of fish species. Thus, we conclude that impacts of the specified activity are not likely to have more than short-term adverse effects on any prey habitat or populations of prey species. Further, any impacts to marine mammal habitat are not expected to result in significant or long-term consequences for individual marine mammals, or to contribute to adverse impacts on their populations.

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 primarily be by Level B harassment, as use of the vibratory and impact pile hammers, potential drill, and other construction equipment has the potential to result in disruption of behavioral patterns for individual marine mammals. There is also some potential for auditory injury (Level A harassment) to California sea lions and harbor seals because they are more likely to occur closer to the project site, particularly considering the small, nearby California sea lion haulout. Auditory injury is unlikely to occur to other groups, and the proposed mitigation and monitoring measures are expected to minimize the severity of such taking to the extent practicable.

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

Generally speaking, 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. We note that while these basic factors can contribute to a basic calculation to provide an initial prediction of takes, additional information that can qualitatively inform take estimates is also sometimes available (*e.g.,* previous monitoring results or average group size). Below, we describe the factors considered here 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). Thresholds have also been developed identifying the received level of in-air sound above which exposed pinnipeds would likely be behaviorally harassed.

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.,* 2012). 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 harbor seals exposed above received levels of 90 dB re 20 µPa (rms) will be behaviorally harassed, and other pinnipeds will be harassed when exposed above 100 dB re 20 µPa (rms).

The City's proposed activity includes the use of continuous (vibratory pile driving, preboring and potential down-the-hole drilling) and impulsive (impact pile driving) sources, and therefore the 120 and 160 dB re 1 µPa (rms) are applicable for in-water noise.

Level A harassment for non-explosive sources—NMFS' Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (Version 2.0) (Technical Guidance, 2018) 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). The City's proposed activities include the use of impulsive (impact hammers) and non-impulsive (vibratory hammers, potential down-the-hole drilling) sources.

These thresholds are provided in the table below. The references, analysis, and methodology used in the development of the thresholds are described in NMFS 2018 Technical Guidance, which may be accessed at *https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-acoustic-technical-guidance*.

TABLE 5—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.

TABLE 5—THRESHOLDS IDENTIFYING THE ONSET OF PERMANENT THRESHOLD SHIFT—Continued

Hearing group	PTS onset acoustic thresholds * (received level)	
	Impulsive	Non-impulsive
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 1μPa²s. 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 durations, 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, which include source levels and transmission loss coefficient.

The sound field in the project area is the existing background noise plus additional construction noise from the proposed project. Marine mammals are expected to be affected via sound generated by the primary components of the project (*i.e.,* impact pile driving, vibratory pile driving and removal, site preparation). The maximum (underwater) area ensonified above the thresholds for behavioral harassment referenced above is 21.53km (13.38 mi) into the river channel during vibratory installation/removal of the 36-inch temporary steel casings, though this distance does not account for tide levels. There is a chance that pile installation work could be done during low tides, where exposed sand bars could significantly reduce the Level B ZOI.

The project includes vibratory removal of timber piles, vibratory and impact pile installation of steel pipe piles and site preparation using a vibratory hammer and H-pile. Source levels of pile installation/removal activities and site preparation are based on reviews of measurements of the same or similar types and dimensions of piles available in the literature. Source levels for each pile size and driving method are presented in Table 6. Source levels for vibratory installation and removal of piles of the same diameter are assumed to be the same.

The source level for vibratory removal of timber piles is from in-water measurements generated by the Greenbusch Group (2018) from the Seattle Pier 62 project (83 FR 39709; April 10, 2018). Hydroacoustic monitoring results from Pier 62 determined unweighted rms ranging from 140 dB to 169 dB. NMFS analyzed source measurements at different distances for all 63 individual timber piles that were removed at Pier 62 and normalized the values to 10 m. The results showed that the median is 152 dB SPLrms.

TABLE 6—SOUND SOURCE LEVELS FOR IN-WATER ACTIVITIES

Pile size/type	Method	Source level (at 10m)			Literature source
		dB RMS	dB SEL [b]	dB peak	
14-inch Timber	Vibratory	152			The Greenbusch Group, Inc (2018).
14-inch Steel H-pile	Vibratory	150			WSDOT (2016).
24-inch Steel Pipe	Vibratory	162			WSDOT (2010).
	Impact	[a] 187	[a] 171	[a] 200	WSDOT (2016).
36-inch Steel Pipe	Vibratory	170			CA Dept. of Transportation (2015).

[a] Includes 7dB reduction from use of bubble curtain.
[b] Sound exposure level (dB re 1 μPa²-sec).

It is anticipated that the contractor may employ two crews during construction to keep the project on schedule. This could result in concurrent use of a vibratory hammer and an impact hammer, however, the contractor will not operate two of the same hammer type concurrently. The hammers would be operated at two different bridges. The ensonified zones would likely overlap during concurrent use, but the multiple-source decibel addition method (Table 7) does not result in significant increases in the noise source when an impact hammer and vibratory hammer are operated at the same time, because the difference in noise source levels (Table 6) between the two hammers is greater than 10dB.

TABLE 7—MULTIPLE-SOURCE DECIBEL ADDITION

When two decibel values differ by:	Add the following to the higher level
0–1 dB	3 dB
2–3 dB	2 dB
4–9 dB	1 dB
>10 dB	0 dB

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

TL = transmission loss in dB
B = transmission loss coefficient
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

Absent site-specific acoustical monitoring with differing measured transmission loss, a practical spreading value of 15 is used as the transmission loss coefficient in the above formula. Site-specific transmission loss data for Astoria are not available, therefore the default coefficient of 15 is used to determine the distances to the Level A and Level B harassment thresholds.

TABLE 8—IN-WATER ACTIVITY SOURCE LEVELS AND DISTANCES TO LEVEL B HARASSMENT THRESHOLDS

Pile size/type	Method	Source level at 10 m (dB re 1 μPa rms)	Level B threshold (dB re 1 μPa rms)	Propagation (xLogR)	Distance to Level B threshold (m)	Level B harassment ensonified area (km^2)
14-inch Timber	Vibratory	152	120	15	1,359.4	3.2
14-inch Steel H-pile	Vibratory	150	120	15	1,000.0	1.8
24-inch Steel Pipe	Vibratory	162	120	15	6,309.6	55.3
	Impact	187	160	15	631.0	0.8
36-inch Steel Pipe	Vibratory	170	120	15	21,544.4	212.3

In-Air Disturbance during General Construction Activities—Behavioral disturbance (Level B harassment take) may occur incidental to the use of construction equipment during general construction that is proposed in the dry, above water, or inland within close proximity to the river banks. These construction activities are associated with the removal and construction of the rail superstructures, removal of the existing concrete foundations, construction of abutment wingwalls, and the construction of a temporary work platform. Possible equipment and sound source levels are included in Table 1. Using the Spherical Spreading Loss Model (20logR), a maximum sound source level of 93 dB RMS at 20 m, sound levels in-air would attenuate below the 90dB RMS Level B harassment threshold for harbor seals at 28 m, and below the 100 dB RMS threshold for all other pinnipeds at 9 m. Harbor seals are not expected to occur within 28m of the activity as there are no nearby haulouts, and are, therefore, not expected to be harassed by in-air sound. Additionally, the City is proposing a 10 m shutdown zone (Table 16) for all construction work to prevent injury from physical interaction with equipment. The City would therefore shut down equipment before hauled out sea lions could be acoustically harassed by the sound produced. No Level B harassment is expected to occur due to increased sounds from roadway construction. However, sea lions may be disturbed by the presence of construction equipment and increased human presence during above-water construction.

When the 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 may result in some degree of overestimate of Level A harassment 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 distance at which, if a marine mammal remained at that distance the whole duration of the activity, it would incur PTS. Inputs entered in the User Spreadsheet (Table 9) and the resulting isopleths are reported below (Table 10).

TABLE 9—USER SPREADSHEET INPUT PARAMETERS USED FOR CALCULATING LEVEL A HARASSMENT ISOPLETHS

Pile size and installation method	Spreadsheet tab used	Weighting factor adjustment (kHz)	Source level at 10 m	Number of piles within 24-h period	Duration to drive single pile (minutes)	Number of strikes per pile	Propagation (xLogR)	Distance from source level measurement (meters)
14-inch Timber Vibratory.	A.1) Vibratory pile driving.	2.5	152dB RMS SPL	50	20		15	10
14-inch Steel H-Pile	A.1) Vibratory pile driving.	2.5	150dB RMS SPL	36	25		15	10
24-inch Steel Vibratory	A.1) Vibratory pile driving.	2.5	162dB RMS SPL	18	20		15	10
36-inch Steel Vibratory	A.1) Vibratory pile driving.	2.5	170dB RMS SPL	36	8		15	10
24-inch Steel Impact	E.1) Impact pile driving.	2	171dB SEL/207 PK SPL.	23		500	15	10

The applicant may conduct down-the-hole drilling, however a separate analysis is not provided for that activity, as it is was not necessary in Phase 1 of the project, and is not expected to be necessary in Phase 2. Should drilling be necessary, the Level B harassment zone will be considered to be the same as that calculated for vibratory installation/removal of 36-inch steel piles, as that Level B harassment zone is clipped in all directions, and therefore is the most conservative a Level B harassment zone could be. A conservative Level B harassment zone is of particular importance due to the fact that the duration of drilling, should it be necessary, is unknown. The applicant will consider the Level A harassment zone for down-the-hole drilling to be the same as the Level A harassment zones calculated for impact pile driving of the 24-inch steel piles. These are the largest Level A harassment zones, and Level A harassment zones are expected to be smaller for a continuous sound source such as down-the-hole drilling.

TABLE 10—CALCULATED DISTANCES TO LEVEL A HARASSMENT ISOPLETHS

Pile size and installation method	Level A harassment zone (m)	
	Phocids	Otariids
14-inch Timber Vibratory	6.8	0.5
14-inch Steel H-Pile	4.7	0.3
24-inch Steel Vibratory	16	1.1
36-inch Steel Vibratory	47	3.3
24-inch Steel Impact *(and down-the-hole drilling, if necessary)*	* 431.5	31.4

* (Peak 7.4)

Marine Mammal Occurrence and Take Calculation and Estimation

In this section we provide the information about the presence, density, or group dynamics of marine mammals, and how it is brought together with the information provided above to produce a quantitative take estimate. Estimated takes of each species were calculated using information provided by the Oregon Department of Fish and Wildlife (Bryan Wright, pers. comm., August 2019), Washington Department of Fish and Wildlife (WDFW, 2014) and the Marine Mammal Commission (Tiff Brookens, pers. comm., March 2018).

Harbor Seal

Numbers of harbor seals hauled out at Desdemona Sands have been reported to reach into the thousands (Profita, 2015), but specific counts were unavailable. Without counts of harbor seals closer to the project site, the maximum average count of harbor seals at the South Jetty (57 seals; WDFW, 2014) is used to calculate take, as in Phase 1 (83 FR 19243, May 2, 2018). The Level B harassment zones for Phase 2 extend far beyond the calculated zones for Phase 1, approaching the South Jetty, further supporting the use of these harbor seal counts.

Harbor seals do not haul out near the project area and would only be potentially harassed if they are transiting through the Level A or Level B harassment zone during the in-water work period (including the extension, if applicable). Level B harassment take was calculated by multiplying the maximum average count of harbor seals at the South Jetty by days of in-water activity (Table 11).

Additionally, while harbor seals are unlikely to occur in the Level A harassment zone during vibratory pile driving (based on Phase 1 monitoring), the applicant is concerned that if a few animals occurred in the Level A harassment zone during impact pile driving, they may need to shut down more frequently than is practical, given the IWWP restrictions previously discussed. As such, NMFS is proposing to observe a shutdown zone that is smaller than the Level A isopleth for impact pile driving and to issue small numbers of Level A harassment take of harbor seals (Table 14). This proposed take would avoid potentially excessive shut downs should a small group of harbor seals enter the project area on each day while impact pile driving activities (or down-the-hole drilling, as necessary) are underway. Level A harassment take of harbor seals was calculated by multiplying a group of two animals by 14 in-water work days. Level A takes may only occur during the subset of in-water work days when the applicant conducts impact pile driving (or down-the-hole drilling, as required), as the shutdown zone contains the entire Level A harassment zone for all other in-water work activities.

Steller Sea Lion

Counts of Steller sea lions at the East Mooring Basin are typically in the single digits (B. Wright, pers. comm., March 2018), while the average number of Steller sea lions observed at the South Jetty during the in-water work period (including the possible extension) from 2000–2014, was 272 animals (WDFW, 2014). When the applicant consulted ODFW for more recent Steller sea lion data, ODFW advised that there were only three more recent surveys, none of which occurred during the IWWP months (Bryan Wright, pers. comm., September 2019). The Level B harassment zones for Phase 2 extend far beyond the calculated zones for Phase 1, approaching the South Jetty. Therefore, NMFS expects that that average daily count from the South Jetty provides an appropriate daily count to calculate potential Steller sea lion Level B harassment take during Phase 2. Note the calculation is based on the average daily count, not the maximum. The maximum daily count was 606 animals, in the month of April. Considering that work will only occur in April if the entire IWWP extension is exercised, and the large difference between the maximum daily count and the average daily count, NMFS believes that using the maximum daily count would greatly overestimate potential take.

For Phase 1 Level B harassment take calculations of Steller sea lions, daily estimates were based off of observations at Bonneville Dam and Willamette Falls, as these animals must transit past Astoria at some point in their travels from the Pacific to the upper Columbia River (83 FR 19243, May 2, 2018). The daily count was 67 animals, 63 at Bonneville Dam and four at Willamette Falls. However, NMFS believes that South Jetty estimates are more appropriate and more conservative for Phase 2 take calculations, given the larger Level B harassment zones, some of which extend downriver close to the South Jetty.

Level B harassment take was calculated by multiplying the daily counts of Steller sea lions by days of activity (Table 11).

Steller sea lions do not haul out near the construction sites and would only be potentially harassed if they are transiting through the Level B harassment zone during the in-water work period (including the extension, if applicable). Steller sea lions are not expected to occur within the calculated Level A harassment zone for otariids (Table 10). No Level A harassment takes of Steller sea lions are proposed nor expected to be authorized.

TABLE 11—LEVEL B HARASSMENT TAKE CALCULATION FOR HARBOR SEAL AND STELLER SEA LION

Species	Maximum average/daily count	Days of in-water activity [c]	Total take (Level B)
Harbor seal	[a] 57	21	1,197
Steller sea lion	[b] 272	21	5,712

[a] Maximum average count of harbor seals at the South Jetty (WDFW, 2014).
[b] Average number of Steller sea lions observed at the South Jetty during the in-water work period (including the possible extension) from 2000–2014 (WDFW, 2014).
[c] Includes in-water activity for the entire project.

California Sea Lion

Aerial surveys of the East Mooring Basin in Astoria from 2011 to 2018 (Bryan Wright, pers. comm., August 2019) were used to calculate in-water Level B harassment take of California sea lions, as in Phase 1 of this activity (83 FR 19243, May 2, 2018). The data provided to NMFS by ODFW included the maximum California sea lion count observed on a single day for each month throughout the survey period. These maximum counts at the East Mooring Basin ranged from 0 California sea lions on a single day in July 2017 to 3,834 on a single day in March 2016. A ''daily average maximum'' for each IWWP month (Table 12) was calculated by averaging the maximum counts on a single day for each survey month provided by ODFW. In addition to ODFW aerial surveys, the City conducted opportunistic surveys of pinnipeds at the bridge sites in December 2017. A maximum of four California sea lions were observed in the water surrounding the bridges and piers. Additional California sea lions were heard vocalizing from the riverbanks under the bridges but the exact number of sea lions could not be determined.

TABLE 12—DAILY AVERAGE MAXIMUM NUMBER OF CALIFORNIA SEA LIONS AT EAST MOORING BASIN FOR IWWP MONTHS, INCLUDING THE POTENTIAL EXTENSION

Month	Daily average maximum [a]
November	141
December	135
January	408
February	893
March	1,191
April	982

[a] Daily average maximum was calculated using data from aerial surveys of the East Mooring Basin in Astoria from 2011 to 2018 (Bryan Wright, pers. comm., 2019).

California sea lions are the most commonly observed marine mammal in the area, and are known to haul out on the riverbanks and structures near the bridges, as described above. California sea lions may be harassed by underwater sound resulting from vibratory pile removal and impact pile driving (at the distances listed above) as well as airborne sound resulting from roadway and railway demolition and construction. As such, California sea lions may be subject to harassment throughout the duration of Phase 2 of the project (December through November).

NMFS is proposing to authorize 1,056 Level B harassment takes of California sea lions associated with above-water construction activities taking place during the above-water work period, not including the IWWP extension (May to October). Level B harassment takes of California sea lions from above-water activities were calculated by multiplying the maximum estimate from the City's 2017 opportunistic surveys at the bridge sites (16 animals) by the estimated 11 days of work per month during the above-water work period.

NMFS is proposing to authorize 25,011 Level B harassment takes of California sea lions associated with in-water and above-water work during the IWWP. The City expects approximately 21 in-water work days across Phase 2 of the project. However, because the exact construction schedule is unknown, there are uncertainties in how many of the estimated work days will occur during each month. Therefore, estimated Level B harassment take during the IWWP (Table 13) is calculated by multiplying the highest daily average maximum (Table 12) during the IWWP months (including the potential extension) by the estimated 21 in-water work days. California sea lions exposed to in-air sound above Level B harassment threshold during the IWWP are expected to have already been taken by in-water activity, and therefore already be included in the take calculation.

Total California sea lion Level B harassment takes (Table 13) are calculated as the sum of above-water work period and IWWP takes.

TABLE 13—LEVEL B HARASSMENT TAKE CALCULATION OF CALIFORNIA SEA LION

Work period	Daily average maximum [b]	Potential number of workdays	Takes per month
IWWP [a]	1,191	21	25,011
May	16	11	176
June	16	11	176
July	16	11	176
August	16	11	176
September	16	11	176

TABLE 13—LEVEL B HARASSMENT TAKE CALCULATION OF CALIFORNIA SEA LION—Continued

Work period	Daily average maximum [b]	Potential number of workdays	Takes per month
October	16	11	176
Total			26,067

[a] IWWP includes the potential extension, as the month of March has the highest daily average maximum count.
[b] Daily average maximums during above-water work months are estimates from the City's opportunistic surveys at the Phase 1 bridge sites in December 2017.

Only 4204 Level B harassment takes of California sea lion were reported for Phase 1; however, the Phase 2 project area is much larger than the area within which marine mammals were reported in Phase 1. Therefore, NMFS expects California sea lion take to be higher for Phase 2 than was reported in the monitoring report for Phase 1.

As discussed above, the City estimates that approximately 16 California sea lions haul out near the project sites based on opportunistic surveys conducted in December 2017. Frequent construction shutdowns are of concern to the applicant, as there is a limited IWWP imposed by the Oregon Department of Fish and Wildlife and, therefore, the proposed mitigation zone does not entirely contain the area within the Level A harassment isopleth for impact pile driving. The applicant has requested Level A harassment takes of California sea lions, as the animals that haulout nearby may enter the Level A harassment zone as they transit between the haulouts and their feeding areas in the Columbia River.

NMFS is proposing to issue 224 Level A harassment takes of California sea lions (Table 14). The Level A harassment takes are calculated by multiplying the 16 animals that haulout near the project site (City of Astoria December 2017 surveys) by 14 in-water work days. Level A takes may only occur during the subset of in-water work days when the applicant conducts impact pile driving (or down-the-hole drilling, as required), as the shutdown zone contains the entire Level A harassment zone for all other in-water work activities.

TABLE 14—LEVEL A HARASSMENT TAKE CALCULATION OF HARBOR SEAL AND CALIFORNIA SEA LION

Species	Daily count	Estimated number of in-water work days	Level A harassment take
Harbor seal	2	14	28
California sea lion	[a] 16	14	224

[a] December 2017 survey estimates of California sea lions by the City at Phase 1 bridge sites.

TABLE 15—TOTAL LEVEL A AND LEVEL B TAKE PROPOSED FOR AUTHORIZATION

Common name	Stock	Level A harassment take	Level B harassment take	Total take	Stock abundance	Percent of stock
Harbor seal	Oregon/Washington Coast	28	1,197	1,225	[a] 24,732	5.0
Steller sea lion	Eastern U.S	0	5,712	5,712	41,638	13.7
California sea lion	U.S	224	26,067	26,291	257,606	10.2

[a] As noted in Table 3, there is no current estimate of abundance available for the Oregon/Washington Coast stock of harbor seal. The abundance estimate from 1999, included here, is the most recent.

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.

In addition to the measures described later in this section, the City will employ the following standard mitigation measures:

- The *City* shall conduct briefings between construction supervisors and crews, marine mammal monitoring team, and City staff prior to the start of all construction work, and when new personnel join the work, in order to explain responsibilities, communication procedures, marine mammal monitoring protocol, and operational procedures;
- For those marine mammals for which Level B harassment take has not been requested, in-water pile installation/removal and drilling will shut down immediately if such species are observed within or on a path towards the monitoring zone (*i.e.,* Level B harassment zone); and
- If observed take reaches the authorized limit for an authorized species, pile installation will be stopped as these species approach the Level B harassment zone to avoid additional take.

The following measures would apply to the City's mitigation requirements:

Establishment of Shutdown Zones—For all pile driving/removal and drilling activities, the City will establish appropriate shutdown zones. The purpose of a shutdown zone is generally to define an area within which shutdown of activity would occur upon sighting of a marine mammal (or in anticipation of an animal entering the defined area). These shutdown zones would be used to prevent incidental Level A exposures from pile driving and removal for Steller sea lions, and to reduce the potential for such take of harbor seals and California sea lions. During all pile driving and removal activities, as well as above-water construction, a minimum shutdown zone of 10m would be enforced (Table 16) for all species to prevent physical injury from interaction with construction equipment. Additionally, a shutdown zone of 32m will be enforced for Steller sea lions during impact pile driving to reduce the likelihood of Level A harassment take (Table 16). The placement of Protected Species Observers (PSOs) during all pile driving and drilling activities (described in detail in the *Monitoring and Reporting Section*) will ensure shutdown zones are visible when they are on site. When PSOs are not on site, the Oregon Department of Transportation (ODOT) inspector will be responsible for ensuring that activities shut down if a marine mammal enters the shutdown zone.

TABLE 16—SHUTDOWN ZONES

Construction activity	Shutdown zone (m)		
	Harbor seal	Steller sea lion	California sea lion
All Vibratory Pile Driving/Removal and Site Preparation	50	10	10
24-inch Steel Impact Pile Driving	.....	32	
Above-water Construction	10	10	

Establishment of Monitoring Zones for Level B Harassment—The City would establish monitoring zones to correlate with Level B harassment zones or zones of influence. These are areas where SPLs are equal to or exceed the 160 dB rms threshold for impact driving and the 120 dB rms threshold during vibratory driving and site preparation. For airborne noise, these thresholds are 90 dB RMS re 20µPa for harbor seals and 100 db RMS re: 20µPa for all other pinnipeds. Monitoring zones provide utility for observing by establishing monitoring protocols for areas adjacent to the shutdown zones. Monitoring zones enable observers to be aware of and communicate the presence of marine mammals in the project area outside the shutdown zone and thus prepare for a potential cease of activity should the animal enter the shutdown zone. The proposed monitoring zones are described in Table 17. Placement of PSOs on the shorelines around the Columbia River allow PSOs to observe marine mammals within the project site, however, due to the size of the Level B harassment zone during some activities, not all Level B harassment takes will be visible to PSOs. Level B harassment exposures will be recorded and extrapolated based upon the number of observed take and the percentage of the Level B zone that was not visible.

TABLE 17—MARINE MAMMAL MONITORING ZONES

Construction activity	Monitoring zone (m)
Above-water Construction.	28 (harbor seal only).
14-inch Timber Vibratory.	1,360.
14-inch Steel H-Pile	1,000.
24-inch Steel Vibratory.	6,310.
36-inch Steel Vibratory.	21,545.
24-inch Steel Impact	635.

Soft Start—The use of soft-start procedures are believed to provide additional protection to marine mammals by providing warning and/or giving marine mammals a chance to leave the area prior to the hammer operating at full capacity. For impact driving, an initial set of three strikes would be made by the hammer at 40 percent energy, followed by a 1-minute wait period, then two subsequent 3-strike sets at 40 percent energy, with 1-minute waiting periods, before initiating continuous driving. Soft start would 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. Soft start is not required during vibratory pile driving and removal activities.

Pre-Activity Monitoring—Prior to the start of daily in-water construction activity, or whenever a break in pile driving/removal or site preparation of 30 minutes or longer occurs, PSOs will observe the shutdown and monitoring zones for a period of 30 minutes. The shutdown zone will be cleared when a marine mammal has not been observed within the zone for that 30-minute period. If a marine mammal is observed within the shutdown zone, a soft-start cannot proceed until the animal has been confirmed to have left the zone or has not been observed for 15 minutes. If the Level B harassment zone has been observed for 30 minutes and non-

permitted species are not observed within the zone, soft start procedures can commence and work can continue even if visibility becomes impaired within the Level B monitoring zone. When a marine mammal permitted for Level B harassment take is present in the Level B harassment zone, activities may begin and Level B take will be recorded. As stated above, if the entire Level B zone is not visible at the start of construction, piling or drilling activities can begin. If work ceases for more than 30 minutes, the pre-activity monitoring of both the Level B and shutdown zone will commence.

Based on our evaluation of the applicant's proposed measures, as well as other measures considered by NMFS, 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.

Marine Mammal Visual Monitoring

Monitoring shall be conducted by NMFS-approved observers. Trained observers shall be placed at the best vantage point(s) practicable to monitor for marine mammals, and will implement shutdown or delay procedures when applicable through communication with the equipment operator. Observer training must be provided prior to project start, and shall include instruction on species identification (sufficient to distinguish the species in the project area), description and categorization of observed behaviors and interpretation of behaviors that may be construed as being reactions to the specified activity, proper completion of data forms, and other basic components of biological monitoring, including tracking of observed animals or groups of animals such that repeat sound exposures may be attributed to individuals (to the extent possible).

Monitoring would be conducted 30 minutes before, during, and 30 minutes after pile driving/removal and drilling activities. In addition, observers shall record all incidents of marine mammal occurrence, regardless of distance from activity, and shall document any behavioral reactions in concert with distance from piles being driven or removed. Pile driving/removal and drilling 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 30 minutes.

Three PSOs will be on-site the first day and every third day thereafter during vibratory hammer installation and site preparation at each bridge. One observer will be stationed at the best practicable land-based vantage point to observe the Shutdown Zone and a portion of the Level A and Level B harassment zones. One observer will be stationed along the north bank of the river at the Washington State Department of Transportation Rest Area: Dismal Nitch. One observer will be stationed at the best practicable land-based vantage point to observe the remainder of the Level A and Level B harassment zones. Likely locations include the 6th Street viewing platform and the Pier 12 parking lot. If vibratory installation of the 36-inch casings occurs, this observer will be positioned along the north bank of the river downstream of the project site within the Chinook County Park. The ODOT on-site inspector will be trained in species identification and monitoring protocol and will be on-site during all vibratory removal and installation activities to confirm that no species enter the 10-meter Shutdown Zone when PSOs are not onsite.

Two PSOs will be on-site the first day of impact pile driving at each bridge, and every third day thereafter. One observer will be stationed at the best practicable land-based vantage point to observe the Shutdown Zone and a portion of the Level A and Level B harassment zones. One observer will be stationed at the best practicable land-based vantage point to observe the remainder of the Level A and Level B harassment zones. Likely locations include the 6th Street viewing platform, the Pier 12 parking lot, or the Washington State Department of Transportation Rest Area: Dismal Nitch on the north bank of the river. The ODOT on-site inspector will be trained in species identification and monitoring protocol and will be on-site during all impact pile driving activities to confirm that no species enter the 10-meter Shutdown Zone when PSOs are not onsite.

PSOs would scan the waters using binoculars, and/or spotting scopes, and would use a handheld GPS or range-finder device to verify the distance to each sighting from the project site. All PSOs would be trained in marine mammal identification and behaviors and are required to have no other project-related tasks while conducting monitoring. In addition, monitoring will be conducted by qualified observers, who will be placed at the best vantage point(s) practicable to monitor for marine mammals and implement shutdown/delay procedures when applicable by calling for the shutdown to the hammer operator. The City would adhere to the following observer qualifications:

(i) Independent observers (*i.e.,* not construction personnel) are required.

(ii) At least one observer must have prior experience working as an observer.

(iii) Other observers may substitute education (degree in biological science or related field) or training for experience.

(iv) The City must submit observer CVs for approval by NMFS.

Additional standard observer qualifications include:

- 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 and times when in-water construction activities were suspended to avoid potential incidental injury from construction sound of marine mammals observed within a defined shutdown zone; and marine mammal behavior; and
- Ability to communicate orally, by radio or in person, with project personnel to provide real-time information on marine mammals observed in the area as necessary.

A draft marine mammal monitoring report would be submitted to NMFS within 90 days after the completion of site preparation and pile driving and removal activities. It will include an overall description of work completed, a narrative regarding marine mammal sightings, and associated PSO data sheets. Specifically, the report must include:

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

If no comments are received from NMFS within 30 days, the draft final report will constitute the final report. If comments are received, a final report addressing NMFS comments must be submitted within 30 days after receipt of comments.

In the unanticipated event that the specified activity clearly causes the take of a marine mammal in a manner prohibited by the IHA (if issued), such as an injury, serious injury or mortality, the City would immediately cease the specified activities and report the incident to the Chief of the Permits and Conservation Division, Office of Protected Resources, NMFS, and the West Coast Regional Stranding Coordinator. The report would include the following information:

- Description of the incident;
- Environmental conditions (*e.g.,* Beaufort sea state, visibility);
- Description of all marine mammal observations 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) (if equipment is available).

Activities would not resume until NMFS is able to review the circumstances of the prohibited take. NMFS would work with the City to determine what is necessary to minimize the likelihood of further prohibited take and ensure MMPA compliance. The City would not be able to resume their activities until notified by NMFS via letter, email, or telephone.

In the event that the City discovers an injured or dead marine mammal, and the lead PSO 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 as described in the next paragraph), the City would immediately report the incident to the Chief of the Permits and Conservation Division, Office of Protected Resources, NMFS, and the NMFS West Coast Stranding Hotline and/or by email to the West Coast Regional Stranding Coordinator. The report would include the same information identified in the paragraph above. Activities would be able to continue while NMFS reviews the circumstances of the incident. NMFS would work with the City to determine whether modifications to the activities are appropriate.

In the event that the City discovers an injured or dead marine mammal and the lead PSO 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), the City would report the incident to the Chief of the Permits and Conservation Division, Office of Protected Resources, NMFS, and the NMFS West Coast Stranding Hotline and/or by email to the West Coast Regional Stranding Coordinator, within 24 hours of the discovery. The City would provide photographs, video footage (if available), or other documentation of the stranded animal sighting to NMFS and the Marine Mammal Stranding Network.

Phase 1 Monitoring Report

The City's monitoring report from Phase 1 of the project (OBEC, 2019) was frequently consulted in the NMFS evaluation of the City's proposed activities and requested take for Phase 2 of the project. The Phase 1 monitoring report indicated recorded take of California sea lions and harbor seals (Table 18). Steller sea lions were not observed during Phase 1 (Table 18), however, due to their known presence in the area, Level B harassment take was still requested for Phase 2 activities. Additionally, as mentioned above, the calculated Level B harassment zones were significantly smaller for Phase 1 than for Phase 2.

TABLE 18—PHASE 1 MONITORING RESULTS

Species	Number of takes recorded by PSOs	Estimated takes on days PSOs not present	Total estimated Level B harassment takes	Authorized Level B harassment take number	Percent of authorized takes that occurred
California sea lion	604	3,600 (240 × 15 days)	4204	33,736	12.5
Steller sea lion	0	0	0	5,360	0
Pacific harbor seal	53	270 (18 × 15 days)	323	4,560	7.1

Level A take was not requested nor authorized for Phase 1 activities, so the City used the calculated Level A isopleth as the shutdown zone to prevent Level A take. Shutdowns occurred on three days during Phase 1 activities. In all instances, shutdowns occurred when one or more California sea lion entered the shutdown zone. The Phase 1 and Phase 2 monitoring reports will provide useful information for analyzing impacts to marine mammals for potential future projects in the lower Columbia River.

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/removal and drilling activities associated with the project as outlined previously, have the potential to disturb or displace marine mammals. Specifically, the specified activities may result in take, in the form of Level A harassment and Level B harassment from underwater sounds generated from pile driving and removal. Potential takes could occur if individuals of these species are present in zones ensonified above the thresholds for Level A or Level B harassment, identified above, when these activities are underway.

The takes from Level A and Level B harassment would be due to potential behavioral disturbance, TTS, and PTS. No mortality is anticipated given the nature of the activity. Level A harassment is only anticipated for California sea lion and harbor seal. The potential for Level A harassment is minimized through the construction method and the implementation of the planned mitigation measures (see *Proposed Mitigation* section).

Effects on individuals that are taken by Level B harassment, on the basis of reports in the literature as well as monitoring from other similar activities, including Phase 1 of the City's project, will likely be limited to reactions such as increased swimming speeds, increased surfacing time, or decreased foraging (if such activity were occurring) (*e.g.,* Thorson and Reyff 2006; HDR, Inc. 2012; Lerma 2014; ABR 2016; OBEC, 2019). Most likely for pile driving, individuals will simply move away from the sound source and be temporarily displaced from the areas of pile driving and drilling, although even this reaction has been observed primarily only in association with impact pile driving. The pile driving activities analyzed here are similar to Phase 1 activities and numerous other construction activities conducted in the Pacific Northwest, which have taken place with no known long-term adverse consequences from behavioral harassment. Level B harassment will be reduced to the level of least practicable adverse impact through use of mitigation measures described herein and, if sound produced by project activities is sufficiently disturbing, animals are likely to simply avoid the area while the activity is occurring. While vibratory driving (and potential drilling) associated with the proposed project may produce sound at distances of many kilometers from the project site, the project site itself is located on a busy waterfront and in a section of the Columbia River with high amounts of vessel traffic. Therefore, we expect that animals disturbed by project sound would simply avoid the area and use more-preferred habitats.

In addition to the expected effects resulting from authorized Level B harassment, we anticipate that California sea lions and harbor seals may sustain some limited Level A harassment in the form of auditory injury. However, animals in these locations that experience PTS would likely only receive slight PTS, *i.e.,* minor degradation of hearing capabilities within regions of hearing that align most completely with the frequency range of the energy produced by pile driving, *i.e.,* the low-frequency region below 2 kHz, not severe hearing impairment or impairment in the regions of greatest hearing sensitivity. If hearing impairment occurs, it is most likely that the affected animal would lose a few decibels in its hearing sensitivity, which in most cases is not likely to meaningfully affect its ability to forage and communicate with conspecifics. As described above, we expect that marine mammals would be likely to move away from a sound source that represents an aversive stimulus, especially at levels that would be expected to result in PTS, given sufficient notice through use of soft start.

The project also is not expected to have significant adverse effects on affected marine mammals' habitat. The project activities would not modify existing marine mammal habitat for a significant amount of time. The activities may cause some fish to leave the area of disturbance, thus temporarily impacting marine mammals' foraging opportunities in a limited portion of the foraging range; but, because of the short duration of the activities and the relatively small area of the habitat that may be affected, the impacts to marine mammal habitat are not expected to cause significant or long-term negative consequences. Other than feeding and the haulout areas previously described, the project area does not include any areas or times of particular biological significance for the affected species.

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 or serious injury is anticipated or authorized;
- No serious injury is anticipated or authorized;
- The Level A harassment exposures are anticipated to result only in slight PTS, within the lower frequencies associated with pile driving;
- The anticipated incidents of Level B harassment would consist of, at worst, temporary modifications in behavior that would not result in fitness impacts to individuals;
- The area impacted by the specified activity is very small relative to the overall habitat ranges of all species;
- The activity is expected to occur over 21 or fewer in-water work days.

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 Sections 101(a)(5)(A) and (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.

The number of takes for each species proposed to be taken as a result of this project is 5, 13.7, and 10.2 percent of the total stock for harbor seal, Steller sea lion, and California sea lion, respectively (Table 15). Additionally, the number of takes requested is based on the number of estimated exposures, not necessarily the number of individuals exposed. Pinnipeds may remain in the general area of the project sites and the same individuals may be harassed multiple times over multiple days, rather than numerous individuals harassed once.

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 NMFS 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. 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 the City of Astoria for conducting waterfront bridge removal and replacement in Astoria, Oregon from November 2019 to October 2020, provided the previously mentioned mitigation, monitoring, and reporting requirements are incorporated. A draft of the proposed IHA can be found at *https://www.fisheries.noaa.gov/permit/incidental-take-authorizations-under-marine-mammal-protection-act.*

Request for Public Comments

We request comment on our analyses, the proposed authorization, and any other aspect of this Notice of Proposed IHA for the proposed project. We also request at this time comment on the potential 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 decisions on the request for this IHA or a subsequent Renewal.

On a case-by-case basis, NMFS may issue a one-year IHA renewal with an additional 15 days for public comments when (1) another year of identical or nearly identical activities as described in the Specified Activities section of this notice is planned or (2) the activities as described in the Specified Activities section of this notice would not be completed by the time the IHA expires and a Renewal would allow for completion of the activities beyond that described in the Dates and Duration section of this notice, 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 under the requested Renewal are identical to the activities analyzed under the initial IHA, are a subset of the activities, or include changes so minor (*e.g.,* reduction in pile size) that the changes do not affect the previous analyses, mitigation and monitoring requirements, or take estimates (with the exception of reducing the type or amount of take because only a subset of the initially analyzed activities remain to be completed under the Renewal).

(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 will remain the same and appropriate, and the findings in the initial IHA remain valid.

Dated: October 31, 2019.

Donna S. Wieting,

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

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DEPARTMENT OF DEFENSE

Department of the Navy

Notice of Fiscal Year 2019 Performance Review Board Membership

AGENCY: Department of the Navy, DoD.

ACTION: Notice.

SUMMARY: The Department of Navy (DON) announces the appointment of members to the DON Senior Executive Service (SES), Senior Level (SL), and Scientific and Professional (ST) Fiscal Year 2019 Performance Review Board (PRB). The purpose of the PRB is to provide fair and impartial review of the annual SES performance appraisal prepared by the senior executive's immediate and second level supervisor; to make recommendations to appointing officials regarding acceptance or modification of the performance rating; and to make recommendations for performance-based bonuses and performance-based pay increases.

FOR FURTHER INFORMATION CONTACT: Leslie Joseph, Director, Executive Management Program Office, Office of Civilian Human Resources at 202–685–6186.