



**BILLING CODE 3510-22-P**

**DEPARTMENT OF COMMERCE**

**National Oceanic and Atmospheric Administration**

**RIN 0648-XG628**

**Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to the Railroad Dock Dolphin Installation Project, Skagway, Alaska**

**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 White Pass & Yukon Route (WP&YR) for authorization to take marine mammals incidental to the Railroad Dock dolphin installation project in Skagway, Alaska. 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 **[INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**.

**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.Piniak@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:** Wendy Piniak, 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 NDAA (Pub. L. 108–136) removed the “small numbers” and “specified geographical region” limitations indicated above and amended the definition of “harassment” as it applies to a “military readiness activity.” 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 August 21, 2018, NMFS received a request from WP&YR for an IHA to take marine mammals incidental to the Railroad Dock dolphin installation project in Skagway, Alaska. WP&YR submitted a revised version of the application on November 9, 2018 which was deemed adequate and complete on November 15, 2018. WP&YR's request is for take of seven species of marine mammals by Level B harassment and Level A harassment incidental to impact pile driving, vibratory pile driving and removal, and down-the-hole drilling activities. Neither WP&YR nor NMFS expects serious injury or mortality to result from this activity and, therefore, an IHA is appropriate. In-water activities (pile installation and extraction) associated with the project are scheduled to begin February 1, 2019, and be completed April 30, 2019.

### **Description of Proposed Activity**

#### *Overview*

WP&YR requested the authorization of take of small numbers of marine mammals incidental to pile driving/removal and down-the-hole drilling associated with the installation of

two new 200-ton pile supported mooring dolphins in Skagway Harbor, Alaska. The purpose of the project is to provide ample safe moorage when both Norwegian Breakaway and Royal Caribbean Quantum class cruise ship vessels are in port. The existing dolphin infrastructure does not allow for both cruise ships to be moored at the dock at the same time. The additional dolphins would allow for both ships to be docked simultaneously. To facilitate dual mooring, the proposed project includes the installation of two 200-ton dolphins, each comprised of six 42-inch steel permanent piles 300 feet in length. WP&YR would also install and subsequently remove 14 36-inch template (temporary) piles (200 feet in length) at the two dolphin locations which are approximately 100 feet and 200 feet, respectively, south of the existing southernmost mooring dolphin at the WP&YR Railroad Dock. The template and permanent piles are comprised of two to three 100-foot long segments which would be spliced (*i.e.*, welded) together as they are installed. All temporary and permanent piles would require a combination of three pile installation methods: vibratory driving, impact driving, and down-the-hole drilling. Sounds produced by these activities may result in take, by Level A and Level B harassment, of marine mammals located in Taiya Inlet, Alaska.

#### *Dates and Duration*

In-water activities (pile installation and extraction) associated with the project are scheduled to begin February 1, 2019, and be completed April 30, 2019. Pile installation and removal would occur for 89 days over the course of the three months. WP&YR anticipates up to 10 hours of activity (vibratory driving, impact driving, and down-the-hole drilling) during daylight hours would occur per day.

#### *Specific Geographic Region*

The activities would occur at the south end of WP&YR's Railroad Dock located in Skagway Harbor, Alaska. Skagway Harbor is located at the southwestern end of the 2.5-mile (mi)-long Skagway River valley. Three anadromous rivers are located near the project site including Skagway River, Taiya River, and Pullen Creek. The Skagway and Taiya Rivers empty into Taiya Inlet at the head of Lynn Canal west and northwest of the project site respectively. Pullen Creek empties into the Taiya Inlet on the southeast side of the valley northeast of the project site. Taiya Inlet/Lynn Canal is the northernmost fjord on the Inside Passage of the south coast of Alaska. The project site is located south of ADL 108521 and seaward of upland Lot 8, U.S. Survey 5110; Latitude 59.44° North (N), Longitude 135.33° West (W) (see Figures 1-3 of WP&YR's application). Limited information is available on the benthic habitat beneath the Railroad Dock, however the basin is composed of glacial till sediments, consisting of mud, silty gravel, cobbles and boulders. The shoreline along Railroad dock is armored with riprap and contains little to no riparian vegetation. This armoring extends to below the mean higher high water (MHHW) mark to an unknown depth. At the project site, the Taiya Inlet is approximately 2 kilometers (km) wide and water depth ranges from approximately 100-200 feet (ft) (30-60 meters (m)); however water depth in Taiya Inlet reaches over 500 ft (152 m), within and south of the project area.

Skagway Harbor is frequently visited by cruise ship vessels during the summer and is a site of recreational and commercial activity. Vessels must travel up Taiya Inlet to enter the Skagway Harbor.

#### *Detailed Description of Specific Activity*

To facilitate dual mooring of large cruise ship vessels, the proposed Railroad Dock dolphin installation project includes installation of two 200-ton dolphins. Two crane barges, one

material barge, and three work boats (each under 25 feet) would be used to complete the project. Barges would be moored on-site for the duration of construction. Each dolphin would require the installation and removal of seven 36-inch steel pipe template piles (14 total) and the installation six 42-inch steel pipe permanent piles (12 total). The temporary template piles would be installed to aid in construction and would be removed after the permanent dolphin piles are installed. Each temporary template pile would be approximately 200 ft in length and would consist of up to two sections that would be spliced (*e.g.* welded) together as they are installed (for a total of up to 28 segments). Each permanent pile would be approximately 300 ft in length and would consist of up to three sections that would be spliced together as they installed (for a total of 36 segments).

Template and permanent piles would be installed in water depths up to 140-feet deep and into loose substrate that is intermixed with cobbles and boulder-sized rocks. Due to the nature of deep-water pile installation in loose sediment, each pile (consisting of two to three segments) would be installed using a combination of installation methods: vibratory hammer, impact hammer, and drilling (Table 1). Removal of template piles would only require the use of a vibratory hammer. It may be necessary to switch between installation methods multiple times per day depending on encountered conditions. However, no activities would occur simultaneously (*e.g.*, only one installation method would occur on one pile at any time). Throughout the project, one crane would be dedicated to drilling only and the second crane would alternate between the vibratory and impact hammers (as noted, only one crane would be active at any given time). In addition to alternating between installation methods, the project would require the piles segments to be spliced together to make the piles longer before continuing installation. That is, the first segment of pile would be installed using one or more methods; the second segment would then be welded to the first segment and the process would be repeated until the entire pile is installed.

**Table 1. Pile installation and removal equipment.**

<b>Pile Installation Equipment</b>	<b>Model/Size</b>	<b>Description/Purpose</b>
Crane	200-250-ton barge with a 200-250-ft boom (up to 2 cranes)	Install piles, set dolphin caps, set catwalks, move material, etc.
Vibratory Hammer	APE 200 or equivalent	Advance pile through overburden to vibratory refusal.
Impact Hammer	Delmag D100 Diesel hammer or equivalent	Advance pile through overburden once vibratory refusal has been reached.
Drill	<p><u>Rock Anchor (8-inch hole):</u> ICE - HS-27 Top drive down-hole hammer PDQL-80 or equivalent.</p> <p><u>Socket (42-inch hole):</u> PPV ring bit MF34 down hole hammer or equivalent</p>	A drill is inserted through the pile all the way down to bedrock. The drill breaks up rock into small flakes (tailings) which are removed from the drilled hole as the pile or casing advances.

The tips of all template piles would be embedded approximately 60 ft beneath the mudline using impact or vibratory hammering and drilling. The structural design of the dolphins requires the tips of all permanent piles to bear on and be socketed in bedrock located 100-200 ft beneath the mudline. During installation, some or all piles will encounter obstructions prior to reaching final tip depth and will require drilling through obstructions to meet project specifications. The first segment of each pile would be impact or vibratory driven to first refusal. First refusal occurs when the pile tip cannot be advanced any further with a vibratory or impact hammer. This will most likely occur when the pile tip is located on an obstruction (prior to reaching bedrock) or at bedrock. To determine whether the pile tip has reached bedrock, the contractor would then drill past the segment tip. If the drill advances up to 20 ft past the segment tip through rock, bedrock is encountered. If the drill “punches through” the obstruction and encounters soft overburden material, the pile would continue to be advanced using drilling, impact, or vibratory methods. Once second refusal is reached, bedrock would again need to be

verified by drilling up to 20-ft past the pile tip into bedrock. This process is repeated until bedrock is confirmed (permanent piles) or the required depth has been achieved (template piles), however it is possible that template piles may be fully installed without encountering bedrock.

As each pile segment is installed, WP&YR would splice segments to increase the length of the pile and continue with the pile installation. Splicing pipe pile involves welding pipe pile end to end with a complete joint penetration weld. On average, splicing is anticipated to require three to five days to complete per pile. For permanent piles, once bedrock is confirmed and all segments are welded together, a smaller 8-inch drill would be used to drill a rock anchor hole into bedrock 50 ft past the pile tip. The 8-inch hole for the rock anchor is drilled beneath the pile tip from within the hollow pipe pile. A steel bar would be grouted into this hole. Once the grout sets, a jack would be applied to the top of the bar and the rock anchor would be locked off to plates at the top of the pile. After the permanent piles are installed, temporary piles would be removed.

WP&YR estimates drilling and vibratory hammering would occur for a maximum of 10 hours per day (although the amount of time within that 10 hour window dedicated to each method cannot be determined at this time as it is dependent upon substrate conditions) and total number of impact pile driving strikes would not exceed 2,000 per day. WP&YR estimates that it would take 8 hours to install and remove one template pile and 28.1 hours (over the course of multiple days) to install one permanent pile (additional details can be found in section 2 of WP&YR's application).

After all dolphin piles are installed, a prefabricated steel dolphin cap would be set on top of the piles and welded to the cap. The project also involves modifications to an existing dolphin cap and installation of two catwalks; however, this work does not include in-water work and is

not anticipated to take marine mammals. All barges, cranes, equipment, personnel, temporary structures, unused materials, etc. would be removed from the site upon project completion.

WP&YR anticipates all in-water construction would occur between February 1, 2019 and April 30, 2019 (89 days) with mobilization occurring December through January, 2019 and above water work and demobilization occurring April through May, 2019. Multiple or all installation methods of template and permanent piles may occur on the same day, but would not occur at the same time. Work may occur seven days per week.

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' Stock Assessment Reports (SAR; <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' website (<https://www.fisheries.noaa.gov/find-species>).

Table 2 lists all species with expected potential for occurrence in the Taiya Inlet and larger Lynn Canal 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 (2017). 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’ 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’ 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. All managed stocks in this region are assessed in NMFS’ U.S. Alaska SARs (*e.g.*, Muto *et al.* 2018). All values presented in Table 2 are the most recent available at the time of publication and are available in the 2017 SARs (Muto *et al.* 2018) and draft 2018 SARs (available online at:

<https://www.fisheries.noaa.gov/national/marine-mammal-protection/draft-marine-mammal-stock-assessment-reports>).

**Table 2. Marine mammals potentially present within Taiya Inlet during the specified activity.**

Common name	Scientific name	Stock	ESA/MMPA status; Strategic (Y/N) <sup>1</sup>	Stock abundance (CV, N <sub>min</sub> , most recent abundance survey) <sup>2</sup>	PBR	Annual M/SI <sup>3</sup>
Order Cetartiodactyla – Cetacea – Superfamily Mysticeti (baleen whales)						
Family Eschrichtiidae						
<i>Gray whale</i>	<i>Eschrichtius robustus</i>	Eastern North Pacific	-, -, N	26,960 (0.05, 25,849, 2016)	801	138
Family Balaenidae						
Humpback whale	<i>Megaptera novaeangliae</i>	Central North Pacific	-, -, Y	10,103 (0.3, 7,890, 2006)	83	25
Minke Whale	<i>Balaenoptera acutorostrata</i>	Alaska	-, -, N	N/A	UND	0
Superfamily Odontoceti (toothed whales, dolphins, and porpoises)						
Family Physeteridae						
<i>Sperm whale</i>	<i>Physeter macrocephalus</i>	North Pacific	E, D, Y	N/A (N/A, N/A, 2015)	UND	4.4
Family Delphinidae						

Killer whale	<i>Orcinus orca</i>	Alaska Resident	- , - , N	2,347 (N/A, 2,347, 2012) <sup>4</sup>	24	1
		Northern Resident	- , - , N	261 (N/A, 261, 2011) <sup>4</sup>	1.96	0
		Gulf of Alaska, Aleutian Islands, Bering Sea Transient	- , - , N	587 (N/A, 587, 2012) <sup>4</sup>	5.87	1
		West Coast Transient	- , - , N	243 (N/A, 243, 2009) <sup>4</sup>	2.4	0
<i>Pacific White-Sided Dolphin</i>	<i>Lagenorhynchus obliquidens</i>	North Pacific	- , - , N	26,880 (N/A, N/A, 1990)	UND	0
Family Phocoenidae (porpoises)						
Harbor porpoise	<i>Phocoena phocoena</i>	Southeast Alaska	- , - , Y	975 (0.12-0.14, 897, 2012) <sup>5</sup>	8.9	34
Dall's porpoise	<i>Phocoenoides dalli</i>	Alaska	- , - , N	83,400 (0.097, N/A, 1991)	UND	38
Order Carnivora – Superfamily Pinnipedia						
Family Otariidae (eared seals and sea lions)						
Steller sea lion	<i>Eumetopias jubatus</i>	Western U.S.	E, D, Y	54,267 (N/A, 54,267, 2017)	326	252
		Eastern U.S.	T, D, Y	41,638 (N/A, 41,638, 2015)	2498	108
Family Phocidae (earless seals)						
Harbor seal	<i>Phoca vitulina richardii</i>	Lynn Canal/ Stephens Passage	- , - , N	9,478 (N/A, 8,605, 2011)	155	50

<sup>1</sup>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.

<sup>2</sup>NMFS marine mammal stock assessment reports online at: <https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessments>. CV is coefficient of variation; N<sub>min</sub> is the minimum estimate of stock abundance. In some cases, CV is not applicable (N/A).

<sup>3</sup>These values, found in NMFS' 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.

<sup>4</sup>N is based on counts of individual animals identified from photo-identification catalogs.

<sup>5</sup>In the SAR for harbor porpoise, NMFS identified population estimates and PBR for porpoises within inland southeast Alaska waters (these abundance estimates have not been corrected for g(0); therefore, they are likely conservative).

All species that could potentially occur in the proposed survey areas are included in Table

2. However, the temporal and/or spatial occurrence of the Pacific white-sided dolphin

(*Lagenorhynchus obliquidens*), gray whale (*Eschrichtius robustus*), and sperm whale (*Physeter*

*macrocephalus*) are such that take is not expected to occur, and they are not discussed further beyond the explanation provided here. The range of Pacific white-sided dolphin is suggested to overlap with Lynn Canal (Muto *et al.* 2018), but no sightings have been documented in the project area (Dahlheim *et al.* 2009; K. Gross, Never Monday Charters, personal communication; R. Ford, Taiya Inlet Watershed Council, personal communication reported in MOS 2016). Gray whale sightings in this northern portion of Southeast Alaska are very rare; there have only been eight sightings since 1997 (J. Neilson, National Park Service, personal communication reported in MOS 2016). None of these observations occurred in the Taiya Inlet/Lynn Canal. Tagged sperm whales have been tracked within the Gulf of Alaska, with one whale tracked up Lynn Canal during October 2014 (SEASWAP 2017). Tagging studies primarily show that sperm whales use the deep water slope habitat extensively for foraging (Mathias *et al.* 2012). This species prefers deeper waters, and are unlikely to occur in Taiya Inlet.

WP&YR requested take for seven marine mammal species documented in the waters of the Taiya Inlet/Lynn Canal (Dahlheim *et al.* 2009; Muto *et al.* 2018). One of the species, the harbor seal, is known to regularly occur near the project site year round; however the closest seasonal haulout site is three miles (4.8 km) from the project area and not within the Level B harassment ensonified area (see Estimated Take). Moderate to high abundances of Steller sea lions are also known to seasonally occupy the inlet, with the closest seasonal haulout located 11 miles (18 km) from the project site. Several humpback whales have been observed within Taiya Inlet, sometimes close to Skagway, during non-winter months. The remaining four species (harbor porpoise, Dall's porpoise, killer whale, and minke whale) may occur in Taiya Inlet/Lynn Canal, but less frequently and farther from Skagway Harbor and the project site. Information on presence and distribution in the WP&YR project area can be found in the

## *Habitat*

No Biologically Important Areas (BIAs) or ESA-designated critical habitat overlap with the project area, however there is seasonally important foraging habitat for some species of marine mammal which overlap spatially and temporally with proposed project activities. The annual eulachon run (which occurs for approximately three to four weeks during April through May) in Lynn Canal is important to all marine mammals (particularly Steller sea lions, and harbor seals, and humpback whales) for seasonal foraging and many species travel into Taiya Inlet to forage on this prey.

## *Cetaceans*

### Humpback Whale

The humpback whale is distributed worldwide in all ocean basins. In winter, most humpback whales are found in the subtropical and tropical waters of the Northern and Southern Hemispheres, and then migrate to high latitudes in the summer to feed. The historic summer feeding range of humpback whales in the North Pacific encompassed coastal and inland waters around the Pacific Rim from Point Conception, California, north to the Gulf of Alaska and the Bering Sea, and west along the Aleutian Islands to the Kamchatka Peninsula and into the Sea of Okhotsk and north of the Bering Strait (Johnson and Wolman 1984).

There are currently three MMPA-designated stocks of humpback whales in the North Pacific: 1) the California/Oregon/Washington stock, consisting of winter/spring populations in coastal Central America and coastal Mexico which migrate to the coast of California to southern British Columbia in summer/fall (Calambokidis *et al.* 1989; Steiger *et al.* 1991; Calambokidis *et al.* 1993); 2) the Central North Pacific stock, consisting of winter/spring populations of the Hawaiian Islands which migrate primarily to northern British Columbia/Southeast Alaska, the

Gulf of Alaska, and the Bering Sea/Aleutian Islands (Perry *et al.* 1990; Calambokidis *et al.* 1997); and 3) the Western North Pacific stock, consisting of winter/spring populations off Asia which migrate primarily to Russia and the Bering Sea/Aleutian Islands. The Central North Pacific stock is the only stock that is found near the project area.

On September 8, 2016, NMFS published a final decision changing the status of humpback whales under the Endangered Species Act (ESA) (81 FR 62259), effective October 11, 2016. Previously, humpback whales were listed under the ESA as an endangered species worldwide. In the 2016 decision, NMFS recognized the existence of 14 distinct population segments (DPSs), classified four of those as endangered and one as threatened, and determined that the remaining nine DPSs do not warrant protection under the ESA. Whales occurring in the project area would primarily include individuals from the delisted Hawaii DPS (93.9 percent probability), but could also include individuals from the threatened Mexico DPS (6.1 percent probability) (Wade *et al.* 2016).

Humpback whales are found throughout southeast Alaska in a variety of marine environments, including open-ocean, near-shore waters, and areas with strong tidal currents (Dahlheim *et al.* 2009). Humpback whales generally arrive in southeast Alaska in March and return to their wintering grounds in November. Some humpback whales depart late or arrive early to feeding grounds, and therefore the species occurs in southeast Alaska year-round (Straley 1990). Dahlheim *et al.* (2009) observed humpback whales throughout all major waterways in southeast Alaska with concentrations of whales consistently observed in Icy Strait, Lynn Canal, Stephens Passage, Chatham Strait, and Frederick Sound. Mean group size varied among season with group sizes of 1.38, 1.65, and 1.95 in spring, summer, and fall respectively.

Subsistence hunters in Alaska are not authorized to take Central North Pacific stock humpback whales and no takes were reported from 2012-2016 (Muto *et al.* 2018). Threats to the Central North Pacific stock include changes in prey distribution due to climate change, entanglement in fishing gear, ship strike, and anthropogenic sound, however the Central North Pacific stock is increasing (Muto *et al.* 2018).

#### Minke Whale

Minke whales are found throughout the northern hemisphere in polar, temperate, and tropical waters. In the North Pacific, minke whales occur from the Bering and Chukchi seas south to near the Equator (Leatherwood *et al.* 1982). Minke whales are generally found in coastal waters shallower than 200 m and are usually observed solitary or in small groups of two to three whales (Zerbini *et al.* 2006; Zerbini *et al.* 2006). In Alaska, there is only one stock of minke whales and seasonal movements are associated with feeding areas that are generally located at the edge of the pack ice (NMFS 2014).

Although no comprehensive abundance estimate is available for the Alaska stock of minke whales, recent surveys provide estimates for portions of the stock's range. A 2010 survey conducted on the eastern Bering Sea shelf produced a provisional abundance estimate of 2,020 (CV = 0.73) whales (Friday *et al.* 2013). This estimate is considered provisional because it has not been corrected for animals missed on the trackline, animals submerged when the ship passed, or responsive movement. Additionally, line-transect surveys were conducted in shelf and nearshore waters (within 30-45 nautical miles of land) in 2001-2003 between the Kenai Peninsula (150° W) and Amchitka Pass (178° W). Minke whale abundance was estimated to be 1,233 (CV = 0.34) for this area (also not corrected for animals missed on the trackline) (Zerbini *et al.* 2006). The majority of the sightings were in the Aleutian Islands, rather than in the Gulf of

Alaska, and in water shallower than 200 m. These estimates cannot be used as an estimate of the entire Alaska stock of minke whales because only a portion of the stock's range was surveyed.

Surveys in southeast Alaska have consistently identified individuals throughout inland waters in low numbers, however none were observed in Taiya Inlet or Lynn Canal (Dahlheim *et al.* 2009). As few minke whales were observed during recent offshore Gulf of Alaska surveys for cetaceans in 2009, 2013, and 2015, a population estimate for minke whales in this area cannot be determined (Rone *et al.* 2017). There are no data available to determine trends in minke whale abundance in Alaska waters. Subsistence takes of minke whales in Alaska is rare, with the last known catch occurring in 1989. Although no incidents of human-related serious injury and mortality were recorded for Alaska stock minke whales between 2012 and 2016, threats to the population include entanglement in fishing gear, ship strikes, and anthropogenic sound, as well as changes in prey distribution due to climate change (Muto *et al.* 2018).

#### Killer Whale

Killer whales have been observed in all oceans and seas of the world, but the highest densities occur in colder and more productive waters found at high latitudes. Killer whales are found throughout the North Pacific, and occur along the entire Alaska coast, in British Columbia and Washington inland waterways, and along the outer coasts of Washington, Oregon, and California (Muto *et al.* 2018). Based on data regarding association patterns, acoustics, movements, and genetic differences, eight killer whale stocks are now recognized in the Pacific Ocean: (1) the Alaska Resident stock; (2) the Northern Resident stock; (3) the Southern Resident stock; (4) the Gulf of Alaska, Aleutian Islands, and Bering Sea Transient stock; (5) the AT1 Transient stock; (6) the West Coast Transient stock; and (7) the Offshore stock, and (8) the Hawaii stock. Only the Alaska Resident, Northern Resident, Gulf of Alaska, Aleutian Islands,

and Bering Sea Transient, and West Coast Transient stocks are considered in this analysis because other stocks occur outside the geographic area under consideration. Any of these four stocks could be seen in the action area; however, the Alaska and Northern Resident stocks are most likely to overlap with the project area (Muto *et al.* 2018).

The Alaska Resident stock is found from southeastern Alaska to the Aleutian Islands and Bering Sea. Intermixing of Alaska Residents have been documented among the three areas, at least as far west as the eastern Aleutian Islands. The Northern Resident stock occurs from Washington State through part of southeastern Alaska. The Northern Resident stock is a transboundary stock, and includes killer whales that frequent British Columbia, Canada and southeastern Alaska (Dahlheim *et al.* 1997; Ford *et al.* 2000). The Gulf of Alaska, Aleutian Islands, and Bering Sea Transient stock occurs mainly from Prince William Sound through the Aleutian Islands and Bering Sea. The West Coast Transient stock includes animals that occur in California, Oregon, Washington, British Columbia and southeastern Alaska.

Transient killer whales occur in smaller, less matrilineal groupings than resident killer whales. They are also more likely to rely on stealth tactics when foraging, making fewer and less conspicuous calls, and edging along shorelines and around headlands in order to hunt their prey, including, Steller sea lions, harbor seals, and smaller cetaceans, in highly coordinated attacks (Barrett-Lennard *et al.* 2011). Residents often travel in much larger and closer knit groups within which they share any fish they catch.

Resident and transient killer whales have been documented in the middle to lower reaches of Lynn Canal, but not within the upper reaches or in Taiya Inlet (Dahlheim *et al.* 2009). Dahlheim *et al.* (2009) frequently observed two resident pods identified as AF and AG pods (Alaska Resident stock) throughout Icy Strait, Lynn Canal, Stephens Passage, Frederick Sound

and upper Chatham Strait. The seasonality of resident killer whales could not be investigated statistically due to low encounter rates and mean group size of resident whales did not vary significantly among seasons and ranged from 19 to 33 individuals (Dahlheim *et al.* 2009).

Dahlheim *et al.* (2009) observed transient killer whales in all major waterways, including Lynn Canal, in open-strait environments, near-shore waters, protected bays and inlets, and in ice-laden waters near tidewater glaciers. The transient killer whale mean group size also did not vary with season and ranged from four to six individuals in Southeast Alaska (Dahlheim *et al.* 2009). Transient killer whale numbers were highest in summer, with lower numbers observed in spring and fall.

No reliable data on trends in population abundance for the entire Alaska Resident, Gulf of Alaska, Aleutian Islands, and Bering Sea Transient, and West Coast Transient stocks of killer whales are unavailable (Muto *et al.* 2018). The Northern Resident stock is increasing with an average 2.1 percent increase over a 36 year time period (Ellis *et al.* 2011). There are no reports of subsistence harvest of killer whales in Alaska, however other threats to the stocks include interactions with fisheries, vessel collisions, and decreases in prey abundance (Muto *et al.* 2018).

#### Harbor Porpoise

The harbor porpoise inhabits temperal, subarctic, and arctic waters. In the eastern North Pacific, harbor porpoises range from Point Barrow, Alaska, to Point Conception, California. While harbor porpoise primarily frequent coastal waters and occur most frequently in waters less than 100 m deep (Hobbs and Waite 2010), they may occasionally be found in deeper offshore waters. Within the inland waters of Southeast Alaska, harbor porpoise distribution is clumped, with greatest densities observed in the Glacier Bay/Icy Strait region, and near Zarembo and

Wrangell Islands and the adjacent waters of Sumner Strait (Allen and Angliss 2014). Group sizes were on average between 1.37-1.59 animals (less than 2) (Dahlheim *et al.* 2009; 2015).

In Alaska, harbor porpoises are currently divided into three stocks, based primarily on geography. These are 1) the Southeast Alaska stock - occurring from the northern border of British Columbia to Cape Suckling, Alaska, 2) the Gulf of Alaska stock - occurring from Cape Suckling to Unimak Pass, and 3) the Bering Sea stock - occurring throughout the Aleutian Islands and all waters north of Unimak Pass (Allen and Angliss 2014). Only the Southeast Alaska stock is considered in this analysis because it is the only stock found in the project area.

No reports of subsistence harvest of harbor porpoises from the Southeast Alaska stock have been reported since the early 1900s (Shelden *et al.* 2014). The total estimated annual level of human-caused mortality and serious injury for Southeast Alaska stock (n= 34) exceeds the calculated PBR of 8.9 porpoises. However because the calculated PBR is based on surveys from 2010-2012 in only a portion of the stock's range (the inside water of southeast Alaska), PBR is likely biased low for the entire stock (Muto *et al.* 2018). Population trends and status of this stock relative to its Optimum Sustainable Population are currently unknown.

#### Dall's Porpoise

Dall's porpoise are widely distributed across the entire North Pacific Ocean. They are found over the continental shelf adjacent to the slope and over deep (greater than 2,500 m) oceanic waters and have been sighted throughout the North Pacific as far north as 65° N (Hall 1979; Buckland *et al.* 1993). The only apparent distribution gaps in Alaska waters are upper Cook Inlet and the shallow eastern flats of the Bering Sea. They are present during all months of the year in much of the eastern North Pacific, although they may make seasonal onshore-

offshore movements along the west coast of the continental United States and winter movements out of areas with ice (Hall 1979; Leatherwood and Fielding 1974; Loeb 1972).

Currently one stock of Dall's porpoise is recognized in Alaskan waters (Muto *et al.* 2018). Dahlheim *et al.* (2009) observed Dall's porpoise throughout Southeast Alaska, but only observed Dall's porpoise in Lynn Canal as far north as Haines, Alaska, about 15 miles south of Skagway. Infrequent observations (three to six) of Dall's porpoise have been observed in Taiya Inlet during the early spring and late fall, however they have not been observed near the project site near the Skagway waterfront (K. Gross, Never Monday Charters, personal communication reported in MOS 2016). At present, there is no reliable information on trends in abundance for the Alaska stock of Dall's porpoise (Muto *et al.* 2018). There are no subsistence uses of this species (Muto *et al.* 2018), however Dall's porpoise are vulnerable to fisheries-related entanglement and injury and to physical modifications of nearshore habitats resulting from urban and industrial development (including waste management and nonpoint source runoff), and noise (Linnenschmidt *et al.* 2013).

### *Pinnipeds*

#### *Steller Sea Lion*

The Steller sea lion is the largest of the eared seals (otariids), ranging along the North Pacific Rim from northern Japan to California, with centers of abundance and distribution in the Gulf of Alaska and Aleutian Islands. Steller sea lions use terrestrial haulout sites to rest and take refuge. They also gather on well-defined, traditionally used rookeries to pup and breed. These habitats are typically gravel, rocky, or sand beaches; ledges; or rocky reefs (Muto *et al.* 2018). Steller sea lion populations that primarily occur west of 144° W (Cape Suckling, Alaska) comprise the western Distinct Population Segment (wDPS) or Western U.S. stock, while all

others comprise the eastern DPS (eDPS) or Eastern U.S. stock; however, there is regular movement of both DPSs across this boundary (Muto *et al.* 2018). Both of these populations may occur in the action area, however in Lynn Canal/Taiya Inlet Steller sea lions are most likely part of the eDPS/Eastern U.S. stock. Based on the percent of branded animals at Gran Point it is estimated that 2 percent of the sea lions in the project area are potentially from the wDPS/Eastern U.S. stock (personal communication, L. Jemison Alaska Department of Fish and Game, 2017). Steller sea lions were listed as threatened range-wide under the ESA on 26 November 1990 (55 FR 49204). Steller sea lions were subsequently partitioned into the western and eastern DPSs in 1997, with the wDPS being listed as endangered under the ESA and the eDPS remaining classified as threatened (62 FR 24345) until it was delisted in November 2013. In August 1993, NMFS published a final rule designating critical habitat for the Steller sea lion as a 20-nautical mile buffer around all major haul-outs and rookeries, as well as associated terrestrial, air and aquatic zones, and three large offshore foraging areas (50 CFR 226.202). There is no Steller sea lion critical habitat located in the action area.

Gran Point, which is located 24 mi (38 km) south of the project area, is the closest year-round Steller sea lion haulout. However, during the spring eulachon run, a seasonal haulout site is located on Taiya Point at the southern tip of Taiya Inlet, approximately 11 mi (18 km) from the project site. Twenty-five to 40 sea lions are estimated to use this haulout for about three weeks during spring run, during which they frequently are observed in the inlet. The eulachon run (which occurs for approximately three to four weeks during mid-March through May) in Lynn Canal is important to Steller sea lions for seasonal foraging. These spawning aggregations of forage fish provide densely aggregated, high-energy prey for Steller sea lions (and harbor seals) for brief time periods and influence haulout use (Sigler *et al.* 2004; Womble *et al.* 2005;

Womble and Sigler 2006). The pre-spawning aggregations and spawning season for many forage fish species occur between March and May in Southeast Alaska just prior to the breeding season of sea lions (Pitcher *et al.* 2001; Womble and Sigler 2006). After May, Steller sea lion presence in the project action area declines. During surveys conducted in 2002 and 2003, Womble *et al.* (2005) observed a maximum of approximately 400 Steller sea lions in the water at the mouth of the Taiya River feeding on eulachon in 2003, but observed very few in the same area in 2002. Steller sea lions have also been observed in Lutak Inlet, a foraging site closer to both Taiya Point and Gran Point haulouts.

Steller sea lions are included in Alaska subsistence harvests. The mean annual subsistence take of Western U.S. Steller sea lions was 203 from 2004-2016, and the mean annual take of Eastern U.S. Steller sea lions was 11 from 2005-2008 and 2012 (Muto *et al.* 2018). Entanglements in fishing gear and marine debris, and interactions with fishing gear are sources of mortality and serious injury for Steller sea lions. The Eastern U.S. stock is increasing with models indicating the rate of increase as 4.76 percent per year based on pup counts and 2.84 percent per year based on non-pup counts (Muto *et al.* 2018). Pup and non-pup counts of Western U.S. stock Steller sea lions in Alaska have increased 1.78 percent per year and 2.14 per year respectively between 2002 and 2017.

### *Harbor Seal*

Harbor seals range from Baja California north along the west coasts of Washington, Oregon, California, British Columbia, and Southeast Alaska; west through the Gulf of Alaska, Prince William Sound, and the Aleutian Islands; and north in the Bering Sea to Cape Newenham and the Pribilof Islands (Muto *et al.* 2018). They haul out on rocks, reefs, beaches, and drifting glacial ice, and feed in marine, estuarine, and occasionally fresh waters. Harbor seals generally

are nonmigratory, with local movements associated with such factors as tides, weather, season, food availability, and reproduction (Scheffer and Slipp 1944; Fisher 1952; Bigg 1969, 1981; Hastings *et al.* 2004).

Harbor seals in Alaska are partitioned into 12 separate stocks based largely on genetic structure: (1) the Aleutian Islands stock, (2) the Pribilof Islands stock, (3) the Bristol Bay stock, (4) the North Kodiak stock, (5) the South Kodiak stock, (6) the Prince William Sound stock, (7) the Cook Inlet/Shelikof stock, (8) the Glacier Bay/Icy Strait stock, (9) the Lynn Canal/Stephens Passage stock, (10) the Sitka/Chatham stock, (11) the Dixon/Cape Decision stock, and (12) the Clarence Strait stock. Only the Lynn Canal/Stephens Passage stock is considered in this analysis. The stock range includes north along the east and north coast of Admiralty Island from the north end of Kupreanof Island through Lynn Canal, including Taku Inlet, Tracy Arm, and Endicott Arm (Muto *et al.* 2018). The most current (2007-2011) estimate of the population trend for the stock is -176 seals per year, with a probability that the stock is decreasing of 0.71 (Muto *et al.* 2018).

Harbor seals are included in subsistence harvests. Annual harvests from the Lynn Canal/Stephens Passage in 2011 and 2012 were 50 animals each year, which is higher than previous estimates of 30 animals, on average, per year from 2004-2008 (Muto *et al.* 2018). Entanglement in fishing gear is also a large contributor to their annual human-caused serious injury/mortality.

Additional information on the biology and local distribution of these species can be found in the NMFS Marine Mammal Stock Assessment Reports, which may be found at:

<https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessments>.

## *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 dB threshold from the normalized composite audiograms, with the exception for lower limits for low-frequency cetaceans where the lower bound was deemed to be biologically implausible and the lower bound from Southall *et al.* (2007) retained. The functional groups and the associated frequencies are indicated below (note that these frequency ranges correspond to the range for the composite group, with the entire range not necessarily reflecting the capabilities of every species within that group):

- Low-frequency cetaceans (mysticetes): generalized hearing is estimated to occur between approximately 7 Hz and 35 kHz;
- Mid-frequency cetaceans (larger toothed whales, beaked whales, and most delphinids): generalized hearing is estimated to occur between approximately 150 Hz and 160 kHz;

- High-frequency cetaceans (porpoises, river dolphins, and members of the genera *Kogia* and *Cephalorhynchus*; including two members of the genus *Lagenorhynchus*, on the basis of recent echolocation data and genetic data): generalized hearing is estimated to occur between approximately 275 Hz and 160 kHz.
- Pinnipeds in water; Phocidae (true seals): generalized hearing is estimated to occur between approximately 50 Hz to 86 kHz;
- Pinnipeds in water; Otariidae (eared seals): generalized hearing is estimated to occur between 60 Hz and 39 kHz.

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

For more detail concerning these groups and associated frequency ranges, please see NMFS (2018) for a review of available information. Seven marine mammal species (five cetacean and two pinniped (one otariid and one phocid) species) have the reasonable potential to co-occur with the proposed activities. Please refer to Table 2. Of the cetacean species that may be present, two are classified as low-frequency cetaceans (*i.e.*, all mysticete species), one is classified as a mid-frequency cetacean (*i.e.*, all delphinid and ziphiid species and the sperm whale), and two are classified as high-frequency cetaceans (*i.e.*, harbor porpoise and *Kogia* spp.).

### **Potential Effects of Specified Activities on Marine Mammals and their Habitat**

This section includes a summary and discussion of the ways that components of the specified activity may impact marine mammals and their habitat. The *Estimated Take by Incidental Harassment* section later in this document includes a quantitative analysis of the

number of individuals that are expected to be taken by this activity. The *Negligible Impact Analysis and Determination* section considers the content of this section, the *Estimated Take by Incidental Harassment* section, and the *Proposed Mitigation* section, to draw conclusions regarding the likely impacts of these activities on the reproductive success or survivorship of individuals and how those impacts on individuals are likely to impact marine mammal species or stocks.

#### *Description of Sound Sources*

The marine soundscape is comprised of both ambient and anthropogenic sounds. Ambient sound is defined as the all-encompassing sound in a given place and is usually a composite of sound from many sources both near and far (ANSI 1994). The sound level of an area is defined by the total acoustical energy being generated by known and unknown sources. These sources may include physical (*e.g.*, waves, wind, precipitation, earthquakes, ice, atmospheric sound), biological (*e.g.*, sounds produced by marine mammals, fish, and invertebrates), and anthropogenic sound (*e.g.*, vessels, dredging, aircraft, construction).

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 would include impact pile driving, vibratory pile driving and removal, and drilling. The sounds produced by these activities fall into one of two general sound types: impulsive and non-impulsive. Impulsive sounds (*e.g.*, explosions, gunshots, sonic booms, impact pile driving) are typically transient, brief (less than 1 second), broadband, and consist of high peak sound pressure with rapid rise time and rapid decay (ANSI 1986; NIOSH 1998; ANSI 2005; NMFS 2018). Non-impulsive sounds (*e.g.* aircraft, machinery operations such as drilling or dredging, vibratory pile driving, and active sonar systems) can be broadband, narrowband or tonal, brief or prolonged (continuous or intermittent), and typically do not have the high peak sound pressure with rapid rise/decay time that impulsive sounds do (ANSI 1995; NIOSH 1998; NMFS 2018). 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).

Two types of pile hammers would be used on this project: impact and vibratory. 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 using a down-the-hole drill inserted through the hollow steel piles. A down-the-hole drill is a drill bit that drills through the bedrock using a pulse mechanism that functions at the bottom of the hole. This pulsing bit breaks up rock to allow removal of debris and insertion of the pile. The head extends so that the drilling takes place below the pile. The pulsing sounds produced by the down-the-hole drilling method 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 WP&YR'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 pile installation and removal and drilling.

#### *Acoustic Impacts*

The introduction of anthropogenic noise into the aquatic environment from pile driving and removal and down-the-hole drilling is the primary means by which marine mammals may be harassed from WP&YR'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 as 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; *e.g.*, Kastelein *et al.* 2014b), 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 (2016), 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 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, and Yangtze finless porpoise (*Neophocoena asiaorientalis*)) 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, vibratory pile driving, and down-the-hole drilling. 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 pile driving and removal and drilling 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.

In 2016, the Alaska Department of Transportation and Public Facilities (ADOT&PF) documented observations of marine mammals during construction activities (*i.e.*, pile driving and down-hole drilling) at the Kodiak Ferry Dock (see 80 FR 60636 for Final IHA Federal Register notice). In the marine mammal monitoring report for that project (ABR 2016), 1,281 Steller sea lions were observed within the Level B disturbance zone during pile driving or drilling (*i.e.*, documented as Level B harassment take). Of these, 19 individuals demonstrated an alert

behavior, 7 were fleeing, and 19 swam away from the project site. All other animals (98 percent) were engaged in activities such as milling, foraging, or fighting and did not change their behavior. In addition, two sea lions approached within 20 meters of active vibratory pile driving activities. Three harbor seals were observed within the disturbance zone during pile driving activities; none of them displayed disturbance behaviors. Fifteen killer whales and three harbor porpoise were also observed within the Level B harassment zone during pile driving. The killer whales were travelling or milling while all harbor porpoises were travelling. No signs of disturbance were noted for either of these species. Given the similarities in activities and habitat 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). Monitoring reports from other recent pile driving and down-the-hole drilling projects in Alaska have observed similar behaviors (for example, the Biorca Island Dock Replacement Project).

*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. Skagway Harbor contains an active port of call for cruise ships and hosts numerous recreational and commercial vessels; therefore, background sound levels in the harbor are already elevated.

*Airborne Acoustic Effects* - Pinnipeds that occur near the project site could be exposed to airborne sounds associated with pile driving and removal and down-the-hole drilling 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 would primarily be an issue for pinnipeds that are swimming or hauled out near the project site within the range of noise levels elevated above the acoustic criteria. 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. However, 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. Thus, the behavioral

harassment of these animals is already accounted for in these estimates of potential take.

Therefore, we do not believe that authorization of incidental take resulting from airborne sound for pinnipeds is warranted, and airborne sound is not discussed further here.

#### *Marine Mammal Habitat Effects*

WP&YR construction activities at the Railroad Dock could have localized, temporary impacts on marine mammal habitat and their prey by increasing in-water sound pressure levels and slightly decreasing water quality. 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, elevated levels of underwater noise would ensonify Taiya Inlet where both fish and mammals occur and could affect foraging success.

Construction activities are of short duration and would likely have temporary impacts on marine mammal habitat through increases in underwater and airborne sound. These sounds would not be detectable at the nearest known Steller sea lion haulouts, and all known harbor seal haulouts are well beyond the maximum distance of predicted in-air acoustical disturbance.

In-water pile driving, pile removal, and drilling activities would also cause short-term effects on water quality due to increased turbidity. Local strong currents are anticipated to disburse suspended sediments produced by project activities at moderate to rapid rates depending on tidal stage. WP&YR would employ standard construction best management practices (BMPs; see section 11 and Appendix B in application), thereby reducing any impacts. Therefore, 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 Lynn Canal/Taiya Inlet (*e.g.*, most of the impacted area is limited to the northern and western portions of Taiya Inlet) and does not include any BIAs or ESA-designated critical habitat. Pile installation/removal and drilling may temporarily increase turbidity resulting from suspended sediments. Any increases would be temporary, localized, and minimal. WP&YR must comply with state water quality standards during these operations by limiting the extent of turbidity to the immediate project area. In general, turbidity associated with pile installation is localized to about a 25-foot radius around the pile (Everitt *et al.* 1980). Cetaceans are not expected to be close enough to the project pile driving areas to experience effects of turbidity, and any pinnipeds would be transiting the area 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 in Lynn Canal/Taiya Inlet.

The duration of the construction activities is relatively short. The construction window is for a maximum of 89 days and during each day, construction activities would only occur during daylight hours. Impacts to habitat and prey are expected to be 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 down-the-hole drilling) 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.

Construction activities, in the form of increased turbidity, have the potential to adversely affect forage fish and juvenile salmonid outmigratory routes in the project area. Both herring and salmon form a significant prey base for Steller sea lions, herring is a primary prey species of humpback whales, and both herring and salmon are components of the diet of many other marine mammal species that occur 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 forage fish and salmon 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. Finally, exposure to turbid waters from construction activities is not expected to be different from the current exposure; fish and marine mammals in the Lynn Canal/Taiya Inlet region are routinely exposed to substantial levels of suspended sediment from glacial sources.

In summary, given the short daily duration of sound associated with individual pile driving and drilling events and the relatively small areas being affected, pile driving and drilling 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 impact and vibratory hammers and down-the-hole drilling 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 result, primarily for low-frequency cetaceans, high-frequency cetaceans, and/or phocids because predicted auditory injury zones are larger than for mid-frequency cetaceans and otariids. Auditory injury is unlikely to occur for mid-frequency cetaceans and otariids. The proposed mitigation and monitoring measures are expected to minimize the severity of such taking to the extent practicable. As described previously, no mortality 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).

*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  $\mu$ Pa (rms) for continuous (*e.g.*, vibratory pile-driving, drilling) and above 160 dB re 1  $\mu$ Pa (rms) for non-explosive impulsive (*e.g.*, seismic airguns) or intermittent (*e.g.*, scientific sonar) sources. WP&YR's proposed activity includes the use of continuous (vibratory pile driving/removal and drilling) and impulsive (impact pile driving) sources, and therefore the 120 and 160 dB re 1  $\mu$ Pa (rms) thresholds are applicable.

*Level A harassment for non-explosive sources* - NMFS' Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (Version 2.0) (NMFS 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). WP&YR’s proposed activity includes the use of impulsive (impact pile driving) and non-impulsive (vibratory pile driving/removal and drilling) sources.

These thresholds are provided in Table 3. 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 3. Thresholds identifying the onset of Permanent Threshold Shift.**

Hearing Group	PTS Onset Thresholds* (Received Level)	
	Impulsive	Non-impulsive
<b>Low-Frequency (LF) Cetaceans</b>	$L_{p,0-pk,flat}$ : 219 dB $L_{E,p,LF,24h}$ : 183 dB	$L_{E,p,LF,24h}$ : 199 dB
<b>Mid-Frequency (MF) Cetaceans</b>	$L_{p,0-pk,flat}$ : 230 dB $L_{E,p,MF,24h}$ : 185 dB	$L_{E,p,MF,24h}$ : 198 dB
<b>High-Frequency (HF) Cetaceans</b>	$L_{p,0-pk,flat}$ : 202 dB $L_{E,p,HF,24h}$ : 155 dB	$L_{E,p,HF,24h}$ : 173 dB
<b>Phocid Pinnipeds (PW) (Underwater)</b>	$L_{p,0-pk,flat}$ : 218 dB $L_{E,p,PW,24h}$ : 185 dB	$L_{E,p,PW,24h}$ : 201 dB
<b>Otariid Pinnipeds (OW) (Underwater)</b>	$L_{p,0-pk,flat}$ : 232 dB $L_{E,p,OW,24h}$ : 203 dB	$L_{E,p,OW,24h}$ : 219 dB

\* Dual metric 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 are recommended for consideration.

Note: Peak sound pressure level ( $L_{p,0-pk}$ ) has a reference value of 1  $\mu$ Pa, and weighted cumulative sound exposure level ( $L_{E,p}$ ) has a reference value of 1  $\mu$ Pa<sup>2</sup>s. In this table, thresholds are abbreviated to be more reflective of International Organization for Standardization standards (ISO 2017). The subscript “flat” is being included to indicate peak sound pressure are flat weighted or unweighted within the generalized hearing range of marine mammals (i.e., 7 Hz to 160 kHz). 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 weighted 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 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 and down-the-hole drilling). The maximum (underwater) ensonification area of 17.9 km<sup>2</sup> due to project activities is governed by the topography of Taiya Inlet (see Figure 6 in the application). The eastern shoreline of the inlet is acoustically shadowed due to land located just south of the proposed project site. Similarly, Yakutania Point and Dyea Point would inhibit transmission of project sounds from reaching Nahku Bay and the upper inlet at the mouth of the Taiya River. Additionally, vessel traffic and other commercial and industrial activities in the project area may contribute to elevated background noise levels which may mask sounds produced by the project.

In order to calculate distances to the Level A and Level B harassment thresholds for piles of various sizes being used in this project, NMFS used acoustic monitoring data from other locations. Note that piles of differing sizes have different sound source levels.

Empirical data from recent sound source verification (SSV) studies in Anchorage and Kodiak, Alaska were used to estimate sound source levels (SSLs) for impact pile driving, vibratory pile driving/removal, and down-the-hole drilling installations of the 42-inch steel pipe permanent piles and the 36-inch steel pipe template piles (Austin *et al.* 2016; Denes *et al.* 2016). These Alaskan construction sites were generally assumed to best represent the environmental conditions found in Skagway and represent the nearest available source level data for 42-inch steel piles.

Tables 4 provides the sound source values used in calculating harassment isopleths for each source type. No data are currently available for 42-inch steel pipe piles. For impact and

vibratory hammer source levels WP&YR used the median levels measured by Austin *et al.* (2016) during installation of 48-inch piles at Port of Anchorage (197.9 and 166.8 dB re 1  $\mu$ Pa (rms at 11 m)). These 48-inch pile impact and vibratory levels are conservatively used for both the 42-inch permanent piles and the 36-inch template piles. Little SSL data are available for down-the-hole drilling. WP&YR used the 90<sup>th</sup> percentile source levels measured by Denes *et al.* (2016) during drilling down the center of 30-inch piles in Kodiak (171 dB re 1  $\mu$ Pa (rms at 10 m)).

**Table 4. Source levels and anticipated daily durations for underwater sound calculations. Hours or strikes per day represents the maximum duration of any single activity.**

	Source	Source Type	SPL <sub>PK</sub> (dB)	SPL <sub>RMS</sub> (dB)	SEL <sub>S-S</sub> (dB)	Hours or Strikes per Day
Template Piles	Vibratory Installation/ Removal	Non-impulsive, continuous	n/a	166.8	n/a	3 hours
	Impact Installation	Impulsive, intermittent	212.5	197.9	186.7	2,000 strikes
	Drilling Installation	Non-impulsive, continuous	n/a	171.0	n/a	6 hours
Permanent Piles	Vibratory Installation	Non-impulsive, continuous	n/a	166.8	n/a	8 hours
	Impact Installation	Impulsive, intermittent	212.5	197.9	186.7	2,000 strikes
	Drilling Installation	Non-impulsive, continuous	n/a	171.0	n/a	8 hours

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:

$TL = B * \text{Log}_{10} (R_1/R_2)$ , where

TL = transmission loss in dB

B = transmission loss coefficient; for practical spreading equals 15

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

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

A practical spreading value of fifteen is often used under conditions, such as at the WP&YR Railroad Dock, where water increases with depth as the receiver moves away from the shoreline, resulting in an expected propagation environment that would lie between spherical and cylindrical spreading loss conditions. Practical spreading loss is assumed here.

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 and drilling, NMFS User Spreadsheet predicts the closest distance at which, if a marine mammal remained at that distance (or greater) the whole duration of the activity, it would not incur PTS. Inputs used in the User Spreadsheet and the resulting isopleths are reported in Tables 5 and 6. As WP&YR plans to employ two

continuous sound sources (vibratory pile driving and drilling) it is necessary to account for accumulation of sound caused by both activities during the full 10 hour work day when calculating Level A harassment isopleths. As drilling has the higher sound pressure level we propose to use drilling to calculate the Level A harassment isopleths for both drilling and vibratory pile driving activities (Table 5). For impact pile driving, isopleths calculated using the SEL<sub>CUM</sub> metric will be used as it produces larger isopleths than SPL<sub>PK</sub>. Isopleths for Level B harassment associated with impact pile driving (160 dB) and vibratory pile driving/removal and drilling (120 dB) were also calculated and are can be found in Table 6.

**Table 5. User spreadsheet input parameters used for calculating harassment isopleths.**

Parameter	Impact Pile Driving	Vibratory Pile Driving and Drilling
Spreadsheet Tab Used	E.1) Impact pile driving	A. 1) Drilling/ Vibratory pile driving
Source Level	186.7 dB SEL	171 dB rms
Weighting Factor Adjustment (kHz)	2	2
Number of strikes per day	2,000	N/A
Activity Duration (h) within 24-hour period	N/A	10 hours
Propagation (xLogR)	15LogR	15LogR
Distance of source level measurement (meters)	11	10

**Table 6. Calculated distances to Level A harassment and Level B harassment isopleths during pile installation and removal and drilling.**

Source	Level A Harassment Zone (meters)					Level B Harassment Zone (meters)
	Low-frequency cetacean	Mid-frequency cetacean	High-frequency cetacean	Phocid pinniped	Otariid pinniped	Cetaceans & Pinnipeds
Drilling and Vibratory Installation	148	8.3	129.7	79.2	5.8	13,000 <sup>1</sup>

Source	Level A Harassment Zone (meters)					Level B Harassment Zone (meters)
	Low-frequency cetacean	Mid-frequency cetacean	High-frequency cetacean	Phocid pinniped	Otariid pinniped	Cetaceans & Pinnipeds
Impact Installation	3,077.2	109.4	3,665.4	1,646.8	119.9	3,698.8
Source	PTS Onset Isopleth – Peak (meters)					
Impact Installation	4.1	n/a	55.1	4.7	n/a	

<sup>1</sup> Based on maximum distance before landfall. Calculated distance was 25.1 km.

### *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 that will inform the take calculations, and how this information is brought together to produce a quantitative take estimate.

Density information is not available for marine mammals in the project area in Taiya Inlet. Potential exposures to impact and vibratory pile driving noise for each threshold for all other marine mammals were estimated using published reports of group sizes and population estimates, and anecdotal observational reports from local commercial entities. For several species, it is not currently possible to identify all observed individuals to stock.

#### *Level B harassment calculations*

The estimation of takes by Level B harassment uses the following calculation:

Level B harassment estimate = N (number of animals in the ensonified area) \* Number of days of noise generating activities.

#### *Humpback Whale*

Humpback whales are the most commonly observed baleen whale in Southeast Alaska, particularly during spring and summer months. Humpback whales in Alaska, although not

limited to these areas, return to specific feeding locations such as Frederick Sound, Chatham Strait, North Pass, Sitka Sound, Glacier Bay, Point Adolphus, and Prince William Sound, as well as other similar coastal areas (Wing and Krieger 1983). In Lynn Canal they have been observed in the spring and fall from Haines to Juneau, however scientific surveys have not documented the species within Taiya Inlet (Dahlheim *et al.* 2009).

Local observations indicate that humpback whales are not common in the project action area but, if they are sighted, are generally present during mid to late spring and vacate the area by July to follow large aggregations of forage fish in lower Lynn Canal. Local observers have reported humpback whales in Taiya Inlet, sometimes fairly close to the Skagway waterfront. Due to seasonal migration patterns, the low frequency of humpbacks in the area, and that no humpback whales have been reported during winter months it is anticipated that no humpback whales will be present in the project area in February. On average, four to five individuals may occur near Skagway during the spring eulachon run in April and May, after which, only a few individuals are observed throughout the summer. In 2015, only one whale was observed (for several) weeks close to Skagway (K. Gross, personal communication reported in MOS 2016). Based on humpback whale occurrence in the project area and local observations, it is estimated that four individuals may be present in the action area each day during April, coinciding with 30 days of project activity (120 exposures). As it is unclear whether humpback whales occur in the inlet in March (for example, should the eulachon run begin early), it is conservatively estimated that one whale might be found in the inlet during that month for five days (0.16 whales per day, 5 exposures), for an overall total of 125 exposures (Table 7).

**Table 7. Estimated takes of humpback whales per month.**

Month	Animals in Inlet per Day	Days in Month	Exposures
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February	0	28	0
March	0.16	31	5
April	4	30	120
TOTAL			125

*Minke Whale*

Minke whales are rarely observed in the project area, and scientific surveys have not documented the species within Taiya Inlet (Dahlheim *et al.* 2009). A single minke whale was observed in the inlet in 2015 (K. Gross, Never Monday Charters, personal communication; R. Ford, Taiya Inlet Watershed Council, both personal communications reported in MOS 2016), and is the only known record of a minke whale in Taiya Inlet. However one minke whale was reported by local observers in the action area in 2015. Based on the available information it is very unlikely minke whales will be present in the inlet, however, minke whale presence is possible based on a single sighting and presence of potential prey (eulachon) in the spring. Thus, we estimate a total of two potential exposures of minke whales.

*Killer Whale*

Although killer whale stocks' ranges include southeast Alaska, they have only been documented as far north as Lynn Canal; therefore, while possible, occurrence north of Lynn Canal into Taiya Inlet is rare. According to local observations, pods of resident killer whales are occasionally seen in Taiya Inlet. Local observations indicate killer whales are observed four or five times a year (between spring and fall) usually in a group of 15 to 20 whales. In 2015 a resident pod was only observed in Taiya Inlet twice, remaining for one to four days per visit (K. Gross, personal communication reported in MOS 2016). There is no evidence of transient whales occurring within Taiya Inlet. While the resident pods remain in Alaska year-round there are no reports of sightings during winter months (January-February) in Taiya Inlet so it is assumed no killer whales will be present in the project area in February. Based on local observations in the

project area in the spring, it is assumed that a group of 20 whales may enter the project area once in each of March and April and remain within the inlet for two days each time, for a total of 80 potential exposures.

*Harbor Porpoise*

Harbor porpoises are primarily found in coastal waters, and in the Gulf of Alaska and Southeast Alaska, they occur most frequently in waters less than 100 meters (Dahlheim *et al.* 2009). Dedicated research studies of harbor porpoise in the project area only occur as far north in Lynn Canal as Haines during the summer (Dahlheim *et al.* 2009; 2015), approximately 16 miles south of Skagway. Group sizes were, on average, between 1.37-1.59 animals (less than 2) (Dahlheim *et al.* 2009; 2015). In Lynn Canal, observations were less frequent, primarily in lower Lynn Canal from Chatham Strait to Juneau, though harbor porpoises have been observed as far north as Haines during the summer (Dahlheim *et al.* 2009; 2015).

Despite lack of observations during dedicated surveys, local charter captains indicate that harbor porpoises commonly occur in small groups of two or three in Taiya Inlet, although they are not encountered on a daily basis and are rarely seen in areas close to the waterfront (K. Gross, personal communication reported in MOS 2016). Therefore, it is conservatively estimated that one group of three individuals may be present in the inlet 75 percent of the days during each month (or 2.25 porpoises per day on average) for a total of 201 potential exposures (Table 8).

**Table 8. Estimated takes of harbor porpoises per month.**

Month	Animals in Inlet per Day	Days in Month	Exposures
February	2.25	28	63
March	2.25	31	70
April	2.25	30	68
TOTAL			201

### *Dall's Porpoise*

Dall's porpoises are widely distributed across the entire North Pacific Ocean. Throughout most of the eastern North Pacific they are present during all months of the year, although there may be seasonal onshore-offshore movements along the west coast of the continental United States and winter movements of populations out of Prince William Sound and areas in the Gulf of Alaska and Bering Sea (Muto *et al.* 2018). Dahlheim *et al.* (2009) observed Dall's porpoise throughout Southeast Alaska, with concentrations of animals consistently found in Lynn Canal, Stephens Passage, Icy Strait, upper Chatham Strait, Frederick Sound, and Clarence Strait. Dahlheim *et al.* (2009), documented Dall's porpoise in Lynn Canal as far north as Haines, Alaska, about 15 miles south of Skagway.

Local observation indicate that three to six Dall's porpoises may be present in Taiya Inlet during the early spring and late fall. Observations have been occasional to sporadic and do not occur on a daily basis. The species has not been observed during winter months and has not been observed near the waterfront (K. Gross, personal communication reported in MOS 2016). The mean group size of Dall's porpoise in Southeast Alaska is estimated to be 3.7 individuals (Dahlheim *et al.* 2009). Therefore, it is estimated that a group of four Dall's porpoises will be present in the project area every other day in March and April (2 per day), for a total of 122 potential exposures (Table 9).

**Table 9. Estimated takes of Dall's porpoises per month.**

<b>Month</b>	<b>Animals in Inlet per Day</b>	<b>Days in Month</b>	<b>Exposures</b>
February	0	28	0
March	2	31	62
April	2	30	60
<b>TOTAL</b>			<b>122</b>

## *Steller Sea Lion*

Several long-term Steller sea lion haulouts are located in Lynn Canal, however none occur in Taiya Inlet. The nearest long-term Steller sea lion haulout is located at Gran Point, south of Haines and 24 mi (38 km) south of the project area. Other year-round haulouts in Lynn Canal are present at Met Point, Benjamin Island, and Little Island, closer to Juneau (Fritz *et al.* 2015). Observations from local charter boat captains and watershed stewards indicate Steller sea lions can be abundant in the action area, particularly in April and May during the eulachon run, but are rarely observed in the project area during the winter (K. Gross, Never Monday Charters, personal communication; R. Ford, Taiya Inlet Watershed Council, personal communication reported in MOS 2016). This is consistent with the National Marine Mammal Laboratory database (Fritz *et al.* 2015), which has identified the largest number of Lynn Canal sea lions during the fall and winter months at Benjamin Island in the lower reaches of the canal. During surveys conducted in 2002 and 2003, Womble *et al.* (2005) observed a maximum of approximately 400 Steller sea lions in the water at the mouth of the Taiya River feeding on eulachon in 2003, but observed very few in the same area in 2002. Steller sea lions have also been observed in Lutak Inlet, a foraging site closer to both Taiya Point and Gran Point haulouts.

During the spring eulachon run, a seasonal haulout site is located on Taiya Point at the southern tip of Taiya Inlet, approximately 11 mi (18 km) from the project site. Twenty-five to 40 sea lions are estimated to use this haulout for about three weeks during spring run, during which they frequently are observed in the inlet (K. Gross, personal communication reported in MOS 2016). However, most animals leave the inlet shortly after the eulachon run and are rarely observed in the summer. Based on survey data and local observations in the project area, it is estimated that two animals may be present each day in February, 16 animals may be present on

each day in March (half of the mean found on Taiya Rocks during the eulachon run), and 40 animals may be present each day in April for a total of 1,032 potential exposures (Table 10).

**Table 10. Estimated takes of Steller sea lions per month.**

<b>Month</b>	<b>Animals in Inlet per Day</b>	<b>Days in Month</b>	<b>Exposures</b>
February	2	28	56
March	16	31	496
April	40	30	1,200
<b>TOTAL</b>			<b>1,752</b>

*Harbor Seal*

No long-term haulout sites have been documented for harbor seals in Taiya Inlet; however, seasonal haulouts are present within six miles of the project area at Seal Cove and at the mouth of the Taiya River. Based on reports from local observers, a few resident harbor seals are expected to occur within Taiya Inlet during the winter months, but during the April and May eulachon run numbers can range from 20 to over 100 (K. Gross and R. Ford, personal communication reported in MOS 2016). Before and after the spawning run, much lower numbers of harbor seals are present.

Based on survey data and local observations in the project area it is assumed that 20 seals (the lower estimate in the range) occur within the project area each day in February through March (560 takes in February and 620 takes in March) and 100 seals (the higher estimate in the range) during April (3,000 takes) for a total of 4,180 potential exposures (Table 11).

**Table 11. Estimated takes of harbor seals per month.**

<b>Month</b>	<b>Animals in Inlet per Day</b>	<b>Days in Month</b>	<b>Takes</b>
February	20	28	560
March	20	31	620
April	100	30	3,000
<b>TOTAL</b>			<b>4,180</b>

*Level A harassment calculations*

WP&YR intends to avoid Level A harassment take by shutting down installation activities at approach of any marine mammal to the representative Level A harassment (PTS onset) ensonification zone up to a practical shutdown monitoring distance. As small/cryptic marine mammal species may enter the Level A harassment zone before shutdown mitigation procedures can be implemented, and some animals may occur between the maximum Level A harassment ensonification zone and the maximum shutdown safety zone, we conservatively estimate that 20 percent of the Level B harassment takes calculated above for humpback whales, harbor porpoises, Dall’s porpoises, and harbor seals, have the potential to be takes by Level A harassment (Table 12). Minke whale occurrence in Taiya Inlet is rare. Because vessel-based PSO are able to monitoring the entire Level A harassment zone (whales entering the inlet), WP&YR did not request, and NMFS is not proposing, to authorize Level A harassment take of minke whales.

**Table 12. Estimated take by Level A and Level B harassment, by species and stock, resulting from proposed WP&YR project activities.**

Common name	Stock	Stock abundance <sup>1</sup>	Level A	Level B	Total proposed take	Proposed take as percentage of stock
Humpback whale	Central North Pacific	10,103 <sup>2</sup>	25	100	125	1.23
Minke Whale	Alaska	N/A	0	2	2	N/A
Killer whale	Alaska Resident	2,347	0	80	80	3.4
	Northern Resident	261				30.6
	Gulf of Alaska, Aleutian Islands, Bering Sea Transient	587				13.6

	West Coast Transient	243				32.9
Harbor porpoise	Southeast Alaska	975	40	161	201	20.6
Dall's porpoise	Alaska	83,400	24	98	122	0.01
Steller sea lion	Western U.S.	54,267	0	35 <sup>3</sup>	35	0.06
	Eastern U.S.	41,638	0	1,717	1,717	4.1
Harbor seal	Lynn Canal/ Stephens Passage	9,478	836	3,344	4,180	44.1

<sup>1</sup> Stock or DPS size is  $N_{best}$  according to NMFS 2018 Draft Stock Assessment Reports.

<sup>2</sup> For ESA section 7 consultation purposes, 6.1 percent are designated to the Mexico DPS and the remaining are designated to the Hawaii DPS; therefore, we assigned 2 Level B takes to the Mexico DPS.

<sup>3</sup> Based on the percent of branded animals at Gran Point and in consultation with the Alaska Regional Office, we used a 2 percent distinction factor to determine the number of animals potentially from the western DPS.

There are a number of reasons why the estimates of potential incidents of take are likely to be conservative. Given the lack of density information, we use conservative estimates of marine mammal presence to calculate takes for each species. Additionally, in the context of stationary activities such as pile driving, and in areas where resident animals may be present, this number represents the number of instances of take that may occur to a small number of individuals, with a notably smaller number of animals being exposed more than once per individual. While pile driving or drilling can occur any day throughout the in-water work window, and the analysis is conducted on a per day basis, only a fraction of that time is actually spent pile driving. The potential effectiveness of mitigation measures in reducing the number of takes is also not quantified in the take estimation process. For these reasons, these take estimates may be conservative, especially if each take is considered a separate individual animal, and especially for pinnipeds.

### **Proposed Mitigation**

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

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

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

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

*Mitigation for Marine Mammals and their Habitat*

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

- Conduct briefings between construction supervisors and crews and the marine mammal monitoring team prior to the start of all pile driving activity, and when new personnel join the work, to explain responsibilities, communication procedures, marine mammal monitoring protocol, and operational procedures;
- For in-water heavy machinery work other than pile driving (*e.g.*, standard barges, etc.), if a marine mammal comes within 10 m, operations shall cease and vessels shall reduce speed to the minimum level required to maintain steerage and safe working conditions. This type of work could include the following activities: (1) movement of the barge to the pile location; or (2) positioning of the pile on the substrate via a crane (*i.e.*, stabbing the pile);
- Work may only occur during daylight hours, when visual monitoring of marine mammals can be conducted;
- 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 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 WP&YR's mitigation requirements:

*Establishment of Shutdown Zone for Level A Harassment* - For all pile driving/removal and drilling activities, WP&YR would establish a shutdown zone. 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). Conservative

shutdown zones of 150 m for low- and high- frequency cetaceans, 80 m for phocid pinnipeds, and 10 m for mid-frequency cetaceans and otariid pinnipeds would be used during all drilling and vibratory pile driving/removal activities to prevent incidental Level A harassment exposure for these activities (Table 13). During impact pile driving a 150 m zone would be used for all species except for low-frequency cetacean for which a 2,000 m zone will be used. These shutdown zones would be used to prevent incidental Level A exposures from impact pile driving for mid-frequency cetaceans and otariid pinnipeds, and to reduce the potential for such take for other species (Table 13). 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. The 150 m zone is the practical distance WP&YR anticipates phocid pinnipeds and high-frequency cetaceans can be effectively observed in the project area. The 2,000 m zone for low-frequency cetaceans is determined by the width of Taiya Inlet at Skagway Harbor. Observers will be present on vessels in the Taiya Inlet and able to observe large whales traveling north into the inlet and project area.

**Table 13. Monitoring and shutdown zones for each project activity.**

Source	Monitoring Zone (m)	Shutdown Zone (m)
Drilling and Vibratory Installation/Removal	13,000	Low- and high- frequency cetaceans: 150 Phocid pinnipeds: 80 Mid-frequency cetaceans and otariid pinnipeds: 10
Impact Installation	3,400	Low-frequency cetaceans: 2,000 All other species: 150

*Establishment of Monitoring Zones for Level B Harassment* - WP&YR would establish monitoring zones to correlate with Level B disturbance zones or zones of influence which 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 drilling. 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 13. The monitoring zone for drilling and vibratory pile driving/removal activities is 13,000 m, corresponding to the maximum distance before landfall. Placement of PSOs on vessels in the Taiya Inlet allow PSOs to observe marine mammals traveling north into the inlet and Skagway Harbor. Should PSOs determine the monitoring zone cannot be effectively observed in its entirety, 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.

*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 pile driving, contractors would be required to provide an initial set of strikes from the hammer at reduced energy, with each strike followed by a 30-second waiting period. This procedure would be conducted a total of three times before impact pile driving begins. 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 drilling 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 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 present 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 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.

Due to the depth of the water column and strong currents present at the project site, bubble curtains would not be implemented as they would not be effective in this environment.

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

### **Proposed Monitoring and Reporting**

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

action area. Effective reporting is critical both to compliance as well as to 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); and
- Mitigation and monitoring effectiveness.

#### *Marine Mammal Visual Monitoring*

Monitoring shall be conducted by NMFS-approved observers. Trained observers shall be placed from the best vantage point(s) practicable to monitor for marine mammals and implement shutdown or delay procedures when applicable through communication with the equipment operator. 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.

A total of five PSOs would be based on land and vessels. During all pile driving/removal and drilling activities observers will be stationed at the Railroad Dock, Yakutania Point, and Dyea Point. These stations will allow full monitoring of the impact hammer monitoring zone and the Level A shutdown zones. The vibratory and drilling monitoring zone will be additionally monitored using two PSOs stationed on boats anchored near the shoreline, with each team (vessel operator and observer) stationed approximately 2 km apart in the inlet south of the project site (Figure 2 in the WP&YR Marine Mammal Mitigation and Monitoring Plan).

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. WP&YR 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) Where a team of three or more observers are required, one observer shall be designated as lead observer or monitoring coordinator. The lead observer must have prior experience working as an observer.
- (v) WP&YR shall 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 pile driving and removal and drilling 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, WP&YR 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 Alaska 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 WP&YR to determine what is necessary to minimize the likelihood of further prohibited take and ensure MMPA compliance. WP&YR would not be able to resume their activities until notified by NMFS via letter, email, or telephone.

In the event that WP&YR 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), WP&YR would immediately report the incident to the Chief of the Permits and Conservation Division, Office of Protected Resources, NMFS, and the NMFS Alaska Stranding Hotline and/or by email to the Alaska 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 WP&YR to determine whether modifications in the activities are appropriate.

In the event that WP&YR 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), WP&YR would report the incident to the Chief of the Permits and Conservation Division, Office of Protected Resources, NMFS, and the NMFS Alaska Stranding Hotline and/or by email to the Alaska Regional Stranding Coordinator, within 24 hours of the discovery. WP&YR would provide photographs, video footage (if available), or other documentation of the stranded animal sighting to NMFS and the Marine Mammal Stranding Network.

### *Acoustic Monitoring*

WP&YR will conduct acoustic monitoring for the purposes of SSV. WP&YR will collect acoustic data for at least one 42-inch permanent pile, using all three installation methods (impact pile driving, vibratory pile driving, and down-the-hole drilling) from at least two distances from the pile (one approximately 10 meters from the pile and at least one additional measurement in the far field). The following data, at minimum, shall be collected during acoustic monitoring and reported:

- Hydrophone equipment and methods: recording device, sampling rate, distance from the pile where recordings were made; depth of recording device(s);
- Type of pile (42-inch), and segment of pile (1, 2, or 3), being driven and method of driving/removal or drilling during recordings; and
- Mean, median, maximum (or 90<sup>th</sup> percentile), and range sound levels (dB re 1 $\mu$ Pa): cumulative sound exposure level ( $SEL_{CUM}$ ), peak sound pressure level ( $SPL_{PK}$ ), root mean square sound pressure level ( $SPL_{RMS}$ ), and single-strike sound exposure level ( $SEL_{S-S}$ ) as appropriate for the sound source.

For more details please see WP&YR's acoustic monitoring plan, available at <https://www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-construction-activities>.

### **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' 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 Railroad Dock installation 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 and down-the-hole drilling. Potential takes could occur if individuals of these species are present in the ensonified zone 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 and measures designed to minimize the possibility of injury to marine mammals. Level A harassment is only anticipated for humpback whales, Dall's porpoise, harbor porpoise, and harbor seal. The potential for harassment is minimized through the construction method and the implementation of the planned mitigation measures (see *Proposed Mitigation* section).

As described previously, minke whales are considered rare in the proposed project area and we have proposed to authorize only nominal and precautionary take of two individuals. Therefore, we do not expect meaningful impacts to minke whales and preliminarily find that the total minke whale take from each of the specified activities will have a negligible impact on this species.

For remaining species, we discuss the likely effects of the specified activities in greater detail. Effects on individuals that are taken by Level B harassment, on the basis of reports in the literature as well as monitoring from other similar activities, will likely be limited to reactions such as increased swimming speeds, increased surfacing time, or decreased foraging (if such activity were occurring) (*e.g.*, Thorson and Reyff 2006; HDR, Inc. 2012; Lerma 2014; ABR 2016). Most likely, 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, or less impactful than, numerous other construction activities

conducted in southeast Alaska, 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 drilling associated with the proposed project may produce sound at distances of many kilometers from the project site, thus intruding on some habitat, the project site itself is located in a busy harbor and the majority of sound fields produced by the specified activities are close to the harbor. Therefore, we expect that animals annoyed 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 humpback whales, harbor porpoises, Dall's porpoises, 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 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.

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

- No mortality is anticipated or authorized;
- Conduct the majority of pile driving/removal and drilling work outside of the eulachon run, minimizing harassment of marine mammals during important foraging times;
- 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 consist of, at worst, temporary modifications in behavior that would not result in fitness impacts to individuals;
- The specified activity and ensonification area is very small relative to the overall habitat ranges of all species and does not include habitat areas of special significance (BIAs or ESA-designated critical habitat); and
- The presumed efficacy of the proposed mitigation measures in reducing the effects of the specified activity to the level of least practicable adverse impact.

In addition, although affected humpback whales and Steller sea lions may be from a DPS that is listed under the ESA, it is unlikely that minor noise effects in a small, localized area of habitat would have any effect on the stocks' ability to recover. In combination, we believe that these factors, as well as the available body of evidence from other similar activities, demonstrate that the potential effects of the specified activities will have only minor, short-term effects on individuals. The specified activities are not expected to impact rates of recruitment or survival and will therefore not result in population-level impacts.

Based on the analysis contained herein of the likely effects of the specified activity on marine mammals and their habitat, and taking into consideration the implementation of the proposed monitoring and mitigation measures, 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.

Table 12 demonstrates the number of animals that could be exposed to received noise levels that could cause Level A harassment and Level B harassment for the proposed work in the WP&YR project area. With the exception of the Northern Resident and West Coast Transient

killer whale stocks and harbor seals, our analysis shows that less than 25 percent of each affected stock could be taken by harassment. The numbers of animals proposed to be taken for these stocks would be considered small relative to the relevant stock's abundances even if each estimated taking occurred to a new individual – an extremely unlikely scenario.

The total proposed authorized take for killer whales as compared to each potentially affected stock ranges from 3.4 percent to 32.9 percent of each stock abundance. In reality, it is highly unlikely that 80 individuals of any one killer whale stock will be temporarily harassed. Instead, it is assumed that there will be a relatively brief period of takes of a smaller number of the same individuals from any stock (20, which is representative of the estimated group size, or 40, if individuals from the same stock are taken), which would result in smaller percentages of stocks (ranging from 0.9 percent to 8.2 percent if 20 whales from the same stock, or 1.7 percent to 16.5 percent if 40 whales from the same stock). We make this assumption because the Alaska and Northern resident stocks are known to occasionally occur in Taiya Inlet, but other stocks' (*e.g.*, transients) range extends into the project area, and therefore they may occur in the upper reaches of Lynn Canal into Taiya Inlet towards Skagway, albeit infrequently. Takes are not assumed to include multiple harassments of the same individual(s), resulting in estimates of proposed take as a percentage of stock abundance that are high compared to actual take that will occur. This is the case with the resident stocks of killer whale and harbor seal (Lynn Canal/Stephens Passage stock).

As reported, a small number of harbor seals, most of which reside in Taiya Inlet year-round, will be exposed to construction activities for three months. The total population estimate in the Lynn Canal/Stephens Passage stock is 9,478 animals over 1.37 million acres (5,500 km<sup>2</sup>) of area in their range, which results in an estimated density of 36 animals within Taiya Inlet. The

largest Level B harassment zone within the inlet occupies 17.9 km<sup>2</sup>, which represents less than 0.4 percent of the total geographical area occupied by the stock. The great majority of these exposures will be to the same animals given their residency patterns.

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. The proposed project will occur near but not overlap with the subsistence area used by the villages of Hoonah and Angoon (Wolfe *et al.* 2013; N. Kovaces, Skagway Traditional Council, personal communication). Harbor seals and Steller sea lions are available for subsistence harvest in this area (Wolfe *et al.* 2013). 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**

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 Alaska Regional Office, whenever we propose to authorize take for endangered or threatened species.

NMFS is proposing to authorize take of the Steller sea lion western DPS and humpback whale Mexico DPS, which are listed under the ESA. On November 29, 2018, the NMFS Office of Protected Resources has requested initiation of section 7 consultation with the Alaska Regional Office for the issuance of this IHA. NMFS will conclude the ESA consultation prior to reaching a determination regarding the proposed issuance of the authorization.

### **Proposed Authorization**

As a result of these preliminary determinations, NMFS proposes to issue an IHA to WP&YR for conducting the Railroad Dock dolphin installation project in Skagway, Alaska from February 1, 2019 through April 30, 2019, provided the previously mentioned mitigation, monitoring, and reporting requirements are incorporated. A draft of the IHA itself is available for review in conjunction with this notice at <https://www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-construction-activities>

### **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 action. We also request comment on the potential for renewal of this proposed IHA as described in the paragraph below. Please include with your comments any supporting data or literature citations to help inform our final decision on the request for MMPA authorization.

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

- A request for renewal is received no later than 60 days prior to expiration of the current IHA.
- The request for renewal must include the following:
  - (1) An explanation that the activities to be conducted beyond the initial dates either are identical to the previously analyzed activities or include changes so minor (*e.g.*, reduction in pile size) that the changes do not affect the previous analyses, take estimates, or mitigation and monitoring requirements.
  - (2) A preliminary monitoring report showing the results of the required monitoring to date and an explanation showing that the monitoring results do not indicate impacts of a scale or nature not previously analyzed or authorized.
- Upon review of the request for renewal, the status of the affected species or stocks, and any other pertinent information, NMFS determines that there are no more than minor changes in the activities, the mitigation and monitoring measures remain the same and appropriate, and the original findings remain valid.

Dated: December 12, 2018.

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