**BILLING CODE 3510-22-P**

**DEPARTMENT OF COMMERCE**

**National Oceanic and Atmospheric Administration**

**XRIN 0648-XF547**

# Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to the Haines Ferry Terminal Modification Project

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

**ACTION:** Proposed incidental harassment authorization; request for comments.

**SUMMARY**: NMFS has received a request from the Alaska Department of Transportation and Public Facilities (ADOT&PF) for authorization to take marine mammals incidental to the Haines Ferry Terminal Modification Project in Haines, 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.

**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.Daly@noaa.gov*.

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

**FOR FURTHER INFORMATION CONTACT**: Jaclyn Daly, Office of Protected Resources, NMFS, (301) 427-8401. Electronic copies of the applications and supporting documents, as well as a list of the references cited in this document, may be obtained online at: *www.nmfs.noaa.gov/pr/permits/incidental/construction.htm*. In case of problems accessing these documents, please call the contact listed above.

**SUPPLEMENTARY INFORMATION**:

**Background**

Sections 101(a)(5)(A) and (D) of the MMPA (16 U.S.C. 1361 *et seq.*) direct the Secretary of Commerce to allow, upon request, the incidental, but not intentional, taking of small numbers of marine mammals by U.S. citizens who engage in a specified activity (other than commercial fishing) within a specified geographical region if certain findings are made and either regulations are issued or, if the taking is limited to harassment, a notice of a proposed authorization is provided to the public for review.

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

NMFS has defined "negligible impact" in 50 CFR 216.103 as "an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival."

NMFS has defined "unmitigable adverse impact" in 50 CFR 216.103 as "an impact resulting from the specified activity:

1) That is likely to reduce the availability of the species to a level insufficient for a harvest to meet subsistence needs by: (i) causing the marine mammals to abandon or avoid hunting areas; (ii) directly displacing subsistence users; or (iii) placing physical barriers between the marine mammals and the subsistence hunters; and

2) That cannot be sufficiently mitigated by other measures to increase the availability of marine mammals to allow subsistence needs to be met.

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

Except with respect to certain activities not pertinent here, the MMPA defines "harassment" as: any act of pursuit, torment, or annoyance which (i) has the potential to injure a marine mammal or marine mammal stock in the wild (Level A harassment); or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption

of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering (Level B harassment).

**National Environmental Policy Act**

To comply with the National Environmental Policy Act of 1969 (NEPA; 42 U.S.C. 4321 *et seq*.) and NOAA Administrative Order (NAO) 216-6A, NMFS must review our proposed action with respect to environmental consequences on the human environment.

Accordingly, NMFS has preliminarily determined that the issuance of the proposed IHA qualifies to be categorically excluded from further NEPA review. This action is consistent with categories of activities identified in CE B4 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.

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 January 9, 2017, NMFS received a request from ADOT&PF for an IHA to take marine mammals incidental to conducting improvements at the Haines Ferry Terminal. On February 3, 2017, NMFS requested additional information and ADOT&PF submitted a revised application on March 27, 2017, which NMFS deemed adequate and complete. However, after further discussions, ADOT&PF submitted a final application on May 30, 2017, and then subsequently sent a request on August 17, 2017, to change the effective dates in the application to accommodate a delayed construction schedule. ADOT&PF's request is for harassment only

and NMFS concurs that serious injury or mortality is not expected to result from this activity. Therefore, an IHA is appropriate.

ADOT&PF's request is for take of humpback whale (*Megaptera novaeangliae*), harbor seals (*Phoca vitulina*), harbor porpoise (*Phocoena phocoena*), and Dall's porpoise (*Phocoenoides dalli*) by Level A and Level B harassment, and an additional two species, Steller sea lion (*Eumetopias jubatus*) and killer whale (*Orcinus orca*) by Level B harassment only. Pile driving would occur for 19 days and pile removal would take 2 additional days (total of 21 days) over the course of 4 months from October 1, 2018, through September 30, 2019, but excluding March 1 through May 31, 2019. No subsequent IHA would be necessary to complete the project.

**Description of Proposed Activity**

*Overview*

ADOT&PF is proposing to construct two new berths and associated infrastructure adjacent at the existing Haines Ferry Terminal (see Attachment 1 in ADOT&PF's application for project drawings). The project includes impact and vibratory pile driving and vibratory pile removal. Sounds resulting from pile driving and removal may result in the incidental take of marine mammals by Level A and Level B harassment up to approximately 4.78 and 21.1 square kilometers ($km^2$), respectively, around the terminal. The terminal is located in southeast Alaska in Lutak Inlet.

*Dates and Duration*

The IHA would be valid from October 1, 2018, through September 30, 2019; however, pile driving and removal would occur for only 21 days over the course of four months during this time period and work would not occur from March 1 through May 31, 2019. ADOT&PF

anticipates up to 1 hour of vibratory pile driving and 15 to 30 minutes of impact pile driving per day.

*Specified Geographic Region*

The northern part of Lynn Canal braids into several inlets including Chilkat, Chilkoot, Taiya and Lutak Inlets. Tanani Point marks the confluence of Lutak Inlet and Chilkoot Inlet and is located approximately one mile (mi) southeast of the terminal. The Terminal is located near the mouth of Lutak Inlet, approximately four miles north of the town of Haines, in northern Southeast Alaska at 59°16'54"N, 135°27'44.6"W (see Figures 1-1 and 1-2 in ADOT's application). At the terminal where pile driving may occur, Lutak Inlet is approximately 1.3 miles (mi) wide and water depth ranges from 20-40 feet (ft; 6-9 meters (m)); however, water depth in Lynn Canal reaches over 300 ft (91 m). Lutak Inlet is a glacial scoured fiord, characterized by a typical U-shaped glacial valley. The sediment is homogeneous, consisting of dark gray, silty gravel material, as well as cobbles and boulders. Other than the terminal, the region is not industrialized and is surrounded by several state parks and the Glacier Bay National Park and Preserve.

*Detailed Description of Specific Activities*

The Terminal is a multi-use dock used by Alaska Marine Highway Systems (AMHS) mainline and fast ferries, Alaska Marine Lines (AML) (tug and barge), and Delta Western (tug and barge). It is the second busiest AMHS port of call and can see up to four ferries coming and going during any given day in summer. The AMHS provides a transportation link for Alaska residents and businesses, as well as for non-residents visiting the state.

The Haines Ferry Terminal Modification Project involves constructing an AMHS End Berth Facility adjacent to the existing dock. The expansion is necessary because the current

configuration does not allow for operation of the new Alaska Class vessels, which are expected to be operational in 2018. Specifically, modification work includes removing an existing structure and installing moorings, vehicle transfer float, float restraint structures, steel transfer bridges and associated abutment and bearing structure, berthing structures, catwalks and gangways, and a pile-supported passenger waiting shelter. The structure to be removed with a vibratory hammer is comprised of four 30-inch (in) cylindrical steel pipe piles. To construct the new infrastructure, ADOT&PF would install 37 new piles. Fifteen piles would be 36-in diameter with 1 in. wall thickness. The remaining 22 piles would be 30-in diameter and ¾ in thick. To minimize noise propagation, the steel piles would be driven with a vibratory hammer, as practicable, except for final proofing, which would require use of an impact hammer. Based on previous pile driving work at the Terminal in 2015, ADOT&PF anticipates each pile would require up 45 to 60 minutes of vibratory driving (to account for proper placement and alignment of the pile) followed by an average of 700 strikes of the impact hammer for a total average installation time of 60-90 minutes. One pile driver would be used onsite; therefore, only one pile would be installed at a time. A construction barge may be used during the project to facilitate pile driving and removal; however, the barge would be anchored.

All pile driving and removal would occur within 500 feet (152 meters) of the shoreline. Assuming two 30 in diameter piles could be removed each day, pile removal would take two days. Pile driving the 30-in piles is expected to take 11 days while an additional 8 days would be necessary to install the 36-in piles. In total, ADOT&PF would be elevating noise levels around the project area for 21 days (two days of pile removal plus 19 days of pile driving) of the 4 month construction window (four months from October 1, 2018, through September 30, 2019, excluding March 1, 2019 through May, 31 2019).

Other work for the project includes using a clamshell bucket dredge to remove sediment around the terminal. However, dredging is not anticipated to result in the taking of marine mammals; therefore, this activity will not be discussed further.

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

**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; *www.nmfs.noaa.gov/pr/sars/*), and more general information about these species (*e.g*., physical and behavioral descriptions) may be found on NMFS website (*www.nmfs.noaa.gov/pr/species/mammals/*).

Table 1 lists all species with expected potential for occurrence in 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 (2016). PBR is defined by the MMPA as the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population (as described in NMFS 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's U.S. Alaska SARs (Muto *et al*. 2017). All values presented in Table 1 are the most recent available at the time of publication and are available in the draft 2016 SARs (available online at: *www.nmfs.noaa.gov/pr/sars/draft.htm*).

Three cetacean species have ranges near the terminal but are unlikely to occur in the project area: the Pacific white-sided dolphin (*Lagenorhynchus obliquidens*), gray whale (*Eschrichtius robustus*), and minke whale (*Balaenopera acutorostrata*). The range of Pacific white-sided dolphin is suggested to overlap with Lynn Canal (Angliss and Allen, 2015), but no sightings have been documented in the project area (Dahlheim *et al.* 2009, MOS 2016). Gray whale sightings in this northern portion of Southeast Alaska are very rare; there have only been eight sightings since 1997 (MOS 2016). These observations were made in the lower portions of Lynn Canal and were not close to the Lutak Inlet/upper Lynn Canal area. Finally, only one minke whale has been observed in Taiya Inlet over the past five years (MOS 2016).

**Table 1. Marine mammals potentially present within Upper Lynn Canal During the Specified Activity**.

| **Common name** | **Scientific name** | **MMPA Stock** | **ESA/MMPA status; Strategic (Y/N)[1]** | **Stock abundance Nbest, (CV, $N_{min}$, most recent abundance survey)[2]** | **PBR** | **Annual M/SI[3]** |
|---|---|---|---|---|---|---|
| Order Cetartiodactyla – Cetacea – Superfamily Mysticeti (baleen whales) | | | | | | |
| Family Balaenidae | | | | | | |
| Humpback whale | *Megaptera novaeangliae* | Central North Pacific | E, D,Y | 10,103 (0.3, 7,890, 2006) | 83 | 24 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Superfamily Odontoceti (toothed whales, dolphins, and porpoises) | | | | | | |
| Family Delphinidae | | | | | | |
| Killer whale | *Orcinus orca* | Alaska Resident | -, N | 2,347 (N/A, 2,347, 2012)[4] | 24 | 1 |
| | | Northern Resident | -, N | 261 (N/A, 261, 2011)[4] | 1.96 | 0 |
| | | Gulf of Alaska, Aleutian Islands, Bering Sea | -, N | 587 (N/A, 587, 2012)[4] | 5.9 | 1 |
| | | West Coast Transient | -, N | 243 (N/A, 243, 2009)[4] | 2.4 | 0 |
| Family Phocoenidae (porpoises) | | | | | | |
| Harbor porpoise | *Phocoena phocoena* | Southeast Alaska | -, Y | 975 (0.10, 896, 2012)[5] | 8.9 | 34[5] |
| Dall's porpoise | *Phocoenoides dalli* | Alaska | -,N | 83,400 (0.097, N/A, 1993) | Undet | 38 |
| Order Carnivora – Superfamily Pinnipedia | | | | | | |
| Family Otariidae (eared seals and sea lions) | | | | | | |
| Steller sea lion | *Eumetopias jubatus* | Western U.S. | E, D; Y | 49,497 (2014) | 297 | 233 |
| | | Eastern U.S. | -, D, Y | 60,131 - 74,448 (2013) | 1,645 | 92.3 |
| Family Phocidae (earless seals) | | | | | | |
| Harbor seal | *Phoca vitulina richardii* | Lynn Canal/Stephens Passage | -, N | 9,478 (8,605, 2011) | 155 | 50 |

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

[2]NMFS marine mammal stock assessment reports online at: *www.nmfs.noaa.gov/pr/sars/*. CV is coefficient of variation; $N_{min}$ is the minimum estimate of stock abundance. In some cases, CV is not applicable (N/A).

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

[4] N is based on counts of individual animals identified from photo-identification catalogs.

[5] In the 2016 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). The Annual M/SI value provided is for all Alaska fisheries, not just inland waters of southeast Alaska.

## *Pinnipeds*

### Steller Sea Lion

Steller sea lion populations that primarily occur west of 144° W (Cape Suckling, Alaska) comprise the western Distinct Population Segment (wDPS), while all others comprise the eastern DPS (eDPS); however, there is regular movement of both DPSs across this boundary (Muto *et al*. 2017). Both of these populations may occur in the action area. 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 (Muto *et al*. 2017), 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 in the action area.

In Lynn Canal, Steller sea lions are most likely part of the eDPS; however, wDPS animals have moved into the area over the past several years. The first western DPS Steller sea lion documented in Lynn Canal occurred in 2003 at Benjamin Island in southern Lynn Canal (approximately 97 km or 60 miles south from the Ferry Terminal and 40 km or 25 miles north of Juneau, Alaska). This animal was subsequently re-sighted in 2003 and 2004. Two additional animals have been observed at Benjamin Island in 2005 and 2006. The Alaska Department of Fish and Game (ADF&G) has documented 88 western DPS Steller sea lions in the eastern region, of which 40 percent were female, and nine of these animals gave birth at rookeries in the eastern region. Data suggest five out of these nine females have permanently immigrated to the eastern region. Branded individuals from the western DPS have also been observed at Gran Point located about 22.5 km (14 mi) southeast of the project area. The eDPS stock has been

increasing (Muto *et al.* 2017). Pup counts for the wDPS have been decreasing; however, this could be due to movement of adult females out of the region (suggesting some level of permanent emigration) indicating that sea lions may have responded to meso-scale (on the order of 100s of kilometers) variability in their environment (Muto *et al.* 2017).

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 (Allen and Angliss, 2013). Gran Point, which is located 14 mi (22.5 km) southeast 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 5 km or 3.1 mi from Haines Terminal). The eulachon run (which occurs for approximately three to four weeks during mid-March through May) in Lutak Inlet is extremely 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 action area declines (see section 4.2 in ADOT&PF's application for more detailed information on fish runs and corresponding Steller sea lion presence).

Steller sea lions are included in subsistence harvests. From 2011-2012, an average of 50 animals from this stock were harvested each year, which is higher than previous estimates of 30 animals, on average, per year from 2004-2008 (Muto and Angliss, 2015). Incidental

entanglement in fishing gear and marine debris is the biggest contributor to their annual human-caused mortality rate. In addition, since 2012, known cases of intentional mortality (*e.g.* gunshot, explosives) have also contributed to this rate with an average of 15 animals per year from 2012 through 2015 (Muto *et al.* 2016).

Harbor Seal

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 are included in subsistence harvests. From 2011-2012, an average of 50 seals from the Lynn Canal/ Stephens Passage stock were harvested each year, which is higher than previous estimates of 30 animals, on average, per year from 2004-2008 (Muto *et al*. 2017). Entanglement is the biggest contributor to their annual human-caused mortality. Lynn Canal/ Stephens Passage harbor seals are not listed as depleted or strategic under the MMPA and are not listed under the ESA.

*Cetaceans*

Humpback whale

Under the MMPA, there are three stocks of humpback whales in the North Pacific: 1) the California/Oregon/Washington and Mexico 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 activities.

On September 8, 2016, NMFS published a final decision changing the status of humpback whales under the 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 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. WNP DPS whales do not occur in Southeast Alaska. Whales from the Mexico DPS, which is a threatened species, have a 6.1 percent probability of occurrence in Southeast Alaska. Humpback whales in Southeast Alaska are most likely to be from the Hawaii DPS (93.9 percent probability), which is not protected under the ESA.

Humpback whales are not common in the action area but, if they are sighted, are generally present during mid- to late spring (mid-May through June) and vacate the area by July to follow large aggregations of forage fish in lower Lynn Canal. However, in recent years humpback whales have been observed at the entrance to Taiya Inlet throughout the fall months (MOS 2016). Four to five whales were observed in the area from spring 2015 to November (MOS 2016).

Killer Whale

Based on data regarding association patterns, acoustics, movements, and genetic differences, eight killer whale stocks are now recognized: (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, occurring from California through southeastern Alaska; and (7) the Offshore stock, and (8) the Hawaiian stock. Only the Alaska resident; Northern resident; Gulf of Alaska, Aleutian Islands, and Bering Sea Transient (Gulf of Alaska transient); and the West coast transient stocks are considered in this application because other stocks occur outside the geographic area under consideration. Any of these four stocks could be seen in the action area; however, the Northern resident stock is most likely to occur in the area.

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 (Allen and Angliss, 2013). 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 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.

Data from Lutak Inlet suggests that a small number of killer whales infrequently enter the inlet, generally during spring fish runs when large aggregations of pinnipeds are also present (K.

Hastings, pers. comm.). Up to 15 to 20 killer whales have been observed in Taiya Inlet 4 to 5 times a year from early spring through fall (MOS 2016). Transient killer whales have also been observed in Lutak Inlet in front of the Terminal when sea lions are present (K. Hastings, pers. comm.), presumably following their preferred food source. The mean group size of four to six animals documented by Dahlheim *et al.* (2009) is consistent with 4 to 5 sightings of up to 20 whales outside Taiya (MOS 2016) and Lutak Inlets.

Harbor Porpoise

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 application because the other stocks are not found in the geographic area under consideration. The total estimated annual level of human-caused mortality and serious injury (M/SI) for harbor porpoise in Alaska (n= 34) exceeds the calculated PBR of 8.9 harbor porpoise. However, this calculated PBR is based on the minimum population estimate for harbor porpoise in inland waters of southeast Alaska only (n=896) while the annual level of human caused M/SI is derived from take in all fisheries throughout Alaska. Therefore, PBR represents the total amount of animals that can be removed from all harbor porpoise stocks in Alaska combined. No mortality or serious injury of harbor porpoise from the Southeast Alaska stock has been observed incidental to U.S. commercial fisheries in Alaska in 2010-2014 (Breiwick 2013; MML unpubl. data). Population trends and status of this stock relative to its optimum sustainable population are currently unknown.

In Lynn Canal, observations of harbor porpoise are not frequent and occur primarily in lower Lynn Canal; however, the species has been observed as far north as Haines during the summer surveys (Dahlheim *et al*. 2009). At the Haines Ferry Terminal, one small pod of harbor porpoise were observed on September 22, 2015 (ADOT&PF 2015). In addition, approximately 30 individuals have been observed in multiple groups of two or three, from spring through fall (MOS 2016).

There are no subsistence use of this species; however, entanglement in fishing gear contributes to human-caused mortality and serious injury. Muto *et al.* (2016) also reports harbor porpoise are vulnerable to physical modifications of nearshore habitats resulting from urban and industrial development (including waste management and nonpoint source runoff) and activities such as construction of docks and other over-water structures, filling of shallow areas, dredging, and noise (Linnenschmidt *et al*. 2013).

Dall's Porpoise

Currently one stock of Dall's porpoise is recognized in Alaskan waters (Muto *et al*. 2015). Dall's porpoise have not been observed in the waters of Lutak Inlet immediately adjacent to the Terminal but may be present in northern Lynn Canal. Local observers have observed only three to six Dall's porpoises in Taiya Inlet during the early spring and late fall (MOS 2016).

At present, there is no reliable information on trends in abundance for the Alaska stock of Dall's porpoise (Muto *et al*. 2015). From 2009 to 2013, no mortality or serious injury of Dall's porpoise was reported to the NMFS Alaska. There are also no subsistence uses of this species (Muto *et al.* 2015). Dall's porpoise are vulnerable 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).

*Marine Mammal Hearing*

Hearing is the most important sensory modality for marine mammals underwater, and exposure to anthropogenic sound can have deleterious effects. To appropriately assess the potential effects of exposure to sound, it is necessary to understand the frequency ranges marine mammals are able to hear. Current data indicate that not all marine mammal species have equal hearing capabilities (e.g., Richardson *et al*., 1995; Wartzok and Ketten, 1999; Au and Hastings, 2008). To reflect this, Southall *et al*. (2007) recommended that marine mammals be divided into functional hearing groups based on directly measured or estimated hearing ranges on the basis of available behavioral response data, audiograms derived using auditory evoked potential techniques, anatomical modeling, and other data. Note that no direct measurements of hearing ability have been successfully completed for mysticetes (*i.e*., low-frequency cetaceans). Subsequently, NMFS (2016) described generalized hearing ranges for these marine mammal hearing groups. Generalized hearing ranges were chosen based on the approximately 65 decibels (dB) threshold from the normalized composite audiograms, with the exception for lower limits for low-frequency cetaceans where the lower bound was deemed to be biologically implausible and the lower bound from Southall *et al*. (2007) retained. The functional groups and the associated frequencies are indicated below (note that these frequency ranges correspond to the range for the composite group, with the entire range not necessarily reflecting the capabilities of every species within that group):

- Low-frequency cetaceans (mysticetes): generalized hearing is estimated to occur between approximately 7 hertz (Hz) and 35 kilohertz (kHz);

- Mid-frequency cetaceans (larger toothed whales, beaked whales, and most delphinids): generalized hearing is estimated to occur between approximately 150 Hz and 160 kHz;
- High-frequency cetaceans (porpoises, river dolphins, and members of the genera Kogia and Cephalorhynchus; including two members of the genus Lagenorhynchus, on the basis of recent echolocation data and genetic data): generalized hearing is estimated to occur between approximately 275 Hz and 160 kHz;
- Pinnipeds in water; Phocidae (true seals): generalized hearing is estimated to occur between approximately 50 Hz to 86 kHz; and
- 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 (2016) for a review of available information. Six marine mammal species (four cetacean and two pinniped (one otariid and one phocid) species) have the reasonable potential to co-occur with the proposed survey activities. Of the cetacean species that may be present, one is classified as a low-frequency cetacean (*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*., 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 will include a quantitative analysis of the number of individuals that are expected to be taken by this activity. The "Negligible Impact Analysis and Determination" section will consider 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.

The introduction of anthropogenic noise into the aquatic environment from pile driving and removal is the primary means by which marine mammals may be harassed from ADOT&PF's specified activity. 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 noise has the potential to result in auditory threshold shifts and behavioral reactions (e.g., avoidance, temporary cessation of foraging and vocalizing, changes in dive behavior). Exposure to anthropogenic noise can also lead to non-observable physiological responses such an increase in stress hormones. Additional noise in a marine mammal's habitat can mask acoustic cues used by marine mammals to carry out daily functions such as communication and predatory and prey detection. The effects of pile driving 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 (Southall *et al*., 2007,

Wartzok *et al.* 2004). 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, 2016). The amount of threshold shift is customarily expressed in dB (ANSI 1995, Yost 2007). A TS can be permanent or temporary. As described in NMFS (2016), there are numerous factors to consider when examining the consequence of TS, including, but not limited to, the signal temporal pattern (*e.g.*, impulsive or non-impulsive), likelihood an individual would be exposed for a long enough duration or to a high enough level to induce a TS, the magnitude of the TS, time to recovery (seconds to minutes or hours to days), the frequency range of the exposure (*i.e.*, spectral content), the hearing and vocalization frequency range of the exposed species relative to the signal's frequency spectrum (*i.e.*, how animal uses sound within the frequency band of the signal; *e.g.*, Kastelein *et al.* 2014b), and the overlap between the animal and the source (*e.g.*, spatial, temporal, and spectral). When analyzing the auditory effects of noise exposure, it is often helpful to broadly categorize sound as either impulsive — noise with high peak sound pressure, short duration, fast rise-time, and broad frequency content — or non-impulsive. When considering auditory effects, vibratory pile driving is considered to be non-impulsive source while impact pile driving is treated as an impulsive source.

*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, 2016). 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).

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

*Temporary Threshold Shift (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, 2016). Based on data from cetacean TTS measurements (see Southall et al. 2007 for a review), 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; Finneran *et al*. 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.

The potential for TTS from impact pile driving exists. After exposure to playbacks of impact pile driving sounds (rate 2760 strikes/hour) in captivity, mean TTS increased from 0 dB after 15 minute exposure to 5 dB after 360 minute exposure; recovery occurred within 60 minute (Kastelein *et al*. 2016). However, one must consider duration of exposure in the field. Installing piles at the Haines terminal requires 700 strikes per pile (average 15 minutes) with re-set time and one hour of vibratory pile driving before impact driving the second pile. Given marine mammals are likely moving through the action area and not remaining for extended periods of time, the potential for TTS declines.

*Behavioral Harassment*

Exposure to noise from pile driving and removal also has the potential to behavioral disturb marine mammals. 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). These potential behavioral responses to sound are highly variable and context-specific and reactions, if any, depend on

species, state of maturity, experience, current activity, reproductive state, auditory sensitivity, time of day, and many other factors (Richardson *et al*., 1995; Wartzok *et al*., 2003; Southall *et al*., 2007). For example, animals that are resting may show greater behavioral change in response to disturbing sound levels than animals that are highly motivated to remain in an area for feeding (Richardson *et al*., 1995; NRC, 2003; Wartzok *et al*., 2003).

If a marine mammal does react to an underwater sound by changing its behavior or moving a small distance, the impacts of that change may not be important to the individual, the stock, or the species as a whole. However, if a sound source displaces marine mammals from an important feeding or breeding area for a prolonged period, impacts on the animals could be important. 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.

In 2016, 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 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).

*Masking and Acoustic Habitat*

Masking is the obscuring of sounds of interest to an animal by other sounds, typically at similar frequencies. It may be caused by both natural (*e.g*., wind, waves, other animals) or anthropogenic (*e.g*., pile driving) sources. Marine mammals are highly dependent on sound, and their ability to recognize sound signals amid other sound is important in communication and detection of both predators and prey. Masking may partially or entirely reduce the audibility of acoustic signals (Southall *et al*. 2007). Background ambient sound may interfere with or mask the ability of an animal to detect a sound signal even when that signal is above its absolute hearing threshold.

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. Masking is also likely to result in more severe consequences when continuous. At the Haines terminal, pile driving is intermittent. That is, vibratory hammering would occur for approximately one hour followed by a break before impact hammering to allow changes in equipment. There would also be another delay before driving the second pile. Further, pile driving would not occur for multiple consecutive days but instead

would be spaced out over 19 days (plus 2 days for pile removal) over the course of approximately four months. Therefore, while masking may occur if a marine mammal if a marine mammal is in the terminal area, it would be of short duration. In addition, ADOT&PF would conduct pile driving outside of important foraging times (*i.e.*, spring echelon runs) the action area does not support key reproduction or other vital areas. Therefore, the impact of masking is likely to be minimal.

*Marine Mammal Habitat Effects*

Construction activities at the Haines Ferry terminal 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 adversely affect marine mammal prey in the vicinity of the project area. During impact pile driving, elevated levels of underwater noise would ensonify across Lutak Inlet where both fish and mammals occur and could affect foraging success. ADOT&PF would avoid pile driving during the more critical months (March 1 through May 31) when ephemeral fish run in the inlet, thereby avoiding the greatest densities of marine mammals.

In-water pile driving, pile removal, and dredging activities would also cause short-term effects on water quality due to increased turbidity. Dredging is likely to cause the greatest increase in suspended solids; however, turbidity plumes created is localized to about 7.6 m (25 ft) and could last from a few minutes to several hours. Any contaminants associated with the re-suspended sediments would be tightly bound to the sediment matrix. Because of the relatively small dredge area, turbidity plumes would be limited to the immediate vicinity of the terminal and adjacent portion of the inlet. ADOT&PF would employ standard construction best

management practices (BMPs; see section 9 and 11.1 in ADOT's application), thereby, reducing any impacts. Therefore, the impact from increased turbidity levels is expected to be discountable.

**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 whether the number of takes is small 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 has the potential to result in disruption of behavioral patterns and/or TTS for individual marine mammals. Impact pile driving may also result in auditory injury (Level A harassment) for mysticetes, high frequency cetaceans, and phocids due to modeled auditory injury zones based on exposure to noise from installing two piles per day. However, there are multiple hours between impact pile driving each pile; therefore, these zones are conservative as animals are not known to linger in the area. Therefore, PTS potential is low and, if occurs, would likely be minimal (*e.g.*, PTS onset). Auditory injury is not expected for mid-frequency species and otariids as the accumulation of energy does not reach NMFS' PTS thresholds. The death of a marine mammal is also a type of incidental take. However, as described previously,

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

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

*Acoustic Thresholds*

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

Level B Harassment for non-explosive sources – Though significantly driven by received level, the onset of behavioral disturbance from anthropogenic noise exposure is also informed to varying degrees by other factors related to the source (*e.g.,* frequency, predictability, duty cycle), the environment (*e.g.,* bathymetry), and the receiving animals (*e.g.,* hearing, motivation, experience, demography, behavioral context) making effects difficult to predict (Southall *et al.,* 2007, Ellison *et al*., 2011). Based on what the available science indicates and the practical need to use a threshold based on a factor that is both predictable and measurable for most activities, NMFS uses a generalized acoustic threshold based on received level to estimate the onset of behavioral harassment. NMFS predicts that marine mammals are likely to be behaviorally harassed in a manner we consider Level B harassment when exposed to underwater

anthropogenic noise above received levels of 120 dB re 1 microPascal (μPa) root mean square (rms) for continuous (*e.g.* vibratory pile-driving, drilling) and above 160 dB re 1 μPa (rms) for non-explosive impulsive (*e.g.*, seismic airguns, impact pile driving) or intermittent (*e.g.*, scientific sonar) sources. ADOT&PF includes the use of continuous (vibratory pile driving) and impulsive (impact pile driving); therefore, the 120 and 160 dB re 1 μPa (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 (Technical Guidance, 2016) identifies dual criteria to assess auditory injury (Level A harassment) for 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).

These thresholds were developed by compiling and synthesizing the best available science and soliciting input multiple times from both the public and peer reviewers to inform the final product, and are provided in Table 2. The references, analysis, and methodology used in the development of the thresholds are described in NMFS 2016 Technical Guidance, which may be accessed at: *http://www.nmfs.noaa.gov/pr/acoustics/guidelines.htm*.

**Table 2. Thresholds identifying the onset of Permanent Threshold Shift,**

| | PTS Onset Acoustic Thresholds* (Received Level) | |
|---|---|---|
| **Hearing Group** | **Impulsive** | **Non-impulsive** |
| **Low-Frequency (LF) Cetaceans** | *Cell 1*<br>$L_{pk,flat}$: 219 dB<br>$L_{E,LF,24h}$: 183 dB | *Cell 2*<br>$L_{E,LF,24h}$: 199 dB |
| **Mid-Frequency (MF) Cetaceans** | *Cell 3*<br>$L_{pk,flat}$: 230 dB<br>$L_{E,MF,24h}$: 185 dB | *Cell 4*<br>$L_{E,MF,24h}$: 198 dB |
| **High-Frequency (HF) Cetaceans** | *Cell 5*<br>$L_{pk,flat}$: 202 dB<br>$L_{E,HF,24h}$: 155 dB | *Cell 6*<br>$L_{E,HF,24h}$: 173 dB |
| **Phocid Pinnipeds (PW) (Underwater)** | *Cell 7*<br>$L_{pk,flat}$: 218 dB<br>$L_{E,PW,24h}$: 185 dB | *Cell 8*<br>$L_{E,PW,24h}$: 201 dB |
| **Otariid Pinnipeds (OW) (Underwater)** | *Cell 9*<br>$L_{pk,flat}$: 232 dB<br>$L_{E,OW,24h}$: 203 dB | *Cell 10*<br>$L_{E,OW,24h}$: 219 dB |

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

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

*Ensonified Area*

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

ADOT&PF prepared an acoustic modeling report that discusses their modeling approach and identifies modeled source levels and harassment zones for the Haines Ferry Terminal project (Quijano *et al*., 2016). A summary of the methods of the modeling effort is presented here; the full report is available at *http://www.nmfs.noaa.gov/pr/permits/incidental/construction.htm*.

To assess potential underwater noise exposure of marine mammals during pile driving, ADOT&PF used two models: a Pile Driving Source Model (PDSM) to estimate the sound radiation generated by the pile driver acting upon the pile (*i.e.*, source levels), and a Full Waveform Range-dependent Acoustic Model (FWRAM) to simulate sound propagation away from the pile. The modeling considered the effect of pile driving equipment, bathymetry, water sound speed profile, and seabed geoacoustic parameters to predict the acoustic footprint from impact and vibratory pile driving of cylindrical pipe piles with respect to NMFS Level A and Level B thresholds. The report presents scenarios in which one pile or two piles are driven per day; however, for purposes here, NMFS considered only the two pile scenario since ADOT&PF has indicated that up to two piles could be driven per day. The resulting Level A harassment distances represent the location at which an animal would remain for the entire duration it takes to drive one pile, reset, and then drive another pile that, in reality, occurs over multiple hours in one day. The Level B isopleth distances represent instantaneous exposure to the Level B harassment criterion.

To model sounds resulting from impact and vibratory pile driving of 30-in and 36-in cylindrical pipe pipes, the PDSM was used in conjunction with GRL Engineer's Wave Equation Analysis Program (GRLWEAP) pile driving simulation software to obtain an equivalent pile source signature (*i.e.*, source level) consisting of a vertical array of discrete point sources (Table 3). This signature accounts for several parameters that describe the operation: pile type, material, size, and length; the pile driving equipment; and approximate pile penetration rate. The amplitude and phase of the point sources along the array were computed so that they collectively mimicked the time-frequency characteristics of the acoustic wave at the pile wall that results from a hammer strike (impact driving) or from forced vibration (vibratory driving) at the top end of the pile. This approach estimates spectral levels within the band 10–800 Hz where most of the energy from pile driving is concentrated. An extrapolation method (Zykov *et al.* 2016) was used to extend modeled levels in 1/3-octave-bands up to 25 kHz, by applying a −2 dB per 1/3-octave-band roll-off coefficient to the SEL value starting at the 800 Hz band. This was done to estimate the acoustic energy at higher frequencies to compare to NMFS thresholds.

Once the pile source signature was computed, the FWRAM sound propagation modeling code was used to determine received levels as a function of depth, range, and azimuth direction. FWRAM is a time-domain acoustic model that used, as input, the PDSM-generated array of point sources representing the pile and computes synthetic pressure waveforms. To exclude sound field outliers, NMFS uses the maximum range at which the given sound level was encountered after excluding 5 percent of the farthest such points ($R_{95\%}$) to estimate harassment threshold distances. To account for hearing groups, full-spectrum frequency-dependent weighting functions were applied at each frequency. The model also showed the transition from

down-slope to up-slope propagation as the sound crosses Lutak Inlet, resulting in a sound field that decays at a constant rate with range.

Steel cylindrical pipe piles 41 m (135 ft) long with ½ in thick walls were modeled for a total penetration of 14 m (46 ft) into the sediment. In the case of vibratory pile driving, both pile sizes were assumed to be driven by an ICE-44B vibratory pile driver. For impact pile driving, the parameters corresponding to the Delmag D30-32 and D36-32 impact pile drivers were used to model scenarios with 30-in and 36-in diameter piles, respectively. Sound energy was accumulated over a specified number of hammer strikes, not as a function of time. The number of strikes required to install a single pile (assumed to be 700 strikes per pile) was estimated based on pile driving logs from another pile driving project at Haines. Sound footprints were calculated for the installation of two piles (thus, accumulated over 1400 strikes). For vibratory pile driving, sound energy was accumulated for the two piles that could be installed or removed in a 24-hour period.

Modeled source levels and distances to NMFS acoustic thresholds based on these source levels and the sound propagation model are presented in Table 3 and 4.

**Table 3. Impact Pile Driving: Modeled Source Levels and Harassment Zones for Impact Driving Two Piles per Day. A dash indicates the threshold was not reached*.**

| Hearing Group | Level A threshold Distance (R95%) (km) | Level A threshold area ($km^2$) | Level B (160 dB) threshold distance (km) | Level B threshold area ($km^2$) |
|---|---|---|---|---|
| 30 inch piles: modeled SL = 179.5 dB SEL | | | | |
| Low-frequency cetacean | 1.65 | 3.17 | 1.98 | 4.52 |
| Mid-frequency cetacean | - | - | | |
| High-frequency cetacean | 1.45 | 1.13 | | |
| Phocid pinniped | 0.26 | 0.09 | | |
| Otarrid pinniped | - | - | | |

| 36 inch piles: modeled SL = 180.9 dB SEL | | | | |
|---|---|---|---|---|
| Low-frequency cetacean | 2.04 | 4.78 | 2.67 | 6.79 |
| Mid-frequency cetacean | - | - | | |
| High-frequency cetacean | 1.49 | 2.17 | | |
| Phocid pinniped | 0.33 | 0.15 | | |
| Otarrid pinniped | - | - | | |

*NMFS also considers peak sound pressure levels; however, in no case were these thresholds reached or greater than the SEL distances.

**Table 4. Vibratory Pile Driving: Modeled Source Levels and Harassment Zones for Vibratory Driving Two Piles per Day. A dash indicates the threshold was not reached*.**

| Hearing Group | Level A threshold Distance (R95%) (km) | Level A threshold area ($km^2$) | Level B (160 dB) threshold distance (km) | Level B threshold area ($km^2$) |
|---|---|---|---|---|
| 30 inch piles: modeled SL = 177.6 dB rms | | | | |
| ALL | - | - | 5.61 | 21.14 |
| 36 inch piles: modeled SL = 179.8 dB rms | | | | |
| Low-frequency cetacean | 0.02 | <0.01 | 5.62 | 21.17 |
| Mid-frequency cetacean | - | - | | |
| High-frequency cetacean | - | - | | |
| Phocid pinniped | - | - | | |
| Otarrid pinniped | - | - | | |

*NMFS also considers peak sound pressure levels; however, in no case were these thresholds reached or greater than the SEL distances.

The modeling approach described above and in ADOT&PF's application constitutes a new approach in that it models both source levels and propagation loss to estimate distances to NMFS harassment thresholds. Some preliminary data comparing measured sound levels to those produced by the models has been presented, but no peer reviewed analysis has been undertaken. To test the validity of the model, NMFS has included a proposed requirement that ADOT&PF conduct a source source verification (SSV) study upon the onset of pile driving to validate the

model or, if necessary, adjust the harassment zones based on measured data. This SSV study will also provide the first measurements of sound levels generated by 36-in piles driven by ADOT&PF. ADOT&PF has prepared a draft acoustic monitoring plan which can be found at *www.nmfs.noaa.gov/pr/permits/incidental/construction.htm*. We welcome comments on the ADOT&PF's source level modeling approach and the acoustic monitoring plan.

*Marine Mammal Occurrence*

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

The data on marine mammals in this area are diverse and fairly robust due mostly to ADF&G surveys. Strong seasonal occurrence of marine mammals in this area is well documented; therefore, density estimates for each species were calculated by month rather than averaged throughout the year. For example, we have already discussed the seasonality of Steller sea lions and how prey aggregations affect their abundance. Monthly Steller sea lion densities were calculated based on abundance surveys conducted at Gran Point (ADF&G, pers. comm). Considering the Steller sea lion data used to calculate density is from Gran Point, ADOT&PF used this location to mark the southern boundary of the action area. The area from Gran Point north that encompasses Lutak Inlet and Lynn Canal is 91.3 $km^2$; this area was used for all species' density estimates. For species other than Steller sea lion, average sighting rate was used to calculate density (*i.e.*, species occurrence rate per month/ 91.3$km^2$). Harbor seals are generally present in the action area throughout the year, but their local abundance is clearly defined by the presence of available prey. During mid-March through mid- June, they are abundant in Lutak Inlet. For these months, an average of 100 seals per day in the inlet is considered a conservative estimate. For all other months, an estimate of 10 seals per month was

incorporated into the density equation. Humpback whales are present in the action area from mid-April through June at a rate of five whales per month and given that a few whales have atypically remained in the area through the fall months (MOS 2016), we assumed two whales may remain within the action area from August through November. Densities for killer whales were calculated assuming five animals enter the area seasonally from one of the resident or transient stocks, and may remain from April through November. Harbor porpoise may be present in low numbers (average of five per month) throughout the year. Finally, Dall's porpoise are not sighted very frequently but tend to travel in larger groups; therefore, ten animals per for the four months of construction were considered in the density calculations. Table 5 provides the resulting marine mammal densities for months when terminal construction would occur (again, no pile activities would occur from March 1 through May 31 to avoid peak marine mammal abundance and critical foraging periods). Although the table provides all relevant months, we used the months with highest density to calculate estimated take for each species, thus producing the most conservative estimates. Please refer to section 6.6.1 in ADOT's application for supporting data information.

**Table 5. Marine Mammal Density Estimates (Animals/km$^2$) During Months When Pile Activities May Occur.**

| Species | Jan | Feb | June | July | Aug | Sept | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|
| Steller sea lion | 2.06 | 1.87 | 7.55 | 1.35 | 0 | 0.01 | 1.85 | 1.59 | 2.47 |
| Harbor seal | 0.109 | 0.109 | 1.09 | 0.109 | 0.109 | 0.109 | 0.109 | 0.109 | 0.109 |
| Humpback whale | 0 | 0 | 0.054 | 0.054 | 0.022 | 0.022 | 0.022 | 0.022 | 0 |
| Killer whale | 0 | 0 | 0.054 | 0.054 | 0.054 | 0.054 | 0.054 | 0.054 | 0 |
| Harbor porpoise | 0.054 | 0.054 | 0.054 | 0.054 | 0.054 | 0.054 | 0.054 | 0.054 | 0.054 |
| Dall's porpoise | 0 | 0 | 0 | 0.03 | 0.03 | 0.03 | 0.03 | 0 | 0 |

*Take Calculation and Estimation*

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

The following equation was used to calculate potential Level A take per species per pile type: *Level A harassment zone/pile installation method/pile type * June density * # of pile driving days/pile type*. As described above, there would be 19 days of pile driving and 2 days of pile removal for a total of 21 pile activity days. We used the June density because, when densities changed throughout the year, this is when the highest density of all species occurs in the project area within the project in-water work window (with the exception of Dall's porpoise-see below) and ADOT&PF could conduct activities during this month. Therefore, the resulting take estimates assume all work is conducted in June, producing conservative estimates. The resulting Level A takes by pile type (30-in and 36-in) were then added to generate a total take number. For Level B harassment, the equation is the same; however, we first subtracted any Level A area from its corresponding Level B zone so not to "double count" takes.

ADOT&PF may take 1.9 humpback whales by Level A harassment when impact driving 30" piles (*i.e.,* 3.17 $km^2$ * 0.054 animals/$km^2$ * 11 days). ADOT&PF may take 2.1 humpback whales by Level A harassment when impact driving 36-in piles (*i.e.,* 4.78 $km^2$ * 0.054 animals/$km^2$ * 8 days). Together, these equal 4 (*i.e.,* 1.9 from 30-in + 2.1 from 36") potential Level A takes (Table 6). The Level B harassment zone for impact driving 30" piles was calculated as 4.52 $km^2$ – 3.17 $km^2$ = 1.35 $km^2$. As such, potential take is calculated as 1.35 $km^2$ * 0.054 animals/$km^2$ * 11 days = 1 animal. To calculate take from impact driving 36" piles, the Level A zone (4.78 $km^2$) was subtracted from the Level B zone (6.79 $km^2$) and the process was repeated: 2.01 $km^2$ * 0.054 animals/$km^2$ * 8 days = 1 animal. These takes were then added for a total of 2 takes from Level B harassment from impact pile driving. Finally, we included the

potential Level B takes from vibratory pile driving and removal (Level B area = 21.1 $km^2$) using the method as described above. The resulting Level B takes (n=24) were added to the impact pile driving Level B takes (n=2) for a total Level B take of 26 humpback whales.

For killer whales, Level B takes from vibratory pile driving were calculated using June density and the full 21.1 $km^2$ Level B zone since no Level A takes are predicted: 21.1 $km^2$ * 0.054 animals/$km^2$ * 21 days = 24 animals. Level B take from impact driving 30-in piles is calculated as 4.52 $km^2$ * 0.054 animals/$km^2$ * 11 days = 2.7 killer whales. Level B take from impact driving was calculated as 6.79 $km^2$ * 0.054 animals/$km^2$ * 8 days = 2.9 killer whales. Together, we proposed to authorize Level B take of 30 killer whales over the 21 days of pile activity.

For Dall's porpoise, we used the July density of 0.03 animals/$km^2$ in the take equations. The resulting Level A take was lower than the average group size; therefore, we increased to the number of takes to represent the possibility one group of ten Dall's porpoise may come within the Level A zone during impact pile driving. For Level B take, calculated take fell between 10 and 20 animals; therefore, we assumed two groups of ten each may occur within the Level B zone and are proposing to authorize 20 Level B takes.

Harbor porpoise take estimates were based on a density of .054 porpoise/$km^2$ with a Level A isopleth of 1.13 $km^2$ and 2.17 $km^2$ for impact pile driving 30-in (11 days) and 36-in (8 days) piles, respectively. The resulting 1 animal is less than the average group size; therefore, we are proposing to authorize the take of three harbor porpoise. For Level B, calculated take was estimated at 28 animals. Level B take numbers for harbor porpoise were based on a 21.1$km^2$ impact zone for vibratory pile driving while an isopleth of 4.62$km^2$ and 3.39$km^2$ were used for pile driving 30-in (11 days) and 36-in (8 days) piles.

Harbor seal Level A take numbers were based on 1.09 seals/$km^2$, a Level A zone of 0.09 and 0.15 $km^2$ for impact pile driving 30-in (11 days) and 36-in (8 days) piles, respectively. In total, three Level A takes of harbor seals are expected. For Level B, a 21.1 $km^2$ impact zone for vibratory pile driving was used whereas a 6.64$km^2$ and 4.43$km^2$ isopleth were used for impact pile driving 36-in and 30-in piles. In all, Level B take numbers for vibratory and impact pile driving were 598. It is important to note that given harbor seals are more likely to haul-out and linger within the Level B harassment zone, it is more likely that this number represents exposures and not individual seals. As with all other species, it is also likely animals will travel through the Level B zone heading up the inlet and then back down again. Because individual identification is not always possible, these separate sighting events would be counted as individual takes.

For Steller sea lions, Level B takes from vibratory pile driving were calculated using the most conservative June density (assuming worst case scenario that all work occurs in June) and the full 21.1 $km^2$ Level B zone since no Level A takes are predicted: 21.1 $km^2$ * 7.55 animals/$km^2$ * 21 days = 3345.4 animals. Level B take from impact driving 30-in piles was calculated as 4.52 $km^2$ * 7.55 animals/$km^2$ * 11 days = 375.4 sea lions. Level B take from impact driving 36-in piles was calculated as 6.79 $km^2$ * 7.55 animals/$km^2$ * 8 days = 410.1 sea lions. Together, NMFS proposes to authorize 4131 takes of sea lions over the 21 days of pile activity. This amount is not believed to be the number of individual Steller sea lions harassed but some lesser amount of individuals with repeated exposures.

Table 6 includes the total proposed take levels, by species, manner of taking, and the percentage of stock potentially taken by Level B harassment (we did not include Level A take percentages as the proposed number of take is essentially zero percent for all stocks).

**Table 6. Estimated take by Level A and Level B harassment, by species and month, resulting from impact and vibratory pile driving.**

| Species | Stock or DPS | Stock or DPS size[1] | Level A | Level B | Level B % of Stock/DPS |
|---|---|---|---|---|---|
| Steller sea lion | eastern U.S. | 60,131 | 0 | 4,131[2] | 6.7 |
| | western U.S. | 49,497 | 0 | 83[2] | 0.16 |
| Harbor Seal | Lynn Canal/Stephens Passage | 9,478 | 3 | 598 | 6.3 |
| Humpback whale | Central North Pacific | 10,103 | 4 | 26[3] | 0.3 |
| Killer whale | Alaska Resident | 2,347 | 0 | 30 | 1.3 -12.3 |
| | Northern Resident | 261 | 0 | | |
| | Gulf of Alaska, Aleutian Islands, Bering Sea | 587 | 0 | | |
| | West Coast Transient | 243 | 0 | | |
| Harbor porpoise | Southeast Alaska | 975 | 3[4] | 28 | 0.27 |
| Dall's porpoise | Alaska | 83,400 | 10[4] | 20[4] | 0.04 |

[1] Stock or DPS size here is $N_{best}$ according to NMFS 2016 Stock Assessment Reports.
[2] Calculated Level B take of all SSL's is based on a June density of 7.55 animals which equals 4131 individuals. 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.
[3] Calculated Level B take of all humpback whales is based on a June density of 0.054 animals which equals 4131 individuals. 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.
[4] The calculated Level A take for harbor porpoise and Dall's porpoise is less than the average group size; therefore, we are proposing to authorize Level A take of one group of each species (*i.e.*, 3 and 10 animals, respectively). For Dall's porpoise, we propose to authorize two groups (*i.e.*, 20 animals) to be taken by Level B harassment. The calculated amount of Level B take for harbor porpoise is sufficient to cover multiple groups; therefore, no adjustments were made.

## 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, as well as subsistence uses. 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.

The following mitigation measures are proposed in the IHA:

- *Schedule*: No pile driving or removal would occur from March 1 through May 31 to avoid peak marine mammals abundance periods and critical foraging periods.
- *Pile Driving Delay/Shut-Down*: If an animal comes within 10 m (33 ft) of a pile being driven or removed, ADOT&PF would shut down. Pile driving activities would only be conducted during daylight hours when it is possible to visually monitor for marine mammals. If poor environmental conditions restrict visibility (*e.g.*, from excessive wind or fog, high Beaufort

state), pile installation would be delayed. If a species for which authorization has not been granted or if a species for which authorization has been granted but the authorized takes are met, ADOT&PF would delay or shut-down pile driving if the marine mammals approaches or is observed within the Level A and/or B harassment zone. In the unanticipated event that the specified activity clearly causes the take of a marine mammal in a manner prohibited by the IHA, such as serious injury or mortality, the protected species observer (PSO) on watch would immediately call for the cessation of the specified activities and immediately report the incident to the Chief of the Permits and Conservation Division, Office of Protected Resources, NMFS, and NMFS Alaska Regional Office.

- *Soft-start*: For all impact pile driving, a ‘‘soft start’’ technique will be used at the beginning of each pile installation to allow any marine mammal that may be in the immediate area to leave before hammering at full energy. The soft start requires ADOT&PF to provide an initial set of three strikes from the impact hammer at 40 percent energy, followed by a one-minute waiting period, then two subsequent 3–strike sets. If any marine mammal is sighted within the Level A zone designated for that species prior to pile-driving, or during the soft start, ADOT&PF will delay pile-driving until the animal is confirmed to have moved outside and on a path away from Level A zone or if 15 minutes have elapsed since the last sighting.

- *Other best management practices*: ADOT&PF will drive all piles with a vibratory hammer to the maximum extent possible (*i.e.,* until a desired depth is achieved or to refusal) prior to using an impact hammer. ADOT&PF will also use the minimum hammer energy needed to safely install the piles. ADOT&PF will also utilize sound attenuation devices (*e.g.,* pile caps/cushions) to reduce source levels and, by association, received levels. However, because

the actual amount of reduction of sound energy from using those devices in unknown, ADOT&PF and NMFS used relied on unattenuated source levels to calculate harassment zones.

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

**Proposed Monitoring and Reporting**

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

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

- Occurrence of marine mammal species or stocks in the area in which take is anticipated (*e.g.*, presence, abundance, distribution, density).

- Nature, scope, or context of likely marine mammal exposure to potential stressors/impacts (individual or cumulative, acute or chronic), through better understanding of: (1) action or environment (*e.g.*, source characterization, propagation, ambient noise); (2) affected

species (*e.g.*, life history, dive patterns); (3) co-occurrence of marine mammal species with the action; or (4) biological or behavioral context of exposure (*e.g.*, age, calving or feeding areas).

- Individual marine mammal responses (behavioral or physiological) to acoustic stressors (acute, chronic, or cumulative), other stressors, or cumulative impacts from multiple stressors.
- How anticipated responses to stressors impact either: (1) long-term fitness and survival of individual marine mammals; or (2) populations, species, or stocks.
- Effects on marine mammal habitat (*e.g.*, marine mammal prey species, acoustic habitat, or other important physical components of marine mammal habitat).
- Mitigation and monitoring effectiveness.

*Visual Monitoring*

Monitoring would be conducted 30 minutes before, during, and 30 minutes after pile driving and removal 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 activities include the time to install or remove a single pile or series of piles, as long as the time elapsed between uses of the pile driving equipment is no more than thirty minutes.

A primary PSO would be placed at the terminal where pile driving would occur and a second observer would be placed at Tanani Point, located approximately 1 mi (1.6 km) southeast of the terminal. This second observer is at an advantage to observe species prior to entering the Level A zone as they move up Chilkoot Inlet, covering a majority of the Level B zone. 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. The following measures also apply to visual monitoring:

(1) Monitoring will be conducted by qualified observers, who will be placed at the best vantage point(s) practicable to monitor for marine mammals and implement shutdown/delay procedures when applicable by calling for the shutdown to the hammer operator. Qualified observers are trained biologists, with the following minimum qualifications:

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

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

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

(d) Experience or training in the field identification of marine mammals, including the identification of behaviors;

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

(f) 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

(g) 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 activities. It will include an overall description of work completed, a narrative regarding marine mammal sightings, and associated marine mammal observation 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, ADOT&PF 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 ADOT&PF to determine what is necessary to minimize the likelihood of further prohibited take and ensure MMPA compliance. ADOT&PF would not be able to resume their activities until notified by NMFS via letter, email, or telephone.

In the event that ADOT&PF 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), ADOT&PF 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 ADOT&PF to determine whether modifications in the activities are appropriate.

In the event that ADOT&PF 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), ADOT&PF 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. ADOT&PF would provide photographs or video footage (if available) or other documentation of the stranded animal sighting to NMFS and the Marine Mammal Stranding Network.

*Acoustic Monitoring*

ADOT&PF relied on source level and sound propagation models to estimate Level A and harassment zones. To validate the outputs of these models, ADOT&PF will conduct acoustic monitoring during the first two days of pile driving. The acoustic monitoring plan is available for review at *http://www.nmfs.noaa.gov/pr/permits/incidental/construction.htm*. In summary, ADOT&PF will deploy three bottom-mounted Autonomous Multichannel Acoustic Recorders (AMARs) and conduct spot measurements with a hydrophone over the side of a vessel. The AMARs will be set 10 m, 1000m and 5,000 m from the pile. Within one week, ADOT&PF will provide NMFS a report of their acoustic measurements. NMFS will review the report and if

empirical data demonstrates adjustments to Level A and B take zones are warranted, those adjustments will be made.

**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).

The Level A harassment zones identified in Tables 3 and 4 are based upon an animal exposed to impact pile driving two piles per day. Considering duration of impact driving each pile (up to 15 minutes) and breaks between pile installations (to reset equipment and move pile into place), this means an animal would have to remain within the area estimated to be

ensonified above the Level A harassment threshold for multiple hours. This is highly unlikely given marine mammal movement throughout the area. If an animal was exposed to accumulated sound energy, the resulting PTS would likely be small (*e.g.*, PTS onset) at lower frequencies where pile driving energy is concentrated. Nevertheless, we propose authorizing a small amount of Level A take for four species which is considered in our analysis.

Behavioral responses of marine mammals to pile driving and removal at the Terminal, if any, are expected to be mild and temporary. Marine mammals within the Level B harassment zone may not show any visual cues they are disturbed by activities (as noted during modification to the Kodiak Ferry Dock) or could become alert, avoid the area, leave the area, or display other mild responses that are not observable such as changes in vocalization patterns. Given the short duration of noise-generating activities per day and that pile driving and removal would occur on 21 days across 4 months, any harassment would be temporary. In addition, ADOT&PF would not conduct pile driving or removal during the spring eulachon and herring runs as well as the fall salmon runs, when marine mammals are in greatest abundance and engaging in concentrated foraging behavior.

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.
- ADOT&PF would avoid pile driving and removal during peak periods of marine mammals abundance and foraging (*i.e.*, March 1 through May 31 eulachon and herring runs,).
- ADOT&PF would implement mitigation measures such as vibratory driving piles to the maximum extent practicable, soft-starts, use of sound attenuation devices, and shut downs.

- Monitoring reports from similar work in Alaska have documented little to no effect on individuals of the same species impacted by the specified activities.

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

**Small Numbers**

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

The amount of take NMFS proposes to authorize is 0.03 to 12.3 percent of any stock's best population estimate. The 12.3 percent is based on the possibility all 30 takes of killer whales are from the West Coast Transient stock (population size 243) which is highly unlikely. The next lowest percent of stock is for the Steller sea lion eDPS at 6.7 percent; however, this is also conservative because it assumes all pile driving occurs in June which has the highest Steller sea lion density and assumes all takes are of individual animals which is likely not the case. Harbor seal takes represent 6.3 percent of the Lynn Canal/Stephens passage population while takes for

the remaining five species, including the Steller sea lion wDPS, represent less than 1 percent of all stocks.

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

**Endangered Species Act (ESA)**

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

NMFS is proposing to authorize take of the Steller sea lion wDPS and the Mexico humpback whale DPS which are listed under the ESA. The Permit and Conservation Division has requested initiation of Section 7 consultation with the Alaska Region 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 ADOT&PF for conducting pile driving and removal at the Haines Ferry Terminal, Alaska, from October 1, 2018 September 30, 2019 provided the previously mentioned mitigation, monitoring,

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

1. This IHA is valid from October 1 2018, through September 30, 2019.

2. This IHA is valid only for pile driving and removal during the Haines Ferry Terminal Modification Project, Haines, Alaska.

3. *General Conditions*

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

(b) The species authorized for taking is the Steller sea lions (*Eumetopias jubatus*), harbor seals (*Phoca vitulina*), harbor porpoise (*Phocoena* phocoena), and Dall's porpoise (*Phocoenoides dalli*) humpback whale (*Megaptera novaeangliae*) and killer whale (*Orcinus orca*).

(c) The taking, by harassment, is limited to the species listed in condition 3(b). See Table 6 for manner of taking and numbers of take authorized, by species.

(d) The taking by serious injury or death of the species listed in condition 3(b) of this IHA or any taking of species of marine mammal not listed in condition 3(b) is prohibited and may result in the modification, suspension, or revocation of this IHA.

(e) The taking of any marine mammal in a manner prohibited under this IHA must be reported immediately to the Office of Protected Resources, NMFS.

(f) ADOT&PF shall conduct briefings between construction supervisors and crews, marine mammal monitoring team, and ADOT&PF staff prior to the start of pile driving and removal for the Haines Ferry Terminal Modification Project, and when new personnel join the

work, in order to explain responsibilities, communication procedures, marine mammal monitoring protocol, and operational procedures.

4. *Mitigation*

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

(a) *Timing Restrictions*: Pile driving and removal shall occur only during daylight hours from October 1, 2018, through September 30, 2019, excluding March 1, 2019, to May 31, 2019.

(b) *Weather Restrictions*: If poor environmental conditions restrict visibility (*e.g.*, from excessive wind or fog, high Beaufort state), the commencement of pile installation shall be delayed.

(c) *Pile Driving Operations*

(i) ADOT&PF shall drive all piles with a vibratory hammer to the maximum extent possible (*i.e.*, until a desired depth is achieved or to refusal) prior to using an impact hammer. ADOT&PF shall also use the minimum hammer energy needed to safely install the piles.

(ii) ADOT&PF shall use sound attenuation devices (*e.g.*, pile caps/cushions) in an attempt to reduce source levels.

(iii) ADOT&PF shall use a ‘‘soft start’’ technique at the beginning of impact pile driving to allow any marine mammal that may be in the immediate area to leave before hammering at full energy. The soft start requires ADOT&PF to provide an initial set of three

strikes from the impact hammer at 40 percent energy, followed by a one-minute waiting period, then two subsequent 3–strike sets.

(iv) ADOT%PF shall use a direct pull method as the primary removal method for piles and, if ineffective, then using a vibratory hammer;

*(d) Shut-down Procedures*

(i) A shut-down zone of 10 m shall be established during impact pile driving. Pile driving shall not commence until marine mammals are not sighted within the shut-down zone for a 15-minute period. If a marine mammal enters the shut down zone during pile driving, the activity shall stop until the animal leaves the shut-down zone or until 15 minutes has elapsed without observation of the animal within the zone.

(ii) If any marine mammal is sighted within the Level A zone (see Tables 3 and 4) designated for that species prior to pile-driving, or during the soft start, ADOT&PF shall delay pile-driving until the animal is confirmed to have moved outside and on a path away from Level A zone or if 15 minutes have elapsed since the last sighting.

(iii) ADOT&PF shall use delay and shut-down procedures, if a species for which authorization has not been granted or if a species for which authorization has been granted but the authorized takes are met, approaches or is observed within the Level A and/or B harassment zone.

(iv) ADOT&PF shall use delay and shut-down procedures, if a species for which authorization has not been granted or if a species for which authorization has been granted but the authorized takes are met, approaches or is observed within the Level A and/or B harassment zone (as appropriate).

5. *Monitoring*

The holder of this Authorization is required to abide by the following monitoring conditions:

(a) Two qualified Protected Species Observer (PSOs) shall be used to detect, document, and minimize impacts to marine mammals. One PSO shall be stationed at the Terminal and another shall be stationed at Tanani Point or other vantage point that allows visual line of sight across Chilkoot Inlet.

(b) Qualifications for PSOs for visual monitoring include:

(i) Visual acuity in both eyes (correction is permissible) sufficient for discernment of harbor seals on land or in the water with ability to estimate target size and distance; use of binoculars may be necessary to correctly identify the target;

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

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

(iv) Experience or training in the field identification of marine mammals, including the identification of behaviors;

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

(vi) 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

construction activities were conducted; dates and times when construction activities were suspended to avoid potential incidental injury from construction sound or visual disturbance of marine mammals observed; and marine mammal behavior; and

(vii) 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.

(c) PSO Monitoring and Data Collection: Monitoring shall be conducted before, during, and after pile driving and removal activities. PSOs shall record all incidents of marine mammal occurrence, regardless of distance from activity, and shall document any behavioral reactions in concert with distance from construction activities. PSOs shall be placed at the best vantage point(s) practicable to monitor for marine mammals. The PSO shall also conduct biological resources awareness training for construction personnel. The awareness training shall be provided to brief construction personnel on identification of marine mammals (including neonates) and the need to avoid and minimize impacts to marine mammals. If new construction personnel are added to the project, the contractor shall ensure that the personnel receive the mandatory training before starting work. The PSO shall have authority to stop construction if marine mammals appear distressed (evasive maneuvers, rapid breathing, inability to flush) or in danger of injury.

(d) Monitoring requirements also include:

(i) The holder of this Authorization must designate at least one biologically-trained, on-site individual(s), approved in advance by NMFS, to monitor marine mammal species. The PSO shall be trained in marine mammal identification and behaviors and are required to have no other construction-related tasks while conducting monitoring.

(ii) PSOs shall be provided with the equipment necessary to effectively monitor for marine mammals in order to record species, behaviors, and responses to construction activities.

(iii) *Pre-activity Monitoring:* At least 30 minutes prior to the start of all pile driving, the PSO(s) must conduct observations on the number, type(s), location(s), and behavior(s) of marine mammals.

(iv) Data collection during marine mammal monitoring shall consist of counts of all marine mammals by species and number (if possible, also include sex and age class), a description of behavior, location, direction of movement, type of construction that is occurring, time construction activities starts and ends, any noise or visual disturbance, and time of the observation. The type of take (*i.e.*, Level A or B) and the assumed cause (whether related to construction activities or not) shall be noted. Environmental conditions such as weather, visibility, temperature, tide level, current, and sea state shall also be recorded. A written log of dates and times of monitoring activity shall be kept. The log shall report the following information:

- Time of PSO arrival on site;
- Time of the commencement of construction activities;
- Distances to all marine mammals relative to the disturbance;
- Observations, notes on marine mammal behavior during construction activities, as described above, and on the number and distribution observed in the project vicinity;
- For observations of all other marine mammals (if observed) the time and duration of each animal's presence in the project vicinity; the number of animals observed; the behavior of each animal, including any response to construction activities;

- Time of the cessation of construction activities;
- Time of PSO departure from site; and
- An estimate of the number (by species) of marine mammals that are known to have been disturbed by construction activities (based on visual observation) with a discussion of any specific behaviors those individuals exhibited. Disturbance must be recorded according to NMFS' three-point scale.

(v) *Post-activity Monitoring:* At least 30 minutes following the cessation of pile driving for the day, the PSO(s) will continue to scan for marine mammals and document any sightings in accordance with section 4(c)(iv) of this IHA.

(e) *Acoustic Monitoring:* ADOT&PF shall conduct acoustic monitoring at the onset of pile driving per the Acoustic Monitoring Plan. The data shall be analyzed to determine if any adjustments to the harassment zones are warranted.

6. *Reporting*

(a) The ADOT&PF shall submit a draft report to NMFS within 90 days of the completion of marine mammal monitoring, or sixty days prior to the issuance of any subsequent IHA for this project (if required), whichever comes first. The report shall include marine mammal observations pre-activity, during-activity, and post-activity of construction, and shall also provide descriptions of any behavioral responses by marine mammals due to disturbance from construction activities and a complete description of total take estimate based on the number of marine mammals observed during the course of construction. If comments are received from the NMFS Office of Protected Resources on the draft report, a final report shall be submitted to NMFS within 30 days thereafter following resolution of comments on the draft report from NMFS. If no comments are received from NMFS, the draft report will be considered

to be the final report. This report must contain the informational elements described above and in the monitoring plan of the application and at minimum shall also include:

(b) Reporting injured or dead marine mammals:

(i) In the unanticipated event that the specified activity clearly causes the take of a marine mammal in a manner prohibited by this IHA, such as serious injury or mortality, ADOT&PF shall immediately cease the specified activities and report the incident to the NMFS' Office of Protected Resources and the West Coast Regional Stranding Coordinator. The report must include the following information:

- Time and date of the incident;
- Description of the incident;
- Environmental conditions (*e.g.*, wind speed and direction, tidal conditions, cloud cover, and visibility);
- Description of all marine mammal observations and active sound
- Species identification or description of the animal(s) involved;
- Fate of the animal(s); and
- Photographs or video footage of the animal(s).

Activities shall not resume until NMFS is able to review the circumstances of the prohibited take. NMFS will work with ADOT&PF to determine what measures are necessary to

minimize the likelihood of further prohibited take and ensure MMPA compliance. ADOT&PF may not resume their activities until notified by NMFS.

(ii) In the event that ADOT&PF 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), ADOT&PF shall immediately report the incident to the NMFS' Office of Protected Resources and the Alaska Regional Stranding Coordinator. The report must include the same information identified in 6(b)(i) of this IHA. Activities may continue while NMFS reviews the circumstances of the incident. NMFS will work with the ADOT&PF to determine whether additional mitigation measures or modifications to the activities are appropriate.

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

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

**Request for Public Comments**

We request comment on our analyses, the draft authorization, and any other aspect of this Notice of Proposed IHA for the proposed Haines Ferry Terminal Dock Modification Project. Please include with your comments any supporting data or literature citations to help inform our final decision on the request for MMPA authorization.

Dated: October 6, 2017.

**Donna S. Wieting,**

*Director,*

*Office of Protected Resources,*

*National Marine Fisheries Service.*

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