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DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

[RTID 0648-XE746]

Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to the Alaska Department of Transportation and Public Facilities Angoon Ferry Terminal Modification Project in Angoon, Alaska

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

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

SUMMARY: NMFS has received a request from the Alaska Department of Transportation and Public Facilities (ADOT&PF) for authorization to take marine mammals incidental to Angoon Ferry Terminal Modification Project in Angoon, Alaska. Pursuant to the Marine Mammal Protection Act (MMPA), NMFS is requesting comments on its proposal to issue an incidental harassment authorization (IHA) to incidentally take marine mammals during the specified activities. NMFS is also requesting comments on a possible one-time, 1-year renewal that could be issued under certain circumstances and if all requirements are met, as described in **Request for Public Comments** at the end of this notice. NMFS will consider public comments prior to making any final decision on the issuance of the requested MMPA authorization and agency responses will be summarized in the final notice of our decision.

DATES: Comments and information must be received no later than [*INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER*].

ADDRESSES: Comments should be addressed to Jolie Harrison, Chief, Permits and Conservation Division, Office of Protected Resources, National Marine Fisheries Service and should be submitted via email to *ITP.davis@noaa.gov*. Electronic copies of the application and supporting documents, as well as a list of the references cited in this document, may be obtained online at: *https://www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-construction-activities*. In case of problems accessing these documents, please call the contact listed below.

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, including all attachments, must not exceed a 25-megabyte file size. All comments received are a part of the public record and will generally be posted online at *https://www.fisheries.noaa.gov/permit/incidental-take-authorizations-under-marine-mammal-protection-act* without change. All personal identifying information (*e.g.*, name, address) voluntarily submitted by the commenter may be publicly accessible. Do not submit confidential business information or otherwise sensitive or protected information.

FOR FURTHER INFORMATION CONTACT: Leah Davis, Office of Protected Resources, NMFS, (301) 427-8401.

SUPPLEMENTARY INFORMATION:

Background

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

Authorization for incidental takings shall be granted if NMFS finds that the taking will have a negligible impact on the species or stock(s) and will not have an unmitigable adverse impact on the availability of the species or stock(s) for taking for subsistence uses (where relevant). Further, NMFS must prescribe the permissible methods of taking and other "means of effecting the least practicable adverse impact" on the affected species or stocks and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of the species or stocks for taking for certain subsistence uses (referred to in shorthand as "mitigation"); and requirements pertaining to the monitoring and reporting of the takings. The definitions of all applicable MMPA statutory terms used above are included in the relevant sections below and can be found in section 3 of the MMPA (16 U.S.C. 1362) and NMFS regulations at 50 CFR 216.103.

National Environmental Policy Act

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

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

Summary of Request

On September 6, 2024, NMFS received a request from ADOT&PF for an IHA to take marine mammals incidental to pile driving (installation and removal) associated with construction for one ferry terminal in Angoon, Alaska. Following NMFS' review of the application, ADOT&PF submitted revised versions on November 6, 2024, November 12, 2024, November 26, 2024, and December 23, 2024. A final revised application was submitted on January 6, 2025 and the application was deemed adequate and complete on January 27, 2025. The ADOT&PF request is for take of eight species (12 stocks) by Level B harassment and, for a subset five of these species, Level A harassment. Neither ADOT&PF nor NMFS expect serious injury or mortality to result from this activity and, therefore, an IHA is appropriate.

Description of Proposed Activity

Overview

ADOT&PF is proposing to make improvements to Angoon Ferry Terminal within Killisnoo Harbor in Angoon, Alaska. The existing Angoon Ferry terminal was originally designed for the Alaska Marine Highway System fast ferries and motor vessels but ADOT&PF is in the process of replacing these aging vessels with longer and wider Alaska Class Ferries. Ferry replacement requires mooring dolphin rearrangement to accommodate these larger vessels as well as upgrades to the lift system from electric to hydraulic actuators for more reliable operations. Construction would occur on approximately 143 non-consecutive in-water work days over the course of 1 year. The proposed activities that have the potential to take marine mammals, by Level A and level B harassment, include down-the-hole drilling (DTH) of rock sockets and tension anchors, vibratory installation and removal of temporary steel pipe piles, vibratory and impact installation of permanent steel pipe piles, and vibratory removal of permanent piles (in cases where piles cannot be removed with direct pull methods).

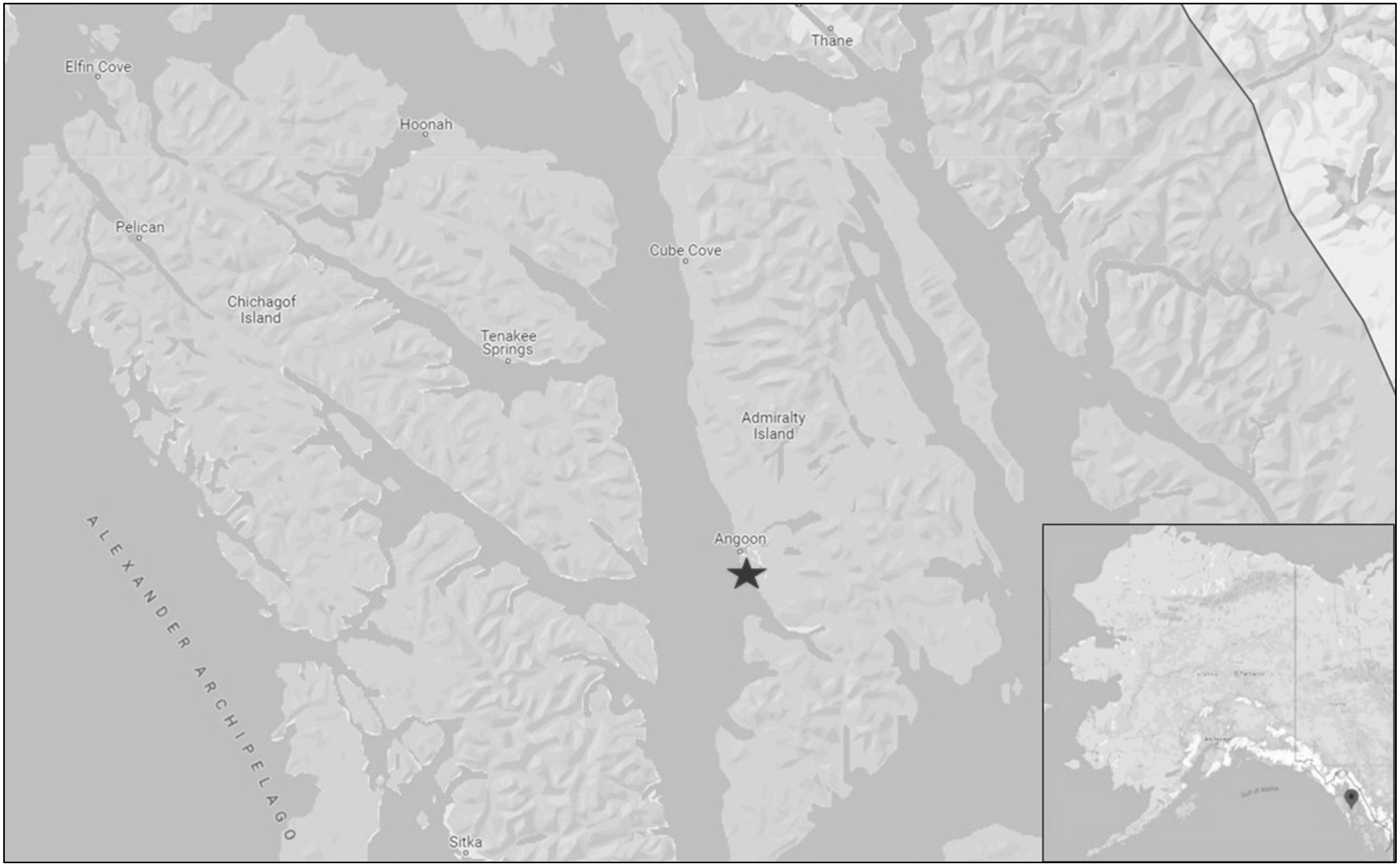
Dates and Duration

ADOT&PF anticipates the project would require 143 non-consecutive -in water days of pile installation and removal over the course of 1 year. The effective date of the IHA, if issued, would be from May 1, 2026 through April 30, 2027.

Specific Geographic Region

The Angoon Ferry Terminal Modifications Project is located in Killisnoo Harbor in Angoon, Alaska as shown in figure 1. Angoon is a small southeast Alaskan village and the only permanent settlement on Admiralty Island. The ferry terminal is approximately 2 miles (3.2 kilometers (km)) south of Angoon's city center. The ferry terminal is adjacent to the City of Angoon's deep draft dock serving as the community's fuel supply operation, and other marine facilities in Angoon include a small boat harbor and seaplane base on Kootznahoo Inlet. Killisnoo Harbor is approximately 1 mile (1.6 km) wide and is situated between the west shore of Admiralty Island on the eastern side of Chatham Strait, which is one of the most extensive inside passages in Southeast Alaska. Water depths in the harbor are generally 150 feet (45.7 meters (m)) or shallower.

Figure 1– Angoon Ferry Terminal Project Area Overview



Detailed Description of the Specified Activity

ADOT&PF is proposing to upgrade the existing Angoon Ferry Terminal to accommodate the new larger Alaska Class Vessel berthing. Work would include installation of three new floating fender dolphins (N4, N8, and N10), replacement of a mooring dolphin (S3), and modification of an existing dolphin (N7, to be renamed N9) to be an ultra-high molecular weight polyethylene panel fender pile, as well as some other above-water work.

The N4 floating fender dolphin would be comprised of one 30 inch (70 centimeters (cm)) steel pipe fender pile, two 24 inch (61 cm) vertical steel pipe piles, and two 24 inch (61 cm) batter piles. The N8 and N10 floating fender pile dolphins would each consist of one fender pile, two vertical piles, and two batter piles, all 30-in steel pipe piles. S3 mooring dolphin replacement would include removal and replacement of two 20 inch (51 cm) batter piles and potentially one 24 inch (61 cm) steel pipe pile. Tension anchors for the S3 mooring dock piles would also be cut at the mudline. ADOT&PF would also install and remove 16 temporary steel pipe piles up to 24 inch (61 cm) in diameter using a vibratory hammer as part of the construction process. ADOT&PF anticipates that pile removal would occur via direct pull, cutting, clipping, or other above water activities when feasible, but may use a vibratory hammer to extract piles if necessary. In addition to vibratory and impact pile driving, ADOT&PF may install rock sockets and tension anchors at some locations. Table 1 includes the total number of piles of each type and the proposed construction method.

The construction crew may use a single installation method for multiple piles on a single day or find other efficiencies to increase production; the anticipated ranges of possible values are provided in table 1. All of the construction activities described above have the potential to result in both Level A and Level B behavioral harassment of marine mammals.

Existing dolphin N7 (to be renamed N9) would be modified by cutting and replacing a portion of the pile about 10 feet (3.0 m) above high tide line. Other out-of-water work would include converting the existing electrical actuated bridge and apron lift system to a hydraulic actuated system; installing new hydraulic actuators, hydraulic power unit, and associated electrical components; and making improvements to the dock's transfer bridge and other uplands components. Modification of dolphin N7 and the other out-of-water work described here is not anticipated to result in take of marine mammal, and therefore, these activities are not discussed further in this document.

Table 1– Number and Type of Piles To Be Installed and Removed by Impact and Vibratory Driving and DTH.

Activity	Method	Pile diameter	Number of piles	Max days of activity
Installation	Vibratory	24 inch (61 cm) Steel Piles	16	16
		20 or 24 inch (51 or 61 cm) Steel Piles	7	7
		30 inch (76 cm) Steel Piles	11	11
Removal	Vibratory	20 inch (51 cm) Steel Piles	2	2
		24 inch (61 cm) Steel Piles	17	17
Installation	Impact	20 or 24 inch (51 or 61 cm) Steel Piles	7	14
		30 inch (76 cm) Steel Piles	11	22
8 inch (20 cm) tension anchor (for 24 inch (61 cm) piles)	DTH	--	7	21
8 inch (20 cm) tension anchor (for 30 inch (76 cm) piles)	DTH	--	8	24
Rock socket (for 30 inch (76 cm) piles)	DTH	--	3	9

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

Description of Marine Mammals in the Area of Specified Activities

Sections 3 and 4 of the application summarize available information regarding status and trends, distribution and habitat preferences, and behavior and life history of the potentially affected species. NMFS fully considered all of this information, and we refer the reader to these descriptions, instead of reprinting the information. Additional information regarding population trends and threats may be found in NMFS' Stock Assessment Reports (SARs; *https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessments*) and more general information about these species (*e.g.*, physical and behavioral descriptions) may be found on NMFS' website (*https://www.fisheries.noaa.gov/find-species)*.

Table 2 lists all species or stocks for which take is expected and proposed to be authorized for the activities at the Angoon Ferry Terminal, and summarizes information related to the population or stock, including regulatory status under the MMPA and Endangered Species Act (ESA) and potential biological removal (PBR), where known. 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 serious injury or mortality is anticipated or proposed to be authorized here, PBR and annual serious injury and mortality (M/SI) from anthropogenic sources are included here as gross indicators of the status of the species or stocks 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' Alaska and Pacific SARs. All values presented in table 2 are the most recent available at the time of publication and are available online at: *https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessments*.

Table 2– Species[a] With Estimated Take from the Specified Activities.

Common name	Scientific name	Stock	ESA/MMPA status; Strategic (Y/N)[b]	Stock abundance (CV, N_{min}, most recent abundance survey)[c]	PBR	Annual M/SI[d]
Order Artiodactyla – Cetacea – Mysticeti (baleen whales)						
Family Balaenopteridae (rorquals)						
Humpback Whale	*Megaptera novaeangliae*	Mainland Mexico - CA/OR/WA	T, D, Y	3,477 (0.101, 3,185, 2018)	43	22
		Hawai'i	-, -, N	11,278 (0.56, 7,265, 2020)	127	27.09
Minke Whale	*Balaenoptera acutorostrata*	Alaska	-, -, N	N/A (N/A, N/A, N/A)[e]	UND	0
Odontoceti (toothed whales, dolphins, and porpoises)						
Family Delphinidae						
Killer whale	*Orcinus orca*	Eastern North Pacific Alaska Resident	-, -, N	1,920 (N/A, 1,920, 2019)[f]	19	1.3
		Eastern Northern Pacific Northern Resident	-, -, N	302 (N/A, 302, 2018)[f]	2.2	0.2
		West Coast Transient	-, -, N	349 (N/A, 349, 2018)[g]	3.5	0.4
Pacific White-Sided Dolphin	*Lagenorhynchus obliquidens*	N Pacific	-, -, N	26,880 (N/A, N/A, 1990)	UND	0
Family Phocoenidae (porpoises)						
Dall's Porpoise	*Phocoenoides dalli*	Alaska	-, -, N	UND (UND, UND, 2015)[h]	UND	37
Harbor Porpoise	*Phocoena phocoena*	Northern Southeast Alaska Inland Waters[i]	-, -, N	1,619 (0.26, 1,250, 2019)	13	5.6
Order Carnivora – Pinnipedia						
Family Otariidae (eared seals and sea lions)						
Steller Sea Lion	*Eumetopias jubatus*	Western	E, D, Y	49,837 (N/A, 49,837, 2022)[j]	299	267
		Eastern	-, -, N	36,308 (N/A, 36,308, 2022)[k]	2,178	93.2
Family Phocidae (earless seals)						
Harbor Seal	*Phoca vitulina*	Sitka/Chatham Strait	-, -, N	13,289 (N/A, 11,883, 2015	356	77

[a] Information on the classification of marine mammal species can be found on the web page for The Society for Marine Mammalogy's Committee on Taxonomy (*https://marinemammalscience.org/science-and-publications/list-marine-mammal-species-subspecies/*).

[b] 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.

[c] NMFS marine mammal SARs online at: *https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports-region*. CV is coefficient of variation; N_{min} is the minimum estimate of stock abundance. In some cases, CV is not applicable.

[d] 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.

[e] Reliable population estimates are not available for this stock. Please see Friday *et al*. (2013) and Zerbini *et al*. (2006) for additional information on numbers of minke whales in Alaska.
[f] N_{est} is based upon counts of individuals identified from photo-ID catalogs.
[g] N_{est} is based upon count of individuals identified from photo-ID catalogs in analysis of a subset of data from 1958-2018.
[h] The best available abundance estimate is likely an underestimate for the entire stock because it is based upon a survey that covered only a small portion of the stock's range.
[i] New stock split from Southeast Alaska stock.
[j] Nest is best estimate of counts, which have not been corrected for animals at sea during abundance surveys. Estimates provided are for the United States only. The overall N_{min} is 73,211 and overall PBR is 439.
[k] N_{est} is best estimate of counts, which have not been corrected for animals at sea during abundance surveys. Estimates provided are for the United States only.

As indicated above, all 8 species (with 12 managed stocks) in table 2 temporally and spatially co-occur with the activity to the degree that take is reasonably likely to occur. All species that could potentially occur in the proposed action area are included in table 3 of the IHA application. While gray whales have been documented in the area, the temporal and/or spatial occurrence of these species is such that take is not expected to occur, and they are not discussed further beyond the explanation provided here. Gray whales are considered to be very rare with no local knowledge of sightings and no sightings in recent years have been reported in recent years.

In addition, the Northern sea otter (*Enhydra lutris kenyoni*) may be found in the project area. However, sea otters are managed by the U.S. Fish and Wildlife Service and are not considered further in this document.

Humpback Whale

The Mainland Mexico - CA/OR/WA and Hawaii stocks of humpback whale occur in the project area. Wild *et al*. (2023) identified Northern Chatham Strait as a Biologically Important Area (BIA) for humpback whales for feeding during the months of May through October, with an importance score of two (indicating an area of moderate importance), an intensity score of two (indicating an area of moderate comparative significance) and a data support score of three (highest relative confidence in the available supporting data). ADOT&PF ferry Captain of the M/V LeConte routinely transits the area and reports that humpback whales are frequently observed in Chatham Strait and the project area.

Minke Whale

Minke whale surveys in Southeast Alaska have consistently identified individuals throughout inland waters in low numbers (Dahlheim *et al.* 2009). All sightings were of single minke whales, except for a single sighting of multiple minke whales. Surveys took place in spring, summer, and fall, and minke whales were present in low numbers in all seasons and years.Little is known about minke whale abundance and distribution in the project area as there have been no systematic studies conducted on the species in or near Killsnoo Harbor. Surveys throughout southeast Alaska between 1991 and 2007 recorded minke whales infrequently, but noted a wide variety of habitat types used throughout all inland waters and little seasonal variation. During these surveys, minke whales were observed in the Chatham Strait during the fall, approximately 19 km north of the proposed action area. Most minke whales observed during the surveys were individual animals (Dahlheim *et al.,* 2009). Therefore, minke whales are expected to be rare near the action area.

Killer Whale

Killer whales occur throughout the North Pacific and along the entire Alaska coast, in British Columbia and Washington inland waterways, and along the outer coasts of Washington, Oregon, and California. Of the eight recognized killer whale stocks, only the Eastern North Pacific Alaska Resident, Eastern Northern Pacific Northern Resident, and West Coast Transient stocks are expected to occur in the project area. Transient killer whales often occur in long-term stable social units (pods) of 1 to 16 whales. Average pod sizes in Southeast Alaska were 6.0 in spring, 5.0 in summer, and 3.9 in fall. Pod sizes of transient whales are generally smaller than those of resident social groups. Resident killer whales occur in larger pods, ranging from 7 to 70 whales that are seen in association with one another more than 50 percent of the time (Dahlheim *et al.,* 2009; NMFS 2016b). In

Southeast Alaska, resident killer whale mean pod size was approximately 21.5 in spring, 32.3 in summer, and 19.3 in fall (Dahlheim *et al.,* 2009).

Surveys between 1991 and 2007 encountered resident killer whales during all seasons throughout southeast Alaska. Both residents and transients were common in a variety of habitats and all major waterways, including protected bays and inlets. The authors found strong seasonal variation in abundance or distribution of killer whales was not present, but there was substantial variability between years (Dahlheim *et al.,* 2009). Systematic surveys of killer whales have not been conducted in Killisnoo Harbor, Hood Bay, or the Chatham Strait. Although killer whales are common throughout southeast Alaska, they are expected to occur infrequently in the project area.

Pacific white-sided dolphin

Pacific white-sided dolphins are a pelagic species inhabiting temperate waters of the North Pacific Ocean and along the coasts of California, Oregon, Washington, and Alaska (Muto *et al.,* 2021). Despite their distribution mostly in deep, offshore waters, they also occur over the continental shelf and near shore waters, including inland waters of Southeast Alaska (Ferrero and Walker 1996). Dalheim *et al.* (2009) frequently encountered Pacific white-sided dolphin in Clarence Strait with significant differences in mean group size, but overall encounters were rare enough to limit the seasonality investigation to a qualitative note that spring featured the highest number of animals observed. These observations were located most typically in open strait environments, near the open ocean.

In southeast Alaska, Pacific white-sided dolphin occur in groups of 2 to 153 individuals, but are most commonly seen in groups of 23-26 individuals (Dahlheim *et al.*, 2009). However, animals have also been observed in groups with over 1,000 individuals (Stacey and Baird 1991). Although estimated to be uncommon in Killisnoo Harbor and

Hood Bay, Pacific white-sided are reasonably likely to occur during the proposed construction activities.

Dall's Porpoise

Dall's porpoise is found in temperate to subarctic waters of the North Pacific and adjacent seas. They are widely distributed across the North Pacific over the continental shelf and slope waters, and over deep (greater than 2,500 m) oceanic waters (Friday *et al.,* 2012; Friday *et al.,* 2013).

Harbor Porpoise

The harbor porpoise is common in coastal waters. Individuals frequently occur in coastal waters of southeast Alaska and are observed most frequently in waters less than 107 m deep (Dahlheim *et al.,* 2009). The Northern Southeast Alaska Inland Waters stock occurs in Cross Sound, Glacier Bay, Icy Strait, Chatham Strait, Frederick Sound, Stephens Passage, Lynn Canal, and adjacent inlets (Young *et al.,* 2023).

Steller Sea Lion

The western distinct population segment (DPS) of Steller sea lion breeds on rookeries located west of 144 degrees W in Alaska and Russia, and the eastern DPS breeds on rookeries in southeast Alaska through California. Movement occurs between the western and eastern DPSs of Steller sea lions, and increasing numbers of individuals from the western DPS have been seen in southeast Alaska in recent years (Muto *et al.,* 2020; Fritz *et al.,* 2016). However, the proposed project area is outside of core mixing zones for western and eastern DPS Steller sea lions, thus animals in this area are expected to primarily be from the eastern DPS (Hastings *et. al.,* 2020).

Harbor seal

Harbor seals are common in the coastal and inside waters of the project areas. Harbor seals in Alaska are typically non-migratory with local movements attributed to factors such as prey availability, weather, and reproduction (Scheffer and Slipp, 1944;

Bigg, 1969; Hastings *et al.*, 2004). Harbor seals haul out of the water periodically to rest, give birth, and nurse their pups.

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. 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, 2019) recommended that marine mammals be divided into hearing groups based on directly measured (behavioral or auditory evoked potential techniques) or estimated hearing ranges (behavioral response data, anatomical modeling, *etc.*). Generalized hearing ranges were chosen based on the ~65 decibel (dB) threshold from composite audiograms, previous analyses in NMFS (2018), and/or data from Southall *et al*. (2007) and Southall *et al.* (2019). We note that the names of two hearing groups and the generalized hearing ranges of all marine mammal hearing groups have been recently updated (NMFS 2024) as reflected below in table 3.

Table 3– Marine Mammal Hearing Groups (NMFS, 2024)

Hearing Group	Generalized Hearing Range*
Low-frequency (LF) cetaceans (baleen whales)	7 Hz to 36 kHz
High-frequency (HF) cetaceans (dolphins, toothed whales, beaked whales, bottlenose whales)	150 Hz to 160 kHz
Very High-frequency (VHF) cetaceans (true porpoises, *Kogia*, river dolphins, Cephalorhynchid, *Lagenorhynchus cruciger* & *L. australis*)	200 Hz to 165 kHz
Phocid pinnipeds (PW) (underwater) (true seals)	40 Hz to 90 kHz
Otariid pinnipeds (OW) (underwater) (sea lions and fur seals)	60 Hz to 68 kHz

***** Represents the generalized hearing range for the entire group as a composite (*i.e.*, all species within the group), where individual species' hearing ranges may not be as broad. Generalized hearing range chosen based on ~65 dB threshold from composite audiogram, previous analysis in NMFS 2018, and/or data from Southall et al. 2007; Southall et al. 2019. Additionally, animals are able to detect very loud sounds above and below that "generalized" hearing range.

For more detail concerning these groups and associated frequency ranges, please see NMFS (2024) for a review of available information.

Potential Effects of Specified Activities on Marine Mammals and Their Habitat

This section provides a discussion of the ways in which components of the specified activity may impact marine mammals and their habitat. The **Estimated Take of Marine Mammals** section later in this document includes a quantitative analysis of the number of individuals that are expected to be taken by this activity. The **Negligible Impact Analysis and Determination** section considers the content of this section, the **Estimated Take of Marine Mammals** 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 whether those impacts are reasonably expected to, or reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival.

Description of Sound Sources

The marine soundscape is comprised of both ambient and anthropogenic sounds. Ambient sound is defined as the all-encompassing sound in a given place and is usually a composite of sound from many sources both near and far (ANSI 1995). The sound level of an area is defined by the total acoustical energy being generated by known and unknown sources. These sources may include physical (*e.g.,* waves, wind, precipitation, earthquakes, ice, atmospheric sound), biological (*e.g.,* sounds produced by marine mammals, fish, and invertebrates), and anthropogenic sound (*e.g.,* vessels, dredging, aircraft, construction).

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

In-water construction activities associated with the proposed project would include impact pile driving, vibratory pile driving and removal, tension anchoring, and rock socketing. The sounds produced by these activities fall into one of two general sound types: impulsive and non-impulsive. Impulsive sounds (*e.g.,* explosions, gunshots, sonic booms, impact pile driving) are typically transient, brief (less than 1 second), broadband, and consist of high peak sound pressure with rapid rise time and rapid decay (American National Standards Institute (ANSI), 1986; National Institute for Occupational Safety and Health (NIOSH), 1998; ANSI, 2005; NMFS, 2018). Non-impulsive sounds (*e.g.,* aircraft, machinery operations such as drilling or dredging, vibratory pile driving, and active sonar systems) can be broadband, narrowband or tonal, brief or prolonged (continuous or intermittent), and typically do not have the high peak sound pressure with rapid rise/decay time that impulsive sounds do (ANSI, 1995; NIOSH, 1998; NMFS, 2018). The distinction between these two sound types is important because they have differing potential to cause physical effects, particularly with regard to hearing (*e.g.,* Ward 1997 in Southall *et al.,* 2007).

Impact hammers operate by repeatedly dropping a heavy piston onto a pile to drive the pile into the substrate. Sound generated by impact hammers is characterized by rapid rise times and high peak levels, a potentially injurious combination (Hastings and

Popper, 2005). Vibratory hammers install piles by vibrating them and allowing the weight of the hammer to push them into the sediment. Vibratory hammers produce significantly less sound than impact hammers. Peak sound pressure levels (SPLs) may be 180 dB or greater, but are generally 10 to 20 dB lower than SPLs generated during impact pile driving of the same-sized pile (Oestman *et al.,* 2009). Rise time is slower, reducing the probability and severity of injury, and sound energy is distributed over a greater amount of time (Nedwell and Edwards, 2002; Carlson *et al.,* 2005).

Rock socket or tension anchoring would be conducted using a DTH hammer. A DTH hammer is essentially a drill bit that drills through the bedrock using a rotating function like a normal drill, in concert with a hammering mechanism operated by a pneumatic (or sometimes hydraulic) component integrated into the DTH hammer to increase speed of progress through the substrate (*i.e.,* it is similar to a "hammer drill" hand tool). Rock anchoring or socketing involves using DTH equipment to create a hole in the bedrock inside which the pile is placed to give it lateral and longitudinal strength. Tension anchoring involves creating a smaller hole below the bottom of a pile. A length of rebar is typically inserted in the small hole and is long enough to run up through the middle of a hollow pile to reach the surface where it is connected to the pile to provide additional mechanical support and stability to the pile. The sounds produced by DTH systems contain both a continuous, non-impulsive component from the drilling action and an impulsive component from the hammering effect. Therefore, NMFS treats DTH systems as both impulsive (for estimating Level A harassment zones) and non-impulsive (for estimating Level B harassment zones) sound source types simultaneously.

The likely or possible impacts of the ADOT&PFs proposed activity on marine mammals could involve both non-acoustic and acoustic stressors. Potential non-acoustic stressors could result from the physical presence of the equipment and personnel; however, any impacts to marine mammals are expected to primarily be acoustic in nature.

Acoustic Impacts

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

NMFS defines a noise-induced TS as a change, usually an increase, in the threshold of audibility at a specified frequency or portion of an individual's hearing range above a previously established reference level (NMFS, 2018, 2024). The amount of TS is customarily expressed in dB. A TS can be permanent or temporary. As described in NMFS (2018, 2024), 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 frequency range of the exposed species relative to the signal's frequency spectrum (*i.e.,* how an animal uses sound within the frequency band of the signal; *e.g.,* Kastelein *et al.,* 2014), and the overlap between the animal and the source (*e.g.,* spatial, temporal, and spectral).

Auditory Injury —NMFS defines auditory injury as “damage to the inner ear that can result in destruction of tissue . . . which may or may not result in permanent threshold shift” (PTS; NMFS, 2024). 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, 2024). PTS does not generally affect more than a limited frequency range, and an animal that has incurred PTS has incurred some level of hearing loss at the relevant frequencies; typically, animals with PTS are not functionally deaf (Au and Hastings, 2008; Finneran, 2016). Available data from humans and other terrestrial mammals indicate that a 40-dB TS approximates PTS onset (see Ward *et al.,* 1958, 1959, 1960; Kryter *et al.,* 1966; Miller, 1974; Ahroon *et al.,* 1996; Henderson *et al.,* 2008). PTS levels for marine mammals are estimates, as with the exception of a single study unintentionally inducing PTS in a harbor seal (Kastak *et al.,* 2008), there are no empirical data measuring PTS in marine mammals largely due to the fact that, for various ethical reasons, experiments involving anthropogenic noise exposure at levels inducing PTS are not typically pursued or authorized (NMFS, 2018).

Temporary Threshold Shift (TTS) —TTS is a temporary, reversible increase in the threshold of audibility at a specified frequency or portion of an individual's hearing range above a previously established reference level (NMFS, 2018). Based on data from cetacean TTS measurements (Southall *et al.,* 2007, 2019), a TTS of 6 dB is considered the minimum TS clearly larger than any day-to-day or session-to-session variation in a subject's normal hearing ability (Schlundt *et al.,* 2000; Finneran *et al.,* 2000, 2002). As described in Finneran (2015), marine mammal studies have shown the amount of TTS increases with cumulative sound exposure level (SEL_{cum}) in an accelerating fashion: At low exposures with lower SEL_{cum}, the amount of TTS is typically small and the growth curves have shallow slopes. At exposures with higher SEL_{cum}, the growth curves become steeper and approach linear relationships with the noise SEL.

Depending on the degree (elevation of threshold in dB), duration (*i.e.,* recovery time), and frequency range of TTS, and the context in which it is experienced, TTS can have effects on marine mammals ranging from discountable to serious (similar to those discussed in auditory masking, below). For example, a marine mammal may be able to readily compensate for a brief, relatively small amount of TTS in a non-critical frequency range that takes place during a time when the animal is traveling through the open ocean, where ambient noise is lower and there are not as many competing sounds present. Alternatively, a larger amount and longer duration of TTS sustained during a 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.

Many studies have examined noise-induced hearing loss in marine mammals (see Finneran (2015) and Southall *et al.* (2019) for summaries). TTS is the mildest form of hearing impairment that can occur during exposure to sound (Kryter, 2013). While experiencing TTS, the hearing threshold rises, and a sound must be at a higher level in order to be heard. In terrestrial and marine mammals, TTS can last from minutes or hours to days (in cases of strong TTS). In many cases, hearing sensitivity recovers rapidly after exposure to the sound ends. For pinnipeds in water, measurements of TTS are limited to harbor seals, elephant seals (*Mirounga angustirostris*), bearded seals (*Erignathus* *barbatus*) and California sea lions (Kastak *et al.,* 1999, 2007; Kastelein *et al.,* 2019b, 2019c, 2021, 2022a, 2022b; Reichmuth *et al.,* 2019; Sills *et al.,* 2020). These studies examined hearing thresholds measured in marine mammals before and after exposure to intense or long-duration sound exposures. The difference between the pre-exposure and post-exposure thresholds can be used to determine the amount of TS at various post-exposure times.

The amount and onset of TTS depends on the exposure frequency. Sounds at low frequencies, well below the region of best sensitivity for a species or hearing group, are less hazardous than those at higher frequencies, near the region of best sensitivity (Finneran and Schlundt, 2013). At low frequencies, onset-TTS exposure levels are higher compared to those in the region of best sensitivity (*i.e.,* a low frequency noise would need to be louder to cause TTS onset when TTS exposure level is higher), as shown for harbor porpoises and harbor seals (Kastelein *et al.,* 2019a, 2019c). Note that in general, harbor seals have a lower TTS onset than other measured pinniped species (Finneran, 2015). In addition, TTS can accumulate across multiple exposures, but the resulting TTS will be less than the TTS from a single, continuous exposure with the same SEL (Mooney *et al.,* 2009; Finneran *et al.,* 2010; Kastelein *et al.,* 2014, 2015). This means that TTS predictions based on the total, SEL_{cum} will overestimate the amount of TTS from intermittent exposures, such as sonars and impulsive sources. Nachtigall *et al.* (2018) describes measurements of hearing sensitivity of multiple odontocete species (*i.e.,* bottlenose dolphin, harbor porpoise, beluga (*Delphinapterus leucas*), and false killer whale (*Pseudorca crassidens*)) when a relatively loud sound was preceded by a warning sound. These captive animals were shown to reduce hearing sensitivity when warned of an impending intense sound. Based on these experimental observations of captive animals, the authors suggest that wild animals may dampen their hearing during prolonged exposures or if conditioned to anticipate intense sounds. Another study showed that echolocating animals (including odontocetes) might have anatomical specializations that might allow for conditioned hearing reduction and filtering of low-frequency ambient noise, including increased stiffness and control of middle ear structures and placement of inner ear structures (Ketten *et al.,* 2021). Additionally, the existing marine mammal TTS data come from a limited number of individuals within these species.

Relationships between TTS and PTS thresholds have not been studied in marine mammals, but such relationships are assumed to be similar to those in humans and other terrestrial mammals. PTS typically occurs at exposure levels at least several dBs above that inducing mild TTS (*e.g.,* a 40-dB TS approximates PTS onset (Kryter *et al.,* 1966; Miller, 1974), while a 6-dB TS approximates TTS onset (Southall *et al.,* 2007, 2019). Based on data from terrestrial mammals, a precautionary assumption is that the PTS thresholds for impulsive sounds (such as impact pile driving pulses as received close to the source) are at least 6 dB higher than the TTS threshold on a peak-pressure basis and PTS SEL_{cum} thresholds are 15 to 20 dB higher than TTS SEL_{cum} thresholds (Southall *et al.,* 2007, 2019). Given the higher level of sound or longer exposure duration necessary to cause PTS as compared with TTS, it is considerably less likely that PTS could occur.

Pile installation at the Angoon Ferry Terminal Modifications Project would require a combination DTH, impact, and vibratory pile driving and removal. Construction at the project site would only include one method of pile installation or removal at a time. Proposed construction activities are not expected to be constant and pauses in the activities producing sound are likely to occur each day. Given these pauses and that many marine mammals are likely moving through the project areas and not remaining for extended periods of time, the potential for TS declines.

Behavioral Harassment— Exposure to noise from pile driving and removal and tension anchoring also has the potential to behaviorally disturb marine mammals. Available studies show wide variation in response to underwater sound; therefore, it is difficult to predict specifically how any given sound in a particular instance might affect marine mammals perceiving the signal. If a marine mammal does react briefly to an underwater sound by changing its behavior or moving a small distance, the impacts of the change are unlikely to be significant to the individual, let alone the stock or population. However, if a sound source displaces marine mammals from an important feeding or breeding area for a prolonged period, impacts on individuals and populations could be significant (*e.g.,* Lusseau and Bejder, 2007; Weilgart, 2007; National Research Council (NRC), 2005).

Disturbance may result in changing durations of surfacing and dives, number of blows per surfacing, or moving direction and/or speed; reduced/increased vocal activities; changing/cessation of certain behavioral activities (such as socializing or feeding); visible startle response or aggressive behavior (such as tail/fluke slapping or jaw clapping); or avoidance of areas where sound sources are located. Pinnipeds may increase their haulout time, possibly to avoid in-water disturbance (Thorson and Reyff, 2006). Behavioral responses to sound are highly variable and context-specific and any reactions depend on numerous intrinsic and extrinsic factors (*e.g.,* species, state of maturity, experience, current activity, reproductive state, auditory sensitivity, time of day), as well as the interplay between factors (*e.g.,* Richardson *et al.,* 1995; Wartzok *et al.,* 2003; Southall *et al.,* 2007; Weilgart, 2007; Archer *et al.,* 2010). Behavioral reactions can vary not only among individuals but also within an individual, depending on previous experience with a sound source, context, and numerous other factors (Ellison *et al.,* 2012), and can vary depending on characteristics associated with the sound source (*e.g.,* whether it is moving or stationary, number of sources, distance from the source). In general, pinnipeds seem more tolerant of, or at least habituate more quickly to, potentially disturbing underwater sound than do cetaceans, and generally seem to be less responsive to exposure to industrial sound than most cetaceans. Please see appendices B and C of Southall *et al.*

(2007) and Gomez *et al.* (2016) for a review of studies involving marine mammal behavioral responses to sound.

Habituation can occur when an animal's response to a stimulus wanes with repeated exposure, usually in the absence of unpleasant associated events (Wartzok *et al.,* 2004). Animals are most likely to habituate to sounds that are predictable and unvarying. It is important to note that habituation is appropriately considered as a "progressive reduction in response to stimuli that are perceived as neither aversive nor beneficial," rather than as, more generally, moderation in response to human disturbance (Bejder *et al.,* 2009). The opposite process is sensitization, when an unpleasant experience leads to subsequent responses, often in the form of avoidance, at a lower level of exposure.

As noted above, behavioral state may affect the type of response. For example, animals that are resting may show greater behavioral change in response to disturbing sound levels than animals that are highly motivated to remain in an area for feeding (Richardson *et al.,* 1995; Wartzok *et al.,* 2004; National Research Council (NRC), 2005). Controlled experiments with captive marine mammals have showed pronounced behavioral reactions, including avoidance of loud sound sources (Ridgway *et al.,* 1997; Finneran *et al.,* 2003). Observed responses of wild marine mammals to loud pulsed sound sources (*e.g.,* seismic airguns) have been varied but often consist of avoidance behavior or other behavioral changes (Richardson *et al.,* 1995; Morton and Symonds, 2002; Nowacek *et al.,* 2007).

Available studies show wide variation in response to underwater sound; therefore, it is difficult to predict specifically how any given sound in a particular instance might affect marine mammals perceiving the signal (*e.g.,* Erbe *et al.,* 2019). If a marine mammal does react briefly to an underwater sound by changing its behavior or moving a small distance, the impacts of the change are unlikely to be significant to the individual, let alone the stock or population. However, if a sound source displaces marine mammals from an important feeding or breeding area for a prolonged period, impacts on individuals and populations could be significant (*e.g.,* Lusseau and Bejder, 2007; Weilgart, 2007; NRC, 2005). However, there are broad categories of potential response, which we describe in greater detail here, that include alteration of dive behavior, alteration of foraging behavior, effects to breathing, interference with or alteration of vocalization, avoidance, and flight.

Changes in dive behavior can vary widely and may consist of increased or decreased dive times and surface intervals as well as changes in the rates of ascent and descent during a dive (*e.g.,* Frankel and Clark, 2000; Costa *et al.,* 2003; Ng and Leung, 2003; Nowacek *et al.,* 2004; Goldbogen *et al.,* 2013a, 2013b, Blair *et al.,* 2016). Variations in dive behavior may reflect interruptions in biologically significant activities (*e.g.,* foraging) or they may be of little biological significance. The impact of an alteration to dive behavior resulting from an acoustic exposure depends on what the animal is doing at the time of the exposure and the type and magnitude of the response.

Disruption of feeding behavior can be difficult to correlate with anthropogenic sound exposure, so it is usually inferred by observed displacement from known foraging areas, the appearance of secondary indicators (*e.g.,* bubble nets or sediment plumes), or changes in dive behavior. In response to playbacks of vibratory pile driving sounds, captive bottlenose dolphins showed changes in target detection and number of clicks used for a trained echolocation task (Branstetter *et al.* 2018). Similarly, harbor porpoises trained to collect fish during playback of impact pile driving sounds also showed potential changes in behavior and task success, though individual differences were prevalent (Kastelein *et al.* 2019d). As for other types of behavioral response, the frequency, duration, and temporal pattern of signal presentation, as well as differences in species sensitivity, are likely contributing factors to differences in response in any given circumstance (*e.g.,* Croll *et al.,* 2001; Nowacek *et al.,* 2004; Madsen *et al.,* 2006;

Yazvenko *et al.,* 2007). A determination of whether foraging disruptions incur fitness consequences would require information on or estimates of the energetic requirements of the affected individuals and the relationship between prey availability, foraging effort and success, and the life history stage of the animal.

A flight response is a dramatic change in normal movement to a directed and rapid movement away from the perceived location of a sound source. The flight response differs from other avoidance responses in the intensity of the response (*e.g.,* directed movement, rate of travel). Relatively little information on flight responses of marine mammals to anthropogenic signals exist, although observations of flight responses to the presence of predators have occurred (Connor and Heithaus, 1996; Bowers *et al.,* 2018). The result of a flight response could range from brief, temporary exertion and displacement from the area where the signal provokes flight to, in extreme cases, marine mammal strandings (England *et al.,* 2001). However, it should be noted that response to a perceived predator does not necessarily invoke flight (Ford and Reeves, 2008), and whether individuals are solitary or in groups may influence the response.

Behavioral disturbance can also impact marine mammals in more subtle ways. Increased vigilance may result in costs related to diversion of focus and attention (*i.e.,* when a response consists of increased vigilance, it may come at the cost of decreased attention to other critical behaviors such as foraging or resting). These effects have generally not been demonstrated for marine mammals, but studies involving fishes and terrestrial animals have shown that increased vigilance may substantially reduce feeding rates (*e.g.,* Beauchamp and Livoreil, 1997; Fritz *et al.,* 2002; Purser and Radford, 2011). In addition, chronic disturbance can cause population declines through reduction of fitness (*e.g.,* decline in body condition) and subsequent reduction in reproductive success, survival, or both (*e.g.,* Harrington and Veitch, 1992; Daan *et al.,* 1996; Bradshaw *et al.,* 1998). However, Ridgway *et al.* (2006) reported that increased vigilance in bottlenose dolphins exposed to sound over a 5-day period did not cause any sleep deprivation or stress effects.

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

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

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

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

Masking —Sound can disrupt behavior through masking, or interfering with, an animal's ability to detect, recognize, or discriminate between acoustic signals of interest (*e.g.,* those used for intraspecific communication and social interactions, prey detection, predator avoidance, navigation) (Richardson *et al.,* 1995). Masking occurs when the receipt of a sound is interfered with by another coincident sound at similar frequencies and at similar or higher intensity, and may occur whether the sound is natural (*e.g.,* snapping shrimp, wind, waves, precipitation) or anthropogenic (*e.g.,* pile driving, shipping, sonar, seismic exploration) in origin. The ability of a noise source to mask biologically important sounds depends on the characteristics of both the noise source and the signal of interest (*e.g.,* signal-to-noise ratio, temporal variability, direction), in relation to each other and to an animal's hearing abilities (*e.g.,* sensitivity, frequency range, critical ratios, frequency discrimination, directional discrimination, age or TTS hearing loss), and existing ambient noise and propagation conditions. Masking of natural sounds can result when human activities produce high levels of background sound at frequencies important to marine mammals. Conversely, if the background level of underwater sound is high (*e.g.,* on a day with strong wind and high waves), an anthropogenic sound source would not be detectable as far away as would be possible under quieter conditions and would itself be masked.

Airborne Acoustic Effects—Pinnipeds that occur near the project site could be exposed to airborne sounds associated with pile driving or DTH that have the potential to cause behavioral harassment, depending on their distance from the activities. Cetaceans are not expected to be exposed to airborne sounds that would result in harassment as defined under the MMPA.

Airborne noise would primarily be an issue for pinnipeds that are swimming or hauled out near the project site within the range of noise levels elevated above the airborne acoustic harassment criteria. We recognize that pinnipeds in the water could be exposed to airborne sound that may result in behavioral harassment when swimming with their heads above water. Most likely, airborne sound would cause behavioral responses similar to those discussed above in relation to underwater sound. For instance, anthropogenic sound could cause hauled-out pinnipeds to exhibit changes in their normal behavior, such as reduction in vocalizations, or cause them to temporarily abandon the area and move further from the source. However, these animals would previously have been `taken' because of exposure to underwater sound above the behavioral harassment thresholds, which are in all cases larger than those associated with airborne sound. Thus, the behavioral harassment of these animals is already accounted for in these estimates of potential take. Therefore, we do not believe that authorization of incidental take resulting from airborne sound for pinnipeds is warranted, and airborne sound is not discussed further.

Marine Mammal Habitat Effects

ADOT&PF's proposed construction activities could have localized, temporary impacts on marine mammal habitat, including prey, by increasing in-water SPLs and slightly decreasing water quality. Increased noise levels may affect acoustic habitat (see *Masking*) and adversely affect marine mammal prey in the vicinity of the project area (see discussion below). During DTH, impact, and vibratory pile driving, elevated levels of underwater noise would ensonify project areas where both fish and mammals occur and could affect foraging success. Additionally, marine mammals may avoid the area during construction; however, displacement due to noise is expected to be temporary and is not expected to result in long-term effects to the individuals or populations.

Water Quality—In-water pile driving activities would also cause short-term effects on water quality due to increased turbidity. Temporary and localized increase in turbidity near the seafloor would occur in the immediate area surrounding where piles are installed or removed due benthic sediment disturbance. In general, turbidity associated with pile installation is localized to about a 25 ft (7.6 m) radius around the pile (Everitt *et al.,* 1980). The suspended solids from disturbed sediment at project site would settle out of the water column within a few hours. Studies of the effects of turbid water on fish (marine mammal prey) suggest that concentrations of suspended sediment can reach thousands of milligrams per liter before an acute toxic reaction is expected (Burton, 1993).

Effects from turbidity and sedimentation are expected to be short-term, minor, and localized. Suspended solids in the water column should dissipate and quickly return to background levels in all construction scenarios. Turbidity within the water column has the potential to reduce the level of oxygen in the water and irritate the gills of prey fish species in the proposed project area. However, suspended sediment associated with the project would be temporary and localized, and fish in the proposed project area would be able to move away from and avoid the areas where plumes may occur. Therefore, it is expected that the impacts on prey fish species from turbidity, and therefore on marine mammals, would be minimal and temporary. In general, the area likely impacted by the proposed construction activities is relatively small compared to the total available marine mammal habitat. Therefore, we expect the impact from increased turbidity levels to be discountable to marine mammals and do not discuss it further.

In-water Effects on Potential Foraging Habitat— The proposed activities would not result in permanent impacts to habitats used directly by marine mammals outside of the actual footprint of the constructed dock. The total seafloor area affected by pile installation and removal is a very small area compared to the vast foraging area available to marine mammals in Chatham Strait and other inland waters of Southeast Alaska. Pile extraction and installation, tension anchoring, and rock socketing may have impacts on benthic invertebrate species primarily associated with disturbance of sediments that may cover or displace some invertebrates. The impacts would be temporary and highly localized, and no habitat would be permanently displaced by construction. Therefore, it is expected that impacts on foraging opportunities for marine mammals due to construction of the dock would be minimal.

It is possible that avoidance by potential prey (*i.e.,* fish) in the immediate area may occur due to temporary loss of this foraging habitat. The duration of fish avoidance of this area after pile driving stops is unknown, but we anticipate a rapid return to normal recruitment, distribution and behavior. Any behavioral avoidance by fish of the disturbed area would still leave large areas of fish and marine mammal foraging habitat in the nearby vicinity in the in the project area and surrounding waters.

Effects on Potential Prey-- Construction activities would produce continuous, non-impulsive (*i.e*., vibratory pile driving, tension anchoring, and rock socketing) and intermittent impulsive (*i.e.*, impact pile driving, tension anchoring, and rock socketing) sounds. Sound may affect marine mammals through impacts on the abundance, behavior, or distribution of prey species (*e.g.,* fish). Marine mammal prey varies by species, season, and location. Here, we describe studies regarding the effects of noise on known marine mammal prey.

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

Fish react to sounds which are especially strong and/or intermittent low-frequency sounds, and behavioral responses such as flight or avoidance are the most likely effects. Short duration, sharp sounds can cause overt or subtle changes in fish behavior and local distribution. The reaction of fish to noise depends on the physiological state of the fish, past exposures, motivation (*e.g.*, feeding, spawning, migration), and other environmental factors. Hastings and Popper (2005a) identified several studies that suggest fish may relocate to avoid certain areas of sound energy. Additional studies have documented effects of pile driving on fish, several of which are based on studies in support of large, multiyear bridge construction projects (*e.g.*, Scholik and Yan, 2001; Popper and Hastings, 2009). Many studies have demonstrated that impulse sounds might affect the distribution and behavior of some fishes, potentially impacting foraging opportunities or increasing energetic costs (*e.g.*, Pearson et al., 1992; Skalski et al., 1992; Santulli et al., 1999; Fewtrell and McCauley, 2012; Paxton *et al.*, 2017). In response to pile driving, Pacific sardines (*Sardinops sagax*) and northern anchovies (*Engraulis mordax*) may exhibit an immediate startle response to individual strikes but return to "normal" pre-strike behavior following the conclusion of pile driving with no evidence of injury as a result (see NAVFAC, 2014). However, some studies have shown no or slight reaction to impulse sounds (e.g., Wardle *et al.*, 2001; Popper *et al.*, 2005; Jorgenson and Gyselman, 2009; Peña *et al.*, 2013).

SPLs of sufficient strength have been known to cause injury to fish and fish mortality (summarized in Popper *et al.* 2014). However, in most fish species, hair cells in the ear continuously regenerate and loss of auditory function likely is restored when damaged cells are replaced with new cells. Halvorsen *et al.* (2012b) showed that a TTS of 4-6 dB was recoverable within 24 hours for one species. Impacts would be most severe when the individual fish is close to the source and when the duration of exposure is long. Injury caused by barotrauma can range from slight to severe and can cause death, and is most likely for fish with swim bladders. Barotrauma injuries have been documented during controlled exposure to impact pile driving (Halvorsen *et al.*, 2012a; Casper *et al.*, 2013) and the greatest potential effect on fish during the proposed project would occur during impact pile driving. Vibratory pile driving may elicit behavioral reactions from fish such as temporary avoidance of the area but is unlikely to cause injuries to fish or have persistent effects on local fish populations. In addition, it should be noted that the area in question is low-quality habitat since it is already developed and experiences anthropogenic noise from vessel traffic.

The most likely impact to fishes from pile driving and DTH activities in the project area would be temporary behavioral avoidance of the area. The duration of fish avoidance of the area after pile driving stops is unknown but a rapid return to normal recruitment, distribution, and behavior is anticipated. There are times of known seasonal marine mammal foraging when fish are aggregating but the impacted areas are small portions of the total foraging habitats available in the regions. In general, impacts to marine mammal prey species are expected to be minor and temporary. Further, it is anticipated that preparation activities for pile driving and DTH activities *(i.e.*, positioning of the hammer) and upon initial startup of devices would cause fish to move away from the affected area where injuries may occur. Therefore, relatively small portions of the proposed project area would be affected for short periods of time, and the potential for effects on fish to occur would be temporary and limited to the duration of sound-generating activities.

Construction activities, in the form of increased turbidity, also have the potential to adversely affect forage fish in the project area. Pacific herring (*Clupea pallasii*) is a primary prey species of Steller sea lions, humpback whales, and many other marine mammal species that occur in the project areas. As discussed earlier, increased turbidity is expected to occur in the immediate vicinity (approximately 25 ft (7.6 m) or less) of construction activities (Everitt *et al*., 1980). However, suspended solids are expected to dissipate quickly within a single tidal cycle. Given the limited area affected and high tidal dilution rates any effects on forage fish are expected to be minor or negligible. In addition, best management practices would be in effect to limit the extent of turbidity to the immediate project area.

In summary, given the short daily duration of sound associated with pile driving and DTH activities, and the relatively small areas being affected, pile driving and DTH activities associated with the proposed action are not likely to have a permanent adverse effect on any fish habitat, or populations of fish species. Thus, we conclude that impacts of the specified activity are not likely to have more than short-term adverse effects on any prey habitat or populations of prey species. Further, any impacts to marine mammal habitat are not expected to result in significant or long-term consequences for individual marine mammals, or to contribute to adverse impacts on their populations.

Estimated Take of Marine Mammals

This section provides an estimate of the number of incidental takes proposed for authorization through the IHA, which will inform NMFS' consideration of "small numbers," the negligible impact determinations, and impacts on subsistence uses.

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 acoustic sources (*i.e.*, pile driving, tension anchoring, and rock socketing) has the potential to result in disruption of behavioral patterns for individual marine mammals. There is also some potential for auditory injury (Level A harassment) to result, primarily during rock socketing. The proposed mitigation and monitoring measures are expected to minimize the severity of the taking to the extent practicable.

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

For acoustic impacts, generally speaking, we estimate take by considering: (1) acoustic criteria above which NMFS believes the best available science indicates marine mammals will likely be behaviorally harassed or incur some degree of auditory injury; (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) the number of days of activities. We note that while these factors can contribute to a basic calculation to provide an initial prediction of potential takes, additional information that can qualitatively inform take estimates is also sometimes available (*e.g.,* previous monitoring results or average group size). Below, we describe the factors considered here in more detail and present the proposed take estimates.

Acoustic Criteria

NMFS recommends the use of acoustic criteria 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 auditory injury of some degree (equated to Level A harassment). We note that the criteria for auditory injury, as well as the names of two hearing groups, have been recently updated (NMFS 2024) as reflected below in the Level A harassment section.

Level B Harassment –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 or exposure context (*e.g.*, frequency, predictability, duty cycle, duration of the exposure, signal-to-noise ratio, distance to the source), the environment (*e.g.*, bathymetry, other noises in the area, predators in the area), and the receiving animals (hearing, motivation, experience, demography, life stage, depth) and can be difficult to predict (*e.g.*, Southall *et al.,* 2007, 2021, Ellison *et al.*, 2012). Based on what the available science indicates and the practical need to use a threshold based on a metric that is both predictable and measurable for most activities, NMFS typically uses a generalized acoustic threshold based on received level to estimate the onset of behavioral harassment. NMFS generally predicts that marine mammals are likely to be behaviorally harassed in a manner considered to be Level B harassment when exposed to underwater anthropogenic noise above root-mean-squared pressure received levels (RMS SPL) of 120 dB (referenced to 1 micropascal (re 1 μPa)) for continuous (*e.g.,* vibratory pile driving, drilling) and above RMS SPL 160 dB re 1 μPa for non-explosive impulsive (*e.g.*, seismic airguns) or intermittent (*e.g.*, scientific sonar) sources. Generally speaking, Level B harassment take estimates based on these behavioral harassment thresholds are expected to include any likely takes by TTS as, in most cases, the likelihood of TTS occurs at distances from the source less than those at which behavioral harassment is likely. TTS of a sufficient degree can manifest as behavioral harassment, as reduced hearing sensitivity and the potential reduced opportunities to detect important signals (conspecific communication, predators, prey) may result in changes in behavior patterns that would not otherwise occur.

ADOT&PF's proposed activity includes the use of continuous (vibratory pile driving/removal and DTH) and impulsive (impact pile driving and DTH) sources, and therefore the RMS SPL thresholds of 120 and 160 dB re 1 μPa are applicable.

Level A harassment – NMFS' Updated Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (Version 3.0) (Updated Technical Guidance, 2024) identifies dual criteria to assess auditory injury (Level A harassment) to five different underwater marine mammal groups (based on hearing sensitivity) as a result of exposure to noise from two different types of sources (impulsive or non-impulsive). ADOT&PF's proposed activity includes the use of impulsive (impact pile driving and DTH) and non-impulsive (vibratory pile driving/removal and DTH) sources.

The 2024 Updated Technical Guidance criteria include both updated thresholds and updated weighting functions for each hearing group. The thresholds are provided in table 4. The references, analysis, and methodology used in the development of the criteria are described in NMFS' 2024 Updated Technical Guidance, which may be accessed at: *https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-acoustic-technical-guidance-other-acoustic-tools*.

Table 4– Thresholds Identifying the Onset of Auditory Injury.

	Auditory Injury Onset Acoustic Thresholds* (Received Level)	
Hearing Group	Impulsive	Non-impulsive
Low-Frequency (LF) Cetaceans	*Cell 1* $L_{pk,flat}$: 222 dB $L_{E,LF,24h}$: 183 dB	*Cell 2* $L_{E,LF,24h}$: 197 dB
High-Frequency (HF) Cetaceans	*Cell 3* $L_{pk,flat}$: 230 dB $L_{E,HF,24h}$: 193 dB	*Cell 4* $L_{E,HF,24h}$: 201 dB
Very High-Frequency (VHF) Cetaceans	*Cell 5* $L_{pk,flat}$: 202 dB $L_{E,VHF,24h}$: 159 dB	*Cell 6* $L_{E,VHF,24h}$: 181 dB
Phocid Pinnipeds (PW) (Underwater)	*Cell 7* $L_{pk,flat}$: 223 dB $L_{E,PW,24h}$: 183 dB	*Cell 8* $L_{E,PW,24h}$: 195 dB
Otariid Pinnipeds (OW) (Underwater)	*Cell 9* $L_{pk,flat}$: 230 dB $L_{E,OW,24h}$: 185 dB	*Cell 10* $L_{E,OW,24h}$: 199 dB

*Dual metric criteria for impulsive sounds: Use whichever criteria results in the larger isopleth for calculating auditory injury onset. If a non-impulsive sound has the potential of exceeding the peak sound pressure level criteria associated with impulsive sounds, the PK SPL criteria are recommended for consideration for non-impulsive sources.

Note: Peak sound pressure level ($L_{p,0\text{-}pk}$) has a reference value of 1 μPa, and weighted cumulative sound exposure level ($L_{E,p}$) has a reference value of 1 μPa^2s. In this table, criteria are abbreviated to be more reflective of International Organization for Standardization (ISO) standards (ISO 2017; ISO 2020). The subscript “flat” is being included to indicate peak sound pressure are flat weighted or unweighted within the generalized hearing range of marine mammals underwater (*i.e.*, 7 Hz to 165 kHz). The subscript associated with cumulative sound exposure level criteria indicates the designated marine mammal auditory weighting function (LF, HF, and VHF cetaceans, and PW and OW pinnipeds) and that the recommended accumulation period is 24 hours. The weighted cumulative sound exposure level criteria 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 criteria will be exceeded.

Ensonified Area

Here, we describe operational and environmental parameters of the activity that are used in estimating the area ensonified above the acoustic thresholds, including source levels and transmission loss coefficient.

The sound field in the proposed project areas is the existing background noise plus additional construction noise from the proposed project. Marine mammals are expected to be affected via sound generated by the primary components of the project activities (*i.e.,* pile driving and removal, tension anchoring, and rock socketing).

The Angoon Ferry Terminal Modifications Project includes vibratory pile installation and removal, impact pile driving, tension anchoring, and rock socketing.

Source levels for these activities are based on reviews of measurements of the same or similar types and dimensions of piles available in the literature. Source levels for each piles size and activity for the Angoon Ferry Terminal Modifications Project are presented in table 5. Source levels for vibratory installation and removal of piles of the same diameter are assumed to be the same.

Table 5– Estimates of Mean Underwater Sound Levels Generated During Vibratory Pile Driving and Removal, Impact Pile Driving, Tension Anchoring, and Rock Socketing

Pile Size and Method	Proxy sound source levels at 10m (dB re 1 µPa)			Reference
	RMS SPL	SEL	Peak	
20 or 24 (51 or 61 cm) inch steel pile; vibratory	163	-	-	NMFS 2023
30 (76 cm) inch steel pile; vibratory	166	-	-	NMFS 2023
24 (61 cm) inch steel pile; impact	190	177	203	Caltrans 2015
30 inch (76 cm) steel pile; impact	190	177	210	Caltrans 2015
8 inch (20 cm) tension anchor (DTH) (for 24 and 30 inch (61 or 76 cm) piles)	156	144	170	NMFS 2022a; Reyff 2020
30 inch (76 cm) steel pile rock socketing (DTH)	174	164	194	Denes *et al.* (2019); NMFS (2022a); Reyff and Heyvaert (2019); Reyff (2020)

Transmission Loss (*TL*) is the decrease in acoustic intensity as an acoustic pressure wave propagates out from a source. *TL* parameters vary with frequency, temperature, sea conditions, current, source and receiver depth, water depth, water chemistry, and bottom composition and topography. The general formula for underwater *TL* is:

$TL = B \times \text{Log10} (R_1 / R_2)$,

where

TL = transmission loss in dB

B = transmission loss coefficient

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

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

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

The ensonified area associated with Level A harassment is more technically challenging to predict due to the need to account for a duration component. Therefore, NMFS developed an optional User Spreadsheet tool to accompany the 2024 Updated Technical Guidance that can be used to relatively simply predict an isopleth distance for use in conjunction with marine mammal density or occurrence to help predict potential takes. We note that because of some of the assumptions included in the methods underlying this optional tool, we anticipate that the resulting isopleth estimates are typically going to be overestimates of some degree, which may result in an overestimate of potential take by Level A harassment. However, this optional tool offers the best way to estimate isopleth distances when more sophisticated modeling methods are not available or practical. For stationary sources pile driving, the optional User Spreadsheet tool predicts the distance at which, if a marine mammal remained at that distance for the duration of the activity, it would be expected to incur auditory injury. Inputs used in the optional User Spreadsheet tool, and the resulting estimated isopleths, are reported below in tables 6 and 7.

Table 6– NMFS User Spreadsheet Inputs for the Angoon Ferry Terminal Modifications Project

Pile size and type	Spreadsheet tab used	Weighting factor adjustment	Activity duration (hours) per pile	Strike rate per second	Number of strikes per pile	Number of piles per day
Vibratory removal						
20 or 24 inch (51 or 61 cm) steel piles (temporary or permanent)	A.1) Vibratory pile driving	2.5	0.25	NA	NA	1-4
Vibratory Installation						
20 or 24 inch (51 or 61 cm) steel piles (permanent) 30 inch (76 cm) steel piles	A.1) Vibratory pile driving	2.5	0.25	NA	NA	1-4
Impact Installation						
20 or 24 inch (51 or 61 cm) steel piles (permanent) 30 inch (76 cm) steel piles	E. 1) Impact pile driving	2	NA	NA	50	0.5-4
DTH						
Rock socket (30 inch (76 cm))	E. 2) DTH pile driving	2	8	10	NA	0.33-1
8 inch (20 cm) tension anchor(for 20, 24 and 30 inch (51, 61, or 76 cm) piles)			4			0.33-2

Table 7– Level A Harassment and Level B Harassment Isopleths and Associated Areas from Vibratory Impact and DTH Pile Driving and Vibratory Removal.

Pile Size/Type	Level A harassment Zone (m)[a], Areas (km^2)[b]					Level B Harassment Zone (m)[a], Areas (km^2)[b]
	LF Cetaceans	HF Cetaceans	VHF Cetaceans	PW	OW	
Vibratory pile driving/removal						
20 or 24 (51 or 61 cm) inch steel pile installation or removal	12.5 (0.003)	4.8 (0.001)	10.2 (0.002)	16.1 (0.004)	5.1 (0.001)	7,356 (9.23)
30 inch (76 cm) steel pile installation	19.9 (0.005)	7.6 (0.002)	16.2 (0.004)	25.6 (0.007)	8.6 (0.002)	11,659 (18.61)
Impact pile driving						
20 or 24 inch (51 or 61 cm) steel installation	135.5 (0.07)	17.3 (0.004)	209.6 (0.14)	120.3 (0.06)	44.9 (0.01)	1,000 (0.86)
30 inch (76 cm) permanent installation	135.5 (0.07)	17.3 (0.004)	209.6 (0.14)	120.3 (0.06)	44.9 (0.01)	1,000 (0.86)
DTH						
8 inch (20 cm) tension anchor installation (drilling)	109.0 (0.05)	13.9 (0.003)	168.7 (0.10)	96.8 (0.04)	36.1 (0.01)	2,512 (2.39)
30 inch (76 cm) steel installation (rock sockets)	2,348.3 (2.23)	299.6 (0.22)	3,634.0 (3.42)	2,086.1 (2.02)	777.6 (0.64)	39,811 (20.26)

[a] Distances represent the calculated radius of the zone. The actual zone may be truncated by landforms.

[b] Areas of zones accounting for truncation by landforms.

Marine Mammal Occurrence and Take Estimation

In this section we provide information about the occurrence of marine mammals, including density or other relevant information which will inform the take calculations. We describe how the information provided is synthesized to produce a quantitative estimate of the take that is reasonably likely to occur and proposed for authorization.

Available information regarding marine mammal occurrence in the vicinity of the project area includes site-specific and nearby survey information and historic data sets. Prior data sets included: (1) Cetacean Surveys conducted from vessels in Southeast Alaska between 1991-2007 (Dahlheim 2009), (2) surveys for humpback whales from vessels in the Prince William Sound, Lynn Canal, and the Sitka Sound from August through March in 2007 through 2009 (Staley *et al*., 2018), (3) line transect surveys from vessels for Dall's and harbor porpoises from 1991 through 1993, 2006 through 2007, and 2010 through 2012 and 2019 (Jefferson *et al*., 2019, Dahlheim *et al.,* 2015, and Zerbini *et. al.,* 2022), and (4) Land-based surveys conducted at Sitka's Whale Park completed weekly between September and May 1995-2000 (Straley and Pendell (2017).

ADOT&PF used species-specific density occurrence information described above to estimate take of each species using one of three formulas provided here:

(1) Incidental take estimate = group size x number of groups per day x days of pile driving activity (143 days)

(2) Incidental take estimate = group size x number of groups per month (considered 30 days) x months of pile driving activity (143 days/30 days per month)

(3) Incidental take estimate = marine mammal density (animals/km2) x ensonified area (km2) for each pile driving activity x days of each pile driving activity, summed across all activities

Minke Whale—Minke whales are generally rare in Southeast Alaska, including the Chatham Strait, and are often observed as single individuals (Dahlheim *et al.* 2009). NMFS estimates that up to one minke whale may occur within Level B harassment zone each month, and applied equation two above. Therefore, NMFS proposes to authorize 5 takes by Level B harassment of minke whales (1 animal x 1 group per month x 4.76 months).

For all project activities, ADOT&PF proposes to implement shutdown zones for low-frequency cetaceans that exceed the Level A harassment isopleths. Therefore, Level A harassment of minke whale from these activities is unlikely. However, given the large shutdown zone for rock socketing (2,350 m), NMFS anticipates that PSOs may not always be able to implement a shutdown at the farther extent of the zone. Therefore, NMFS anticipates that a minke whale could enter and remain within the Level A harassment zone long enough to incur auditory injury, and as requested by ADOT&PF, NMFS is proposing to authorize 1 take of minke whale by Level A harassment.

Humpback Whale—Humpback whales are common in inland water of Southeast Alaska. They occur daily with an average group size two animals (Dahlheim *et al.* 2009). NMFS estimates that up to one group of two humpback whales would occur in the Level B harassment zone each day of the proposed construction activities, and applied equation 1 above. Therefore, NMFS proposes to authorize 286 takes by Level B harassment of humpback whales (2 animals x 1 group per day x 143 days). In the project area, the majority of whales (98 percent) are anticipated to be from the Hawaii DPS and 2 percent from the ESA-listed Mexico DPS (Wade 2021; Muto *et al.* 2022). Therefore, of the 286 takes by Level B harassment, NMFS anticipates that 280 would be of individuals from the Hawaii DPS (Hawaii stock) and six takes would be of individuals from the Mexico DPS (Mexico-North Pacific stock).

For all project activities, ADOT&PF proposes to implement shutdown zones for low-frequency cetaceans that exceed the Level A harassment isopleths. Therefore, Level A harassment of humpback whale from these activities is unlikely. However, given the large shutdown zone for rock socketing (2,350 m), NMFS anticipates that PSOs may not always be able to implement a shutdown at the farther extent of the zone. Therefore, NMFS anticipates that a humpback whale could enter and remain within the Level A harassment zone long enough to incur auditory injury on each project day where the shutdown zone extends to that distance (2,350 m; 9 days). Therefore, ADOT&PF requested, and NMFS is proposing to authorize, 9 take of humpback whale by Level A harassment. Of the nine takes by Level A harassment, NMFS anticipates that eight would be of individuals from the Hawaii DPS (Hawaii stock) and one of an individual from the Mexico DPS (Mexico-North Pacific stock).

Killer Whale—Killer whales are commonly observed each month in Southeast Alaska inland waters, including the project action area. The three stocks that are most likely to occur in Southeast Alaska are the Eastern North Pacific Alaska Resident stock, Eastern North Pacific Northern Resident stock, and the West Coast Transient stock (Young *et al*. 2023). Mean group size for all seasons for residents is 24.4 animals; for transients 4.9 animals (Dahlheim *et al.* 2009). NMFS anticipates that up to two groups of 25 killer whales may occur in the project area during each month of construction, and applied equation 2 above. Therefore, NMFS proposes to authorize 238 takes of killer whales by Level B harassment (25 animals x 2 groups per month x 4.76 months).

The largest Level A harassment zone for killer whales is 299.6 m during rock socketing. For all activities, ADOT&PF would implement shutdown zones that exceed the Level A harassment zone for HF cetaceans. Therefore, considering the small size of all Level A harassment zones and the proposed shutdown zone requirements, no take by Level A harassment of killer whales is anticipated or proposed for authorization.

Pacific White-sided Dolphin—Pacific white-sided dolphins are generally rare in the project area but have been documented in the Chatham Strait. To avoid underestimating potential impacts from the project, NMFS estimates that up to one group may occur in the project area every other month (*i.e.*, one group every 60 days). Pacific white-sided dolphins typically occur in groups of 23-26 individuals (Dahlheim *et al.,* 2009), but have been observed in southeast Alaska in groups of up to 153. Using the equation above would result in an estimate of 62 takes by Level B harassment (26 animals x .5 groups per month x 4.76 months). However, to account for the potential of a large group occurring in the Level B harassment zone, NMFS proposes to authorize 153 takes by Level B harassment.

The largest Level A harassment zone for Pacific white-sided dolphins is 299.6 m during rock socketing. For all activities, ADOT&PF would implement shutdown zones that exceed the Level A harassment zone for HF cetaceans. Therefore, considering the small size of all Level A harassment zones and the proposed shutdown zone requirements, no take by Level A harassment of Pacific white-sided dolphins is anticipated or proposed for authorization.

Dall's Porpoise—Dall's porpoises are frequently observed in that Chatham Strait, including the proposed project area. Dall's porpoise typically occur in group sizes of less than five individuals with a mean group size of 3.13 individuals per group during spring, summer, and fall (Jefferson *et al.* 2019). The density of Dall's porpoise in Southeast Alaska was 0.189 animals per km^2 (Jefferson *et al.* 2019). NMFS applied equation three above to estimate take of Dall's porpoise by Level B harassment. Therefore, NMFS proposes to authorize 173 takes by Level B harassment of Dall's porpoise (i.e., (0.189 animals/km^2 x 9.23 km^2 x 42 days=73.3) + (0.189 animals/km^2 x 18.61 km^2 x 11 days= 39.0) + (0.189 animals/km^2 x 0.86 km^2 x 14 days= 2.3) + (0.189 animals/km^2 x 0.86 km^2

x 22 days= 3.6) + (0.189 animals/km^2 x 2.39 km^2 x 45 days= 20.3) + (0.189 animals/km^2 x 20.26 km^2 x 9 days= 34.5) = 173 takes by Level B harassment).

For all project activities except rock socketing, ADOT&PF proposes to implement shutdown zones for very high-frequency cetaceans that exceed the Level A harassment isopleths. Therefore, Level A harassment of Dall's porpoise from these activities is unlikely. For rock socketing, the Level A harassment zone exceeds the shutdown zone, and NMFS anticipates that one group of 3 Dall's porpoise could enter and remain within the Level A harassment zone long enough to incur auditory injury on each of the 9 days of that activity. Therefore, NMFS is proposing to authorize 27 takes of Dall's porpoise by Level A harassment.

Harbor Porpoise—Harbor porpoises have been infrequently observed in the south Chatham Strait, including the proposed action area. The density of harbor porpoise in Southeast Alaska was 0.106 animals per km^2 (Zerbini *et al.*, 2022). NMFS applied equation three above to estimate take of harbor porpoise by Level B harassment. Therefore, NMFS proposes to authorize 97 takes by Level B harassment of harbor porpoise (*i.e.*, (0.106 animals/km^2 x 9.23 km^2 x 42 days=41.1) + (0.106 animals/km^2 x 18.61 km^2 x 11 days= 21.7) + (0.106 animals/km^2 x 0.86 km^2 x 14 days= 1.3) + (0.106 animals/km^2 x 0.86 km^2 x 22 days= 2.0) + (0.106 animals/km^2 x 2.39 km^2 x 45 days= 11.4) + (0.106 animals/km^2 x 20.26 km^2 x 9 days= 19.3) = 97 takes by Level B harassment).

For all project activities except rock socketing, ADOT&PF proposes to implement shutdown zones for very high-frequency cetaceans that exceed the Level A harassment isopleths. Therefore, Level A harassment of harbor porpoise from these activities is unlikely. For rock socketing, the Level A harassment zone exceeds the shutdown zone, and NMFS anticipates that one group of five harbor porpoise could enter and remain within the Level A harassment zone long enough to incur auditory injury on each of the 9 days of that activity. Therefore, NMFS is proposing to authorize 45 takes of harbor porpoise by Level A harassment.

Harbor Seal –Harbor seals are observed daily in the Chatham Strait. They typically occur in groups of one to four individuals (Jefferson *et al.,* 2019). NMFS estimates that up to two groups of three seals could occur in the project area each day, and applied equation 1 above. Therefore NMFS proposes to authorize 858 takes by Level B harassment of harbor seals (3 animals x 2 groups per day x 143 days).

For all project activities except rock socketing, ADOT&PF proposes to implement shutdown zones for phocids that exceed the Level A harassment isopleths. Therefore, Level A harassment of harbor seal from these activities is unlikely. For rock socketing, the Level A harassment zone exceeds the shutdown zone, and NMFS anticipates that up to two groups of three harbor seals could enter and remain within the Level A harassment zone long enough to incur auditory injury on each of the 9 days of that activity. Therefore, NMFS is proposing to authorize 54 takes of harbor seal by Level A harassment.

Steller Sea Lion—Steller sea lions are observed in the project area every month. They typically occur in groups of one to four individuals (NMFS 2023). To avoid potentially underestimating take, NMFS estimates that up to two groups of two Steller sea lions could occur in the Level B harassment zone each day, and applied equation 1 above (2 animals x 2 group per day x 143 days). Therefore, NMFS is proposing to authorize 572 takes by Level B harassment of Steller sea lion. NMFS estimates that the majority of Steller sea lions in the project area (98.6 percent) would be from the Eastern DPS and 1.4 percent would be from the Western DPS (Hastings *et al.,* 2020). Therefore, of the 572 takes by Level B harassment, NMFS anticipates 564 takes would be of individuals from the Eastern DPS and 8 from the Western DPS.

For all project activities except rock socketing, ADOT&PF proposes to implement shutdown zones for otariids that exceed the Level A harassment isopleths. Therefore, Level A harassment of Steller sea lion from these activities is unlikely. For rock socketing, the Level A harassment zone exceeds the shutdown zone, and NMFS anticipates that up to one Steller sea lion could enter and remain within the Level A harassment zone long enough to incur auditory injury on each of the 9 days of that activity. Given the expected occurrence of Western vs Eastern DPS Steller sea lions in the area, none of these takes are anticipated to be of Western DPS animals. Therefore, NMFS is proposing to authorize 9 takes of Eastern DPS Steller sea lion by Level A harassment. A summary of estimated take by Level A and Level B harassment is provided in table 8.

Table 8–Estimated Take by Level A and Level B Harassment, by Species and Stock.

Common Name	Stock	Stock abundance[a]	Level A harassment	Level B harassment	Total proposed take	Proposed take as a percentage of stock
Minke whale	Alaska	Undetermined	1	5	6	Undetermined
Humpback whale	Hawaii (Hawaii DPS)	11,278	8	280	288	2.6
	Mexico-North Pacific (Mexico DPS)	Undetermined	1	6	7	Undetermined
Killer whale	Eastern North Pacific Alaska Resident	1,920	0	238	238	12.4[b]
	West Coast Transient	349				68.2[b]
	Eastern North Pacific Northern Resident	302				78.8[b]
Pacific white-sided dolphin	North Pacific	26,880	0	153	153	Less than 1
Dall's porpoise	Alaska	Undetermined	27	173	200	Undetermined
Harbor porpoise	Northern Southeast Alaska Inland Waters	1,619	45	97	142	8.8
Harbor seal	Sitka/Chatham Strait	13,289	54	858	912	6.9
Steller sea lion	Western DPS	49,837	0	8	8	Less than 1
	Eastern DPS	36,308	9	564	573	1.6

[a] Stock size is N_{best} according to NMFS 2023 SARs.
[b] NMFS conservatively assumed that all takes could occur to each stock.

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 the activity, and other means of effecting the least practicable impact on the species or stock and its habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of the 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 the 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, NMFS considers two primary factors:

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

(2) The practicability of the measures for applicant implementation, which may consider such things as cost, and impact on operations.

The mitigation measures described in the following paragraphs would apply to all in-water construction activities for the Angoon Ferry Modifications project.

Shutdown Zones and Monitoring

ADOT&PF must establish shutdown zones for all pile driving activates. The purpose of a shutdown zone is generally to define an area within which shutdown of the activity would occur upon sighting of a marine animal (or in anticipation of an animal entering the defined area). Shutdown zones vary based on the activity type and duration and marine mammal hearing group, as shown in table 9. A minimum shutdown zone of 10 m would be required for all in-water construction activities to avoid physical interaction with marine mammals. Marine mammal monitoring would be conducted during all pile driving activities to ensure that shutdowns occur, as required. Proposed shutdown zones for each activity type are shown in table 9.

Prior to the start of any pile driving, ADOT&PF would establish shutdown zones for construction activities (table 9). Protected species observers (PSO) would survey the shutdown zones for at least 30 minutes before pile driving activities start. If marine mammals are observed within the shutdown zone, pile driving, tension anchoring, or rock socketing will be delayed until the animal has moved out of the shutdown zone, either verified by a PSO or by waiting until 15 minutes has elapsed without a sighting of small cetaceans, and pinnipeds; or 30 minutes has elapsed without a sighting of a large cetacean. If a marine mammal approaches or enters the shutdown zone during pile driving, tension anchoring, or rock socketing, the activity would be halted. Pile-driving would not re-commence until all marine mammals are assumed to have cleared these established shutdown zones as described above. If a species for which authorization has not been granted, or a species which has been granted but the authorized takes are met, is observed approaching or within the Level B harassment zone during pile driving, pile removal, or tension anchoring, the activity would be halted. Pile driving may resume after the animal has moved out of and is moving away from the shutdown zone (or Level B harassment zone for a species for which take is not authorized, or a species for take is authorized but the authorized takes are met) or after at least 15 minutes has passed since the last observation of the animal.

All marine mammals would be monitored in the Level B harassment zones and throughout the area as far as visual monitoring can take place. If a marine mammal enters the Level B harassment zone, in-water activities would continue and PSOs would document the animal's presence within the estimated harassment zone.

Table 9–Shutdown Zones and Level B Harassment Zones by Activity.

Activity	Minimum Shutdown Zone (m)					Level B harassment zone (m)
	LF Cetaceans	HF Cetaceans	VHF Cetaceans	Phocids	Otariids	
Barge movements, pile positioning, *etc.*	10	10	10	10	10	--
Vibratory pile driving/removal						
20 or 24 (51 or 61 cm) inch temporary and permanent pile installation or removal	15	10	15	20	10	7,360
30 inch (76 cm) steel permanent installation	20	10	20	30	10	11,660
Impact pile driving						
20 or 24 inch (51 or 61 cm) steel permanent installation	140	20	210	120	45	1,000
30 inch (76 cm) steel permanent installation	140	20	210	120	45	1,000
DTH (Tension anchoring and rock sockets)						
8 inch (20 cm) tension anchor installation	110	15	170	100	40	2,515
30 inch (76 cm) steel permanent installation	2,350	300	400	400	400	12,865

Protected Species Observers

The monitoring locations for all protected species observers (PSOs) during all pile driving activities (described in the **Proposed Monitoring and Reporting** Section) would ensure that the entirety of all shutdown zones are visible, except potentially the outer extent of the zone for LF cetaceans during rock socketing. PSOs would monitor the shutdown zones and as much of the Level B harassment zones as possible. Monitoring enables observers to be aware of and communicate the presence of marine mammals in the project areas outside the shutdown zones and thus prepare for a potential cessation of activity should the animal enter the shutdown zone.

Pre- and Post-Activity Monitoring

Monitoring must take place from 30 minutes prior to initiation of pile driving activities (*i.e.,* pre-clearance monitoring) through 30 minutes post-completion of pile driving. Prior to the start of daily in-water construction activity, or whenever a break in pile driving of 30 minutes or longer occurs, PSOs would observe the shutdown and monitoring zones for a period of 30 minutes. The shutdown zone would be considered cleared when a marine mammal has not been observed within the zone for a 30-minute period. If a marine mammal is observed within the shutdown zones, pile driving activity would be delayed or halted. If work ceases for more than 30 minutes, the pre-activity monitoring of the shutdown zones would commence. A determination that the shutdown zone is clear must be made during a period of good visibility (*i.e.,* the entire shutdown zone and surrounding waters must be visible to the naked eye).

Soft Start

Soft-start procedures are used to provide additional protection to marine mammals by providing warning and/or giving marine mammals a chance to leave the area prior to the hammer operating at full capacity. For impact pile driving, ADOT&PF would be required to provide an initial set of three strikes from the hammer at reduced energy, followed by a 30-second waiting period, then two subsequent reduced- energy strike sets. Soft start would be implemented at the start of each day's impact pile driving and at any time following cessation of impact pile driving for a period of 30 minutes or longer.

Based on our evaluation of the applicant's proposed measures, NMFS has preliminarily determined that the proposed mitigation measures provide the means of 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 while conducting the activities. 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 activity; or (4) biological or behavioral context of exposure (*e.g.*, age, calving or feeding areas);
- Individual marine mammal responses (behavioral or physiological) to acoustic stressors (acute, chronic, or cumulative), other stressors, or cumulative impacts from multiple stressors;

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

Visual Monitoring

Marine mammal monitoring must be conducted in accordance with the Marine Mammal Monitoring and Mitigation Plan and section 5 of the IHA. ADOT&PF's draft Marine Mammal Monitoring and Mitigation Plan is Appendix B of the IHA application.

Marine mammal monitoring during pile driving activities would be conducted by PSOs meeting NMFS' standards and in a manner consistent with the following:

- PSOs must be independent of the activity contractor (for example, employed by a subcontractor) and have no other assigned tasks during monitoring periods;
- At least one PSO would have prior experience performing the duties of a PSO during construction activity pursuant to a NMFS-issued incidental take authorization;
- Other PSOs may substitute education (degree in biological science or related field) or training for prior experience performing the duties of a PSO during construction activity pursuant to a NMFS-issued incidental take authorization. PSOs may also substitute Alaska native traditional knowledge for experience;
- Where a team of three or more PSOs is required, a lead observer or monitoring coordinator would be designated. The lead observer must have prior experience performing the duties of a PSO during construction activity pursuant to a NMFS-issued incidental take authorization.
- PSOs must be approved by NMFS prior to beginning any activities subject to this IHA.

PSOs should have the following additional qualifications:

- Ability to conduct field observations and collect data according to assigned protocols;
- Experience or training in the field identification of marine mammals, including the identification of behaviors;
- Sufficient training, orientation, or experience with the construction operation to provide for personal safety during observations;
- Writing skills sufficient to prepare a report of observations including but not limited to the number and species of marine mammals observed; dates and times when in-water construction activities were conducted; dates, times, and reason for implementation of mitigation (or why mitigation was not implemented when required); and marine mammal behavior; and
- Ability to communicate orally, by radio or in person, with project personnel to provide real-time information on marine mammals observed in the area as necessary.

During all pile driving activities, a minimum of two PSOs will monitor shutdown zones during pile driving activities. PSOs will establish monitoring locations as described in the Marine Mammal Mitigation and Monitoring Plan. Monitoring locations would be selected by the contractor during pre-construction. PSOs would monitor for marine mammals entering the Level B harassment zones; the position(s) may vary based on construction activity and location of piles or equipment.

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

Data Collection

PSOs would use approved data forms to record the following information:

- Dates and times (beginning and end) of all marine mammal monitoring; and
- PSO locations during marine mammal monitoring.
- Construction activities occurring during each daily observation period, including how many and what type of piles were driven or removed and by what method (*i.e.,* vibratory, impact, tension anchoring, or rock socketing).
- Weather parameters and water conditions;
- The number of marine mammals observed, by species, relative to the pile location and if pile driving or removal was occurring at time of sighting;
- Distance and bearings of each marine mammal observed to the pile being driven or removed;
- Description of marine mammal behavior patterns, including direction of travel;
- Age and sex class, if possible, of all marine mammals observed; and
- Detailed information about implementation of any mitigation triggered (such as shutdowns and delays), a description of specific actions that ensued, and resulting behavior of the animal if any.

Reporting

A draft marine mammal monitoring report would be submitted to NMFS within 90 days after the completion of pile driving activities, or 60 days prior to a requested date of issuance of any future IHAs for the project, or other projects at the same location, whichever comes first. The marine mammal report would include an overall description of work completed, a narrative regarding marine mammal sightings, and associated PSO data sheets. Specifically, the report would include:

- Dates and times (begin and end) of all marine mammal monitoring;
- Construction activities occurring during each daily observation period, including the number and type of piles driven or removed and by what method (*i.e.,* impact, vibratory, tension anchoring). The total duration of driving time must be recorded for each pile during vibratory driving and, number or strikes for each pile during impact driving, and the duration of operation of drilling and components for tension anchoring;
- PSO locations during marine mammal monitoring;
- Environmental conditions during monitoring periods (at beginning and end of PSO shift and whenever conditions change significantly), including Beaufort sea state and any other relevant weather conditions including cloud cover, fog, sun glare, and overall visibility to the horizon, and estimated observable distance;
- Upon observation of a marine mammal, the following information: (1) name of PSO who sighted the animal(s) and PSO location and activity at time of sighting; (2) time of sighting; (3) identification of the animal(s) (*e.g.,* genus/species, lowest possible taxonomic level, or unidentified), PSO confidence in identification, and the composition of the group if there is a mix of species; (4) distance and bearing of each marine mammal observed relative to the pile being driven for each sighting (if pile driving was occurring at time of sighting); (5) estimated number of animals (min/max/best estimate); (6) estimated number of animals by cohort (adults, juveniles, neonates, group composition, *etc.*); (7) animal's closest point of approach and estimated time spent within the harassment zone; and (8) description of any marine mammal behavioral observations (*e.g.,* observed behaviors such as feeding or traveling), including an assessment of behavioral responses thought to have resulted from the activity (*e.g.,* no response or changes

in behavioral state such as ceasing feeding, changing direction, flushing, or breaching);

- Number of marine mammals detected within the harassment zones, by species; and
- Detailed information about any implementation of any mitigation triggered (*e.g.,* shutdowns and delays), a description of specific actions that ensued, and resulting changes in behavior of the animal(s), if any.

If no comments are received from NMFS within 30 days, the draft reports would constitute the final reports. If comments are received, a final report addressing NMFS' comments would be required to be submitted within 30 days after receipt of comments. All PSO datasheets and/or raw sighting data would be submitted with the draft marine mammal report.

Reporting Injured or Dead Marine Mammals

In the event that personnel involved in the construction activities discover an injured or dead marine mammal, ADOT&PF shall report the incident to the Office of Protected Resources, NMFS and to the Alaska regional stranding network as soon as feasible. If the death or injury was clearly caused by the specified activity, ADOT & PF must immediately cease the specified activities until NMFS is able to review the circumstances of the incident and determine what, if any, additional measures are appropriate to ensure compliance with the terms of the IHA. The IHA-holder must not resume their activities until notified by NMFS. The report must include the following information:

- Time, date, and location (latitude/longitude) of the first discovery (and updated location information if known and applicable);
- Species identification (if known) or description of the animal(s) involved;

- Condition of the animal(s) (including carcass condition if the animal is dead);
- Observed behaviors of the animal(s), if alive;
- If available, photographs or video footage of the animal(s); and,
- General circumstances under which the animal was discovered.

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 impacts or responses (*e.g.*, intensity, duration), the context of any impacts or responses (*e.g.*, critical reproductive time or location, foraging impacts affecting energetics), 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 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).

To avoid repetition, the majority of our analysis applies to all the species listed in table 2, given that many of the anticipated effects of this project on different marine mammal stocks are expected to be relatively similar in nature. Where there are meaningful differences between species or stocks, or groups of species, in anticipated individual responses to activities, impact of expected take on the population due to differences in population status, or impacts on habitat, they are described independently in the analysis below.

Pile driving and removal, tension anchoring, and rock socketing have the potential to disturb or displace marine mammals. Specifically the project activities may result in take, in the form of Level A harassment (minke whale, humpback whale, Dall's porpoise, harbor porpoise, harbor seal, and Steller sea lion only) and Level B harassment from underwater sounds generated from pile driving and removal, tension anchoring, and rock socketing. Potential takes could occur if individuals are present in the ensonified zone when these activities are underway.

The takes by Level B harassment would be due to potential behavioral disturbance and TTS. Takes by Level A harassment would be due to auditory injury. No mortality or serious injury is anticipated given the nature of the activity, even in the absence of the required mitigation. The potential for harassment is minimized through the construction method and the implementation of the proposed mitigation measures (see **Proposed Mitigation Measures** section).

Take would occur within a limited, confined area (Killisnoo Harbor) of the stocks' ranges. The intensity and duration of take by Level A harassment and Level B harassment would be minimized through use of mitigation measures described herein. Further, the project is not anticipated to impact any known important habitat areas for any marine mammal species with the exception of a known biologically important area for humpback whales, discussed below.

Take by Level A harassment is proposed for authorization to account for the potential that an animal could enter and remain within the area between a Level A harassment zone and the shutdown zone for a duration long enough to be taken by Level

A harassment. Any take by Level A harassment is expected to arise from, at most, a small degree of auditory injury because animals would need to be exposed to higher levels and/or longer duration than are expected to occur here in order to incur any more than a small degree of auditory injury. Additionally, and as noted previously, some subset of the individuals that are behaviorally harassed could also simultaneously incur some small degree of TTS for a short duration of time. Because of the small degree anticipated, though, any auditory injury or TTS potentially incurred here would not be expected to adversely impact individual fitness, let alone annual rates of recruitment or survival.

Behavioral responses of marine mammals to pile driving at the project site, 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 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 limited number of piles to be installed or extracted per day and that pile driving and removal would occur across a maximum of 143 days within the 12-month authorization period, any harassment would be temporary.

Any impacts on marine mammal prey that would occur during ADOT&PF's proposed activity would have, at most, short-term effects on foraging of individual marine mammals, and likely no effect on the populations of marine mammals as a whole. Indirect effects on marine mammal prey during the construction are expected to be minor, and these effects are unlikely to cause substantial effects on marine mammals at the individual level, with no expected effect on annual rates of recruitment or survival.

In addition, it is unlikely that elevated noise in a small, localized area of habitat would have any effect on the stocks' annual rates of recruitment or survival. In combination, we believe that these factors, as well as the available body of evidence from other similar activities, demonstrate that the potential effects of the specified activities will have only minor, short-term effects on individuals. The specified activities are not expected to impact rates of recruitment or survival, and would therefore not result in population-level impacts.

The waters of the Chatham Strait are part of the Alaska humpback whale feeding BIA (Wild *et al.,* 2023). However, underwater sound would be constrained to Killisnoo Harbor and would be truncated by land masses. The area of the BIA that may be affected by the proposed project is small relative to the overall area of the BIA. The humpback whale feeding BIA is active between May and October while the proposed project is scheduled to occur from May 2026 through April 2027. Although the construction period overlaps when the humpback whale BIA is active, construction activities are only expected to occur for 143 non-consecutive days over one year period. Underwater sounds produced from proposed construction activities would only effect a small proportion of the BIA. Therefore, the proposed project is not expected to have significant adverse effects on humpback whales foraging in Alaska.

The closest harbor seal haul out to the proposed project is approximately 12 km away in Hood Bay, and the closest Steller sea lion haul out is 20 km away at Point Lull. Each of these haulouts are located outside of the ensonified area for this project, and the project is not expected to have adverse effects on these haulout sites. No areas of specific biological importance (*e.g.,* ESA critical habitat, other BIAs, or other areas) for any other species are known to overlap the project area.

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 any of the species or stocks through effects on annual rates of recruitment or survival:

- No serious injury or mortality is anticipated or authorized;
- For killer whale, Pacific white-sided dolphin, and the Western stock of Steller sea lions, no Level A harassment is anticipated or proposed for authorization;

- The intensity of anticipated takes by Level B harassment is relatively low for all stocks and would not be of a duration or intensity expected to result in impacts on reproduction or survival;
- The lack of anticipated significant or long-term negative effects to marine mammal habitat;
- With the exception of the humpback whale BIA described above, no areas of specific biological importance (*e.g.,* ESA critical habitat, other BIAs, or other areas) for any other species are known to co-occur with the project area; and
- ADOT&PF would implement mitigation measures, such as soft-starts for impact pile driving and shutdowns to minimize the numbers of marine mammals exposed to injurious levels of sound, and to ensure that take by Level A harassment, is at most, a small degree of auditory injury.

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 previously, only take of small numbers of marine mammals may be authorized under sections 101(a)(5)(A) and (D) of the MMPA for specified activities other than military readiness activities. The MMPA does not define small numbers and so, in practice, where estimated numbers are available, NMFS compares the number of individuals taken to the most appropriate estimation of abundance of the relevant species or stock in our determination of whether an authorization is limited to small numbers of marine mammals. When the predicted number of individuals to be taken is fewer than one-third of the species or stock abundance, the take is considered to be of small numbers. 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 is proposing to authorize is below one-third of the estimated stock abundance of all species and stocks. For all stocks other than the West Coast Transient and Eastern North Pacific Northern Resident stocks of killer whale, the number of takes proposed for authorization would be considered small relative to the relevant stocks' abundances, even in the unlikely scenario that each estimated taking occurred to a new individual.

The West Coast Transient stock of killer whale occurs from California through Southeast Alaska, and the Eastern North Pacific Northern Resident stock of killer whale occurs from Washington State through part of Southeast Alaska. Movements of killer whales, for both transient and resident stocks, between widely separated geographical areas have been documented. However, given the relatively sheltered location of the project site in inland waters of southeast Alaska, it is unlikely that numerous discrete groups of individuals sufficient to exceed one-third of the stock abundance would occur within the immediate vicinity of the project. It is more likely that individual groups that occur in the area would remain for periods of time and potentially be resighted on multiple days. As such, and given that the proposed takes would be allocated among three distinct killer whale stocks, the numbers of individuals taken would likely comprise less than one-third of the best available population abundance estimate of both the West Coast Transient and the Eastern North Pacific Northern Resident stocks of killer whale.

There are no valid abundance estimates available for humpback whale (Mexico-North Pacific stock), minke whale (Alaska stock), or Dall's porpoise (Alaska stock). There is no recent stock abundance estimate for the Mexico-North Pacific stock of humpback whale and the minimum population is considered unknown (Young *et al.,* 2024). There are two minimum population estimates for this stock that are over 15 years old: 2,241 (Martínez-Aguilar, 2011) and 766 (Wade, 2021). Using either of these estimates, the seven total takes proposed for authorization (six by Level B harassment, one by Level A harassment) represent small numbers of the stock. There is also no current abundance estimate of the Alaska stock of minke whale, but an abundance of 2,020 individuals was estimated on the eastern Bering shelf based on a 2010 survey (Friday *et al.*, 2013; Young *et al.*, 2024). Therefore, the six takes proposed for authorization (five by Level B harassment, one by Level A harassment) represent small numbers of this stock, even if each take occurred to a new individual.

The most recent stock abundance estimate of the Alaska stock of Dall's porpoise was 83,400 animals and, although the estimate is more than 8 years old, it is unlikely this stock has drastically declined since that time. Therefore, the 200 takes proposed for authorization (173 by Level B harassment, 27 by Level A harassment), represent small numbers of this stock.

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 would be taken relative to the population size of the affected species or stocks.

Unmitigable Adverse Impact Analysis and Determination

In order to issue an IHA, NMFS must find that the specified activity will not have an "unmitigable adverse impact" on the subsistence uses of the affected marine mammal species or stocks by Alaskan Natives. 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 Kootznoowoo Tlingit tribe of Admiralty Island traditionally traded fur and harvested marine mammals. Today, much of the population engages in a commercial fishing and/or subsistence lifestyle with 98 percent of households reporting use of some type of subsistence resource in 2012, the last year for which data is available (ADF&G 2024f). About 10 percent of Angoon households attempted harvest of marine mammals, and 41 percent of households report using marine mammals, mostly harbor seals. No sea lion harvest was reported in the community in 2012.

This project would occur in Killisnoo Harbor, and subsistence hunting of marine mammals does not occur in the project area; therefore, there are no relevant subsistence uses of marine mammals adversely impacted by this action. The proposed project is not likely to adversely impact the availability of any marine mammal species or stocks that are commonly used for subsistence purposes or to impact subsistence harvest of marine mammals in the region.

Based on the description of the specified activity and the proposed mitigation and monitoring measures, NMFS has preliminarily determined that there will not be an unmitigable adverse impact on subsistence uses from ADOT&PF's proposed activities.

Endangered Species Act

Section 7(a)(2) of the ESA of 1973 (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' Office of Protected Resources (OPR) consults internally whenever we propose to authorize take for endangered or threatened species, in this case with the Alaska Regional Office (AKRO).

NMFS is proposing to authorize take of humpback whale (Mexico DPS) and Steller sea lion (Western DPS), which are listed under the ESA. OPR has requested initiation of section 7 consultation with AKRO 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 the Angoon Ferry Terminal Modification Project in Angoon, Alaska from May 1, 2026 through April 30, 2027, provided the previously mentioned mitigation, monitoring, and reporting requirements are incorporated. A draft of the proposed IHA can be found at: *https://www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-construction-activities*.

Request for Public Comments

We request comment on our analyses, the proposed authorization, and any other aspect of this notice of proposed IHA for the proposed construction project. We also request comment on the potential renewal of this proposed IHA as described in the paragraph below. Please include with your comments any supporting data or literature citations to help inform decisions on the request for this IHA or a subsequent renewal IHA.

On a case-by-case basis, NMFS may issue a one-time, 1-year renewal IHA following notice to the public providing an additional 15 days for public comments when (1) up to another year of identical or nearly identical activities as described in the **Description of Proposed Activity** section of this notice is planned or (2) the activities as described in the **Description of Proposed Activity** section of this notice would not be completed by the time the IHA expires and a renewal would allow for completion of the activities beyond that described in the *Dates and Duration* section of this notice, provided all of the following conditions are met:

- A request for renewal is received no later than 60 days prior to the needed renewal IHA effective date (recognizing that the renewal IHA expiration date cannot extend beyond 1 year from expiration of the initial IHA).

- The request for renewal must include the following:

(1) An explanation that the activities to be conducted under the requested renewal IHA are identical to the activities analyzed under the initial IHA, are a subset of the activities, or include changes so minor (*e.g.*, reduction in pile size) that the changes do not affect the previous analyses, mitigation and monitoring requirements, or take estimates (with the exception of reducing the type or amount of take).

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

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

Dated: March 18, 2025.

Catherine Marzin,

Acting Director, Office of Protected Resources,

National Marine Fisheries Service.

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