**E 3510-22-P**

**DEPARTMENT OF COMMERCE**

**National Oceanic and Atmospheric Administration**

**[RTID 0648-XF502]**

**Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to the Alaska Department of Transportation and Public Facilities' Ward Creek Bridge Replacement Project in Ketchikan, Alaska**

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

**ACTION:** Notice; proposed incidental harassment authorizations; request for comments on proposed authorizations and possible renewals.

**SUMMARY:** NMFS has received a request from Alaska Department of Transportation and Public Facilities (ADOT&PF) for authorization to take marine mammals incidental to the Ward Creek Bridge Replacement Project in Ketchikan, Alaska (AK). Pursuant to the Marine Mammal Protection Act (MMPA), NMFS is requesting comments on its proposal to issue two consecutive incidental harassment authorizations (IHAs) to incidentally take marine mammals during the specified activities. NMFS is also requesting comments on possible one-time, 1-year renewals that could be issued for either or both of the two IHAs under certain circumstances and if all requirements are met, as described in **Request for Public Comments** at the end of this notice. NMFS will consider public comments prior to making any final decision on the issuance of the requested MMPA authorizations.

**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 Permits and Conservation Division, Office of Protected Resources, National Marine Fisheries Service and should be submitted via email to *ITP.jacobus@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:** Kristy Jacobus, Office of Protected Resources, NMFS, (301) 427-8401.

**SUPPLEMENTARY INFORMATION:**

**Background**

The MMPA prohibits the "take" of marine mammals, with certain exceptions. Section 101(a)(5)(A) and (D) of the MMPA (16 U.S.C. 1361 *et seq*.) directs 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; 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 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 (see also 16 U.S.C. 1362; 50 C.F.R 216.3, 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 IHAs qualifies to be categorically excluded from further NEPA review.

**Summary of Request**

On November 18, 2025, NMFS received a request from ADOT&PF for two consecutive IHAs to take marine mammals incidental to the Ward Creek Bridge Replacement Project in Ketchikan, AK. Following NMFS' review of the application, ADOT&PF submitted revised versions on March 24 and April 30, 2026. The application was deemed adequate and complete on May 5, 2026. ADOT&PF's request is for take of 7 species of marine mammals (comprising 10 stocks) by Level B harassment and, for a subset of 6 of these species, Level A harassment. Neither ADOT&PF nor NMFS expect serious injury or mortality to result from this activity and, therefore, IHAs are appropriate.

**Description of Proposed Activity**

*Overview*

ADOT&PF plans to replace the Ward Creek Bridge which spans Ward Creek, and reconstruct associated roadways, in Ward Cove, Ketchikan, AK. The project includes removal of existing steel piles, installation (and removal) of steel piles to support a temporary work trestle, installation of new bridge steel piles, and removal of two areas of rock along the highway via blasting. Pile removal would be conducted with vibratory methods and pile installation would be conducted with impact, vibratory, and/or down-the-hole (DTH) methods. Pile driving (and removal) and DTH have the potential to introduce underwater sound that may result in take of marine mammals by Level A harassment and Level B harassment. Blasting of rocks has the potential to result in Level A and Level B harassment due to introduction of underwater and in-air sound.

*Dates and Duration*

The proposed IHAs would be valid from May 1, 2028, through April 30, 2029 (Year 1) and May 1, 2029, through April 30, 2030 (Year 2). ADOT&PTF expects that during Year 1, pile driving and DTH will occur over approximately 37 non-consecutive days and blasting will occur over approximately 6 non-consecutive days. Pile driving and DTH during Year 2 are expected to occur over approximately 32 non-consecutive days.

*Specific Geographic Region*

The proposed project would occur in Ward Cove off of Tongass Narrows in the city of Ketchikan, AK (see figure 1). The Ward Creek Bridge spans Ward Creek at mile post 11 of the North Tongass Highway.

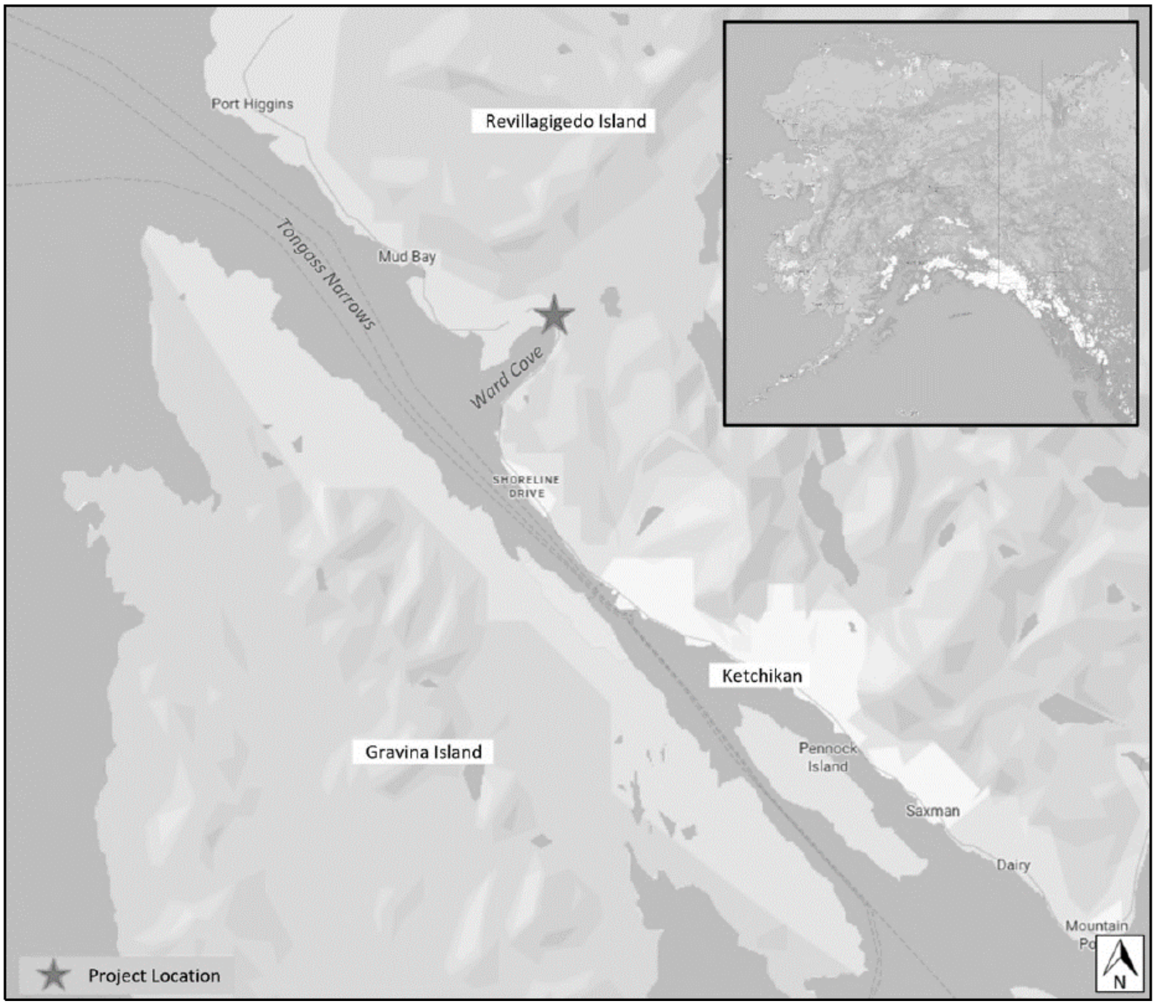


**Figure 1 -- Project Location**

*Detailed Description of the Specified Activity*

ADOT&PF proposes to replace the Ward Creek Bridge in Ward Cove, Ketchikan, AK, over the course of 2 years, which includes pile removal, pile installation, and removal of rock via blasting. ADOT&PF plans to conduct pile driving and removal above and below the high tide line (HTL). Pile installation and removal below HTL is expected to result in harassment of marine mammals. Pile driving and removal above HTL would not produce underwater sound that exceeds harassment thresholds. Therefore, no harassment of marine mammals is expected or proposed for pile driving or removal above HTL and will not be discussed further.

Blasting of rock would occur above HTL approximately 110 meters (m) from shoreline, northwest of Ward Creek, and approximately 33 m from shoreline, southeast from Ward Creek. NMFS expects that the sound from blasting could result in Level A and Level B harassment of hauled out pinnipeds in Ward Cove resulting from exposure to in-air noise, and that, due to the proximity of the blasting to the shoreline, the sound from blasting could transfer through the rock and result in underwater sound that could exceed underwater Level A and Level B harassment thresholds. The sound pressure waves produced by blasting would be attenuated by the ground such that underwater sound pressure levels would not reach levels sufficient to result in serious injury or mortality of marine mammals.

Year 1

During Year 1, ADOT&PF plans to remove 18-inch steel shell piles from the existing bridge, install 24-inch steel shell piles to support a temporary work trestle just upstream of the existing bridge (piles would be removed once construction during Year 1 is complete), and install piles for new bridge pier piles (36-inch steel shell piles). All pile removal would be conducted with vibratory methods. The 24-inch steel shell piles will be installed using vibratory and impact pile driving. The 36-inch steel shell piles would be installed using a vibratory and impact hammer, then a DTH hammer would be placed inside the piling and a shaft would be drilled into the bedrock. See table 1 for the Year 1 pile installation and removal schedule.

Excavation would be conducted using an excavator in the immediate vicinity of the Ward Creek Bridge. Excavated material would be removed, and riprap and fill would be placed under the bridge along the banks of Ward Creek. Noise from excavation and fill is not expected to result in take of marine mammals.

**Table 1 -- Schedule for Pile Driving and DTH (Below HTL) During Year 1**

| Project Component | Pile Size/Type | Installation/Removal Method | Number of Piles | Piles per Day | Number of Days |
|---|---|---|---|---|---|
| Existing bridge | 18-inch steel shell | Vibratory removal | 2 | 2 | 1 |
| Temporary trestle bridge | 24-inch steel shell | Vibratory installation | 20 | 6 | 4 |
| | 24-inch steel shell | Impact installation | 20 | 6 | 4 |
| | 24-inch steel shell | Vibratory removal | 20 | 6 | 4 |
| New bridge | 36-inch steel shell | Vibratory installation | 8 | 1 | 8 |
| | | Impact installation | 8 | 1 | 8 |
| | | Vibratory installation | 8 | 1 | 8 |
| Total | | | | | 37 |

In addition to pile driving, ADOT&PF proposes to remove 220 linear feet (67 m) of rock northwest of Ward Creek, approximately 110 m from the shoreline, and 350 linear feet (106.7 m) of rock southeast from Ward Creek, approximately 33 m from the shoreline, via blasting. ADOT&PF expects blasting to occur over 6 days, approximately 3 days at each site, with one blasting event per day. ADOT&PF estimates a total of 104 charge delays ranging from 90-300 pounds net explosive weight (NEW).

Year 2

During Year 2 of the project, 18-inch steel shell piles from the existing bridge would be removed; 24-inch steel shell piles would be installed downstream of the existing bridge to support a temporary work trestle (and removed following construction); and 36-inch steel shell piles would be installed in construction of the new bridge. Installation and removal methods would be the same as Year 1. See table 2 for the pile installation and removal schedule during Year 2.

**Table 2 -- Schedule for Pile Driving and DTH (Below HTL) During Year 2**

| Project Component | Pile Size/Type | Installation/ Removal Method | Number of Piles | Piles per Day | Number of Days |
|---|---|---|---|---|---|
| Existing bridge | 18-inch steel shell | Vibratory removal | 10 | 6 | 2 |
| Temporary trestle bridge | 24-inch steel shell | Vibratory installation | 20 | 6 | 4 |
| | 24-inch steel shell | Impact installation | 20 | 6 | 4 |
| | 24-inch steel shell | Vibratory removal | 20 | 6 | 4 |
| New bridge | 36-inch steel shell | Vibratory installation | 6 | 1 | 6 |
| | 36-inch steel shell | Impact installation | 6 | 1 | 6 |
| | 36-inch steel shell | DTH installation | 6 | 1 | 6 |
| Total | | | | | 32 |

Riprap and fill would be placed under the bridge around the new abutments. Placement of fill is not expected to result in take of marine mammals.

**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 3 lists all species or stocks for which take is expected and proposed to be authorized for this activity 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 mortality and serious injury (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' U.S. Pacific and Alaska SARs. All values presented in table 3 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 3 -- Species[1] With Estimated Take from the Specified Activities**

| Common name | Scientific name | Stock | ESA/ MMPA status; Strategic (Y/N)[2] | Stock abundance (CV, $N_{min}$, most recent abundance survey)[3] | PBR | Annual M/SI[4] |
|---|---|---|---|---|---|---|
| Order Artiodactyla – Cetacea – Mysticeti (baleen whales) | | | | | | |
| *Family Balaenopteridae (rorquals)* | | | | | | |
| Humpback Whale | *Megaptera novaeangliae* | Hawai'i | -, -, N | 11,278 (0.56, 7,265, 2020) | 127 | 27.09 |
| Humpback Whale | *Megaptera novaeangliae* | Mexico-North Pacific | T, D, Y | UND (N/A, N/A, 2006)[5] | UND | 0.57 |
| 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) [6] | 19 | 1.3 |
| Killer Whale | *Orcinus orca* | Eastern North Pacific Northern Resident | -, -, N | 302 (N/A, 302, 2018) [6] | 2.2 | 0.2 |
| Killer Whale | *Orcinus orca* | West Coast Transient | -, -, N | 349 (N/A, 349, 2018) [6] | 3.5 | 0.4 |
| *Family Phocoenidae (porpoises)* | | | | | | |
| Dall's Porpoise | *Phocoenoides dalli* | Alaska | -, -, N | UND (UND, UND, 2015)[7] | UND | 37 |
| Harbor Porpoise | *Phocoena phocoena* | Southern Southeast Alaska Inland Waters | -, -, Y | 890 (0.37, 610, 2019) | 6.1 | 7.4 |
| Order Carnivora – Pinnipedia | | | | | | |
| *Family Otariidae (eared seals and sea lions)* | | | | | | |
| Steller Sea Lion | *Eumetopias jubatus* | Eastern | -, -, N | 36,308 (N/A, 36,308, 2022)[8] | 2,178 | 93.2 |
| *Family Phocidae (earless seals)* | | | | | | |
| Harbor Seal | *Phoca vitulina* | Clarence Strait | -, -, N | 27,659 (N/A, 24,854, 2015) | 746 | 40 |
| Northern Elephant Seal | *Mirounga angustirostris* | California Breeding | -, -, N | 187,386 (N/A, 85,369, 2013) | 5,122 | 13.7 |

[1]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/*).

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

[3]NMFS marine mammal stock assessment reports 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.
[4]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, vessel strike). Annual M/SI often cannot be determined precisely and is in some cases presented as a minimum value or range.
[5]Abundance estimates are based upon data collected more than 8 years ago and, therefore, current estimates are considered unknown. However, these estimates remain the best available data regarding abundance of these stocks.
[6] $N_{EST}$ is based upon counts of individuals identified from photo-ID catalogs.
[7]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.
[8]Stock abundance is best estimate of counts, which have not been corrected for animals at sea during abundance surveys. Estimates are provided for the United States only.

As indicated above, all 7 species (with 10 managed stocks) in table 3 temporally and spatially co-occur with the activity to the degree that take is reasonably likely to occur. While gray whales, fin whales, minke whales, and Pacific white-sided dolphins have been reported in the area, the occurrence of these species is so rare that take is not expected to occur, and they are not discussed further.

In addition, the sea otter may be found in Ketchikan. However, sea otters are managed by the U.S. Fish and Wildlife Service and are not considered further in this document.

*Humpback whale*

Humpback whales migrate seasonally from high latitude subarctic and temperate summering areas to low latitude subtropical and tropical wintering areas. Two stocks of humpback whale are expected in ADOT&PF's proposed project area, the Hawai'i stock (which is not ESA-listed) and the Mexico-North Pacific Stock (listed as threatened under the ESA). NMFS expects that 98 percent of humpback whales in the proposed project area are from the Hawai'i stock and 2 percent are from the Mexico-North Pacific stock, as described in Wade (2021). Humpback whales are not commonly seen in Ward Cove, but are common in Tongass Narrows. Sightings of humpback whales are most common in spring and summer.

ADOT&PF's project area overlaps with a Biologically Important Area (BIA) identified as important for humpback whale feeding (Wild *et al*., 2023). This BIA is active from May through September and has an importance score of 1 with an intensity score of 2.

*Killer whale*

Killer whales from the Eastern North Pacific Alaska Resident, Eastern North Pacific Northern Resident, and West Coast Transient stocks may be present in ADOT&PF's proposed project area. The Alaska Resident stock includes killer whales from Southeast Alaska to the Aleutian Islands and Bering Sea (Young *et al*., 2023). The Northern Resident stock is a transboundary stock and includes killer whales that frequent British Columbia and southeast Alaska (Muto *et al*., 2020). The West Coast transient stock is trans-boundary, occurring from California through Southeast Alaska and including whales from British Columbia (Muto *et al*., 2021).

*Dall's porpoise*

Dall's porpoises are widely distributed across the entire North Pacific. They are considered one of the most common cetaceans found in Alaska waters, with a preference for both deep pelagic and inland waters, such as southeast Alaska (Jefferson *et al*., 2019). Dall's porpoises have been occasionally observed in Tongass Narrows during monitoring for previous projects, but typically do not enter Ward Cove due to their preference for deeper water (Solstice Alaska Consulting, 2025).

*Harbor porpoise*

Harbor porpoises frequent the coastal waters of Southeast Alaska and typically occur in waters less than 100 m deep (Young *et al*., 2023). Harbor porpoises have been observed in Tongass Narrows during monitoring for previous projects, but they typically do not enter Ward Cove due to their preference for deeper water (Solstice Alaska Consulting, 2025).

*Steller sea lion*

The Eastern distinct population segment (DPS) includes Steller sea lions originating from rookeries east of Cape Suckling (144 degrees west longitude). Steller sea lions are considered common in the proposed project area year-round and have been observed both in Ward Cove and in Tongass Narrows (Solstice Alaska Consulting, 2025). There are no Steller sea lion haulouts in Ward Cove or in the adjacent waters in Tongass Narrows. The closest haulout is approximately 25 kilometers (km) from Ward Creek Bridge at Grindall Island (Solstice Alaska Consulting, 2025).

*Harbor seal*

Harbor seals inhabit coastal and estuarine waters off Baja California, north along the western coast of the United States, British Columbia, and Southeast Alaska and up through the Gulf of Alaska and Aleutian Islands and in the Bering Sea and Pribilof Islands. They are generally non-migratory with local movements associated with such factors as tides, weather, season, food availability, and reproduction (Muto *et al.*, 2020). Harbor seals are regularly sighted in the proposed project area and could occur on any given day (Solstice Alaska Consulting, 2025). The only known harbor seal haulout in Ward Cove is a dock, on the southern part of the Cove, approximately 1 km from Ward Creek Bridge (Solstice Alaska Consulting, 2025).

*Northern elephant seal*

Northern elephant seals breed and give birth in California and Baja California from December to March. Males migrate to the Gulf of Alaska and western Aleutian Islands along the continental shelf, while females migrate to pelagic areas in the Gulf of Alaska and central North Pacific to feed on pelagic prey. Adults return to land between March and August to molt. Northern elephant seals are uncommon around ADOT&PF's proposed project area, although sightings of northern elephant seals are increasing within

Tongass Narrows and are occasionally sighted in surrounding waters such as Clarence Strait and Nichols Passage (Solstice Alaska Consulting, 2025).

*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.*, Au and Hastings, 2008, Richardson *et al*., 1995, Wartzok and Ketten, 1999). 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 4. Of the species that may be potentially taken by Level B and/or Level A harassment, humpback whales are considered low-frequency (LF) cetaceans, killer whales are considered high-frequency (HF) cetaceans, Dall’s porpoises and harbor porpoises are considered very high-frequency (VHF) cetaceans, Steller sea lions are otariid pinnipeds, and harbor seals and northern elephant seals are phocid pinnipeds.

**Table 4 -- Marine Mammal Hearing Groups (NMFS, 2024)**

| Hearing Group | Generalized Hearing Range* |
|---|---|
| Low-frequency (LF) cetaceans<br>(baleen whales) | 7 hertz (Hz) to 36 kilohertz (kHz) |
| High-frequency (HF) cetaceans<br>(dolphins, toothed whales, beaked whales, bottlenose whales) | 150 Hz to 160 kHz |
| Very High-frequency (VHF) cetaceans<br>(true porpoises, *Kogia*, river dolphins, Cephalorhynchid, *Lagenorhynchus cruciger* & *L. australis*) | 200 Hz to 165 kHz |
| Phocid pinnipeds (PW) (underwater)<br>(true seals) | 40 Hz to 90 kHz |
| Otariid pinnipeds (OW) (underwater)<br>(sea lions and fur seals) | 60 Hz to 68 kHz |
| IN-AIR | |
| Phocid pinnipeds (PA) (true seals) | 42 Hz to 52 kHz |
| Otariid pinnipeds (OA) (sea lions and fur seals) | 90 Hz to 40 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 approximately 65 dB threshold from composite audiogram, previous analysis in NMFS (2018), and/or data from Southall *et al.* (2007) and 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.

Acoustic effects on marine mammals during the specified activities are expected to potentially occur from vibratory pile installation and removal, impact pile driving, DTH systems, and blasting. The effects of underwater and in-air noise from ADOT&PF's proposed activities have the potential to result in Level B harassment and Level A harassment of marine mammals in the proposed project area.

There are a variety of types and degrees of effects on marine mammals and their habitat (including prey) that could occur as a result of the specified activities. Below we provide a brief description of the types of sound generated by specified activities, the general impacts on marine mammals and their habitat from these types of activities, and a related project-specific analysis with consideration of the proposed mitigation measures.

*Description of Sound Sources for the Specified Activities*

Activities associated with the project that have the potential to incidentally take marine mammals through exposure to sound include vibratory pile installation and removal, impact pile driving, DTH systems, and blasting.

Impact hammers typically operate by repeatedly dropping and/or pushing a heavy piston onto a pile to drive the pile into the substrate. Sound generated by impact hammers is impulsive, characterized by rapid rise times and high peak sound pressure levels (SPLs), 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 substrate, and extract piles by using vibration to break the sediment friction and allow a crane to pull the piles out. Vibratory hammers typically produce less sound (*i.e.*, lower SPLs) than impact hammers. Peak SPLs may be 180 dB or greater, but are generally 10 to 20 dB lower than SPLs generated during impact pile driving of the same-sized pile (Oestman *et al*., 2009, Caltrans, 2015, Caltrans, 2020). Sounds produced by vibratory hammers are non-impulsive; compared to sounds produced by impact hammers, they have a slower rise time, reducing the probability and severity of injury, and the sound energy is distributed over a greater amount of time (Nedwell and Edwards, 2002, Carlson *et al*., 2005).

DTH systems use a combination of drilling and percussive mechanisms to advance a hole into the rock, with or without simultaneously advancing a pile/casing into that hole. Drill cuttings and debris at the rock face are removed by an air-lift exhaust through the inside of the pile (Guan and Miner, 2020). Unlike other pile installation methods, at least one sound source during DTH is found at the intersection of the drill tip and the substrate and is often more characteristically a point source rather than a linear source, as in impact and vibratory pile driving. A DTH system is essentially a drill bit that drills through the bedrock using a rotating function like a normal drill integrated with a hammering mechanism to increase speed of progress through the substrate (*i.e*., it is similar to a "hammer drill" hand tool). DTH systems typically involve a single hammer (mono-hammer), but multi- or "cluster" hammer drills may also be used.

DTH systems include both DTH drilling and DTH driving techniques. During DTH pile drilling, the DTH hammer does not make direct contact with the pile; rather the hammer acts as a percussive drill to advance a hole through the substrate within a casing (casing is driven through overburden using impact or vibratory methods). After the hole is drilled to the desired depth, the casing is removed, and the production pile is placed inside the hole. Often, an impact hammer is then used to confirm the pile has reached load-bearing capacity (*i.e.*, proof). If needed, a tension anchor can be drilled following these same methods within the production pile to add lateral support to the pile.

During DTH pile driving, the DTH hammer directly strikes a specially designed shoe located at the bottom of the pile, which has wings that have a slightly larger diameter than the pile (*i.e.*, the hammer directly strikes the production pile itself; no pile casing is used). The drill head locks into the bottom of the pile, and then the drill head and pile advance simultaneously into the substrate to the desired depth. Often, the production pile is then proofed with an impact hammer. If needed, a tension anchor can be drilled using DTH drilling methods within the production pile to add lateral support to the pile.

The sounds produced by the DTH methods simultaneously contain both a continuous non-impulsive component from the drilling action and an impulsive component from the hammering effect. Therefore, for purposes of evaluating Level A and Level B harassment under the MMPA, NMFS treats DTH systems as both impulsive (Level A harassment thresholds) and continuous, non-impulsive (Level B harassment thresholds) sound source types simultaneously.

Typical activities for which DTH systems are used include rock socketing and tension or rock anchoring. ADOT&PF proposes to use DTH for rock socketing. Rock socketing involves using DTH techniques to create a hole in the bedrock inside which a pile is placed to give it lateral and longitudinal strength as described in DTH drilling, above. Rock sockets are made in bedrock when overlaying sediments are too shallow to adequately secure the bottom portion of a pile using other methods.

Blasting is characterized as an impulsive sound source. ADOT&PF proposes to conduct detonations on land, which can result in propagation of sound waves both in-air and underwater. For on land detonations in relatively close proximity to the shoreline, as proposed by ADOT&PF, the pressure shock wave would propagate from the blast site to the shoreline. The peak pressure of the shock wave would be highest near the detonation but would decrease with distance from the detonation location due to spreading and attenuation losses. The pressure wave would continue to propagate to the interface of the seabed and the water and would be partially transmitted into the water. Similarly, blasting would produce an in-air sound pressure wave. Based on the proximity of the blasting to the shoreline and the overall blast plan, NMFS expects marine mammal take due to both in-air and underwater sound due to the use of on-land blasting by ADOT&PF.

*Potential Effects of Sound on Marine Mammals*

The introduction of anthropogenic noise into the air from blasting and into the aquatic environment from impact and vibratory pile driving, DTH, and blasting is the primary means by which marine mammals may be harassed from the ADOT&PF's specified activity. Anthropogenic sounds cover a broad range of frequencies and sound levels and can have a range of highly variable impacts on marine life from none or minor to potentially severe responses depending on received levels, duration of exposure, behavioral context, and various other factors. Broadly, underwater and in-air sound from active acoustic sources, such as those in ADOT&PF's proposed project, can potentially result in one or more of the following: temporary or permanent hearing impairment, non-auditory physical or physiological effects, behavioral disturbance, stress, and masking (Richardson *et al*., 1995, Gordon *et al*., 2003, Nowacek *et al*., 2007, Southall *et al*., 2007, Götz *et al*., 2009).

We describe the more severe effects of certain non-auditory physical or physiological effects only briefly as we do not expect that use of impact and vibratory pile driving, DTH, and blasting are reasonably likely to result in such effects (see below for further discussion). Potential effects from impulsive sound sources can range in severity from effects such as behavioral disturbance or tactile perception to physical discomfort, slight injury of the internal organs and the auditory system, or mortality (Yelverton *et al.*, 1973). Non-auditory physiological effects or injuries that theoretically might occur in marine mammals exposed to high level underwater sound or as a secondary effect of extreme behavioral reactions (*e.g*., change in dive profile as a result of an avoidance reaction) caused by exposure to sound include neurological effects, bubble formation, resonance effects, and other types of organ or tissue damage (Cox *et al*., 2006, Southall *et al*., 2007, Zimmer and Tyack, 2007, Tal *et al*., 2015).

Explosives can result in some of these more severe effects such as organ or tissue damage, or mortality. However, these effects are associated with underwater explosives. ADOT&PF proposes to use explosives on land, approximately 33 m and 100 m from the shoreline. Because of the proximity to the water, the explosives are expected to result in auditory and behavioral effects but are not expected to result in physical injury or mortality.

The degree of effect of an acoustic exposure on marine mammals is dependent on several factors, including, but not limited to, sound type (*e.g.*, impulsive vs. non-impulsive), signal characteristics, the species, age and sex class (*e.g.*, adult male vs. mom with calf), duration of exposure, the distance between the noise source and the animal, received levels, behavioral state at time of exposure, and previous history with exposure (Wartzok *et al*., 2004, Southall *et al*., 2007). In general, sudden, high-intensity sounds can cause hearing loss as can longer exposures to lower-intensity sounds. Moreover, any temporary or permanent loss of hearing, if it occurs at all, will occur almost exclusively for noise within an animal's hearing range. We describe below the specific manifestations of acoustic effects that may occur based on the activities proposed by ADOT&PF.

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

Below, we provide additional detail regarding potential impacts on marine mammals and their habitat from noise in general, starting with hearing impairment, as well as from the specific activities ADOT&PF plans to conduct, to the degree it is available.

*Hearing Threshold Shifts* -- NMFS defines a noise-induced threshold shift (TS) as a change, usually an increase, in the threshold of audibility at a specified frequency or portion of an individual's hearing range above a previously established reference level (NMFS, 2018, 2024). The amount of threshold shift 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 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 (AUD INJ)* -- NMFS (2024) defines AUD INJ as damage to the inner ear that can result in destruction of tissue, such as the loss of cochlear neuron synapses or auditory neuropathy (Houser, 2021, Finneran, 2024). AUD INJ may or may not result in a permanent threshold shift (PTS). PTS is subsequently defined 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 some level of hearing loss at the relevant frequencies; typically, animals with PTS or other AUD INJ are not functionally deaf (Au and Hastings, 2008; Finneran, 2016). Available data from humans and other terrestrial mammals indicate that a 40-dB threshold shift approximates AUD INJ onset (see Ward *et al.*, 1958, 1959, Ward, 1960, Kryter *et al*., 1966, Miller, 1974, Ahroon *et al*., 1996, Henderson *et al*., 2008). AUD INJ 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 AUD INJ in marine mammals largely due to the fact that, for various ethical reasons, experiments involving anthropogenic noise exposure at levels inducing AUD INJ are not typically pursued or authorized (NMFS, 2024).

*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, 2024), and is not considered an AUD INJ. Based on data from marine mammal TTS measurements (see Southall *et al.*, 2007, 2019), a TTS of 6 dB is considered the minimum threshold shift clearly larger than any day-to-day or session-to-session variation in a subject's normal hearing ability (Finneran *et al*., 2000, 2002, Schlundt *et al*., 2000). As described in Finneran (2015), marine mammal studies have shown the amount of TTS increases with the 24-hour cumulative sound exposure level ($SEL_{24}$) in an accelerating fashion: at low exposures with lower $SEL_{24}$, the amount of TTS is typically small and the growth curves have shallow slopes. At exposures with higher $SEL_{24}$, the growth curves become steeper and approach linear relationships with the sound exposure level (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 more impactful (similar to those discussed in auditory masking, below). For example, a marine mammal may be able to readily compensate for a brief, relatively small amount of TTS in a non-critical frequency range that takes place during a time when the animal is traveling through the open ocean, where ambient noise is lower and there are not as many competing sounds present. Alternatively, a larger amount and longer duration of TTS sustained during time when communication is critical for successful mother/calf interactions could have more severe 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) (Finneran, 2015). In many cases, hearing sensitivity recovers rapidly after exposure to the sound ends. For cetaceans, published data on the onset of TTS are limited to captive bottlenose dolphin (*Tursiops truncatus*), beluga whale (*Delphinapterus leucas*), harbor porpoise (*Phocoena phocoena*), and Yangtze finless porpoise (*Neophocoena asiaeorientalis*) (Southall *et al.*, 2019). For pinnipeds in water, measurements of TTS are limited to harbor seals, elephant seals, bearded seals (*Erignathus barbatus*) and California sea lions (*Zalophus californianus*) (Kastak *et al*., 1999, 2007, Kastelein *et al*., 2019b, 2019c, 2021, 2022a, 2022b, Reichmuth *et al*., 2019, Sills *et al*., 2020). TTS was not observed in spotted (*Phoca largha*) and ringed (*Pusa hispida*) seals exposed to single airgun impulse sounds at levels matching previous predictions of TTS onset (Reichmuth *et al*., 2016). These studies examine 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 threshold shift at various post-exposure times.

The amount and onset of TTS depend on the exposure frequency. Sounds below the region of best sensitivity for a species or hearing group are less hazardous than those 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 and harbor porpoises have a lower TTS onset than other measured pinniped or cetacean 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, $SEL_{24}$ will overestimate the amount of TTS from intermittent exposures, such as sonars and impulsive sources. Nachtigall *et al*. (2018) describe measurements of hearing sensitivity of multiple odontocete species (bottlenose dolphin, harbor porpoise, beluga, 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). Data available on noise-induced hearing loss for mysticetes are currently lacking (NMFS, 2024). Additionally, the existing marine mammal TTS data come from a limited number of individuals within these species.

Relationships between TTS and AUD INJ thresholds have not been studied in marine mammals, and there are no measured PTS data for cetaceans, but such relationships are assumed to be similar to those in humans and other terrestrial mammals. AUD INJ typically occurs at exposure levels at least several dB above that inducing mild TTS (*e.g.*, a 40-dB threshold shift approximates AUD INJ onset (Kryter *et al*., 1966, Miller, 1974), while a 6-dB threshold shift approximates TTS onset (Southall *et al.*, 2007, 2019). Based on data from terrestrial mammals, a precautionary assumption is that the AUD INJ 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 AUD INJ cumulative sound exposure level thresholds are 15 to 20 dB higher than TTS cumulative sound exposure level thresholds (Southall *et al.*, 2007, 2019). Given the higher level of sound or longer exposure duration necessary to cause AUD INJ as compared with TTS, it is considerably less likely that AUD INJ could occur.

*Behavioral Effects* – Exposure of marine mammals to certain sounds could result in behavioral disturbance, not all of which constitutes harassment under the MMPA. Behavioral disturbance may include a variety of effects, including subtle changes in behavior (*e.g.*, minor or brief avoidance of an area or changes in vocalizations), more conspicuous changes in similar behavioral activities, and more sustained and/or potentially severe reactions, such as displacement from or abandonment of high-quality habitat. Behavioral responses may include changing durations of surfacing and dives, changing direction and/or speed; reducing/increasing vocal activities; changing/cessation of certain behavioral activities (such as socializing or feeding); eliciting a visible startle response or aggressive behavior (such as tail/fin slapping or jaw clapping); and avoidance of areas where sound sources are located. In addition, pinnipeds may increase their haul out time, possibly to avoid in-water disturbance (Thorson and Reyff, 2006), or for in-air noise produced by explosives, pinnipeds may display behavioral responses such as flushing into the water.

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*., 2004, Southall *et al*., 2007, 2019 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 reviews 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 shown 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. 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). 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.

*Avoidance and displacement* – 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. Acoustic and movement bio-logging tools also have been used in some cases to infer responses to anthropogenic noise. For example, Blair (2015) reported significant effects on humpback whale foraging behavior in Stellwagen Bank in response to vessel noise including slower descent rates, and fewer side-rolling events per dive with increasing vessel nose. In addition, Wisniewska *et al.* (2018) reported that tagged harbor porpoises demonstrated fewer prey capture attempts when encountering occasional high-noise levels resulting from vessel noise as well as more vigorous fluking, interrupted foraging, and cessation of echolocation signals observed in response to some high-noise vessel passes. 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.

Respiration rates vary naturally with different behaviors and alterations to breathing rate as a function of acoustic exposure can be expected to co-occur with other behavioral reactions, such as a flight response or an alteration in diving. However, respiration rates in and of themselves may be representative of annoyance or an acute stress response. Various studies have shown that respiration rates may either be unaffected or could increase, depending on the species and signal characteristics, again highlighting the importance in understanding species differences in the tolerance of underwater noise when determining the potential for impacts resulting from anthropogenic sound exposure (*e.g.*, Kastelein *et al*., 2001, 2005, 2006, Gailey *et al.*, 2007). For example, harbor porpoise respiration rates increased in response to pile driving sounds at and above a received broadband SPL of 136 dB (zero-peak SPL: 151 dB referenced to 1 micropascal (re 1 μPa); SEL of a single strike ($SEL_{ss}$): 127 dB re 1 $\mu Pa^2$-s) (Kastelein *et al*., 2013).

Avoidance is the displacement of an individual from an area or migration path as a result of the presence of a sound or other stressors and is one of the most obvious manifestations of disturbance in marine mammals (Richardson *et al.*, 1995). For example, gray whales (*Eschrictius robustus*) are known to change direction – deflecting from customary migratory paths – in order to avoid noise from seismic surveys (Malme *et al.*, 1984). Harbor porpoises, Atlantic white-sided dolphins (*Leucopleurus actuus*), and minke whales have demonstrated avoidance in response to vessels during line transect surveys (Palka and Hammond, 2001). In addition, beluga whales in the St. Lawrence Estuary in Canada have been reported to increase levels of avoidance with increased boat presence by way of increased dive durations and swim speeds, decreased surfacing intervals, and by bunching together into groups (Blane and Jaakson, 1994). Avoidance may be short-term, with animals returning to the area once the noise has ceased (*e.g.*, Bowles *et al*., 1994, Goold, 1996, Stone *et al*., 2000, Morton and Symonds, 2002, Gailey *et al*., 2007). Longer-term displacement is possible, however, which may lead to changes in abundance or distribution patterns of the affected species in the affected region if habituation to the presence of the sound does not occur (*e.g.*, Blackwell *et al*., 2004, Bejder *et al*., 2006, Teilmann *et al*., 2006).

A flight response is a dramatic change in normal movement to a directed and rapid movement away from the perceived location of a sound source. The flight response differs from other avoidance responses in the intensity of the response (*e.g.*, directed movement, rate of travel). Relatively little information on flight responses of marine mammals to anthropogenic signals exist, although observations of flight responses to the presence of predators have occurred (Connor and Heithaus, 1996, 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.

Many animals perform vital functions, such as feeding, resting, traveling, and socializing, on a diel cycle (24-hour cycle). Disruption of such functions resulting from reactions to stressors such as sound exposure are more likely to be significant if they last more than one diel cycle or recur on subsequent days (Southall *et al.*, 2007). Consequently, a behavioral response lasting less than 1 day and not recurring on subsequent days is not considered particularly severe unless it could directly affect reproduction or survival (Southall *et al.*, 2007). Note that there is a difference between multi-day substantive (*i.e.*, meaningful) behavioral reactions and multi-day anthropogenic activities. For example, just because an activity lasts for multiple days does not necessarily mean that individual animals are either exposed to activity-related stressors for multiple days or, further, exposed in a manner resulting in sustained multi-day substantive behavioral responses.

*Physiological 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.*, (Selye, 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, Ayres *et al*., 2012, Yang *et al*., 2021). Stress responses due to exposure to anthropogenic sounds or other stressors and their effects on marine mammals have also been reviewed (Fair and Becker, 2000, Romano *et al*., 2002b) and, more rarely, studied in wild populations (*e.g.*, Romano *et al*., 2002a). For example, Rolland *et al*. (2012) found that noise reduction from reduced vessel traffic in the Bay of Fundy was associated with decreased stress in North Atlantic right whales. In addition, Lemos *et al*. (2022) observed a correlation between higher levels of fecal glucocorticoid metabolite concentrations (indicative of a stress response) and vessel traffic in gray whales. Yang *et al*. (2021) studied behavioral and physiological responses in captive bottlenose dolphins exposed to playbacks of "pile-driving-like" impulsive sounds, finding significant changes in cortisol and other physiological indicators but only minor behavioral changes. 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, 2005), however distress is an unlikely result of this project based on observations of marine mammals during previous, similar construction projects.

*Vocalizations and Auditory Masking* -- Since many marine mammals rely on sound to find prey, moderate social interactions, and facilitate mating (Tyack, 2008), noise from anthropogenic sound sources can interfere with these functions, but only if the noise spectrum overlaps with the hearing sensitivity of the receiving marine mammal (Southall *et al*., 2007, Clark *et al*., 2009, Hatch *et al*., 2012). Chronic exposure to excessive, though not high-intensity, noise could cause masking at particular frequencies for marine mammals that utilize sound for vital biological functions (Clark *et al.*, 2009). Acoustic masking is when other noises such as from human sources interfere with an animal's ability to detect, recognize, or discriminate between acoustic signals of interest (*e.g.*, those used for intraspecific communication and social interactions, prey detection, predator avoidance, navigation) (Richardson *et al*., 1995, Erbe *et al*., 2016). Therefore, under certain circumstances, marine mammals whose acoustical sensors or environment are being severely masked could also be impaired from maximizing their performance fitness in survival and reproduction. 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 (Hotchkin and Parks, 2013).

Marine mammals vocalize for different purposes and across multiple modes, such as whistling, echolocation click production, calling, and singing. Changes in vocalization behavior in response to anthropogenic noise can occur for any of these modes and may result from a need to compete with an increase in background noise or may reflect increased vigilance or a startle response. For example, in the presence of potentially masking signals, humpback whales and killer whales have been observed to increase the length of their songs (Miller *et al*., 2000, Fristrup *et al*., 2003) or vocalizations (Foote *et al*., 2004), respectively, while North Atlantic right whales (*Eubalaena glacialis*) have been observed to shift the frequency content of their calls upward while reducing the rate of calling in areas of increased anthropogenic noise (Parks *et al*., 2007). Fin whales (*Balaenoptera physalus*) have also been documented lowering the bandwidth, peak frequency, and center frequency of their vocalizations under increased levels of background noise from large vessels (Castellote *et al*., 2012). Other alterations to communication signals have also been observed. For example, gray whales, in response to playback experiments exposing them to vessel noise, have been observed increasing their vocalization rate and producing louder signals at times of increased outboard engine noise (Dahlheim and Castellote, 2016). Alternatively, in some cases, animals may cease sound production during production of aversive signals (Bowles *et al*., 1994, Wisniewska *et al*., 2018).

Under certain circumstances, marine mammals experiencing significant masking could also be impaired from maximizing their performance fitness in survival and reproduction. Therefore, when the coincident (masking) sound is human-made, it may be considered harassment when disrupting or altering critical behaviors. It is important to distinguish TTS and PTS, which persist after the sound exposure, from masking, which occurs during the sound exposure. Because masking (without resulting in TS) is not associated with abnormal physiological function, it is not considered a physiological effect, but rather a potential behavioral effect (though not necessarily one that would be associated with harassment).

The frequency range of the potentially masking sound is important in determining any potential behavioral impacts. For example, low-frequency signals may have less effect on high-frequency echolocation sounds produced by odontocetes but are more likely to affect detection of mysticete communication calls and other potentially important natural sounds such as those produced by surf and some prey species. The masking of communication signals by anthropogenic noise may be considered as a reduction in the communication space of animals (*e.g.*, Clark *et al.*, 2009) and may result in energetic or other costs as animals change their vocalization behavior (*e.g.*, Miller *et al.*, 2000, Foote *et al.*, 2004, Parks *et al.*, 2007, Di Iorio and Clark, 2010, Holt *et al.*, 2009). Masking can be reduced in situations where the signal and noise come from different directions (Richardson *et al.*, 1995), through amplitude modulation of the signal, or through other compensatory behaviors, including modifications of the acoustic properties of the signal or the signaling behavior (Hotchkin and Parks, 2013). Masking can be tested directly in captive species (*e.g.*, Erbe, 2008), but in wild populations it must be either modeled or inferred from evidence of masking compensation. There are few studies addressing real-world masking sounds likely to be experienced by marine mammals in the wild (*e.g.*, Branstetter *et al.*, 2013).

Masking occurs in the frequency band that the animals utilize and is more likely to occur in the presence of broadband, relatively continuous noise sources such as vibratory pile driving. Energy distribution of vibratory pile driving sound covers a broad frequency spectrum, and is anticipated to be within the audible range of marine mammals present in the proposed action area. Since noises generated from the proposed construction activities are mostly concentrated at low frequencies (< 2 kHz), these activities likely have less effect on mid-frequency echolocation sounds produced by odontocetes (toothed whales). However, lower frequency noises are more likely to affect detection of communication calls and other potentially important natural sounds such as surf and prey noise. Low-frequency noise may also affect communication signals when they occur near the frequency band for noise and thus reduce the communication space of animals (*e.g.*, Clark *et al.*, 2009) and cause increased stress levels (*e.g.*, Holt *et al.*, 2009). Unlike TS, masking, which can occur over large temporal and spatial scales, can potentially affect the species at population, community, or even ecosystem levels, in addition to individual levels. Masking affects both senders and receivers of the signals, and at higher levels for longer durations, could have long-term chronic effects on marine mammal species and populations. However, the noise generated by the ADOT&PF's proposed activities will only occur intermittently, across an estimated 43 non-consecutive days (37 days of pile driving and DTH and 6 days of blasting) during Year 1 and 32 non-consecutive days during Year 2 in a relatively small area focused around the proposed construction site. Thus, while ADOT&PF's proposed activities may mask some acoustic signals that are relevant to the daily behavior of marine mammals, the short-term duration and limited areas affected make it very unlikely that the fitness of individual marine mammals would be impacted.

*Airborne Acoustic Effects* -- Pinnipeds that occur near the project site could be exposed to airborne sounds associated with construction activities that have the potential to cause behavioral harassment, depending on their distance from these activities. 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 airborne acoustic harassment criteria. 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 flush from haulouts, temporarily abandon the area, and or move further from the source. Cetaceans are not expected to be exposed to airborne sounds that would result in harassment as defined under the MMPA.

*Potential Effects on Marine Mammal Habitat*

ADOT&PF's proposed activities could have localized, temporary impacts on marine mammal habitat, including prey, by increasing in-water SPLs. Increased noise levels may affect acoustic habitat and adversely affect marine mammal prey in the vicinity of the project areas (see discussion below). Elevated levels of underwater noise would ensonify the project areas where both fishes and mammals occur and could affect foraging success. Additionally, marine mammals may avoid the area during the proposed construction activities; 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.

The total area likely impacted by ADOT&PF's activities is relatively small compared to the available habitat in southeast Alaska. Avoidance by potential prey (*i.e.*, fish) of the immediate area due to increased noise is possible. The duration of fish and marine mammal avoidance of this area after pile driving and blasting stops is unknown, but a rapid return to normal recruitment, distribution, and behavior is anticipated. Any behavioral avoidance by fish or marine mammals of the disturbed area would still leave significantly large areas of fish and marine mammal foraging habitat in the nearby vicinity.

The proposed project would occur within the same footprint as existing marine infrastructure. Ward Creek is a busy waterway, with cruise ships docking at the Ward Cove cruise ship dock in spring through summer, and seaplanes and other shoreside industrial activities occurring year-round. Temporary, intermittent, and short-term habitat alteration may result from increased noise levels during the proposed construction activities. Effects on marine mammal habitat would be limited to temporary pile installation and removal and blasting noise, and effects on prey species would be similarly limited in time and space.

*Water quality* – Temporary and localized reduction in water quality would occur as a result of in-water construction activities. Most of this effect would occur during the installation and removal of piles when bottom sediments are disturbed. The installation and removal of piles would disturb bottom sediments and may cause a temporary increase in suspended sediment in the project area. During pile extraction, sediment attached to the pile moves vertically through the water column until gravitational forces cause it to slough off under its own weight. The small resulting sediment plume is expected to 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).

Impacts to water quality from DTH are expected to be similar to those described for pile driving. Impacts to water quality would be localized and temporary and would have negligible impacts on marine mammal habitat. Drilling would have negligible impacts on water quality from sediment resuspension because the system would operate within a casing set into the bedrock. The drill would collect excavated material inside of the apparatus where it would be lifted to the surface and placed onto a barge for subsequent disposal. We expect impacts to water quality from blasting to be mild and brief because the blasting will occur on land at a sufficient distance from the water so as to introduce only minor amounts of sedimentation into the water.

Effects to turbidity and sedimentation are expected to be short-term, minor, and localized. 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, turbidity plumes 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 available marine mammal habitat in southeast Alaska.

*Potential Effects on Prey* -- Sound may affect marine mammals through impacts on the abundance, behavior, or distribution of prey species (*e.g.*, crustaceans, cephalopods, fishes, zooplankton). Marine mammal prey varies by species, season, and location and, for some, is not well documented. Studies regarding the effects of noise on known marine mammal prey are described here.

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

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

SPLs of sufficient strength have been known to cause injury to fishes 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 to 6 dB was recoverable within 24 hours for one species. Impacts would be most severe when the individual fish is close to the source and when the duration of exposure is long. Injury caused by barotrauma can range from slight to severe and can cause death, and is most likely for fish with swim bladders. Barotrauma injuries have been documented during controlled exposure to impact pile driving (Halvorsen *et al*., 2012a, Casper *et al*., 2013, 2017). Underwater explosive detonations have been known to cause injury and mortality to fish (Dahl *et al*., 2020). However, because the blasting proposed by ADOT&PF will occur on land, the SPLs are expected to be attenuated by land and would not be of sufficient levels to cause injury or death of fish.

Fish populations in the proposed project area that serve as marine mammal prey could be temporarily affected by noise from pile installation and removal. The frequency range in which fishes generally perceive underwater sounds is 50 to 2,000 Hz, with peak sensitivities below 800 Hz (Popper and Hastings, 2009). Fish behavior or distribution may change, especially with strong and/or intermittent sounds that could harm fishes. High underwater SPLs have been documented to alter behavior, cause hearing loss, and injure or kill individual fish by causing serious internal injury (Hastings and Popper, 2005).

Zooplankton is a food source for several marine mammal species, as well as a food source for fish that are then preyed upon by marine mammals. Population effects on zooplankton could have indirect effects on marine mammals. Data are limited on the effects of underwater sound on zooplankton species, particularly sound from construction (Erbe *et al.*, 2016). Popper and Hastings (2009) reviewed information on the effects of human-generated sound and concluded that no substantive data are available on whether the sound levels from pile driving, seismic activity, or any human-made sound would have physiological effects on invertebrates. Any such effects would be limited to the area very near (1 to 5 m) the sound source and would result in no population effects because of the relatively small area affected at any one time and the reproductive strategy of most zooplankton species (short generation, high fecundity, and very high natural mortality). No adverse impact on zooplankton populations is expected to occur from the specified activity due, in part, to large reproductive capacities and naturally high levels of predation and mortality of these populations. Any mortalities or impacts that might occur would be negligible.

The greatest potential impact to marine mammal prey during construction would occur during impact pile driving and DTH excavation. Vibratory pile driving would possibly elicit behavioral reactions from fishes such as temporary avoidance of the area but is unlikely to cause injuries to fishes or have persistent effects on local fish populations. Construction also would have minimal permanent and temporary impacts on benthic invertebrate species, a marine mammal prey source.

*Potential Effects on Foraging Habitat*

ADOT&PF's Ward Creek Bridge Replacement Project is not expected to result in any habitat-related effects that could cause significant or long-term negative consequences for individual marine mammals or their populations, since installation and removal of in-water piles would be temporary and intermittent. 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 outside this project area. In addition, although Southeast Alaska in its entirety is listed as a BIA for humpback whales (Wild *et al*., 2023), the proposed project area does not contain particularly high-value habitat and is not unusually important for this species or any of the other species potentially impacted by the ADOT&PFs activities. The area impacted by the project is relatively small compared to the available habitat just outside the project area, and there are no areas of particular importance that would be impacted by this project. Any behavioral avoidance by fish of the disturbed area would still leave significantly large areas of fish and marine mammal foraging habitat in the nearby vicinity. As described in the preceding, the potential for ADOT&PF's construction to affect the availability of prey to marine mammals or to meaningfully impact the quality of physical or acoustic habitat is considered to be insignificant. Therefore, impacts of the project are not likely to have adverse effects on marine mammal foraging habitat in the proposed project area.

In summary, given the relatively small areas being affected, as well as the temporary and mostly transitory nature of the proposed construction activities, any adverse effects from ADOT&PF's activities on prey habitat or prey populations are expected to be minor and temporary. The most likely impact to fishes at the project site would be temporary avoidance of the area. Any behavioral avoidance by fish of the disturbed area would still leave significantly large areas of fish and marine mammal foraging habitat in the nearby vicinity. Thus, we conclude that impacts of the specified activities 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 IHAs, 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 and explosive sources (*i.e.*, vibratory and impact pile driving and explosives) has the potential to result in disruption of behavioral patterns for individual marine mammals. There is also some potential for AUD INJ (Level A harassment) to result, primarily for mysticetes, very high frequency species, phocids, and otariids because predicted AUD INJ zones are larger than for high-frequency species. AUD INJ is unlikely to occur for high-frequency species. 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 there is some reasonable potential for marine mammals to be behaviorally harassed or incur some degree of AUD INJ; (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 AUD INJ of some degree (equated to Level A harassment). We note that the criteria for AUD INJ, 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 sound pressure levels (RMS SPL) of 120 dB (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. For in-air sounds, NMFS predicts that harbor seals exposed above received levels of 90 dB re 20 μPa (RMS) will be behaviorally harassed, and other pinnipeds will be harassed when exposed above 100 dB re 20 μPa (RMS). 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 construction includes the use of continuous (vibratory pile driving) and impulsive (impact pile driving and blasting) sources, and therefore the RMS SPL thresholds of 120 and 160 dB re 1 μPa are applicable. DTH systems have both continuous, non-impulsive, and impulsive components as discussed above in the *Description of Sound Sources for the Specified Activities* section. When evaluating Level B harassment, NMFS recommends treating DTH as a continuous source and applying the RMS SPL thresholds of 120 dB re 1 μPa.

*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 AUD INJ (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 construction includes the use of impulsive (impact pile driving and explosive) and non-impulsive (vibratory pile driving) sources. As described above, DTH includes both impulsive and non-impulsive characteristics. When evaluating Level A harassment, NMFS recommends treating DTH as an impulsive source.

The 2024 Updated Technical Guidance criteria include both updated thresholds and updated weighting functions for each hearing group. The thresholds are provided in table 5 below. 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 5 -- Thresholds Identifying the Onset of Auditory Injury**

| | AUD INJ 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 | *Cell 10* $L_{E,OW,24h}$: 199 dB |

| | | |
|---|---|---|
| | $L_{E,OW,24h}$: 185 dB | |
| * Dual metric criteria for impulsive sounds: Use whichever criteria results in the larger isopleth for calculating AUD INJ onset. If a non-impulsive sound has the potential of exceeding the peak (PK) SPL criteria associated with impulsive sounds, the PK SPL criteria are recommended for consideration for non-impulsive sources.<br><br>Note: Peak SPL ($L_{p,0\text{-}pk}$) has a reference value of 1 μPa, and weighted cumulative sound exposure level ($L_{E,p}$) has a reference value of 1 $\mu Pa^2s$. In this table, criteria are abbreviated to be more reflective of International Organization for Standardization standards (ISO, 2017). The subscript "flat" is being included to indicate peak sound pressure are flat weighted or unweighted within the generalized hearing range of marine mammals 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. | | |

*Explosive sources* – Based on the best available science, NMFS uses the acoustic and pressure thresholds indicated in table 6 to predict the onset of behavioral harassment, AUD INJ, and TTS.

For explosive activities using single detonations (*i.e.*, no more than one detonation within a day), such as those described in the proposed activity, NMFS uses TTS onset thresholds to assess the likelihood of behavioral harassment, rather than the Level B harassment threshold for multiple detonations indicated in the table. While marine mammals may also respond to single explosive detonations, these responses are expected to more typically be in the form of startle reaction, rather than a more meaningful disruption of a behavioral pattern. On the rare occasion that a single detonation might result in a behavioral response that qualifies as Level B harassment, it would be expected to be in response to a comparatively higher received level. Accordingly, NMFS considers the potential for these responses to be quantitatively accounted for through the application of the TTS criteria, which, as noted above, is 5 dB higher than the behavioral harassment threshold for multiple explosives.

**Table 6 -- Explosive Thresholds for Marine Mammals for AUD INJ, TTS, and Behavior (Multiple Detonations)**

| Hearing Group | AUD INJ Impulsive Threshold* | TTS Impulsive Threshold* | Behavioral Threshold (multiple detonations) |
|---|---|---|---|
| Low-Frequency (LF) Cetaceans | *Cell 1* $L_{pk,flat}$: 222 dB $L_{E,LF,24h}$: 183 dB | *Cell 2* $L_{pk,flat}$: 216 dB $L_{E,LF,24h}$: 168 dB | *Cell 3* $L_{E,LF,24h}$: 163 dB |
| High-Frequency (HF) Cetaceans | *Cell 4* $L_{pk,flat}$: 230 dB $L_{E,HF,24h}$: 193 dB | *Cell 5* $L_{pk,flat}$: 224 dB $L_{E,HF,24h}$: 178 dB | *Cell 6* $L_{E,HF,24h}$: 173 dB |
| Very High-Frequency (VHF) Cetaceans | *Cell 7* $L_{pk,flat}$: 202 dB $L_{E,VHF,24h}$: 159 dB | *Cell 8* $L_{pk,flat}$: 196 dB $L_{E,VHF,24h}$: 144 dB | *Cell 9* $L_{E,VHF,24h}$: 139 dB |
| Phocid Pinnipeds (PW) (Underwater) | *Cell 10* $L_{pk,flat}$: 223 dB $L_{E,PW,24h}$: 183 dB | *Cell 11* $L_{pk,flat}$: 217 dB $L_{E,PW,24h}$: 168 dB | *Cell 12* $L_{E,PW,24h}$: 163 dB |
| Otariid Pinnipeds (OW) (Underwater) | *Cell 13* $L_{pk,flat}$: 230 dB $L_{E,OW,24h}$: 185 dB | *Cell 14* $L_{pk,flat}$: 224 dB $L_{E,OW,24h}$: 170 dB | *Cell 15* $L_{E,OW,24h}$: 165 dB |

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

**Note:** Peak SPL ($L_{p,0\text{-}pk}$) has a reference value of 1 µPa, and weighted cumulative sound exposure level ($L_{E,p}$) has a reference value of 1 µPa$^2$s. In this table, criteria are abbreviated to be more reflective of International Organization for Standardization 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 project area is the existing background noise plus additional construction noise from the proposed project. Marine mammals are expected to be affected via sound generated by the primary components of the project (*i.e.*, pile driving and explosives).

Pile Driving and DTH

The project includes vibratory pile installation and removal, impact pile installation, and DTH installation. 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 pile size and activity are presented in table 7. Source levels for vibratory installation and removal of piles of the same diameter are assumed to be the same.

**Table 7 -- Sound Source Levels for Pile Driving and DTH**

| Pile Size and Type | Source level (at 10 m) | | | Reference |
|---|---|---|---|---|
| | Peak (dB re 1 µPa) | RMS (dB re 1 µPa) | SEL (dB re 1 µPa2 sec) | |
| Vibratory | | | | |
| 18-inch steel shell piles | N/A | N/A | 163 | U.S. Navy (2012, 2013), Miner (2020)* |
| 24-inch steel shell piles | N/A | N/A | 163 | U.S. Navy (2012, 2013), Miner (2020)* |
| 36-inch steel shell pile | N/A | N/A | 166 | U.S. Navy (2012, 2013), Sexton (2007), Laughlin (2011, 2017), Miner (2020)* |
| Impact | | | | |
| 24-inch steel shell piles | 203 | 190 | 177 | Caltrans (2015) |
| 36-inch steel shell piles | 210 | 193 | 183 | Caltrans (2015, 2020) |
| DTH | | | | |
| 36-inch steel shell pile | 194 | 174 | 164 | Denes *et al*. (2019), Reyff and Heyvaert (2019), Reyff (2020) |

*Methodology followed Navy (2015) and included available data from Puget Sound, WA and Southern Alaska.

DTH systems have both continuous, non-impulsive, and impulsive components. When evaluating Level B harassment, NMFS recommends treating DTH as a continuous source and applying RMS SPL thresholds of 120 dB re 1 μPa, and when evaluating Level A harassment, NMFS recommends treating DTH as an impulsive source (NMFS, 2022).

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 transmission loss, a practical spreading value of 15 is used as the transmission loss coefficient in the above formula. Project and site-specific transmission loss data for Ward Cove are not available; therefore, the default coefficient of 15 is used to determine the distances to the Level A 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 such as vibratory and impact pile driving and DTH, 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 AUD INJ. Inputs used in the optional User Spreadsheet tool (table 8), and the resulting estimated isopleths, are reported below. User Spreadsheet inputs are the same for Year 1 and Year 2 except for the number of piles per day for vibratory installation of 18-inch steel shell piles (see table 8). Level A and Level B harassment isopleths for pile driving and DTH are provided in table 9. We note that some of the isopleths will be truncated by land. Therefore, the furthest we expect underwater sound to extend due to ADOT&PF's proposed construction is approximately 4,000 m (see ADOT&PF's application for a visual depiction).

**Table 8 -- User Spreadsheet Input Parameters Used for Calculating Level A Harassment Isopleths for Pile Driving and DTH**

| Pile type/size | Piles per day | Duration (minutes) | Strikes per pile | Strikes per second | Weighting Factor Adjustment (kHz) |
|---|---|---|---|---|---|
| Vibratory | | | | | |
| 18-inch steel shell | 2 (Year 1), 6 (Year 2) | 60 | N/A | N/A | 2.5 |
| 24-inch steel shell | 6 | 60 | N/A | N/A | 2.5 |
| 36-inch steel shell | 1 | 60 | N/A | N/A | 2.5 |
| Impact | | | | | |
| 24-inch steel shell | 6 | N/A | 100 | N/A | 2 |
| 36-inch steel shell | 1 | N/A | 1,000 | N/A | 2 |
| DTH | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| 36-inch steel shell | 1 | 480 | N/A | 12 | 2 |

**Table 9 -- Calculated Distances to Level A and Level B Harassment Isopleths for Pile Driving and DTH**

| Pile Type/Size | Level A Harassment zones (m) | | | | | Level B Harassment Zone (m) |
|---|---|---|---|---|---|---|
| | LF | HF | VHF | PW | OW | |
| Vibratory | | | | | | |
| 18-inch steel shell (Year 1) | 20 | 8 | 16 | 26 | 9 | 7,356* |
| 18-inch steel shell (Year 2) | 41 | 16 | 34 | 53 | 18 | 7,356* |
| 24-inch steel shell | 41 | 16 | 34 | 53 | 18 | 7,356* |
| 36-inch steel shell | 20 | 8 | 16 | 26 | 9 | 11,659* |
| Impact | | | | | | |
| 24-inch steel shell | 282 | 36 | 436 | 250 | 93 | 1,000 |
| 36-inch steel shell | 995 | 127 | 1,540 | 884 | 330 | 1,585 |
| DTH | | | | | | |
| 36-inch steel shell | 2,652 | 338 | 4,104* | 2,356 | 878 | 39,811* |

*Isopleth is truncated by land at approximately 4,000 m.

Blasting

Estimation of ranges to underwater Level A and Level B harassment isopleths from blasting assumed a total of 104 discrete explosive charges ranging from 90-300 pounds NEW. Detonation of these charges occur in rapid succession such that they are assumed to comprise a single explosive or blast event that would together only occur once per 24 hour period. However, the delay between detonations (8.5-100 milliseconds) is designed such that no two charges would produce primary pressure waves (*i.e.*, the short lived initial shock wave) that would overlap directly in space and time. Therefore the peak pressure would be that of the largest single charge. For SEL, energy is accumulated based on the number of charge delays. As the blasting is occurring on land, distance to the shoreline is a critical parameter, and two scenarios were analyzed here: distances of 33 m and 110 m from shore. The general procedure consisted of several steps: determine the peak overpressure at the water/land interface, convert that overpressure to PK SPL and SEL, apply single frequency weighting factor adjustments to produce auditory injury weighted SEL for each hearing group, and finally propagate both PK SPL and weighted SEL to the NMFS 2024 thresholds for explosives.

Underwater peak overpressures at the water/land interface were estimated using the empirical relationship from Dunlap (2009), which was derived from field measurements of blasting of bridges and culverts near or in fish streams in the Tongass National Forest in Alaska. This model is used in lieu of the commonly cited equations from Wright and Hopky (1998) based on the similarity of the activities measured in Dunlap (2009), as well as better agreement of the model with other measurements which are also representative of these circumstances, (*e.g.*, Laughlin, 2017)). The empirical equation for peak pressure is provided in figure 2.5 of Dunlap (2009).

To convert from PK SPL to SEL, an empirical relationship was derived from the measurements and empirical relationships observed in Soloway and Dahl (2014), Laughlin (2017), Dunlap (2009), and Robinson *et al*. (2022). This relationship results in a range-dependent adjustment factor in dB which approximates the difference between PK SPL and SEL and is approximately equal to 24 dB + 3.4 log10(r/250 m), where r is the range in meters. Based on the equation from Dunlap (2009) for peak overpressure, as well as the relationship between PK SPL and SEL, sound level metrics at the shoreline can be computed for the nearest distances from shoreline indicated in the application (*i.e.*, 33m and 110 m). The PK SPL for distances to the shoreline of 33 m and 110 m are 203.5 and 187.8 dB re 1 uPa $m^2$, respectively. The cumulative SEL for the entire events are 194.5 and 178.7 dB 1 $uPa^2s$ $m^2$ for 33 and 110 m, respectively.

Before comparing the resulting SEL sound field to the appropriate thresholds, the NMFS (2024) auditory injury weighting functions are used to compute adjustment factors using a single frequency approximation of 1 kHz, which is similar to what is commonly done for pile driving. The choice of 1 kHz is based on the measurements of Laughlin (2017), which show that the spectrum has almost no energy at high frequencies (greater than approximately 600 Hz). Propagation is handled via spherical spreading but considers the impact of the water/rock interface assuming normal incidence and was based on the methodology in Waters (1972). For more details about methodology, see appendix C in ADOT&PF's application. See table 10 for the calculated underwater Level A and Level B harassment zones for blasting.

**Table 10 -- Underwater Level A and Level B Harassment Zones for Blasting**

| Activity | LF | HF | VHF | Phocids | Otariids |
|---|---|---|---|---|---|
| Level A Harassment Zones (m) | | | | | |
| Blasting, 33 m from shore | 285 | 1 | 21 | 158 | 1 |
| Blasting, 110 m from shore | 1 | 1 | 1 | 1 | 1 |
| Level B Harassment Zones (m) | | | | | |
| Blasting, 33 m from shore | 3,162 | 138 | 719 | 1,967 | 324 |
| Blasting, 110 m from shore | 1,152 | 1 | 35 | 572 | 1 |

For in-air impacts to pinnipeds, many of the above assumptions were the same including the size and number of explosives, that the peak pressure would be that of a largest single charge delay, and that SEL is cumulative based on the number of charges. Peak sound pressure was estimated using measurements from a proxy project (KTN Wolfe Point Project; Breeds and Ahlfinger, 2025) with similar blasting conditions. By plotting data from 20 previous blasts, the common scaled range formula was used to create an empirical model to predict the peak sound level based on the distance from the blast and the weight of the explosive. This formula was adjusted for agreement with the loudest singular blast and to follow a range dependence consistent with spherical spreading. In order to estimate RMS SPL and SEL, which were not reported in the proxy data, sound signatures were digitized from the Wolfe Point project to find a reliable conversion rate. It was determined that RMS can be estimated by subtracting 10 dB from the peak pressure, and SEL can be estimated by subtracting 13 dB. This conversion methodology was found to be either consistent with or conservative based on a comparison with similar data from Sharp and Yule (1998). Based on this methodology, distances to in-air Level A and Level B harassment thresholds for pinnipeds were determined. Calculated in-air Level A and Level B harassment isopleths for ADOT&PF's proposed blasting activities can be found in tables table 11 and table 12. We note that the isopleths in tables 11 and 12 represent both the distance from the explosives and from the shoreline. For purposes of determining shutdown zones, monitoring areas, and estimation of take, the distance from shoreline was used.

Notably, the distances to in-air Level B harassment for pinnipeds extend to approximately 16.5 km for harbor seals and more than 5 km for other pinnipeds. To understand the likelihood of in-air noise propagating over this distance, radiosonde data (*i.e.*, temperature and humidity) near the proposed project site was obtained via the National Centers for Environmental Information integrated Global Radiosonde Archive (Durre *et al*., 2018), in order to construct vertical sound speed profiles. The data showed that it is reasonable to expect upward refracting conditions, with the sound speed decreasing from approximately 337 m/s, at the surface, to approximately 300 m/s at an altitude of approximately 10 km, depending on the time of year. This indicates that the only sound likely to propagate significant distances horizontally (*e.g*., 16.5 km), will be propagating very near the horizon. Because the terrain near the project site is surrounded in most directions with significant terrain and vegetation, and because of the upward refracting propagation conditions, it is unlikely that the in-air noise will propagate long distances, with the exception of the direction towards open water (*i.e.* south-west). For this reason, the isopleths for in-air behavioral disturbance are expected to be truncated by the land at Gravina Island (approximately 4,000 m from the blasting sites).

**Table 11 -- Calculated In-Air Level A Harassment Isopleths for Blasting (m)**

| Activity | Phocids | | Otariids | |
|---|---|---|---|---|
| | Distance from Blasting (m) | Distance from Shoreline (m) | Distance from Blasting (m) | Distance from Shoreline (m) |
| Blasting, 33 m from shoreline | 257 | 224 | 18 | 0 |
| Blasting, 110 m from shoreline | 257 | 147 | 18 | 0 |

**Table 12 -- Calculated In-Air Level B Harassment Isopleths for Blasting (m)***

| Activity | Harbor seals | | Other pinnipeds | |
|---|---|---|---|---|
| | Distance from Blasting (m) | Distance from Shoreline (m) | Distance from Blasting (m) | Distance from Shoreline (m) |
| Blasting, 33 m from shoreline | 16,511 | 16,478 | 5,221 | 5,188 |
| Blasting, 110 m from shoreline | 16,511 | 16,401 | 5,221 | 5,111 |

*Isopleths are truncated by land at approximately 4,000 m.

*Marine Mammal Occurrence*

In this section we provide information about the occurrence of marine mammals, including density or other relevant information which will inform the take calculations.

Marine mammal density information is not available for ADOT&PF's proposed project area. ADOT&PF used monitoring data from the Ward Cove Cruise Ship Dock Project (Power Systems & Supplies of Alaska, 2020) and the Tongass Narrows Ferry Berth Improvement Project (ADOT&PF, 2021, 2022, 2023a, 2023b) to estimate occurrence of marine mammals in the project area. ADOT&PF estimated group size based on this monitoring data and data from Dahlheim *et al*. 2009. For marine mammals that are considered relatively common in the area, daily occurrence was used, and for marine mammals that are expected to be less common, weekly or monthly occurrence was used.

Humpback whales

Sightings of humpback whales in Tongass Narrows are common (Solstice Alaska Consulting, 2025), however, they are uncommon in Ward Cove itself. During the Ward Cove Cruise Ship Dock Project, which is approximately 800 m from the Ward Creek Bridge, 42 individuals were observed over 18 days of in-water work from February to September. Group sizes ranged from single whales to pods of up to six animals (Power Systems & Supplies of Alaska, 2020). None of the whales entered Ward Cove but passed by in Tongass Narrows. During the Tongass Narrows Ferry Berth Improvements Project, which was conducted from October 2020 to April 2023, a total of 160 humpback whales were documented in Tongass Narrows, 9 of which were observed entering Ward Cove during the months of November and December (ADOT&PF, 2021, 2022, 2023a, 2023b). Humpback whales were most commonly observed as single whales or in pairs. ADOT&PF therefore conservatively assumes two whales per group and one group per day, and NMFS concurs.

Killer whales

Two groups of killer whales, one consisting of two individuals and one group consisting of five individuals, were observed during the Ward Cove Cruise Ship Dock Project, from February to September 2020 (Power Systems & Supplies of Alaska, 2020). During monitoring efforts over approximately 3 years for the Tongass Narrows Ferry Berth Improvements Project, a total of 132 killer whales were observed in pods ranging from 2-8 individuals. Killer whales are observed in southeast Alaska during all months of the year but are most common in the summer (Solstice Alaska Consulting, 2025).

ADOT&PF assumes seven whales per group and that four groups will occur per month of construction, and NMFS concurs.

Dall's porpoise

Dall's porpoises are not expected in Ward Cove based on their preference for deeper waters. However, ADOT&PF expects they would be present in Tongass Narrows during construction. A pod of three individuals and a pod of five individuals were documented traveling through Tongass Narrows in the spring of 2020 during the Ward Cove Cruise Ship Dock Project (Power Systems & Supplies of Alaska, 2020). Over approximately 3 years of monitoring for the Tongass Narrows Ferry Berth Improvement Project, 113 Dall's porpoises were sighted, ranging in groups of 2-13 individuals, although most commonly in groups of 2-6 animals (ADOT&PF, 2021, 2022, 2023a, 2023b). ADOT&PF conservatively assumes a group of six animals and one group per month, and NMFS concurs.

Harbor porpoise

During monitoring efforts for the Ward Cove Cruise Ship Dock Project, a total of 15 harbor porpoises were sighted, as individuals or in a pod up to 10 individuals (Power Systems & Supplies of Alaska, 2020). During the monitoring efforts for the Tongass Narrows Ferry Berth Improvements Project, 64 harbor porpoises were observed during in-water work, as individuals and in groups of up to 11 animals (ADOT&PF, 2021, 2022, 2023a, 2023b), but harbor porpoises are most commonly seen as groups of 3 to 5 animals. ADOT&PF estimates one group of four harbor porpoises per month, and NMFS concurs.

Harbor seal

Harbor seals are a common species in and around Ward Cove and Tongass Narrows. During the monitoring efforts for the Ward Cove Cruise Ship Dock Project, a total of 271 individuals were sighted as individuals, pairs, or groups of 3 (Power Systems & Supplies of Alaska, 2020). During the Tongass Narrows Ferry Berth Improvements

Project, harbor seals were sighted on most days of in-water work, with group sizes ranging from one to seven animals. Several sightings occurred within 15 to 30 m from the ferry dock construction (ADOT&PF, 2021, 2022, 2023a, 2023b). Based on this information, ADOT&PF expects two groups of five harbor seals per day of construction, and NMFS concurs. A group of 9-13 harbor seals has been documented on a dock in Ward Cove (the only known harbor seal haulout in Ward Cove), approximately 1 km from Ward Creek Bridge (Solstice Alaska Consulting, 2025). This haulout is not regularly occupied each day, and ADOT&PF therefore assumes 1 group of 13 harbor seals will be present on the haulout per week in order to take into account the potential for take from in-air blasting, and NMFS concurs.

Northern Elephant Seal

Sightings of northern elephant seals are uncommon in Tongass Narrows but have been increasing in recent years (Solstice Alaska Consulting, 2025). During monitoring efforts for the Tongass Narrows Ferry Berth Improvement project, one elephant seal was documented in April 2022 and one individual was seen in September 2022 (ADOT&PF, 2023b). No northern elephant seals were observed during the Ward Cove Improvement Project (Power Systems & Supplies of Alaska, 2020). ADOT&PF expects one individual northern elephant seal per month of construction, and NMFS concurs. There are no known northern elephant seal haulouts within the in-air Level B harassment isopleths from blasting.

Steller sea lion

Steller sea lions are considered common in the area around Ward Cove and Tongass Narrows. During the Ward Cove Cruise Ship Project, 181 Steller sea lions were observed over 44 separate days during the 98 days of monitoring. Observations were mostly of individuals and pairs, but larger groups of up to 10 individuals were seen (Power Systems & Supplies of Alaska, 2020). During monitoring for the Tongass

Narrows Ferry Berth Improvements, 599 Steller sea lions were observed over 86 days of monitoring, mostly as individuals, but occasionally in groups of up to 5 animals (ADOT&PF, 2021, 2022, 2023a, 2023b). ADOT&PF expects two groups per day, with two sea lions per group. The nearest known Steller sea lion haulout is approximately 25 km northwest of the project area, outside of the Level B harassment isopleth from blasting.

*Take Estimation*

Here we describe how the information provided above is synthesized to produce a quantitative estimate of the take that is considered likely to occur and proposed for authorization.

Level B Harassment Take Estimation

The method for take calculation was the same for Years 1 and 2, except that blasting was not used in the calculations for Year 2 since blasting is planned only for Year 1. For all species, Level B harassment estimates were calculated using the estimated marine mammal occurrence (as described in the *Marine Mammal Occurrence* section) multiplied by the estimated number of days of pile driving and DTH. For humpback whales, harbor seals, northern elephant seal, and Steller sea lion the daily occurrence was also multiplied by the number of estimated blasting days for Year 1. Blasting was not used to calculate take by Level B harassment for killer whales, Dall's porpoises, and harbor porpoises. For these species (HF and VHF species), the Level B harassment isopleths are well within Ward Cove (see table 10), and these species are generally expected to stay in Tongass Narrows and not enter into Ward Cove.

When calculating Level B harassment from blasting for harbor seals, we took into account both in-water and in-air take, as there is a known haulout in Ward Cove, about 1 km from Ward Creek Bridge. When calculating Level B harassment from blasting for Steller sea lions and northern elephant seals, we assume that take could be from either in-air or in-water noise, but base our estimates solely on the larger in-air isopleths for these species, which adequately accounts for all likely takes.

As described above, the estimated in-air Level B harassment isopleth for blasting is approximately 16.5 km, however, this sound would be truncated by land and the local topography. Although there are known harbor seal haulouts along the northwestern aspect of Gravina Island, approximately 9 km and 10.5 km from Ward Creek Bridge, because of the truncation of sound, we do not expect the Level B harassment isopleth to reach these haulouts. We, therefore, did not account for these haulouts when conducting take calculations for harbor seals.

In Year 1, we expect 37 days of pile driving and 6 days of blasting, assuming 3 days of blasting at each site. For Year 2, we expect 32 days of pile driving. We note here that when a monthly occurrence is assumed, we assume a month is 30 days. See table 13 and table 14 for Level B harassment estimates for Years 1 and 2.

**Table 13 -- Level B Harassment Take Estimations for Year 1**

| Species | Activity | Estimated Group Size | Group Occurrence | # of Days | # Calculated | # Proposed |
|---|---|---|---|---|---|---|
| Humpback whale | Pile driving/DTH | 2 | 1 group/day | 37 | 74 | 74 |
| | Blasting | 2 | 1 group/day | 6 | 12 | 12 |
| Killer whale | Pile driving/DTH | 7 | 4 groups/month | 37 (1.23 months) | 34.5 | 35 |
| Dall's porpoise | Pile driving/DTH | 6 | 1 group/month | 37 (1.23 months) | 7.4 | 7 |
| Harbor porpoise | Pile driving/DTH | 4 | 1 group/month | 37 (1.23 months) | 4.9 | 5 |
| Steller sea lion | Pile driving/DTH | 2 | 2 groups/day | 37 | 148 | 148 |
| | Blasting | 2 | 2 groups/day | 6 | 24 | 24 |
| Harbor seal | Pile driving/DTH | 5 | 2 groups/day | 37 | 370 | 370 |
| | Blasting | 5[a] | 2 groups/day | 6 | 60 | 60 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | Blasting | 13 (per haulout)[b] | 1 group/week | 6 | 11.1 | 11 |
| Northern elephant seal | Pile driving/DTH | 1 | 1 group/month | 37 (1.23 months) | 1.2 | 1 |
| | Blasting | 1 | 1 group/month | 6 (0.2 months) | 0.2 | 0 |

[a]This number accounts for in-water Level B harassment takes of harbor seals during blasting.
[b]This number accounts for in-air Level B harassment takes of harbor seals during blasting.

**Table 14 -- Level B Harassment Take Estimations for Year 2**

| Species | Activity | Estimated Group Size | Group Occurrence | # of Days | # Calculated | # Proposed |
|---|---|---|---|---|---|---|
| Humpback whale | Pile driving/DTH | 2 | 1 group/day | 32 | 64 | 64 |
| Killer whale | Pile driving/DTH | 7 | 4 groups/month | 32 (1.06 months) | 29.7 | 30 |
| Dall's porpoise | Pile driving/DTH | 6 | 1 group/month | 32 (1.06 months) | 6.4 | 6 |
| Harbor porpoise | Pile driving/DTH | 4 | 1 group/month | 32 (1.06 months) | 4.2 | 4 |
| Steller sea lion | Pile driving/DTH | 2 | 2 groups/day | 32 | 128 | 128 |
| Harbor seal | Pile driving/DTH | 5 | 2 groups/day | 32 | 320 | 320 |
| Northern elephant seal | Pile driving/DTH | 1 | 1 group/month | 32 (1.06 months) | 1.06 | 1 |

Level A Harassment Take Estimation

Level A harassment is considered likely and is proposed for authorization for humpback whale, Dall's porpoise, harbor porpoise, harbor seal, northern elephant seal, and Steller sea lion. Level A harassment is not proposed for killer whales.

The method for estimating take due to Level A harassment is similar to that for Level B harassment, as described above, using the same estimated marine mammal occurrence and group size. However, for Level A harassment we only take into account the number of days in which the Level A harassment isopleth is greater than the shutdown zone (impact pile driving, DTH, and blasting, depending on the species). For humpback whales, we use number of days of DTH; for VHF cetaceans we use DTH and impact pile driving days; for Steller sea lion we use number of days of DTH and impact pile driving of 36-inch piles; and for phocids we use days for DTH, all impact pile driving, and blasting. Table 15 presents the estimated number of days of each of these activities for both Year 1 and Year 2. Table 16 and table 17 present the calculated and proposed numbers of Level A harassment takes for Years 1 and 2, respectively.

**Table 15 -- Estimated Number of Days of Impact Pile Driving, DTH, and Blasting for Years 1 and 2**

| Activity | Estimated Number of Days | |
|---|---|---|
| | Year 1 | Year 2 |
| Impact Pile Driving of 24-inch piles | 4 | 4 |
| Impact Pile Driving of 36-inch piles | 8 | 6 |
| DTH | 8 | 6 |
| Blasting | 6 | 0 |

**Table 16 -- Estimated Takes by Level A Harassment for Year 1**

| Species | Activity | Estimated Group Size | Group Occurrence | # of Days | # Calculated | # Proposed |
|---|---|---|---|---|---|---|
| Humpback whale | DTH | 2 | 1 group/day | 8 | 16 | 16 |
| Dall's porpoise | Impact pile driving and DTH | 6 | 1 group/month | 20 days (0.67 months) | 4 | 4 |
| Harbor porpoise | Impact pile driving and DTH | 4 | 1 group/month | 20 days (0.67 months) | 2.7 | 3 |
| Steller sea lion | Impact Pile Driving of 36-inch piles and DTH | 2 | 2 groups/day | 16 | 64 | 64 |
| Harbor seal | Impact pile driving and DTH | 5 | 2 groups/day | 20 | 200 | 200 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | Blasting | 5 | 2 groups/day | 6 | 60 | 60 |
| Northern elephant seal | Impact pile driving and DTH | 1 | 1 group/month | 20 days (0.67 months) | 0.7 | 1 |
| | Blasting | 1 | 1 group/month | 6 days (0.2 months) | 0.2 | 0 |

**Table 17 -- Estimated Takes by Level A Harassment for Year 2**

| Species | Activity | Estimated Group Size | Group Occurrence | # of Days | # Calculated | # Proposed |
|---|---|---|---|---|---|---|
| Humpback whale | DTH | 2 | 1 group/day | 6 | 12 | 12 |
| Dall's porpoise | Impact pile driving and DTH | 6 | 1 group/month | 16 (0.53 months) | 3.2 | 3 |
| Harbor porpoise | Impact pile driving and DTH | 4 | 1 group/month | 16 (0.53 months) | 2.1 | 2 |
| Steller sea lion | Impact Pile Driving of 36-inch piles and DTH | 2 | 2 groups/day | 12 | 48 | 48 |
| Harbor seal | Impact pile driving and DTH | 5 | 2 groups/day | 16 | 160 | 160 |
| Northern elephant seal | Impact pile driving and DTH | 1 | 1 group/month | 16 (0.53 months) | 0.5 | 1 |

See table 18 and table 19 for total numbers of takes proposed for each species and stock for Year 1 and Year 2, respectively. When attributing take to respective humpback whale stocks, NMFS assumed that 98 percent of total calculated take would be from the Hawai'i stock and 2 percent would be from the Mexico-North Pacific stock, as described in Wade (2021).

**Table 18 – Year 1 Take Proposed for Authorization as a Percentage of Stock Abundance**

| Species | Stock | Stock Abundance | Estimated Takes by Level B Harassment | Estimated Takes by Level A Harassment | Total Instances of Take | Percent of Stock |
|---|---|---|---|---|---|---|
| Humpback whale | Hawai'i | 11,278 | 84 | 16 | 100 | 0.9 |
| | Mexico-North Pacific | UND | 2 | 0 | 2 | N/A[a] |
| Killer whale[b] | Eastern North Pacific Alaska Resident | 1,920 | | | | 1.8 |
| | Eastern Northern Pacific Northern Resident | 302 | 35 | 0 | 35 | 11.6 |
| | West Coast Transient | 349 | | | | 10 |
| Dall's porpoise | Alaska | UND | 7 | 4 | 11 | N/A[a] |
| Harbor porpoise | Southern Southeast Alaska Inland Waters | 890 | 5 | 3 | 8 | 0.9 |
| Steller sea lion | Eastern | 36,308 | 172 | 64 | 236 | 0.6 |
| Harbor seal | Clarence Strait | 27,659 | 441 | 260 | 701 | 2.5 |
| Northern elephant seal | California Breeding | 187,386 | 1 | 1 | 2 | <0.1 |

[a] See small numbers discussion below for additional information.
[b] Scientific data is not available to determine the likelihood of each killer whale stock in ADOT&PF's proposed project area, and the stocks cannot be differentiated in the field. When calculating the percentage of stock, we conservatively attribute the total proposed instances of take to each killer whale stock.

**Table 19 -- Year 2 Take Proposed for Authorization as a Percentage of Stock Abundance**

| Species | Stock | Stock Abundance | Estimated Takes by Level B Harassment | Estimated Takes by Level A Harassment | Total Instances of Take | Percent of Stock |
|---|---|---|---|---|---|---|

| | | | | | | |
|---|---|---|---|---|---|---|
| Humpback whale | Hawai'i | 11,278 | 62 | 12 | 74 | 0.7 |
| | Mexico-North Pacific | UND | 2 | 0 | 2 | N/A[a] |
| Killer whale [b] | Eastern North Pacific Alaska Resident | 1,920 | 30 | 0 | 30 | 1.6 |
| | Eastern Northern Pacific Northern Resident | 302 | | | | 9.9 |
| | West Coast Transient | 349 | | | | 8.6 |
| Dall's porpoise | Alaska | UND | 6 | 3 | 9 | N/A[a] |
| Harbor porpoise | Southern Southeast Alaska Inland Waters | 890 | 4 | 2 | 6 | 0.7 |
| Steller sea lion | Eastern | 36,308 | 128 | 48 | 176 | 0.5 |
| Harbor seal | Clarence Strait | 27,659 | 320 | 160 | 480 | 1.7 |
| Northern elephant seal | California Breeding | 187,386 | 1 | 1 | 2 | <0.1 |

[a] See small numbers discussion below for additional information.
[b] Scientific data is not available to determine the likelihood of each killer whale stock in ADOT&PF's proposed project area, and the stocks cannot be differentiated in the field. When calculating the percentage of stock, we conservatively attribute the total proposed instances of take to each killer whale 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 requirements described in the following were proposed by ADOT&PF in its adequate and complete application or are the result of subsequent coordination between NMFS and ADOT&PF. ADOT&PF has agreed that all of the mitigation measures are practicable. NMFS has fully reviewed the specified activities and the mitigation measures to determine if the mitigation measures would result in the least practicable adverse impact on marine mammals and their habitat, as required by the MMPA, and has determined the proposed measures are appropriate. NMFS describes these below as proposed mitigation requirements and has included them in the proposed IHA.

In addition to the measures described later in this section, ADOT&PF would follow these general mitigation measures:

- Authorized take, by Level A and Level B harassment only, would be limited to the species and numbers listed in table 18 and table 19 for Years 1 and 2, respectively. Construction activities must be halted upon observation of either a species for which incidental take is not authorized or a species for which incidental take has been authorized but the authorized number of takes has been met, entering, or is within the harassment zone.
- The taking by serious injury or death of any of the species listed in table 18 and table 19 or any taking of any other species of marine mammal would be prohibited and would result in the modification, suspension, or revocation of the IHA, if issued. Any taking exceeding the authorized amounts listed in table 18 during Year 1 or table 19 during Year 2 would be prohibited and would result in the modification, suspension, or revocation of the IHA, if issued.
- Ensure that construction supervisors and crew, the marine mammal monitoring team, and relevant ADOT&PF staff are trained prior to the start of all construction activities, so that responsibilities, communication procedures, marine mammal monitoring protocol, and operational procedures are clearly understood. New personnel joining during the project must be trained prior to commencing work;
- ADOT&PF, construction supervisors and crews, protected species observers (PSOs), and relevant ADOT&PF staff must avoid direct physical interaction with marine mammals during construction activity. If a marine mammal comes within 10 m of such activity, operations must cease and vessels must reduce speed to the minimum level required to maintain steerage and safe working conditions, as necessary to avoid direct physical interaction.

- Employ PSOs and establish monitoring location as described in ADOT&PF's Marine Mammal Monitoring and Mitigation Plan (see appendix B of ADOT&PF's application). ADOT&PF must monitor the project area to the maximum extent possible based on the required number of PSOs, required monitoring locations, and environmental conditions;
- ADOT&PF also would abide by the reasonable and prudent measures and terms and conditions of a Biological Opinion and Incidental Take Statement if issued by NMFS pursuant to Section 7 of the ESA.

Additionally, the following mitigation measures apply to ADOT&PF's in-water construction and on-land blasting activities.

*Establishment of Shutdown and Clearance Zones*

ADOT&PF would establish shutdown zones with radial distances as identified in table 20 for all pile driving and DTH activities. 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 mammal (or in anticipation of an animal entering the defined area). The shutdown zones vary by activity type and marine mammal hearing group and are generally based on the estimated Level A harassment zones and distances at which PSOs would be able to observe relevant species. ADOT&PF has proposed a maximum shutdown zone of 55 m for phocids due to the frequency of sightings of harbor seal in Ward Cove. ADOT&PF has determined that a larger shutdown zone would require a frequency of shutdown that would result in significant delays, rendering the larger zones not practicable, and NMFS concurs. If a marine mammal is observed entering or within the shutdown zones indicated in table 20, pile driving and DTH activity must be delayed or halted. If pile driving or DTH activity is delayed or halted due to the presence of a marine mammal, the activity may not commence or resume until either the animal has voluntarily exited and been visually confirmed beyond the shutdown zones or 15 minutes have passed without re-detection of the animal. If a marine mammal comes within or approaches the shutdown zone indicated in table 20, such operations must cease. Shutdown zones would vary based on the activity type and marine mammal hearing group. Shutdown zones are the same in both Year 1 and Year 2, with the exception of vibratory installation and removal of 18-inch steel shell piles (see table 20).

**Table 20 -- Proposed Shutdown Zones (m) During Pile Driving and DTH***

| Pile Size/Type | LF | HF | VHF | PW | OW |
|---|---|---|---|---|---|
| Vibratory | | | | | |
| 18-inch steel shell (Year 1) | 20 | 10 | 20 | 30 | 10 |
| 18-inch steel shell (Year 2) | 45 | 20 | 35 | 55 | 20 |
| 24-inch steel shell | 45 | 20 | 35 | 55 | 20 |
| 36-inch steel shell | 20 | 10 | 20 | 30 | 10 |
| Impact | | | | | |
| 24-inch steel shell | 285 | 40 | 200 | 55 | 95 |
| 36-inch steel shell | 995 | 130 | 200 | 55 | 200 |
| DTH | | | | | |
| 36-inch steel shell | 2,000 | 340 | 200 | 55 | 200 |

*Shutdown zones are the same for Years 1 and 2 for each pile size/type except for 18-inch steel shell piles, as noted above.

ADOT&PF would establish clearance zones with radial distances as identified in table 21 and table 22 for blasting activities. The purpose of a clearance zone is to prevent potential instances of auditory injury and more severe behavioral disturbance the maximum extent practicable by delaying the commencement of an activity if marine mammals are observed within the defined area. Because ADOT&PF's proposed blasting could result in harassment due to underwater noise and in-air noise, clearance zones have been established for both animals in the water and above water (in-air). The in-air clearance zones are intended for hauled out animals. The in-water clearance zone would be used for all swimming animals, even though they might periodically have their heads above water. If a marine mammal is observed entering or within the clearance zone indicated in table 21 or table 22, blasting activities must be delayed. The sound from blasting would occur over only a few seconds but could not be halted once it has been initiated. If an animal were to enter the clearance zone once blasting has been initiated, the blasting could not be halted, and the animal would be recorded as a potential take.

**Table 21 -- In-Water Clearance Zones (m) for Blasting***

| Activity | LF | HF | VHF | PW | OW |
|---|---|---|---|---|---|
| Blasting, 33 m from shore | 285 | 10 | 25 | 160 | 10 |
| Blasting, 110 m from shore | 10 | 10 | 10 | 10 | 10 |

*Measured from the shoreline.

**Table 22 -- In-Air Clearance Zones (m) for Blasting***

| Activity | Phocids | Otariids |
|---|---|---|
| Blasting, 33 m from shore | 225 | 10 |
| Blasting, 110 m from shore | 150 | 10 |

*Measured from the shoreline

*Pre- and Post-Activity Monitoring*

Monitoring would take place from 30 minutes prior to initiation of pile driving and blasting activity (*i.e.*, pre-start clearance monitoring) through 30 minutes post-completion of pile driving, DTH, and blasting activity. In addition, monitoring for 30 minutes would take place whenever a break in the specified activity (*i.e.*, impact pile driving, vibratory pile driving, DTH) of 30 minutes or longer occurs. Pre-start clearance monitoring would be conducted during periods of visibility sufficient for the lead PSO to determine that the shutdown or pre-clearance zones indicated in table 20, table 21, and table 22 are clear of marine mammals. Pile driving and blasting may commence following 30 minutes of observation when the determination is made that the shutdown and clearance zones are clear of marine mammals.

*Soft Start*

ADOT&PF would use soft-start techniques when impact pile driving. Soft-start requires contractors to provide an initial set of three strikes at reduced energy, followed by a 30-second waiting period, then two subsequent reduced-energy strike sets. A 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. Soft-start procedures are used to provide additional protection to marine mammals by providing a warning and/or giving marine mammals a chance to leave the area prior to the hammer operating at full capacity.

*Bubble Curtains*

ADOT&PF fully considered the use of bubble curtains during impact pile driving. In general, bubble curtains reduce noise levels near the source, minimizing exposure levels. However, due to shallow water depths, tidal fluctuations, and associated creek flow velocities within the project area, ADOT&PF determined that the use of bubble curtains would not be practicable during this project, and NMFS concurs. Further, the Level A and Level B harassment zones for impact pile driving are relatively small and both ADOT&PF and NMFS expect that the proposed mitigation measures, including monitoring, use of shutdown zones, and soft starts for impact pile driving will be effective to reduce impacts to marine mammals. Therefore, ADOT&PF has determined that bubble curtains would not be practicable for this project, and NMFS concurs.

NMFS conducted an independent evaluation of the proposed measures and has preliminarily determined, for each proposed IHA, 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.

ADOT&PF would abide by all monitoring and reporting measures contained within the IHA, if issued, and their Marine Mammal Monitoring and Mitigation Plan (see appendix B of ADOT&PF's application). The monitoring and reporting requirements described in the following were proposed by ADOT&PF in its adequate and complete application and/or are the result of subsequent coordination between NMFS and ADOT&PF. ADOT&PF has agreed to the requirements. NMFS describes these below as requirements and has included them in the proposed IHA.

*Visual Monitoring*

All PSOs must be NMFS-approved. PSOs would 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 an activity pursuant to a NMFS-issued Incidental Take Authorization (ITA) or Letter of Concurrence (LOC). Other PSOs may substitute other relevant experience (including relevant Alaska Native traditional knowledge), 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. 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 ITA or LOC.

PSOs would also have the following additional qualifications:

- The 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: (1) the number and species of marine mammals observed; (2) dates and times when in-water construction activities were conducted; (3) dates, times, and reason for implementation of mitigation (or why mitigation was not implemented when required); and (4) marine mammal behavior; and
- The 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.

ADOT&PF must establish monitoring locations as described in the Marine Mammal Monitoring and Mitigation Plan (see appendix B of ADOT&PF's application). For all pile driving and DTH activities, a minimum of one PSO must be assigned to each active pile driving location to monitor the shutdown zones and a minimum of one PSO must be assigned to monitor the pre-clearance zones prior to blasting.

Between two and three PSOs will be on duty depending on the size of the Level B harassment zone. The specific locations of the PSOs are as follows, as described in the Marine Mammal Monitoring and Mitigation Plan (see figure 2 for visual depiction of PSO stations):

- Station 1: at the Alaska Gymnastics Academy/FedEx parking lot, next to Ward Creek Bridge
- Station 2: Ketchikan Pulp Company landfill property on the northwest shore of Ward Cove
- Station 3: at Peninsula Point

During impact pile driving of 24- and 36-inch steel shell piles, PSOs will be present at Stations 1 and 2. During vibratory pile driving of 18-, 24,- and 36-inch steel shell piles, DTH installation of 36-inch steel shell piles, and blasting, PSOs will be present at Stations 1, 2, and 3.

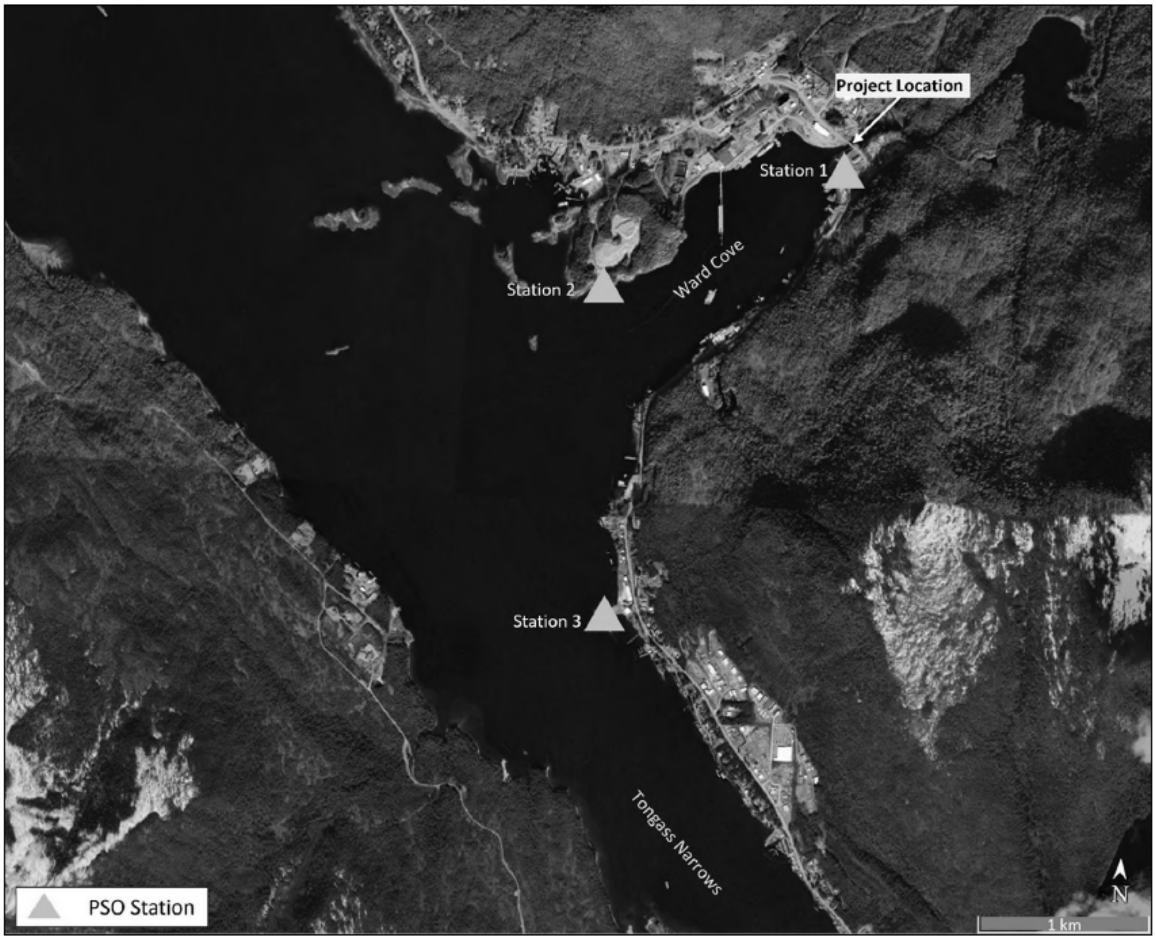


**Figure 2 -- Proposed PSO Locations for the Ward Creek Bridge Replacement Project**

PSOs would record all observations of marine mammals, regardless of distance from the pile being driven or from blasting, as well as the additional data indicated below and in section 6 of the IHA, if issued.

*Reporting*

Marine Mammal Monitoring Report

ADOT&PF would be required to submit an annual draft summary report on all construction activities and marine mammal monitoring results to NMFS within 90 days following the end of construction or 60 days prior to the requested issuance of any subsequent IHA for similar activity at the same location, whichever comes first. The draft summary report would include an overall description of construction work completed, a narrative regarding marine mammal sightings, and associated raw PSO data sheets (in electronic spreadsheet format). Specifically, the report must include:

- Dates and times (begin and end) of all marine mammal monitoring;
- Construction activities occurring during each daily observation period, including: (a) how many and what type of piles were driven or removed and the method (*i.e.*, impact, vibratory, DTH); and (b) the total duration of time for each pile (vibratory and DTH) or number of strikes for each pile (impact); (c) number of boreholes, net explosive weight per borehole, associated delays between charges, location for each daily blasting event, and approximate distance to the nearest shoreline;
- PSO locations during marine mammal monitoring; and
- Environmental conditions during monitoring periods (at the 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 must be reported:

- Name of PSO who sighted the animal(s) and PSO location and activity at the time of the sighting;
- Time of the sighting;
- 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;
- Distance and bearing of each observed marine mammal relative to the pile being driven or removed, or blasting site, for each sighting;
- Estimated number of animals (min/max/best estimate);
- Estimated number of animals by cohort (*e.g.*, adults, juveniles, neonates, group composition, *etc.*);
- Animal's closest point of approach and estimated time spent within the estimated harassment zone(s);
- 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 estimated harassment zones, by species; and
- Detailed information about implementation of any mitigation (*e.g.*, shutdowns and delays), a description of specified actions that ensued, and resulting changes in behavior of the animal(s), if any.

If no comments are received from NMFS within 30 days after the submission of the draft summary report, the draft report would constitute the final report. If

ADOT&PF receives comments from NMFS, a final summary report addressing NMFS' comments would be submitted within 30 days after receipt of comments.

Reporting Injured or Dead Marine Mammals

In the event that personnel involved in ADOT&PF's activities discover an injured or dead marine mammal, ADOT&PF would report the incident to the NMFS Office of Protected Resources (*PR.ITP.MonitoringReports@noaa.gov*, *ITP.jacobus@noaa.gov*) and to the Alaska Regional Stranding Coordinator as soon as is feasible. If the death or injury was clearly caused by the specified activity, ADOT&PF would immediately cease the specified activities until NMFS is able to review the circumstances of the incident and determine what, if any additional measures appropriate to ensure compliance with the IHA. ADOT&PF would not resume their activities until notified by NMFS. The report would include the following information:

- Description of the incident;
- Environmental conditions (*e.g.*, Beaufort sea state, visibility);
- Description of all marine mammal observations in the 24 hours preceding the incident;
- Photographs or video footage of the animal(s) (if equipment is available);
- 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; 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 discussion of our analysis applies to all species listed in table 3, given that the anticipated effects of this activity on these different marine mammal stocks are expected to be similar. There is little information about the nature or severity of the impacts, or the size, status, or structure of any of these species or stocks that would lead to a different analysis for this activity.

Impact and vibratory pile driving and DTH are planned for Year 1 and Year 2, and on-land blasting is planned for Year 1. These activities have the potential to disturb or displace marine mammals. Specifically, pile driving and DTH may result in take in the form of Level B harassment for all species and stocks in table 3 and Level A harassment for all species and stocks in table 3 except for killer whales. On-land blasting, which is proposed for Year 1 only, may result in Level B harassment of humpback whales, harbor seals, northern elephant seals, and Steller sea lions and Level A harassment of harbor seals and northern elephant seals. Potential takes could occur if individuals of these species are present in zones ensonified above the thresholds for Level A and Level B harassment identified above when these activities are underway.

Given the nature of the proposed activities, NMFS does not anticipate serious injury or mortality due to ADOT&PF's proposed project, even in the absence of required mitigation. No Level A harassment is anticipated for killer whales due to the relatively small Level A harassment zones for high frequency cetaceans and required shutdown zones that are equal to or exceed the Level A harassment isopleths for high frequency cetaceans. Take by Level A harassment due to pile driving and DTH is proposed for humpback whale, Dall's porpoise, harbor porpoise, Steller sea lion, harbor seal, and northern elephant seal 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. Take by Level A harassment due to blasting is proposed for harbor seals and northern elephant seals to account for the potential that an animal might enter the Level A harassment zone during blasting. Any take by Level A harassment is expected to arise from, at most, a small degree of AUD INJ 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 AUD INJ. Additionally, 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, any AUD INJ or TTS potentially incurred here is not expected to adversely impact individual fitness, let alone annual rates of recruitment or survival.

For all species and stocks, take would occur within a limited, confined area 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 amount of take proposed is small when compared to stock abundance.

Behavioral responses of marine mammals to pile driving, pile removal, DTH, and on-land blasting in Ward Cove are expected to be mild, short term, and temporary. Marine mammals within the Level B harassment zones may not show any visual cues they are disturbed by activities or they could become alert, avoid the area, leave the area, or display other mild responses that are not visually observable such as change in vocalization patterns. Given that pile driving, DTH activities, and on-land blasting would occur for only a limited number of days each year, often on non-consecutive days, any harassment would be temporary. Additionally, many of the species present in Ward Cove and Tongass Narrows would only be present temporarily based on seasonal patterns or during transit between other habitats. These species would be exposed to even shorter periods of noise-generating activity, further decreasing the impacts.

The potential for harassment is minimized through the implementation of the proposed mitigation measures. The use of shutdown and clearance zones reduce the likelihood of incurring AUD INJ. During impact driving, implementation of soft start procedures shall be required, reducing possibility for injury. Through the use of soft start during impact pile driving, marine mammals are expected to move away from a disturbing sound source prior to it becoming potentially injurious.

Any impacts on prey that would occur during in-water construction 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. Therefore, effects on marine mammal prey during the construction are expected to be minimal and, therefore, are unlikely to cause substantial effects on marine mammals at the individual or population level.

In addition, it is unlikely that minor noise effects in a small, localized area of habitat would have any effect on the reproduction or survival of any individual, much less 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, demonstrated that the potential effects of the specified activities would have only 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.

For humpback whales, the inland waters of Southeast Alaska, including Ward Cove and Tongass Narrows, are a seasonal feeding BIA from May through September (Wild *et al*., 2023). However, the ensonified area from ADOT&PF's proposed project activities, in Ward Cove and a small portion of Tongass Narrows, represents a very small portion of the total available habitat. We do not expect ADOT&PF's proposed construction to have any effect on humpback whales' ability to forage and find food.

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 for either year of authorization:

- No serious injury or mortality is anticipated or authorized;
- Authorized Level A harassment would be limited and of low degree;
- Mitigation measures such as shutdown zones for pile driving and DTH, clearance zones for blasting, and soft-starts for impact pile driving will be employed to minimize the numbers of marine mammals exposed to injurious levels of sound, and to ensure that any take by Level A harassment is, at most, a small degree of AUD INJ;
- The anticipated incidents of Level B harassment consist of, at worst, temporary modifications in behavior;

- The project area represents a very small portion of the available foraging area for all potentially impacted marine mammal species and stocks, and anticipated habitat impacts are minor;
- The project area overlaps a very small portion of a feeding BIA for humpback whales. The project is not expected to have any effect on humpback whales' ability to forage or feed; and
- The intensity of anticipated take by Level B harassment is relatively low for all stocks and will not be of a duration or intensity expected to result in impacts on reproduction or survival.

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 for each proposed IHA 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 section 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 (see 86 FR 5322, January 19, 2021). Additionally, other qualitative factors may be considered in the analysis, such as the temporal or spatial scale of the activities.

The number of instances of take for each species or stock proposed for authorization is included in table 18 for Year 1 and table 19 for Year 2. Our analysis shows that for all species with available population abundance estimates, less than one-third of the best available population abundance estimate of each stock could be taken by harassment during both years of proposed construction.

Abundance estimates for the Mexico-North Pacific stock of humpback whales are based upon data collected more than 8 years ago and, therefore, current estimates are considered unknown (Young *et al*., 2024). The most recent minimum population estimates ($N_{min}$) for the population include an estimate of 2,241 individuals between 2003 and 2006 (Martínez-Aguilar, 2011) and 766 individuals between 2004 and 2006 (Wade, 2021). NMFS' Guidelines for Assessing Marine Mammal Stocks suggest that the $N_{min}$ estimate of the stock should be adjusted to account for potential abundance changes that may have occurred since the last survey and provide reasonable assurance that the stock size is at least as large as the estimate (NMFS, 2023). The abundance trend for this stock is unclear; therefore, there is no basis for adjusting these estimates (Young *et al.,* 2024). NMFS is proposing to authorize two takes of the Mexico-North Pacific stock of humpback whale during both Year 1 and Year 2. This represents small numbers of this stock (0.2 percent of the stock assuming $N_{min}$ of 766 individuals).

The Alaska stock of Dall's porpoise has no official NMFS abundance estimate for this area, as the most recent estimate is greater than 8 years old. As described in the 2021 Alaska SAR (Muto *et al*., 2022) the minimum population estimate is assumed to correspond to the point estimate of the 2015 vessel-based abundance computed by (Rone *et al*., 2017) in the Gulf of Alaska (N = 13,110; CV = 0.22). NMFS is proposing to authorize 12 takes of the stock in Year 1 and 11 takes of the stock in Year 2. Comparison to the minimum population estimate shows that less than 0.1 percent of the stock would be expected to be impacted for each year of ADOT&PF’s proposed construction.

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 for each proposed IHA 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.

Harbor seals are the most commonly harvested marine mammal by the Ketchikan subsistence community. In 2012, the most recent survey year of subsistence harvest in southeast Alaska, 22.2 percent of households reported harvesting harbor seal, and 55.6 percent reported using harbor seal (Wolfe *et al*., 2013). In that same year, no households reported harvesting Steller sea lion, although 11.1 percent of households reported using Steller sea lion (Wolfe *et al*., 2013). Since surveying of subsistence harvest began in 1992, there has been a decline in the number of households harvesting seals in Southeast Alaska. The count of harvesters in 2012 (140 households) was the second lowest since the seal survey began in 1992 (Wolfe *et al*., 2013). There have been no apparent trends in sea lion harvests in Southeast Alaska, with harvest staying at relatively low levels since surveys began (Wolfe *et al*., 2013).

All project activities would take place in Ward Cove, a relatively industrial area, with a pier for cruise ships, and an area where subsistence activities do not occur. Harbor seals and Steller sea lions may temporarily be displaced from the project area. However, neither the local population nor any individual pinnipeds are likely to be adversely impacted by the proposed action beyond noise-induced harassment or slight auditory injury. The proposed project is anticipated to have no long-term impact on Steller sea lion or harbor seal populations, and there are no long term impact expected on the availability of marine mammals for subsistence uses.

Based on the description of the specified activity, the measures described to minimize adverse effects on the availability of marine mammals for subsistence purposes, and the proposed mitigation and monitoring measures, NMFS has preliminarily determined for each proposed IHA 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 ensures 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 incidental take authorizations, NMFS consults internally whenever we propose to authorize take for ESA-listed species, in this case with NMFS Alaska Regional Office (AKRO).

NMFS Office of Protected Resources (OPR) is proposing to authorize take of the Mexico DPS of humpback whale, which are listed as threatened under the ESA. OPR has requested initiation of section 7 consultation with the 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 two consecutive IHAs to ADOT&PF for conducting construction in Ward Cove, Ketchikan, AK, 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 authorizations, and any other aspect of this notice of proposed IHAs for the proposed construction. We also request comment on the potential renewal of these proposed IHAs 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 these IHAs 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: May 6, 2026.

**Kimberly Damon-Randall**,

*Director, Office of Protected Resources,*

*National Marine Fisheries Service.*

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