DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

[RTID 0648–XE765]

Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to the Alaska Department of Transportation and Public Facilities Prince William Sound Ferry Terminal Improvement Projects in Cordova, Chenega, and Tatitlek, 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 the Alaska Department of Transportation and Public Facilities (ADOT&PF) for authorization to take marine mammals incidental to the Prince William Sound Ferry Terminal Improvement Projects (PWS Projects) in Cordova, Chenega, and Tatitlek, Alaska. Pursuant to the Marine Mammal Protection Act (MMPA), NMFS is requesting comments on its proposal to issue three incidental harassment authorizations (IHAs) to incidentally take marine mammals during the specified activities associated with each of the three projects. NMFS is also requesting comments on possible one-time, 1-year renewals that could be issued under certain circumstances and if all requirements are met, as described in Request for Public Comments at the end of this notice. NMFS will consider public comments prior to making any final decision on the issuance of the requested MMPA authorizations and agency responses will be summarized in the final notice of our decision.

DATES: Comments and information must be received no later than July 7, 2025.

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.hotchkin@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: Cara Hotchkin, Office of Protected Resources, NMFS, (301) 427–8401.

SUPPLEMENTARY INFORMATION:

Background

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

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

National Environmental Policy Act

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

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

We will review all comments submitted in response to this notice prior to concluding our NEPA process or making a final decision on the IHA requests.

Summary of Request

On September 9, 2024, NMFS received a request from ADOT&PF for three IHAs to take marine mammals incidental to pile driving (installation and removal) associated with construction to improve three existing ferry terminals in Cordova, Chenega, and Tatitlek, Alaska. Following NMFS' review of the application, ADOT&PF submitted revised versions of their request on December 23, 2024, February 18, 2025, and March 13, 2025. The application was deemed adequate and complete on April 15, 2025. ADOT&PF's request is for take of 8 species (13 stocks) of marine mammals by Level B harassment and, for a subset of 5 of these species, Level A harassment. Neither ADOT&PF nor NMFS expect serious injury or mortality to result from this activity and, therefore, an IHA is appropriate.

Description of Proposed Activity

Overview

The ADOT&PF, in cooperation with the Maritime Administration and the Prince William Sound Economic Development District, proposes to improve and modify three existing ferry terminals and associated structures at the Cordova Ferry Terminal (Cordova Project), the Chenega Ferry Terminal (Chenega Project), and the Tatitlek Ferry Terminal (Tatitlek Project) located in the Prince William Sound (PWS), Alaska.

The Cordova Project would modify the existing stern- and side-berth docking facilities in Cordova, Alaska. The Chenega Project would construct a new side-loading ferry terminal and this includes an approach causeway, vehicle transfer bridge support floats, and mooring structures in Chenega Bay, Alaska. The Tatitlek Project would require retrofitting the existing end-loading ferry terminal facility and construction includes a vehicle transfer bridge, a bridge support float (or bridge support) to replace the existing tidal ramp facility in Tatitlek, Alaska.

The ferry terminals require the proposed modifications to accommodate larger Alaska Marine Highway System (AMHS) Alaska Class Ferry Vessels (ACFV) which would replace the existing smaller class ferry vessels that would be phased out. Construction activities included as part of the PWS Projects with the potential to result in Level A and B harassment of marine mammals from underwater sound production include vibratory and impact installation, vibratory removal, and down-the-hole (DTH) installation (Chenega and Tatitlek only) of steel pipe piles.

Dates and Duration

Each of the three separate IHAs would be effective for one year from January 1, 2027 through December 31, 2027. ADOT&PF anticipates that in-water construction for the Cordova Project would occur over 60 non-consecutive days within a 3-month construction window beginning in the summer of 2027, with 20 days for pile removal, 12 days for the installation of temporary piles, and 28 days for the installation of permanent mooring dolphins. Construction for the Chenega Project is anticipated to occur over 156 non-consecutive days within a 4-month construction window beginning in the summer of 2027, with 20 days for installation and removal of temporary piles and 136 days for the installation of permanent piles and tension anchors. The Tatitlek Project construction is anticipated to occur over a total of 76 non-consecutive days within a 4-month construction window beginning in the summer of 2027, with 4 days for pile removal, 14 days for temporary pile installation and removal, and 58 days for permanent pile installation. The ADOT&PF conservatively estimated pile installation and removal rates at all three project sites to account for weather conditions, construction and mechanical delays, protected species shutdowns, and logistical constraints.

Specific Geographic Region

The Cordova, Chenega, and Tatitlek Project sites are located throughout the PWS southeast of Anchorage, Alaska (figure 1). The Cordova Project is located on the east side of PWS in Orca Inlet, northwest of the Copper River Delta in Cordova, Alaska (figure 2). Orca Inlet is approximately 28 kilometers (km) long, varies from 2.5 to 5 km wide, and leads to the Strawberry Channel out to the Gulf of Alaska. The southern and central areas of the inlet are filled with sediment, making the area very shallow with exposed mudflats during low tides. The bathymetry is predominantly mud and sand, with rocks closer to shore. Depths are shallower toward the mouth of Orca Inlet, generally 4 meters (m) or less with few, discontinuous channels. Freshwater inputs to Orca Inlet near the Cordova Project vicinity include multiple anadromous streams: Fleming Creek, Ocean Dock Creek, Odiak Slough, and Eccles Creek. Orca Inlet is generally characterized by semidiurnal tides averaging 3.5 m that can exceed 6.5 m during the highest spring tides (Adelfio 2016). The city of Cordova has elevated background in-air and underwater acoustic conditions within proximity to the Cordova Project site because of the industrial activities, commercial fishing, and recreational boating.

The Chenega Project site is located between Crab Bay and Sawmill Bay on the east side of Evans Island, in the southwest corner of PWS (figure 3). Chenega is connected to the Gulf of Alaska through Elrington Passage to the south. The bathymetry of Sawmill Bay is variable depending on location and proximity to shore, islands, or rocks; depths range from 20 to 60 m, and up to 155 m toward the mouth of the bay. Freshwater input into Crab Bay includes an anadromous stream, O'Brien Creek, and a couple of its unnamed tributaries. Sawmill Bay is generally characterized by semidiurnal tides with a typical tidal range of up to 5 m. Chenega has regular vessel activities including commercial fishing and recreation boating as well as limited industrial activities, all of which contribute to background in-air and underwater noise within proximity to the project site.

The Tatitlek Project is located north of Port Fidalgo, at the entrance to Boulder Bay and the Tatitlek Narrows on the east side of PWS (figure 4). Tatitlek is a secluded area separated from the Pacific Ocean by a series of islands. The bathymetry of the project area is variable by location and depends on the proximity shore, islands or rocks. Depths approach 140 m or more within Port Fidalgo, up to 37 m in Boulder Bay, and as shallow as 3 m within the Tatitlek Narrows. The main navigation channel for Valdez, Alaska is within 15 km of the project site. Freshwater inputs to the Tatitlek Narrows and Boulder Bay include multiple anadromous streams: Nunu Creek, Borodkin Creek, Tedishoff Creek, Brown Creek, Boardwalk Creek, and Katelnikoff Creek are nearest. The Tatitlek Narrows are generally characterized by semidiurnal tides with mean tidal ranges of around 5 m. The navigation channel has regular oil tanker, tug boat, commercial fishing, and recreational boating traffic which contribute to background in-air and underwater noise levels within proximity to the project site.

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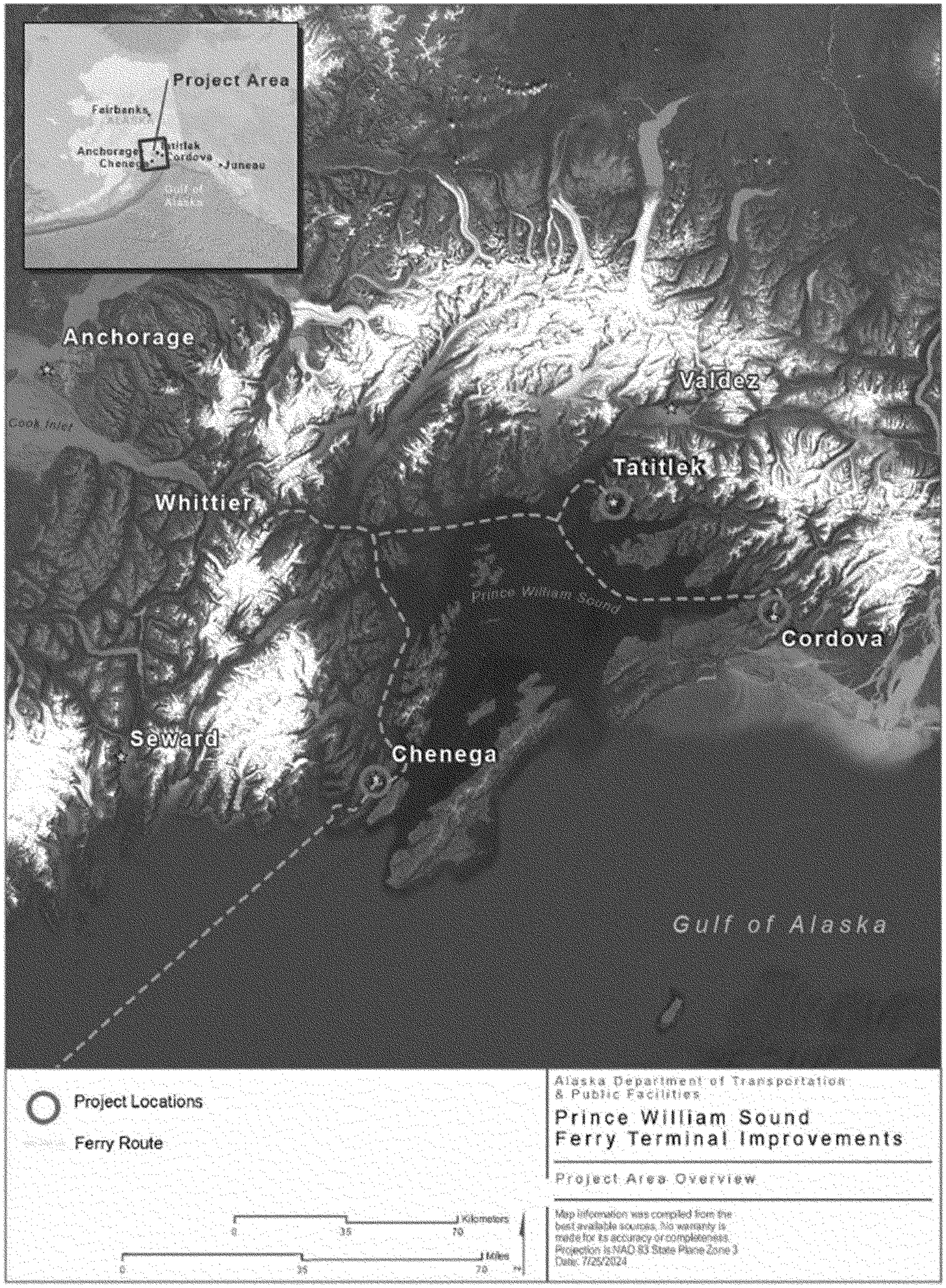

Figure 1 – Three Ferry Terminal Construction Sites in Prince William Sound

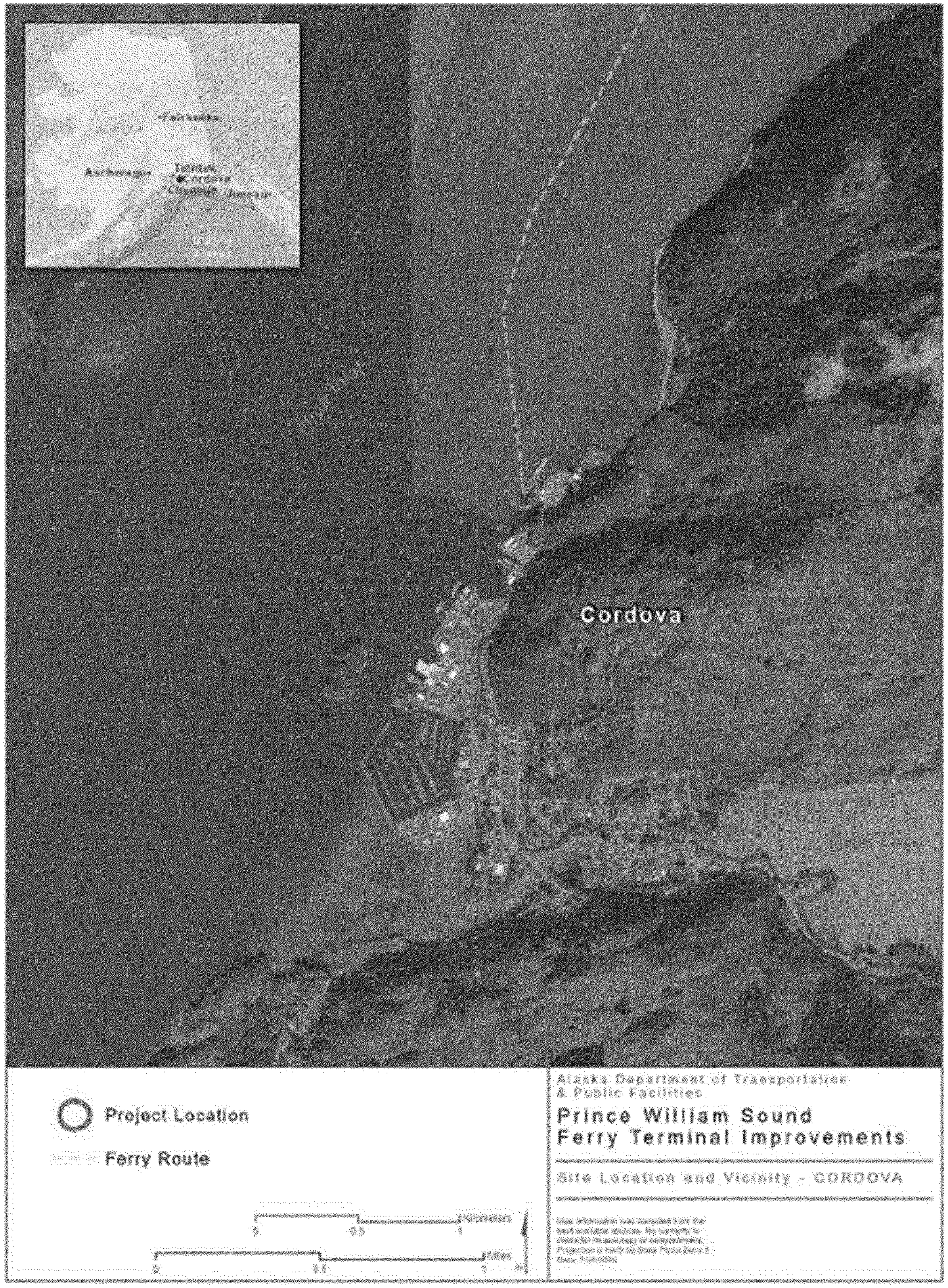

Figure 2 – Location of the Cordova Project in Prince William Sound, Alaska

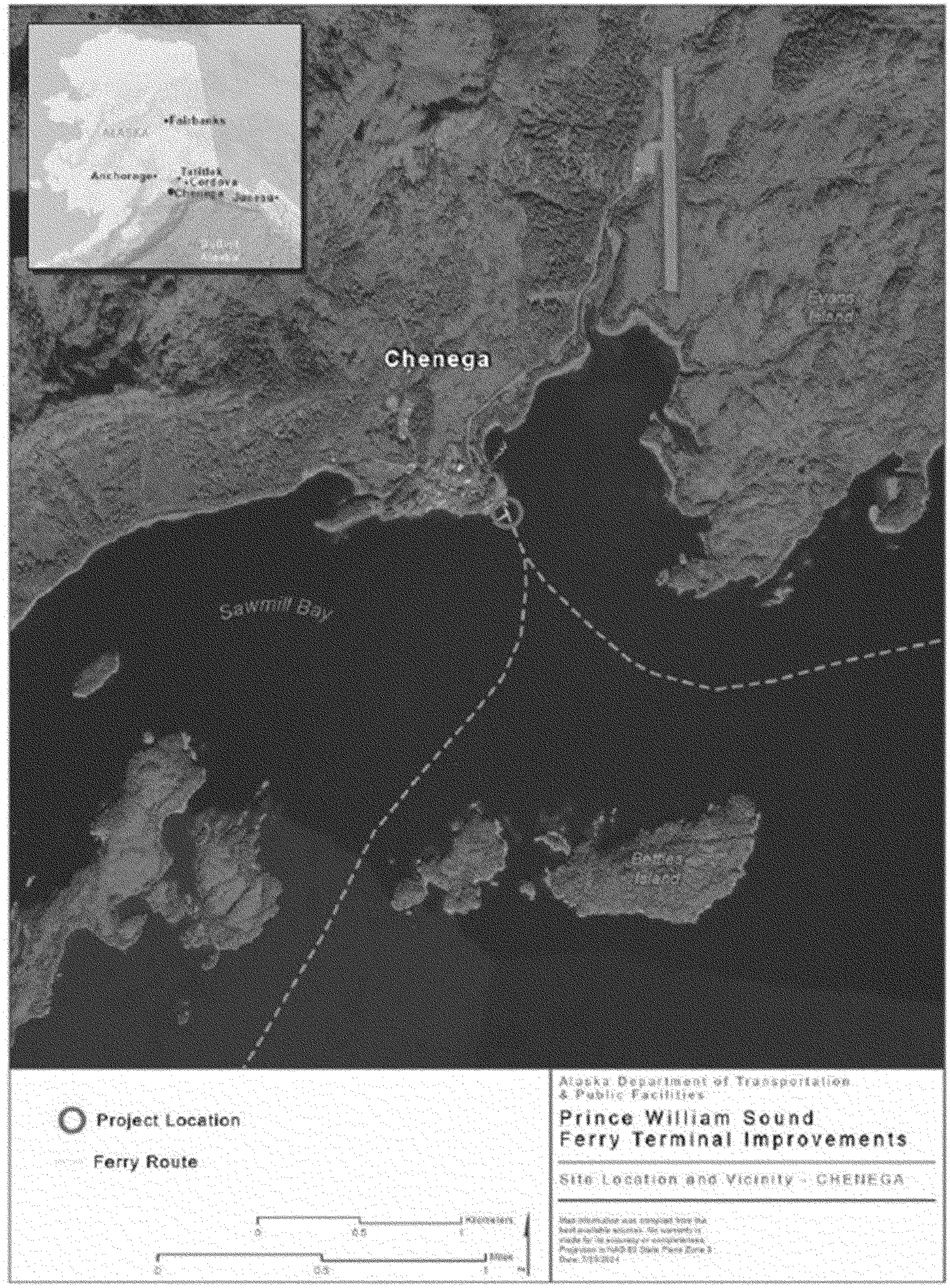

Figure 3 – Location of the Chenega Project in Prince William Sound, Alaska

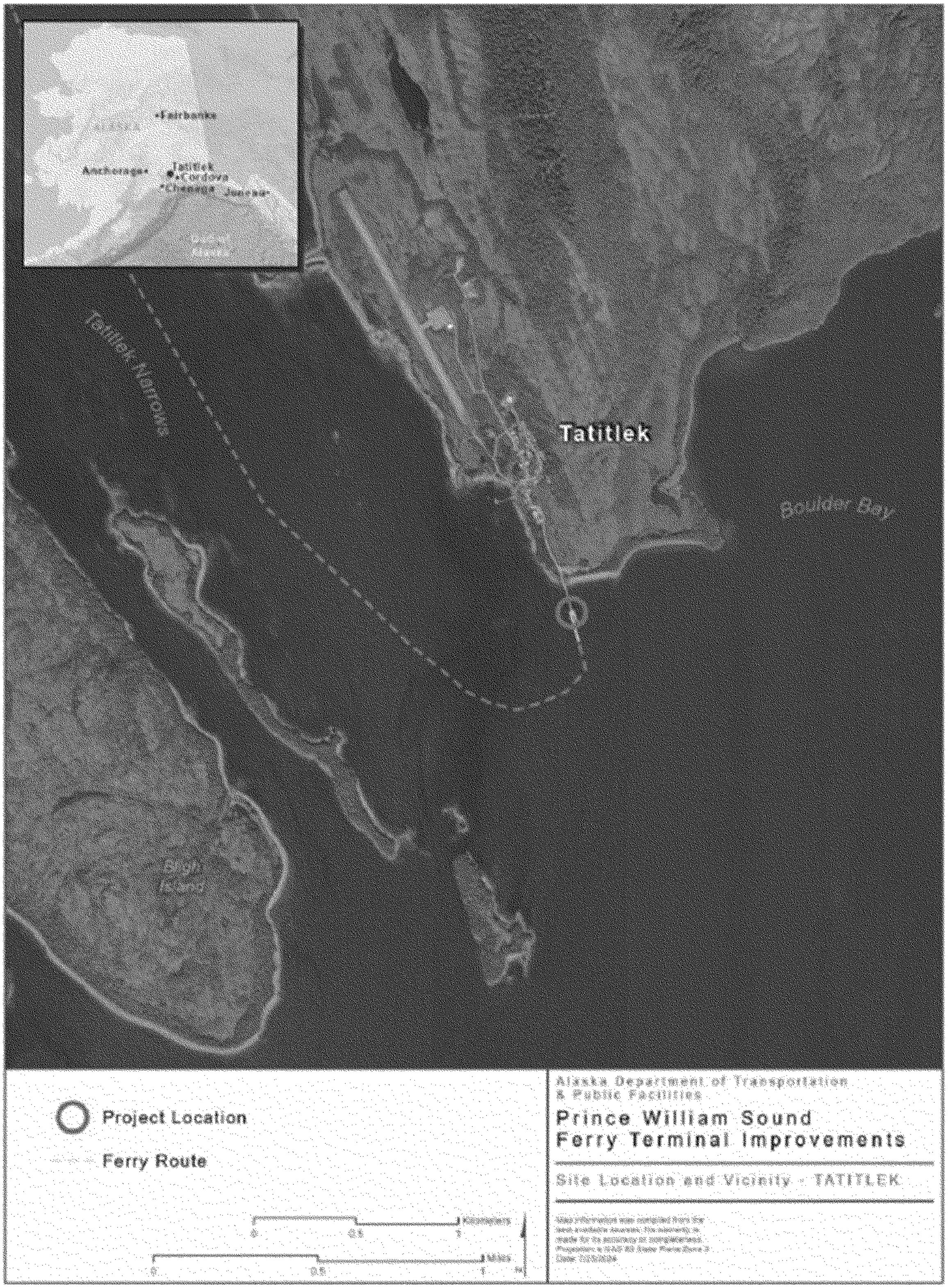

Figure 4 – Location of the Tatitlek Project in Prince William Sound, Alaska

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Detailed Description of the Specified Activity

The overall Project's purpose is to ensure that the Cordova, Chenega, and Tatitlek ferry terminals can accommodate the new ACFVs, as existing vessels serving these ports will be retired and the ACFVs cannot be accommodated without reconfiguring existing facilities or installing a separate facility. This Project would ensure that ferry service, including the delivery of critical goods, supplies, and passenger transportation, is not lost to these coastal Alaska communities.

Cordova Ferry Terminal—The current stern berth of the Cordova Ferry Terminal has a shallow water approach that can cause landing issues for larger ACFVs, as it was built for a vessel that is no longer being operated by the AMHS. The proposed side berth modifications will make landing more efficient and reliable for the larger and newer ACF vessels that are now being used to service this community.

The Cordova Project will involve the removal of five floating fender dolphins, a four-pile dolphin fixed fender dolphin, and a 2-pile catwalk support structure. Pile removal will include six vertical steel pipe piles (30-inch (76 cm) diameter), three vertical steel pipe piles (18-inch (46 cm) diameter), and 15 battered steel pipe piles (18-inch (46 cm) diameter). 23 vertical and 18 battered steel pipe piles (30-inch (76 cm) diameter) will be installed to create five new 5-pile floating fender dolphins, and two new 4-pile fixed fender dolphins. Up to 36 temporary 24-inch (61 cm) steel pipe piles will be installed to support pile installation and will be removed following completion of construction.

The installation of the permanent mooring dolphins would include the installation of 20 30-inch (76 cm) steel pipe (ten vertical and ten battered) piles, which would initially be installed with a vibratory hammer to the point of refusal and then driven approximately 3 m with an impact hammer to ensure structural capacity and pile embedment. See table 1 for anticipated production rates for all pile types and installation or removal methods. The exact duration or staging of each pile installation method used will depend on sediment depth and conditions at each pile location. Pile installation and removal will occur in waters approximately 2–10 meters in depth.

Dredging would also occur around the stern berth of the fender line to –7.6 m. Dredging is not expected to cause take of marine mammals because dredging activities would not last for sufficient duration to present the reasonable potential for disruption of behavioral patterns, do not produce sound levels with likely potential to result in marine mammal harassment, or some combination of the above, and are thus not addressed further.

TABLE 1—SUMMARY OF PILES TO BE INSTALLED AND REMOVED AS PART OF THE CORDOVA PROJECT

Pile diameter and type	Number of piles	Impact strikes per pile (duration in minutes)	Vibratory duration per pile (minutes)	Total duration of activity per pile (hours)	Typical production rate in piles per day (range)	Estimated days of installation or removal (range)
Installation						
24-inch (64 cm) steel pipe piles (temporary).	36	N/A	30	0.5	3 (2–4)	12 (9–18)
30-inch (76 cm) steel pipe piles (permanent mooring dolphins).	23 (vertical), 18 (battered)	600 (60)	60	2	1.5 (1–2)	28 (21–41)
Removal						
18-inch (46 cm) steel pipe piles	3 (vertical), 15 (battered)	N/A	60	1	3 (2–4)	6 (5–18)
24-inch (61 cm) steel pipe piles (temporary).	36	N/A	30	0.5	3 (2–4)	12 (9–18)
30-inch (76 cm) steel pipe piles	6	N/A	60	1	3 (2–4)	2 (2–3)
Totals	138	N/A	N/A	N/A	N/A	60 (46–98)

Note: N/A means not applicable.

Chenega Ferry Terminal—The purpose of the Chenega Project is to construct a new side berth facility to accommodate the ACFVs. The Chenega Project will involve the installation of piles to support an approach trestle, bridge abutment, two lift towers, and three mooring dolphins. The approach trestle will involve the installation of 30 24-inch (61 cm) vertical steel pipe piles. The bridge abutment will necessitate the installation of six 30-inch (76 cm) vertical steel pipe piles. The lift towers will involve the installation of eight 36-inch (91 cm) vertical steel pipe piles. Twelve 30-inch (76 cm) steel pipe piles (six vertical, six battered) will be used to support the three mooring dolphins. Rock sockets will be required on all vertical permanent piles, and tension anchors on most vertical and battered permanent piles. Up to 30 temporary 24-inch (61 cm) steel pipe piles will be installed to support pile installation and will be removed following completion of construction.

Tension anchors would be installed in 36 permanent piles (eight 36-inch (91 cm), 18 30-inch (76 cm), and 10 24-inch (61 cm) piles). Tension anchors are installed within piles that are drilled into the bedrock below the elevation of the pile tip after the pile has been driven through the sediment layer to refusal. A 6- or 8-inch (15 or 20 cm) diameter steel pipe casing would be inserted inside the larger diameter production pile and may be seated with a small pneumatic hammer. A rock drill would be inserted into the casing, and a 6- to 8-inch (15 to 20 cm) diameter hole would be drilled into bedrock with rotary and percussion drilling methods. The drilling work is contained within the steel pile casing and the steel pipe pile. The typical depth of the drilled tension anchor hole varies, but 20–30 feet (ft; 6.1–9.1 meters (m)) is common. Rock fragments would be removed through the top of the casing with compressed air. A steel rod would then be grouted into the drilled hole and affixed to the top of the pile. The purpose of a tension anchor is to secure the pile to the bedrock to withstand uplift forces. It is estimated that tension anchor installation would take between 1–4 hours per pile.

Pile removal would be conducted using a vibratory hammer. Pile installation would be conducted using both a vibratory and an impact hammer and DTH pile installation methods.

Piles would be advanced to refusal using a vibratory hammer. After DTH pile installation, the final approximately 10 ft (3.0 m) of driving would be conducted using an impact hammer so that the structural capacity of the pile embedment can be verified. The exact duration or staging of each pile installation method would depend on sediment depth and conditions at each pile location. Pile installation and removal would occur in waters approximately 6–7 m (20–23 ft) in depth. See table 2 for anticipated production rates for all pile types and installation or removal methods. Above-water construction activities or fill placement to support the new approach causeway would also occur, but would not last for sufficient duration to present the reasonable potential for disruption of behavioral patterns, would not produce sound levels with likely potential to result in marine mammal harassment, or some combination of these, and are thus not addressed further.

TABLE 2—SUMMARY OF PILES TO BE INSTALLED AND REMOVED AS PART OF THE CHENEGA PROJECT

Pile diameter and type	Number of piles	Number of rock sockets [1]	Number of tension anchors [2]	Impact strikes per pile (duration in minutes)	Vibratory duration per pile (minutes)	Rock socket DTH pile installation duration (range) per pile (minutes)	Tension anchor DTH pile installation duration (range) per pile (minutes)	Total duration of activity per pile (hours)	Typical production rate in piles per day (range)	Estimated days of installation or removal (range)
Installation										
24-inch (61 cm) steel pipe piles (temporary).	30	N/A	N/A	N/A	15	N/A	N/A	0.25	3 (2–4)	10 (7.5–15)
24-inch (61 cm) steel pipe piles (permanent; Approach Trestle).	30 (vertical).	30	10	50 (30)	15	240 (60–480)	120 (60–240)	6.75 (vertical).	0.33 (0–1)	70 (30–100)
30-inch (76 cm) steel pipe piles (permanent; mooring dolphins).	6 (vertical) 6 (battered).	6	12	50 (30)	15	240 (60–480)	120 (60–240)	6.75 (vertical). 2.75 (battered).	0.33 (0–1)	36 (12–36)
30-inch steel (76 cm) piles (Permanent; Bridge Abutment).	6 (vertical)	6	6	50 (30)	15	240 (60–480)	120 (60–240)	6.75 (vert)	0.33 (0–1)	18 (6–24)
36-inch (91 cm) steel piles (permanent; lift towers).	8 (vertical)	8	8	50 (30)	15	240 (60–480)	120 (60–240)	6.75	0.33 (0–1)	24 (8–32)
Removal										
24-inch (61 cm) steel pipe piles (temporary).	30	N/A	N/A	N/A	30	N/A	N/A	0.5	3 (2–4)	10 (7.5–15)
Totals	116	50	36	N/A	N/A	N/A	N/A	N/A	N/A	156 (72–222)

[1] Battered piles would not require rock sockets.
[2] Maximum rock socket and tension anchor production rates assumes two days of drilling per socket, one day of drilling for tension anchors, and one day for impact/vibratory seating.
Note: N/A means not applicable.

Tatitlek Ferry Terminal—The Tatitlek Ferry Terminal is a multipurpose dock structure that only supports stern berthing from the Aurora Class vessels. Improvements to the dock are required to allow the larger ACFVs to access Tatitlek and provide critical transportation needs into the future. The Tatitlek Project ferry terminal modifications would include a retrofit to the existing end-loading ferry terminal facility to replace the existing tidal ramp facility, including a new vehicle transfer bridge, mechanical support system for the seaward end of the bridge, and two dolphins. These modifications would require the removal of 11 existing steel pipe piles (20- and 30-inch (51 and 76 cm) diameter) that support the existing dolphin and ramp structures. To install the new access gangway, six 30-inch (76 cm) steel piles would be installed for the bridge abutment, eight 36-inch (91 cm) steel piles would be installed to support the lift towers, and four vertical and four battered 30-inch (76 cm) piles would be installed as mooring dolphins. Up to 20 temporary 24-inch (61 cm) steel pipe piles would be installed to support pile installation and would be removed following completion of construction. Tension anchors would be required on all permanent piles, and rock sockets would be required on all vertical permanent piles.

Piles would be installed via vibratory, impact, and DTH methods as described for the Chenega Project. All permanent piles (vertical and battered) would require tension anchors and all vertical permanent piles would require rock sockets. Piles would be advanced to refusal using a vibratory hammer. After DTH pile installation, the final seating of the pile will be conducted using an impact hammer so that the structural capacity of the pile embedment could be verified (*i.e.,* proofing). Pile removal would be conducted using a vibratory hammer. The exact duration or staging of each pile installation method would depend on sediment depth and conditions at each pile location. Pile installation and removal would occur in waters approximately 6–9 m in depth. See table 3 for anticipated production rates for all pile types and installation or removal methods.

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

TABLE 3—SUMMARY OF PILES TO BE INSTALLED AND REMOVED AS PART OF THE TATITLEK PROJECT

Pile diameter and type	Number of piles	Number of rock sockets [1]	Number of tension anchors [2]	Impact strikes per pile (duration in minutes)	Vibratory duration per pile (minutes)	Rock socket DTH pile installation duration (range) per pile (minutes)	Tension anchor DTH pile installation duration (range) per pile (minutes)	Total duration of activity per pile (hours)	Typical production rate in piles per day (range)	Estimated days of installation or removal (range)
Installation										
24-inch (61 cm) steel pipe piles (temporary).	20	N/A	N/A	N/A	15	N/A	N/A	0.25	3 (2–4)	7 (5–10)
30-inch (76 cm) steel pipe piles (permanent; bridge abutment).	6	6	6	50 (30)	15	240 (60–480)	120 (60–240)	6.75	0.33 (0–1)	18 (6–24)
30-inch (76 cm) steel pipe piles (permanent; mooring dolphins).	4 (vertical) 4 (battered).	4	8	50 (30)	15	240 (60–480)	120 (60–240)	6.75 (vertical). 2.75 (battered).	0.5 (0–1)	16 (8–24)
36-inch (76 cm) steel pipe piles (permanent; lift towers).	8	8	8	50 (30)	15	240 (60–480)	120 (60–240)	6.75	0.33 (0–1)	24 (8–32)
Removal										
20-inch (51 cm) steel pipe piles (dolphin).	3	N/A	N/A	N/A	60	N/A	N/A	1.0	3 (2–3)	1 (1–2)
24-inch (61 cm) steel pipe piles (temporary).	20	N/A	N/A	N/A	30	N/A	N/A	0.5	3 (2–4)	7 (5–10)
30-inch (76 cm) steel pipe piles (ramp).	8	N/A	N/A	N/A	60	N/A	N/A	1.0	3 (2–4)	3 (2–4)
Totals	73	18	22	N/A	N/A	N/A	N/A	N/A	N/A	76 (35–105.5)

[1] Battered piles would not require rock sockets.
[2] Maximum rock socket and tension anchor production rates assumes two days of drilling per socket, one day of drilling for tension anchors, and one day for impact/vibratory seating.
Note: N/A means not applicable.

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 4 lists all species or stocks for which take is expected and proposed to be authorized for each project activity and summarizes information related to the population or stock, including regulatory status under the MMPA and Endangered Species Act and potential biological removal (PBR), where known. PBR is defined by the MMPA as the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population (as described in NMFS' SARs). While no serious injury or mortality is anticipated or proposed to be authorized here, PBR and annual serious injury and mortality (M/SI) from anthropogenic sources are included here as gross indicators of the status of the species or stocks and other threats.

Marine mammal abundance estimates presented in this document represent the total number of individuals that make up a given stock or the total number estimated within a particular study or survey area. NMFS' stock abundance estimates for most species represent the total estimate of individuals within the geographic area, if known, that comprise 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. 2023 SARs. All values presented in table 4 are the most recent available at the time of publication (including from the draft 2024 SARs) and are available online at: *https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessments*.

TABLE 4—SPECIES WITH ESTIMATED TAKE FROM THE SPECIFIED ACTIVITIES

Common name	Scientific name	Stock	ESA/MMPA status; strategic (Y/N) [1]	Stock abundance (CV, Nmin, most recent abundance survey) [2]	PBR	Annual M/SI [3]
Family Balaenopteridae (rorquals):						
Humpback Whale	*Megaptera novaeangliae*	Mexico-North Pacific	T, D, Y	N/A (N/A, N/A, 2006)	UND4	0.57
		Hawai'i	-, -, N	11,278 (0.56, 7,265, 2020)	127	27.09
Minke Whale [4]	*Balaenoptera acutorostrata*	AK	-, -, N	N/A (N/A, N/A, N/A)	UND	0
Family Delphinidae:						

TABLE 4—SPECIES WITH ESTIMATED TAKE FROM THE SPECIFIED ACTIVITIES—Continued

Common name	Scientific name	Stock	ESA/MMPA status; strategic (Y/N) [1]	Stock abundance (CV, Nmin, most recent abundance survey) [2]	PBR	Annual M/SI [3]
Killer Whale	*Orcinus orca*	Eastern North Pacific Alaska Resident.	-, -, N	1,920 (N/A, 1,920, 2019)	19	1.3
		AT1 (Chugach) Transient [5]	-, D, Y	7 (N/A, 7, 2019)	0.1	0
		Eastern Northern Pacific Northern Resident.	-, -, N	302 (N/A, 302, 2018)	2.2	0.2
		West Coast Transient	-, -, N	349 (N/A, 349, 2018)	3.5	0.4
Pacific White-Sided Dolphin.	*Lagenorhynchus obliquidens*	N Pacific	-, -, N	26,880 (N/A, N/A, 1990)	UND	0
Family Phocoenidae (porpoises):						
Dall's Porpoise [6]	*Phocoenoides dalli*	AK	-, -, N	UND (UND, UND, 2015)	UND	37
Harbor Porpoise	*Phocoena phocoena*	Gulf of Alaska	-, -, Y	31,046 (0.21, N/A, 1998)	UND	72
Order Carnivora—Pinnipedia						
Family Otariidae (eared seals and sea lions):						
Steller Sea Lion [7]	*Eumetopias jubatus*	Western	E, D, Y	49,837 (N/A, 49,837, 2022)	299	267
		Eastern	-, -, N	36,308 (N/A, 36,308, 2022)	2,178	93.2
Family Phocidae (earless seals):						
Harbor Seal	*Phoca vitulina*	Prince William Sound	-, -, N	44,756 (N/A, 41,776, 2015)	1,253	413

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

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

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

[4] Reliable population estimates are not available for this stock. Please see Friday *et al.* (2013) and Zerbini *et al.* (2006) for additional information on numbers of minke whales in Alaska.

[5] Nest is based upon counts of individuals identified from photo-ID catalogs. PBR has been calculated, however, a reliable estimate of the maximum net productivity rate is not available for this stock, and the default cetacean maximum theoretical net productivity rate was used for the PBR calculation.

[6] 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.

[7] Nest is best estimate of counts, which have not been corrected for animals at sea during abundance surveys. Estimates provided are for the U.S. only.

As indicated above, all 8 species (with 13 managed stocks) in table 4 temporally and spatially co-occur with the activity to the degree that take is reasonably likely to occur. While gray whales (*Eschrichtius robustus*), sperm whales (*Physeter microcephalus*), northern elephant seals (*Mirounga angustirostris*), and northern fur seals (*Callorhinus ursinus*) have been documented in PWS, the temporal and/or spatial occurrence of these species is such that take is not expected to occur, and they are not discussed further beyond the explanation provided here. These species are all considered rare (no sightings in recent years), very rare (no local knowledge of sightings within the project vicinity), or are generally restricted to offshore waters in deep water, thus take is not expected to occur, and it is not discussed further in this notice.

Sea otters may be found in PWS, 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 are the most commonly observed baleen whale in Alaska and have been observed in Southeast Alaska in all months of the year (Baker *et al.,* 1986). They undergo seasonal migrations in Alaska from spring until fall with other whale species present.

Three stocks may occur in the project areas: the Western North Pacific stock, the Mexico-North Pacific stock, and the Hawaii Stock. In the project areas, Hawaii stock is the most predominant and make up approximately 89 percent of humpbacks occurring in the Gulf of Alaska. The Mexico-North Pacific stock is expected to represent approximately 11 percent, while the Western North Pacific stock represents less than 1 percent of humpbacks observed within the project areas (Wade, 2021).

Critical habitat for humpback whales in Alaska was updated in 2021 (86 FR 21082). This designated critical habitat overlaps with all three of the proposed PWS Project sites. All three PWS Project sites would also occur within (Chenega, Tatitlek) or in close proximity to (Cordova) a seasonal humpback whale feeding Biologically Important Area (BIA) for the months of September through December, and March through May (Wild *et al.* 2023).

Minke Whale

Minke whales are found throughout the northern hemisphere in polar, temperate, and tropical waters. The International Whaling Commission has identified three minke whale stocks in the North Pacific: one near the Sea of Japan, a second in the rest of the western Pacific (west of 180° W), and a third, less concentrated stock throughout the eastern Pacific. NMFS further splits this third stock between Alaska whales and resident whales of California, Oregon, and Washington (Muto *et al.,* 2018). Minke whales are found in all Alaska waters, however no population estimates are currently available for the Alaska stock.

Minke whales are generally found in shallow, coastal waters within 200 m (656 ft) of shore (Zerbini *et al.,* 2006). Dedicated surveys for cetaceans in southeast Alaska found that minke whales were scattered throughout inland waters from Glacier Bay and Icy Strait to Clarence Strait, with small concentrations near the entrance of Glacier Bay. Surveys took place in spring, summer, and fall, and minke whales were present in low numbers in all seasons and years (Dahlheim *et al.,* 2009). Additionally, minke whales were observed during the Biorka Island Dock Replacement Project at the mouth of Sitka Sound (Turnagain Marine Construction, 2018).

Killer Whale

Killer whales have been observed in all oceans, but the highest densities occur in colder and more productive waters found at high latitudes. Killer whales occur along the entire coast of Alaska (Braham and Dahlheim, 1982), inland waterways of British Columbia and Washington (Bigg *et al.,* 1990), and along the outer coasts of Washington, Oregon, and California (Green *et al.,* 1992; Barlow, 1995, 1997; Forney *et al.,* 1995). Resident killer whales in the eastern North Pacific primarily feed on salmonids, and show distinct preference for Chinook salmon, whereas transient killer whales primarily hunt and feed on marine mammals, including harbor seals, Dall's porpoise, harbor porpoises, and sea lions (Muto et. al., 2020). Eight stocks of killer whales are recognized within the Pacific U.S. Exclusive Economic Zone (Muto *et al.,* 2020). Of those, four stocks are that are most likely to occur in the PWS at all three project sites and include: (1) Eastern North Pacific Alaska Resident stock, (2) AT1 (Chugach) Transient stock, (3) Eastern North Pacific Northern Resident stock, and (4) West Coast Transient stock. For the PWS Projects at Cordova, Chenega, and Tatitlek, all stocks are expected to occur in the proposed project areas during the proposed in-water work.

Pacific White-Sided Dolphins

The Pacific white-sided dolphin is found in temperate waters of the North Pacific from the southern Gulf of California to Alaska. Across the North Pacific, it appears to occur between 33° N and 47 ° N (Young *et al.,* 2023; Waite and Shelden, 2018). In the eastern North Pacific Ocean, the Pacific white-sided dolphin is one of the most common cetacean species, occurring primarily in shelf and slope waters (Green *et al.,* 1993; Barlow 2003, 2010). During winter, this species is most abundant in California slope and offshore areas; as northern waters begin to warm in the spring, it appears to move north to slope and offshore waters off Oregon/Washington (Green *et al.,* 1992, 1993; Forney *et al.,* 1995; Buchanan *et al.,* 2001; Barlow, 2003). Pacific White-sided are highly gregarious and typically observed in groups from 10 to 100 individuals but groups can range into the thousands.

Dall's Porpoise

Dall's porpoise is found in temperate to subarctic waters of the North Pacific and adjacent seas (Jefferson *et al.,* 2015). It is widely distributed across the North Pacific over the continental shelf and slope waters, and over deep (greater than 2,500 m) oceanic waters (Friday *et al.,* 2012; Friday *et al.,* 2013). It is probably the most abundant small cetacean in the North Pacific Ocean, and its abundance changes seasonally, likely in relation to water temperature (Becker, 2007).

Dall's porpoises are common in the PWS and have been documented in a wide range of habitats, such as bays, shallow water, and nearshore waters. Observations of groups in the Prince William Sound Range between 1 to 18 animals per group (Moran et. al., 2018).

Harbor Porpoise

There are six harbor porpoise stocks in Alaska: the Bering Sea stock occurs throughout the Aleutian Islands and all waters north of Unimak Pass; the Gulf of Alaska stock occurs from Cape Suckling to Unimak Pass; the Northern Southeast Alaska Inland Waters stock includes Cross Sound, Glacier Bay, Icy Strait, Chatham Strait, Frederick Sound, Stephens Passage, Lynn Canal, and adjacent inlets; the Southern Southeast Alaska Inland Waters stock encompasses Sumner Strait, including areas around Wrangell and Zarembo Islands, Clarence Strait, and adjacent inlets and channels within the inland waters of Southeast Alaska north-northeast of Dixon Entrance; and the Yakutat/Southeast Alaska Offshore Waters stock includes offshore habitats in the Gulf of Alaska west of the Southeast Alaska inland waters and the areas around Yakutat Bay (Young *et al.,* 2023). Only the Gulf of Alaska stocks are expected to be encountered throughout all three PWS Project sites.

Steller Sea Lion

The Steller sea lion's range extends across the North Pacific Rim from northern Japan to California with areas of abundance in the Gulf of Alaska and Aleutian Islands (Muto *et al.,* 2020). In 1997, based on demographic and genetic dissimilarities, NMFS identified two DPSs of Steller sea lions under the ESA: a western DPS (western stock) and an eastern DPS (eastern stock). The western DPS breeds on rookeries located west of 144° W in Alaska and Russia, whereas the eastern DPS breeds on rookeries in southeast Alaska through California.

Movement occurs between the western and eastern DPSs of Steller sea lions, and increasing numbers of individuals from the western DPS have been seen in southeast Alaska in recent years (Muto *et al.,* 2020; Fritz *et al.,* 2016). This DPS-exchange is especially evident in the outer southeast coast of Alaska, including Sitka Sound. Hastings *et al.* (2020) indicates that the Eastern stock is increasing while the Western stock is decreasing, influencing mixing of both populations at new rookeries in northern southeast Alaska. Steller Sea Lion critical habitat has been defined in Alaska within 20 nautical miles (nmi; 37 km) of major haulouts and major rookeries (50 CFR 226.202). All three project sites have identified haulouts within this radius; the nearest haulouts are 35.7 km from Cordova, 14 km from Chenega, and 25.9 km from Tatitlek.

Harbor Seal

Harbor seals are common in the coastal and inside waters of the project areas. Harbor seals in Alaska are typically non-migratory with local movements attributed to factors such as prey availability, weather, and reproduction (Scheffer and Slipp, 1944; Fisher, 1952; Bigg 1969, 1981; Hastings *et al.,* 2004). Harbor seals haul out of the water periodically to rest, give birth, and nurse their pups. There are 12 stocks of harbor seals in Alaska but only the Prince William Stock is expected to occur at all three PWS Project action areas.

Marine Mammal Hearing

Hearing is the most important sensory modality for marine mammals underwater, and exposure to anthropogenic sound can have deleterious effects. To appropriately assess the potential effects of exposure to sound, it is necessary to understand the frequency ranges marine mammals are able to hear. Not all marine mammal species have equal hearing capabilities (*e.g.,* Richardson *et al.,* 1995; Wartzok and Ketten, 1999; Au and Hastings, 2008). To reflect this, Southall *et al.* (2007, 2019) recommended that marine mammals be divided into hearing groups based on directly measured (behavioral or auditory evoked potential techniques) or estimated hearing ranges (behavioral response data, anatomical modeling, etc.). Subsequently, NMFS (2018, 2024) described generalized hearing ranges for these marine mammal hearing groups. Generalized hearing ranges were chosen based on the approximately 65-decibel (dB) threshold from the normalized composite audiograms, with the exception for lower limits for low-frequency cetaceans where the lower bound was deemed to be biologically implausible and the lower bound from Southall *et al.* (2007)

retained. 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 5.

TABLE 5—MARINE MAMMAL HEARING GROUPS

[NMFS, 2024]

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

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

Hz = hertz; kHz = kilohertz.

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

Potential Effects of Specified Activities on Marine Mammals and Their Habitat

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

Description of Sound Sources

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

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

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

Three types of pile hammers would be used on PWS Projects: impact, vibratory, and DTH. Impact hammers operate by repeatedly dropping a heavy piston onto a pile to drive the pile into the substrate. Sound generated by impact hammers is characterized by rapid rise times and high peak levels, a potentially injurious combination (Hastings and Popper, 2005). Vibratory hammers install piles by vibrating them and allowing the weight of the hammer to push them into the sediment. Vibratory hammers produce significantly less sound than impact hammers. Peak sound pressure levels (SPLs) may be 180 dB or greater, but are generally 10 to 20 dB lower than SPLs generated during impact pile driving of the same-sized pile (Oestman *et al.,* 2009). Rise time is slower, reducing the probability and severity of injury, and sound energy is distributed over a greater amount of time (Nedwell and Edwards, 2002; Carlson *et al.,* 2005).

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

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

Potential Effects of Underwater Sound on Marine Mammals

The introduction of anthropogenic noise into the aquatic environment from DTH and pile driving and removal is the 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 sound from active acoustic sources, such as those in the 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 pile driving hammers (impact, vibratory, and DTH) 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). The Project activities considered here do not involve the use of devices such as explosives or mid-frequency tactical sonar that are associated with these types of effects.

In general, animals exposed to natural or anthropogenic sound may experience physical and psychological effects, ranging in magnitude from none to severe (Southall *et al.,* 2007, 2019). Exposure to anthropogenic noise has the potential to result in auditory threshold shifts and behavioral reactions (*e.g.,* avoidance, temporary cessation of foraging and vocalizing, changes in dive behavior). It can also lead to non-observable physiological responses, such an increase in stress hormones. Additional noise in a marine mammal's habitat can mask acoustic cues used by marine mammals to carry out daily functions, such as communication and predator and prey detection.

The 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.

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

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

Depending on the degree (elevation of threshold in dB), duration (*i.e.,* recovery time), and frequency range of TTS, and the context in which it is experienced, TTS can have effects on marine mammals ranging from discountable to serious (similar to those discussed in auditory masking, below). For example, a marine mammal may be able to readily compensate for a brief, relatively small amount of TTS in a non-critical frequency range that takes place during a time when the animal is traveling through the open ocean, where ambient noise is lower and there are not as many competing sounds present. Alternatively, a larger amount and longer duration of TTS sustained during a time when communication is critical for successful mother/calf interactions could have more serious impacts. We note that reduced hearing sensitivity as a simple function of aging has been observed in marine mammals, as well as humans and other taxa (Southall *et al.,* 2007), so we can infer that strategies exist for coping with this condition to some degree, though likely not without cost.

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

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

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

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

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

Bejder, 2007; Weilgart, 2007; NRC, 2005).

Disturbance may result in changing durations of surfacing and dives, number of blows per surfacing, or moving direction and/or speed; reduced/increased vocal activities; changing/cessation of certain behavioral activities (such as socializing or feeding); visible startle response or aggressive behavior (such as tail/fluke slapping or jaw clapping); avoidance of areas where sound sources are located. Pinnipeds may increase their haul out time, possibly to avoid in-water disturbance (Thorson and Reyff, 2006). Behavioral responses to sound are highly variable and context-specific and any reactions depend on numerous intrinsic and extrinsic factors (*e.g.,* species, state of maturity, experience, current activity, reproductive state, auditory sensitivity, time of day), as well as the interplay between factors (*e.g.,* Richardson *et al.,* 1995; Wartzok *et al.,* 2004; Southall *et al.,* 2007, 2021; Weilgart, 2007; Archer *et al.,* 2010). Behavioral reactions can vary not only among individuals but also within exposures of an individual, depending on previous experience with a sound source, context, and numerous other factors (Ellison *et al.,* 2012, Southall *et al.,* 2021), 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. For a review of the studies involving marine mammal behavioral responses to sound, see Southall *et al.,* 2007; Gomez *et al.,* 2016; and Southall *et al.,* 2021 reviews.

Disruption of feeding behavior can be difficult to correlate with anthropogenic sound exposure, so it is usually inferred by observed displacement from known foraging areas, the appearance of secondary indicators (*e.g.,* bubble nets or sediment plumes), or changes in dive behavior. As for other types of behavioral response, the frequency, duration, and temporal pattern of signal presentation, as well as differences in species sensitivity, are likely contributing factors to differences in response in any given circumstance (*e.g.,* Croll *et al.,* 2001; Nowacek *et al.,* 2004; Madsen *et al.,* 2006; Yazvenko *et al.,* 2007). A determination of whether foraging disruptions incur fitness consequences would require information on 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.

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

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

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

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

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

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

Auditory Masking—Sound can disrupt behavior through masking, or interfering with, an animal's ability to detect, recognize, or discriminate between acoustic signals of interest (*e.g.,* those used for intraspecific communication and social interactions, prey detection, predator avoidance, navigation) (Richardson *et al.,* 1995; Erbe *et al.,* 2016). Masking occurs when the receipt of a sound is interfered with by another coincident sound at similar frequencies and at similar or higher intensity, and may occur whether the sound is natural (*e.g.,* snapping shrimp, wind, waves, precipitation) or anthropogenic (*e.g.,* shipping, sonar, seismic exploration) in origin. The ability of a noise source to mask biologically important sounds depends on the characteristics of both the noise source and the signal of interest (*e.g.,* signal-to-noise ratio, temporal variability, direction), in relation to each other and to an animal's hearing abilities (*e.g.,* sensitivity, frequency range, critical ratios, frequency discrimination, directional discrimination, age or TTS hearing loss), and existing ambient noise and propagation conditions. Masking of natural sounds can result when human activities produce high levels of background sound at frequencies important to marine mammals. Conversely, if the background level of underwater sound is high (*e.g.,* on a day with strong wind and high waves), an anthropogenic sound source would not be detectable as far away as would be possible under quieter conditions and would itself be masked.

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 man-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.

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, 2009; 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 (Houser and Moore, 2014). 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 affects both senders and receivers of acoustic signals and can potentially have long-term chronic effects on marine mammals at the population level as well as at the individual level. Low-frequency ambient sound levels have increased by as much as 20 dB (more than three times in terms of SPL) in the world's ocean from pre-industrial periods, with most of the increase from distant commercial shipping (Hildebrand, 2009). All anthropogenic sound sources, but especially chronic and lower-frequency signals (*e.g.,* from vessel traffic), contribute to elevated ambient sound levels, thus intensifying masking. Project sites at Cordova, Chenega, and Tatitlek are in areas with commercial and recreational fishing, recreational boating, ferry operations, vessel traffic associated with crude oil transport from Valdez, Alaska, and local industrial activities; therefore, background sound levels are generally already elevated.

Marine Mammal Habitat Effects

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

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

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

In-water Effects on Potential Foraging Habitat—The proposed activities would not result in permanent impacts to habitats used directly by marine mammals and no increases in vessel traffic are expected in either location as a result of the specified activities. The areas likely impacted by the proposed actions are relatively small compared to the total available habitat in PWS. The proposed project areas are highly influenced by anthropogenic activities and provide limited foraging habitat for marine mammals. The total seafloor area affected by piling activities is small compared to the vast foraging areas available to marine mammals at any of the proposed construction sites. At best, the areas impacted provide marginal foraging habitat for marine mammals and fishes. Furthermore, pile driving at the project locations would not obstruct movements or migration of marine mammals.

In-Water Effects on Potential Prey—Sound may affect marine mammals through impacts on the abundance, behavior, or distribution of prey species (*e.g.,* crustaceans, cephalopods, fish, zooplankton, and other marine mammals). Marine mammal prey varies by species, season, and location. Here, we describe studies regarding the effects of noise on known marine mammal prey.

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

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

SPLs of sufficient strength have been known to cause injury to fish and fish mortality. However, in most fish species, hair cells in the ear continuously regenerate and loss of auditory function likely is restored when damaged cells are replaced with new cells. Halvorsen *et al.* (2012b) showed that a TTS of 4–6 dB was recoverable within 24 hours for one species. Impacts would be most severe when the individual fish is close to the source and when the duration of exposure is long. Injury caused by barotrauma can range from slight to severe and can cause death, and is most likely for fish with swim bladders. Barotrauma injuries have been documented during controlled exposure to impact pile driving (Halvorsen *et al.,* 2012a; Casper *et al.,* 2013) and the greatest potential effect on fish during the proposed project would occur during impact pile driving, if it is required. However, the duration of impact pile driving would be limited to a contingency in the event that vibratory driving does not satisfactorily install the pile depending on observed soil resistance. In-water construction activities would only occur during daylight hours allowing fish to forage and transit the project area at night. Vibratory pile driving may elicit behavioral reactions from fish such as temporary avoidance of the area but is unlikely to cause injuries to fish or have persistent effects on local fish populations. In addition, it should be noted that the area in question is low-quality habitat since it is already developed and experiences anthropogenic noise from vessel traffic.

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

Construction activities, in the form of increased turbidity, also have the potential to adversely affect forage fish in the project area. Pacific herring (*Clupea pallasii*) is a primary prey species of Steller sea lions, humpback whales, and many other marine mammal species that occur in the project areas. As discussed earlier, increased turbidity is expected to occur in the immediate vicinity (approximately 25 ft (7.6 m) or less) of construction activities (Everitt *et al.,* 1980). However, suspended solids are expected to dissipate quickly within a single tidal cycle. Given the limited area affected and high tidal dilution rates any effects on forage fish are expected to be minor or negligible. In addition, best management practices would be in effect to limit the extent of turbidity to the immediate project areas. Finally, exposure to turbid waters from construction activities is not expected to be different from the current exposure; fish and marine mammals in the regions are routinely exposed to substantial levels of suspended sediment from glacial sources.

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

Estimated Take of Marine Mammals

This section provides an estimate of the number of incidental takes proposed for authorization through the 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 sources (*i.e.,* impact pile installation, vibratory pile installation and removal, and DTH pile installation) 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 low frequency cetaceans, very high frequency cetaceans, phocids, and otariids because predicted AUD INJ zones are larger than other high frequency cetaceans. AUD INJ is unlikely to occur for other high frequency cetaceans. The proposed mitigation and monitoring measures are expected to minimize the severity of the taking to the extent practicable.

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

For acoustic impacts, generally speaking, we estimate take by considering: (1) acoustic criteria above which NMFS believes the best available science indicates marine mammals will likely be behaviorally harassed or incur some degree of 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 pressure received levels (RMS SPL) of 120 dB (referenced to 1 micropascal (re 1 μPa)) for continuous (*e.g.,* vibratory pile driving, drilling) and above RMS SPL 160 dB re 1 μPa for non-explosive impulsive (*e.g.,* seismic airguns) or intermittent (*e.g.,* scientific sonar) sources. Generally speaking, estimates of take by Level B harassment based on these behavioral harassment thresholds are expected to include any likely takes by TTS as, in most cases, the likelihood of TTS occurs at distances from the source less than those at which behavioral harassment is likely. TTS of a sufficient degree can manifest as behavioral harassment, as reduced hearing sensitivity and the potential reduced opportunities to detect important signals (conspecific communication, predators, prey) may result in changes in behavior patterns that would not otherwise occur.

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

Level A Harassment—NMFS' Updated Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (Version 3.0) (Updated Technical Guidance, 2024) identifies dual criteria to assess 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 activity includes the use of impulsive (impact pile installation and DTH pile installation) and non-impulsive (vibratory pile installation/removal and DTH pile installation) sources.

The 2024 Updated Technical Guidance criteria include both updated thresholds and updated weighting functions for each hearing group. The thresholds are provided in table 6 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 6—THRESHOLDS IDENTIFYING THE ONSET OF AUDITORY INJURY

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

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

Note: Peak sound pressure level (Lp,0-pk) has a reference value of 1 μPa, and weighted cumulative sound exposure level (LE,p) has a reference value of 1 μPa2s. In this table, criteria are abbreviated to be more reflective of International Organization for Standardization (ISO) standards (ISO 2017; ISO 2020). The subscript "flat" is being included to indicate peak sound pressure are flat weighted or unweighted within the generalized hearing range of marine mammals underwater (*i.e.,* 7 Hz to 165 kHz). The subscript associated with cumulative sound exposure level criteria indicates the designated marine mammal auditory weighting function (LF, HF, and VHF cetaceans, and PW and OW pinnipeds) and that the recommended accumulation period is 24 hours. The weighted cumulative sound exposure level criteria could be exceeded in a multitude of ways (*i.e.,* varying exposure levels and durations, duty cycle). When possible, it is valuable for action proponents to indicate the conditions under which these criteria will be exceeded.

Ensonified Area

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

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

Sound Source Levels and TL of Proposed Activities—The intensity of pile driving sounds is greatly influenced by factors such as the type of piles (material and diameter), hammer type, and the physical environment (*e.g.,* sediment type) in which the activity takes place. PWS Projects include vibratory pile installation and removal, impact pipe pile installation, and DTH pile installation. ADOT&PF estimated source levels and transmission loss coefficient measurements using empirical measurements from similar activities elsewhere in Alaska or outside of Alaska and relied on the best available and most relevant sound source verification studies to determine appropriate proxy levels for their proposed activities. Recently proposed and issued IHAs from southeast Alaska were also reviewed to identify the most appropriate proxy SPLs and TL coefficients. NMFS agrees that the SPL values and TL coefficients that the ADOT&PF proposed are appropriate proxy levels for their proposed activities (see table 7 for proposed proxy levels and TLs). Source levels for vibratory removal of piles are assumed to be the same as source levels for vibratory installation of piles of the same diameter. Note that the values in table 7 and those discussed herein represent SPL values referenced at a distance of 10 m from the source.

TABLE 7—SUMMARY OF UNATTENUATED IN-WATER PILE DRIVING PROXY LEVELS (AT 10 M) AND TRANSMISSION LOSS COEFFICIENTS

Pile size and type	RMS SPL (dB re 1 μPa)	SEL (dB re 1 μPa2-sec)	Peak SPL (dB re 1 μPa)	TL coefficient (log10)	Reference	Relevant project location
Vibratory pile installation and removal						
18-inch (46 cm) steel piles.	161	N/A	N/A	15	CALTRANS 2020	Chenega, Cordova
20-inch (51 cm) steel piles.	161	N/A	N/A	15	CALTRANS 2020 (cited in NMFS 2023).	Tatitlek
24-inch (61 cm) steel piles.	161	N/A	N/A	15	CALTRANS 2020 (cited in NMFS 2023).	All
30-inch (76 cm) steel piles.	166	N/A	N/A	15	U.S. Navy 2015	All
36-inch (91 cm) steel piles.	166	N/A	N/A	15	U.S. Navy 2015	Tatitlek
Impact pile installation						
24-inch (61 cm) steel piles.	193	181	207	15	CALTRANS 2020 (cited in NMFS 2023) and U.S. Navy 2015.	All
30-inch (76 cm) steel piles.	193	184	211	15	U.S. Navy 2015	All
36-inch (91 cm) steel piles.	193	184	211	15	U.S. Navy 2015	Tatitlek

TABLE 7—SUMMARY OF UNATTENUATED IN-WATER PILE DRIVING PROXY LEVELS (AT 10 M) AND TRANSMISSION LOSS COEFFICIENTS—Continued

Pile size and type	RMS SPL (dB re 1 μPa)	SEL (dB re 1 μPa2-sec)	Peak SPL (dB re 1 μPa)	TL coefficient (log10)	Reference	Relevant project location
DTH of rock sockets and tension anchors						
24-inch (61 cm) steel piles, (rock socket).	167	159	184	17	NMFS 2022; Reyff *et al.* 2025.	Chenega, Tatitlek
30- and 36-inch (76 and 91 cm) steel piles (rock socket).	174	164	194	17	NMFS 2022; Reyff *et al.* 2025.	Chenega, Tatitlek
8-inch (20 cm) tension anchors.	156	144	170	18	NMFS 2022; Reyff *et al.* 2025.	Chenega, Tatitlek

Note: N/A means not applicable.

NMFS (2022) recommends that DTH system installation be treated as a continuous sound source for Level B behavioral harassment calculations and as an impulsive source for Level A harassment calculations given these systems produce noise including characteristics of both source types (described above in the Description of Sound Sources section). Source levels proposed by ADOT&PF for all DTH pile installations match those recommended by NMFS (2022), and thus are deemed acceptable by NMFS as proxy levels for the proposed Projects. The TL coefficients proposed by ADOT&PF for DTH pile installation differ from those recommended by NMFS (2022), but for reasons explained below are acceptable proxy TL coefficients for the proposed Projects.

TL data from the proposed Project sites or from areas with similar physical and environmental conditions were not available for vibratory pile installation, vibratory pile removal, and impact driving; therefore, ADOT&PF proposed practical spreading (*i.e.,* the default TL coefficient of 15) as the proxy TL coefficient to determine distances to the Level A harassment and Level B harassment thresholds for these activities. For DTH and tension anchoring activities, ADOT&PF made comparisons with Chenega and Tatitlek to other ferry terminal locations where underwater sound source verification (SSV) studies have been conducted in south central and southeast Alaska. Among the sites where SSV studies have been conducted, it was determined that similar environmental characteristics, including water temperature, substrate type, and bathymetry were similar to the Chenega and Tatitlek project sites. Data from Alaska DTH studies provide evidence that sounds from drilling rock sockets for the pile sizes proposed in the PWS Projects decay at a greater rate than practical spreading, with TL coefficients from all but one study in Alaska ranging from an average of 15.5 to 19.5 (Reyff *et al.* 2025). Therefore, ADOT&PF proposed an average TL coefficient of 17.0 for rock sockets.

Tension anchors of 8- to 10-inch (20 to 25 cm) diameter have been measured throughout Alaska with variable results. Despite this, underwater noise from tension anchor construction has typically been low, possibly because the bedrock is overlain with sediments, which together attenuate noise production from the drilling and reduce noise propagation into the water column. Additionally, the casing used during drilling is inside the larger-diameter pile, further reducing noise levels. TL coefficients have ranged from 17 to 24, with a mean TL of approximately 18 (J. Reyff, Pers. Coms.). For the proposed Projects, ADOT&PF have proposed to use the TL coefficients for the DTH installation of 8- to 10-inch (20 to 25 cm) tension anchors. Due to the similarity in site characteristics of the proposed PWS Projects and the measured TL coefficients, NMFS concurs that ADOT&PF's proposed TL coefficients for DTH pile installation are acceptable as proxy coefficients for the proposed Projects.

Estimated Harassment Isopleths—All estimated Level B harassment isopleths are reported in table 11. At all proposed Project sites, Level B harassment isopleths would be truncated by the surrounding coastlines and certain bathymetric features (*e.g.,* mud flats exposed during low tides).

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 pile driving, the optional User Spreadsheet tool predicts the distance at which, if a marine mammal remained at that distance for the duration of the activity, it would be expected to incur AUD INJ.

To account for potential variations in daily productivity during DTH pile installation, ADOT&PF calculated ensonified areas for Level A harassment were for different durations of installation, ranging from 60 minutes minimum up to 480 minutes for rock sockets, and from 60 minutes to 240 minutes for tension anchors. For vibratory installation, harassment zones were calculated based on the maximum number of piles and duration for any given day for contactor flexibility.

The pulse rate or frequency for DTH pile installation is generally negatively correlated with borehole diameter but varies by the equipment used. ADOT&PF have estimated that rock socket boreholes would be constructed by equipment operating at approximately 15 Hz, or 15 cycles per second, which is equivalent to 900 strikes per minute. Due to the smaller diameter of tension anchor boreholes, ADOT&PF have estimated that a strike rate of 30 Hz (30 cycles per second) is appropriate for the DTH installation of tension anchors.

ADOT&PF estimate that impact installation of all pile sizes would require 50 strikes per pile for proofing; however, this may vary based on the embedment. At Cordova Ferry Terminal, where the use of DTH methods is not anticipated, full impact installation of permanent piles is estimated to be 600 strikes per pile. Inputs used in the optional User Spreadsheet tool, and the resulting estimated isopleths, are reported in tables 8, 9, 10, and 11.

TABLE 8—NMFS USER SPREADSHEET INPUTS FOR THE CORDOVA PROJECT

Pile diameter	Spreadsheet tab used	Source level (SPL)	Weighting factor adjustment	Transmission loss coefficient	Activity duration (minutes)	Number of strikes per pile	Number of piles per day	Distance of sound pressure level measurement (m)
Vibratory installation								
24-inch (61 cm)	A.1) Vibratory Pile Driving.	161 dB RMS	2.5	15	30	N/A	4	10
30-inch (76 cm)		166 dB RMS	2.5	15	60	N/A	2	10
Vibratory removal								
18-inch (46 cm)	A.1) Vibratory Pile Driving.	161 dB RMS	2.5	15	60	N/A	4	10
24-inch (61 cm)		161 dB RMS	2.5	15	30	N/A	4	10
30-inch (76 cm)		166 dB RMS	2.5	15	60	N/A	3	10
Impact installation								
30-inch (76 cm)	E.1) Impact Pile driving.	184 dB SEL	2	15	N/A	600	1, 2	10

Note: N/A means not applicable.

TABLE 9—NMFS USER SPREADSHEET INPUTS FOR THE CHENEGA PROJECT

Pile diameter	Spreadsheet tab used	Source level	Weighting factor adjustment	Transmission loss coefficient	Activity duration (minutes)	Number of strikes per pile (impact) or strike rate (DTH)	Number of piles per day	Distance of sound pressure level measurement (m)
Vibratory installation								
18-inch (46 cm)	A.1) Vibratory Pile Driving.	161 dB RMS	2.5	15	15	N/A	2	10
24-inch (61 cm)		161 dB RMS	2.5	15	15	N/A	4	10
30-inch (76 cm)		166 dB RMS	2.5	15	15	N/A	4	10
Vibratory removal								
24-inch (61 cm)	A.1) Vibratory Pile Driving.	161 dB RMS	2.5	15	30	N/A	4	10
Impact installation								
24-inch (61 cm)	E.1) Impact Pile driving.	181 dB SEL	2	15	N/A	50	2	10
30-inch (76 cm)		184 dB SEL	2	15	N/A	50	2	10
DTH (rock socket)								
24-inch (61 cm)	E.2) DTH Systems	159 dB SEL	2	17	60	15	1	10
		159 dB SEL	2	17	120	15	1	10
		159 dB SEL	2	17	240	15	1	10
		159 dB SEL	2	17	360	15	1	10
		159 dB SEL	2	17	480	15	1	10
30-inch (76 cm)		164 dB SEL	2	17	60	15	1	10
		164 dB SEL	2	17	120	15	1	10
		164 dB SEL	2	17	240	15	1	10
		164 dB SEL	2	17	360	15	1	10
		164 dB SEL	2	17	480	15	1	10
DTH (tension anchor)								
8-inch (20 cm)	E.2) DTH Systems	144 dB SEL	2	18	60	15	1	10
		144 dB SEL	2	18	120	15	1	10
		144 dB SEL	2	18	180	15	1	10
		144 dB SEL	2	18	240	15	1	10

Note: N/A means not applicable.

TABLE 10—NMFS USER SPREADSHEET INPUTS FOR THE TATITLEK PROJECT

Pile diameter	Spreadsheet tab used	Source level (SPL)	Weighting factor adjustment	Transmission loss coefficient	Activity duration (minutes)	Number of strikes per pile (impact) or strike rate (DTH)	Number of piles per day	Distance of sound pressure level measurement (m)
Vibratory installation								
24-inch (61 cm)	A.1) Vibratory Pile Driving.	161 dB RMS	2.5	15	15	N/A	4	10
30-inch (76 cm)		166 dB RMS	2.5	15	15	N/A	1	10
36-inch (91 cm)		166 dB RMS	2.5	15	15	N/A	1	10
Vibratory removal								
20-inch (51 cm)	A.1) Vibratory Pile Driving.	161 dB RMS	2.5	15	60	N/A	3	10
24-inch (61 cm)		161 dB RMS	2.5	15	30	N/A	4	10
30-inch (76 cm)		166 dB RMS	2.5	15	60	N/A	4	10
Impact installation								
30-inch (76 cm)	E.1) Impact Pile driving.	184 dB SEL	2	15	N/A	50	1	10
30-inch (76 cm)		184 dB SEL	2	15	N/A	50	1	10
36-inch (91 cm)		184 dB SEL	2	15	N/A	50	1	10
36-inch (91 cm)		184 dB SEL	2	15	N/A	50	1	10
DTH (rock socket)								
30-inch (76 cm)	E.2) DTH Systems	164 dB SEL	2	17	60	15	1	10
		164 dB SEL	2	17	120	15	1	10
		164 dB SEL	2	17	240	15	1	10
		164 dB SEL	2	17	360	15	1	10
		164 dB SEL	2	17	480	15	1	10
36-inch (91 cm)		164 dB SEL	2	17	60	15	1	10
		164 dB SEL	2	17	120	15	1	10
		164 dB SEL	2	17	240	15	1	10
		164 dB SEL	2	17	360	15	1	10
		164 dB SEL	2	17	480	15	1	10
DTH (tension anchor)								
8-inch (20 cm)	....	144 dB SEL	2	18	60	15	1	10
		144 dB SEL	2	18	120	15	1	10
		144 dB SEL	2	18	180	15	1	10
		144 dB SEL	2	18	240	15	1	10

Note: N/A means not applicable.

TABLE 11—CALCULATED DISTANCES AND AREAS OF LEVEL A AND LEVEL B HARASSMENT PER PILE TYPE AND PILE DRIVING METHOD

Activity	Pile diameter (inches)	Activity duration (min)	Strikes per pile	Piles per day	Level A harassment isopleth, by hearing group (m)					Level B harassment distance (m; all hearing groups)	Level B harassment area (km2; all hearing groups)[1]		
					LF	HF	VHF	PW	OW		Cordova	Chenega	Tatitlek
Vibratory Installation	18-inch (46 cm)	15	N/A	2	5.8	2.2	4.7	7.5	2.5	5,412	N/A	11.84	N/A
	24-inch (61 cm)	15		4	9.2	3.5	7.5	11.9	4		N/A	11.84	20.90
		30		4	14.6	5.6	12.0	18.8	6.3		22.33	N/A	N/A
	30-inch (76 cm)	15		2	12.5	4.8	10.2	16.1	5.4	11,659	N/A	N/A	50.35
		15		4	19.9	7.6	16.2	25.6	8.6		N/A	12.98	N/A
		60		4	31.5	12.1	25.8	40.6	13.7		52.22	N/A	N/A
	36-inch (91 cm)	15		2	12.5	4.8	10.2	16.1	5.4		N/A	N/A	50.35
Vibratory Removal	18-inch (46 cm)	60		4	23.2	8.9	19.0	29.9	10.1	5,412	22.33	N/A	N/A
	20-inch (51 cm)	60		3	19.2	7.4	15.7	24.7	8.3			N/A	20.90
	24-inch (61 cm)	30		4	14.6	5.6	12.0	18.8	6.3			11.84	20.90
	30-inch (76 cm)	60		3	41.3	15.9	33.8	53.2	17.9	11,659	52.22	N/A	N/A
				4	50.1	19.2	40.9	64.4	21.7		N/A	N/A	62.38
Impact Installation	24-inch (61 cm)	N/A	50	2	157.7	20.1	244.0	140.1	52.2	1,585	N/A	3.80	N/A
	30-inch (76 cm)		50	2	249.9	31.9	386.8	222.0	82.8		N/A	3.80	N/A
			600	1	825.3	105.3	1,277.1	733.1	273.3		3.95	N/A	N/A
				2	1,310.0	167.1	2,027.3	1,163.8	433.8				
	36-inch (91 cm)		50	1	157.4	20.1	243.7	139.9	52.1		N/A	N/A	5.14
			20	2	249.9	31.9	386.8	222.0	82.8				
DTH rock socket	24-inch (61 cm)	60	N/A	N/A	234.5	38.1	344.7	211.2	88.4	5,817	N/A	12.17	N/A
		120			352.5	57.3	518.3	317.5	132.9				
		240			529.9	86.1	779.0	477.4	199.9				
		360			672.7	109.4	988.9	606.0	253.7				
		480			796.7	129.5	1,171.2	717.7	300.5				
	30-inch (76 cm)	60	N/A	N/A	461.5	75.0	678.4	415.7	174.1	15,013	N/A	12.98	62.38
		120			693.9	112.8	1,020.0	625.0	261.7				
		240			1,043.1	169.6	1,533.4	939.7	393.4				
		360			1,324.1	215.2	1,946.5	1,192.8	499.4				
		480			1,568.3	254.9	2,305.4	1,412.7	591.4				
	36-inch (76 cm)	60	N/A	N/A	461.5	75.0	678.4	415.7	174.1	15,013	N/A	12.98	62.38
		120			693.9	112.8	1,020.0	625.0	261.7				
		240			1,043.1	169.6	1,533.4	939.7	393.4				
		360			1,324.1	215.2	1,946.5	1,192.8	499.4				
		480			1,568.3	254.9	2,305.4	1,412.7	591.4				
DTH (tension anchor)	8-inch (20 cm)	60	N/A	N/A	42.4	7.6	61.1	38.5	16.9	1,000	N/A	1.92	2.28
		120			53.2	9.6	76.5	48.2	21.2				
		180			62.4	11.2	89.8	56.5	24.8				
		240			91.7	16.5	131.9	83.1	36.5				

[1]Level B harassment areas vary by location based on the local topographies.
Note: N/A means not applicable. km^2 = square kilometer.

Marine Mammal Occurrence and Take Estimation

In this section we provide information about the occurrence of marine mammals, including density or other relevant information which will inform the take calculations. Available information regarding marine mammal occurrence in the vicinity of the project area includes site-specific and nearby survey information, historic data sets, and observations from local residents at each project site. In particular, ADOT&PF gathered qualitative information from discussions with knowledgeable local people in the Cordova, Chenega, and Tatitlek communities, including individuals familiar with marine mammals in the Project areas. NMFS disagrees with some of the occurrence estimates proposed by ADOT&PF, and has provided explanations and adjusted estimates below for each species. Tables 12 and 13 show the occurrence estimates requested by ADOT&PF and the adjusted occurrence estimates used by NMFS in our take estimation calculations.

Humpback whale—Humpback whales are rarely observed around Cordova, with residents describing a small number of sightings annually. However, to account for the potential for a higher than normal abundance of humpback whales to occur during the 33 construction days (approximately six 5-day work weeks), ADOT&PF estimated up to two humpback exposures per construction week. NMFS concurs with this estimate.

Humpback whales are occasionally observed around Chenega, with residents describing a small number of sightings annually, typically in groups of two to five individuals. To account for the potential for a higher than normal abundance of humpback whales occur during the project, ADOT&PF estimated up to five humpback exposures per construction week of the Chenega Project. NMFS disagrees with this estimate, noting that a few sightings annually would not equate to five individuals per week. NMFS proposes to authorize exposures of up to two individuals per week for the estimated 12 weeks of construction.

Humpback whales are occasionally observed around Tatitlek, with residents describing a small number of sightings annually. However, to avoid shutdowns should a higher than normal abundance of humpback whales occur during the project, ADOT&PF estimated that up to two humpbacks may be exposed per week; NMFS concurs with this estimate.

Minke whale—Local residents reported that no minke whales have been observed near Cordova, Chenega, or Tatitlek. To account for the potential for a higher than average minke whale abundance occur during the construction window, ADOT&PF estimated that up to two minke whales could occur within each project area over the entire duration of each project. NMFS concurs with these estimates.

Killer whale—Killer whales have been monitored in PWS since the 1989 Exxon Valdez oil spill, with regular observations near Cordova (Matkin *et al.* 2013), and a reasonable likelihood of occurrence near Chenega and Tatitlek. ADOT&PF estimates that one pod of 15 resident animals, or multiple smaller pods of transient animals totaling 15 animals, may transit through each project area during each month of construction. NMFS concurs with this estimate. Specific to AT1 Transient stock, NMFS considers any exposure of AT1 whales would likely be of a group, here assumed to consist of 7 individuals. NMFS considers it reasonably likely that AT1 whales may occur one time during the course of the project at each project site.

Pacific white-sided dolphin—Most observations of Pacific white-sided dolphins occur off the outer coast or in inland waterways near entrances to the open ocean (Muto *et al.* 2021). Irregular sightings indicate that there is a small potential for Pacific white-sided dolphins to occur in the Project areas. However, recent fluctuations in distribution and abundance decrease the certainty in this prediction. ADOT&PF therefore estimated that one large group (92 individuals based on the median of groups between 20 and 164 individuals) (Muto *et al.* 2018) of Pacific white-sided dolphins may occur in each project area over the duration of the in-water construction period.

Dall's porpoise—Sightings of Dall's porpoises throughout PWS were not described by local residents. At Tatitlek, however, an unidentified porpoise was described as occurring in deeper, open water. As such, there is limited potential for Dall's porpoises to occur in the project areas. Recent research indicates that Dall's porpoises may opportunistically exploit nearshore habitats when predators, such as killer whales, are absent (Moran *et al.* 2018). Based on knowledge of Dall's porpoise abundance in PWS, ADOT&PF estimated that two pods of up to 10 individuals (or 20 individuals total) may transit the each project site during each month of in-water construction. NMFS disagrees with the estimates of group size and frequency based on the highest average seasonal group size (4.8 individuals, winter) and encounter rates in PWS (Moran *et al.* 2018), and instead proposes that four groups of 5 individuals may transit each project site each month.

Harbor porpoise—Sightings of harbor porpoises throughout PWS were not described by local residents, except at Chenega, where residents report seeing bow-riding harbor porpoises, but mostly in the open waters away from the project area. At Tatitlek, an unidentified porpoise was described as occurring in deeper, open water. As such, there is limited potential for harbor porpoise to occur in the project areas in low numbers. ADOT&PF therefore estimated that up to two harbor porpoises per day could occur in each of the project areas. NMFS disagrees with this estimate because in the absence of definitive sightings by local residents an estimate of two porpoises per day is not reasonably likely. However, this species is small, cryptic, and can be difficult to detect. NMFS therefore conservatively estimates that one group of two porpoises could occur every other day at each project location.

Harbor seal—Harbor seals are commonly sighted throughout PWS and along the North Gulf Coast included in this region. The Alaska Fisheries Science Center identified ''key'' haulouts (haulouts that have had 50 or more harbor seals documented during surveys) within a 10-mile radius of the project areas: 17 at Cordova, 12 at Chenega; and two at Tatitlek (NOAA 2021). NMFS aerial survey data between 2006 and 2015 indicate that as many as 348 harbor seals were sighted near Cordova (Area GG08, NOAA 2022), between 86 and 531 near Chenega (Area HF21, NOAA 2022), and up to 10 near Tatitlek (Area GG08, NOAA 2022). However, local residents report that only small numbers of harbor seals are regularly observed near the project areas: one to two near Cordova; two to five near Chenega; and two to five near Tatitlek. In Cordova, these individuals are generally observed monthly near the ferry terminal, with lower sightings during the winter months, while in Chenega and Tatitlek, residents noted that harbor seals are observed weekly throughout the year, and more frequently observed during herring and salmon runs in spring and summer.

ADOT&PF estimated that up to four harbor seals could be present each day at Cordova and Chenega, and up to five harbor seals per day at Tatitlek. NMFS concurs with the estimates for Chenega and Tatitlek based on local resident knowledge, and disagrees with the estimate for Cordova. Group sizes at

Cordova were cited as one to two individuals observed monthly; thus, an estimate of four animals per day is not reasonably likely to occur. NMFS instead proposes that up to two individuals may be present per day at Cordova.

Steller sea lions—Steller sea lions are uncommon in the Cordova Project area. The nearest documented haulout is Hook Point, about 35.7 km (22.2 miles) southwest of Cordova on Hinchinbrook Island. Up to 70 Steller sea lions were present during aerial surveys over Hook Point that occurred between 2013 and 2019 (Sweeney *et al.* 2019). However, local residents report that Steller sea lions can often be seen on buoys around 3 km (1.9 miles) from the Cordova Project area (one to two individuals at a time) and in nearby waters (four to five individuals), with greater presence during hooligan and salmon runs in spring, summer, and fall. ADOT&PF estimated that a group of 10 Steller sea lions could transit the Cordova project area every day. NMFS disagrees with this estimate based on the resident reports of a maximum of five individuals per group, and instead proposes that up to five Steller sea lions could be in the Cordova project area each day of construction.

Steller sea lions are common in the Chenega project area with systematic counts or surveys completed by NMFS in the area around Chenega identifying multiple haulouts within 15 miles of the harbor. The nearest documented haulout is Point LaTouche, about 14 km (8.6 miles) southwest of Chenega. No Steller sea lions were present during aerial surveys over Point LaTouche that occurred between 2013 and 2021 (Fritz *et al.* 2016; Sweeney *et al.*2017; Sweeney *et al.* 2019; Sweeney *et al.* 2021). Other sites within 15 miles of Chenega harbor—Danger Island, Point Elrington, and Procession Rocks—had 305 sea lions observed, four of which were pups at Procession Rocks (Sweeney *et al.* 2021). Local residents report observing groups of Steller sea lions year-round (3 to 5 individuals), with a particularly high presence (up to 40 individuals) during the late summer and early fall salmon runs. ADOT&PF conservatively estimated that an average of up to 20 Steller sea lions could transit the Chenega Project area every day. NMFS disagrees with this estimate, based on resident reports of up to 40 individuals only during late summer, and a much smaller group size (three to five animals) during the remainder of the year. NMFS proposes that a reasonably likely annual average for this project site is 10 Steller sea lions per day.

Steller sea lions are uncommon in the Tatitlek project area. The nearest documented haulout is Glacier Island, about 25.9 km (16.1 miles) southwest of Tatitlek. Recent surveys documented 821 Steller sea lions and 20 Steller sea lion pups during aerial surveys over Glacier Island that occurred in 2019 (Sweeney *et al.* 2019). Steller sea lion presence was reported to be higher during spring and summer, with groups as large as 6 to 10 individuals. ADOT&PF conservatively estimated that one group of 10 Steller sea lions could transit the Tatitlek project area every day. NMFS disagrees with this estimate, based on the range of group sizes reported by residents, and instead proposes that the minimum number cited be used as the daily average, resulting in up to six Steller sea lions per day in the Tatitlek project area.

TABLE 12—SPECIES OCCURRENCE ESTIMATES AS PROPOSED BY ADOT AND ADJUSTED BY NMFS

Species	Proposed by ADOT			NMFS adjusted		
	Group size	Frequency	Reference	Group size	Frequency	Reason for change
Cordova						
Harbor porpoise	2	Daily	No local reports	2	Every other Day	No local reports, but possible that small cryptic species could be present and unobserved on an irregular basis.
Dall's porpoise	10	2x monthly	Known to occur throughout PWS in groups of 1–10 individuals.	5	4x Monthly	Moran *et al.* (2018) shows maximum average group size of 4.82 during winter in PWS, and frequently encountered throughout PWS.
Steller sea lion	10	Daily	Regular sightings of 1 to 5 individuals in spring, summer, and fall.	5	Daily	Maximum daily sightings of 5.
Harbor seal	4	Daily	Regular sightings of 1–2 individuals monthly.	2	Daily	Maximum sightings of 2 individuals on a monthly basis; 2 per day is more reasonable.
Chenega						
Humpback whale	5	1x/week	Occasional local sightings of 2–5 individuals.	2	1x/week	Use minimum group size for "occasional" sightings, vs. max of 5.
Harbor porpoise	2	Daily	No local reports	2	Every other Day	No local reports, but possible that small cryptic species could be present and unobserved on an irregular basis.
Dall's porpoise	10	2x monthly	Known to occur throughout PWS in groups of 1–10 individuals.	5	4x Monthly	Moran *et al.* (2018) shows maximum average group size of 4.82 during winter in PWS, and frequently encountered throughout PWS.

TABLE 12—SPECIES OCCURRENCE ESTIMATES AS PROPOSED BY ADOT AND ADJUSTED BY NMFS—Continued

Species	Proposed by ADOT			NMFS adjusted		
	Group size	Frequency	Reference	Group size	Frequency	Reason for change
Steller sea lion	20	Daily	Regular sightings of 3 to 5 individuals year round; up to 40 during summer salmon runs.	10	Daily	Regular sightings of up to 5, with occasional much larger groups; 10 per day is likely a reasonable average.
Tatitlek						
Harbor porpoise	2	1x/day	No local reports	2	Every other Day	No local reports, but possible that small cryptic species could be present and unobserved on an irregular basis,
Dall's porpoise	10	2x monthly	Known to occur throughout PWS in groups of 1–10 individuals.	5	4x Monthly	Moran *et al.* (2018) shows maximum average group size of 4.82 during winter in PWS, and frequently encountered throughout PWS.
Steller sea lion	10	Daily	Sightings of 6 to 10 individuals in summer.	6	Daily	Annual average is likely fewer than 10 individuals per day; 6 is reasonable.

TABLE 13—PROPOSED SPECIES OCCURRENCES AT ALL THREE PROJECT LOCATIONS

Species	Frequency	Group size		
		Cordova	Chenega	Tatitlek
Humpback whale	1x/week	2	2	2
Minke whale	1x/year	2	2	2
Killer whale	1x/month	15	15	15
Pacific white-sided dolphin	1x/year	92	92	92
Harbor porpoise	Every other Day	2	2	2
Dall's porpoise	4x/month	5	5	5
Steller sea lion	Daily	5	10	6
Harbor seal	Daily	2	4	5

Take Estimation

Here we describe how occurrence information is synthesized to produce a quantitative estimate of the take that is reasonably likely to occur and proposed for authorization for each project. Take was estimated based on the estimated species group size and frequency, as well as the best estimate of the number of days proposed for each activity, and, for some species, the predicted ensonified areas for each activity.

Total exposures for each species at each location was calculated using the occurrence estimates shown in table 13, multiplied by the best estimate of work duration at each project location (tables 1 through 3). Estimated take by Level B harassment was calculated as the total exposures minus the estimated take by Level A harassment. Estimated take by Level A harassment for species that are relatively common at the project sites (*i.e.,* Steller sea lion, harbor seal, harbor porpoise, and humpback whale) was calculated based on the ratio of the maximum Level A harassment area to the maximum Level B harassment area for each site (table 14). For pinnipeds and VHF cetacean species, the area of the proposed shutdown zone was subtracted from the area of the Level A harassment zone.

TABLE 14—AREAS AND CALCULATED RATIOS FOR ESTIMATING TAKE BY LEVEL A HARASSMENT FOR FOUR SPECIES

	Steller sea lion	Harbor seal	Harbor porpoise	Humpback whale
Cordova				
Shutdown zone area (km^2)	0.1413			0
Level A area (km^2)	0.33	2.285	na	2.8
Level B area (km^2)	3.95			
Ratio	0.048	0.543	na	0.709

TABLE 14—AREAS AND CALCULATED RATIOS FOR ESTIMATING TAKE BY LEVEL A HARASSMENT FOR FOUR SPECIES—Continued

	Steller sea lion	Harbor seal	Harbor porpoise	Humpback whale
Chenega				
Shutdown zone area (km²)	0.21195			0
Level A area (km²)	0.77	3.2	5.5	3.75
Level B area (km²)	12.975			
Ratio	0.043	0.016	0.408	0.289
Tatitlek				
Shutdown zone area (km²)	0.21195			0
Level A area (km²)	0.499	2.6	6	3.2
Level B area (km²)	62.375			
Ratio	0.005	0.038	0.093	0.051

For the remaining species, which are uncommon at the project locations, estimated take by Level A harassment was either not considered likely due to low occurrence estimates and historical sighting data (*i.e.,* Pacific white-sided dolphin, minke whale) or high visibility of the species (*i.e.,* killer whale), or was adjusted based on average group size (*i.e.,* Dall's porpoise).

Total exposures and proposed take by Level A and Level B harassment at Cordova, Chenega, and Tatitlek are shown in tables 15, 16, and 17, respectively.

TABLE 15—PROPOSED TAKE OF MARINE MAMMALS BY LEVEL A AND LEVEL B HARASSMENT AND PERCENT OF STOCK PROPOSED TO BE TAKEN AT THE CORDOVA PROJECT

Species	Stock	Level A	Level B	Total	Percent of stock
Steller sea lion	Western North Pacific	1	299	300	0.6
Harbor seal	Prince William Sound	3	117	120	0.27
Harbor porpoise	Gulf of Alaska	56	4	60	0.19
Dall's porpoise	Alaska	10	30	40	[a] UND
Pacific white-sided dolphin	North Pacific	0	92	92	0.34
Killer whale [b]	Alaska Resident	0	30	30	1.56
	AT1 Transient				n/a
	Northern Resident				9.93
	West Coast Transient				8.6
Humpback whale	Hawaii	5	10	15	0.13
	Mexico-North Pacific	0	2	2	[a] UND
Minke whale	Alaska	0	2	2	[a] UND

[a] Stock size is undetermined.
[b] NMFS conservatively assumes that all takes may come from any stock, thus these numbers represent overestimates if multiple stocks occur. See discussion in Small Numbers section.

TABLE 16—PROPOSED TAKE OF MARINE MAMMALS BY LEVEL A AND LEVEL B HARASSMENT AND PERCENT OF STOCK PROPOSED TO BE TAKEN AT THE CHENEGA PROJECT

Species	Stock	Level A	Level B	Total	Percent of stock
Steller sea lion	Western North Pacific	63	1497	1560	3.13
Harbor seal	Prince William Sound	10	614	624	1.39
Harbor porpoise	Gulf of Alaska	120	36	156	0.50
Dall's porpoise	Alaska	50	50	100	[a] UND
Pacific white-sided dolphin	North Pacific	0	92	92	0.34
Killer whale [b]	Alaska Resident	0	75	75	4.47
	AT1 Transient				n/a
	Northern Resident				24.7
	West Coast Transient				30.1
Humpback whale	Hawaii	11	29	40	0.35
	Mexico-North Pacific	1	4	5	[a] UND

TABLE 16—PROPOSED TAKE OF MARINE MAMMALS BY LEVEL A AND LEVEL B HARASSMENT AND PERCENT OF STOCK PROPOSED TO BE TAKEN AT THE CHENEGA PROJECT—Continued

Species	Stock	Level A	Level B	Total	Percent of stock
Minke whale	Alaska	0	0	2	[a] UND

[a] Stock size is undetermined.
[b] NMFS conservatively assumes that all takes may come from any stock, thus these numbers represent overestimates if multiple stocks occur. See discussion in Small Numbers section.

TABLE 17—PROPOSED TAKE OF MARINE MAMMALS BY LEVEL A AND LEVEL B HARASSMENT AND PERCENT OF STOCK PROPOSED TO BE TAKEN AT THE TATITLEK PROJECT

Species	Stock	Level A	Level B	Total	Percent of stock
Steller sea lion	Western North Pacific	4	452	456	0.91
Harbor seal	Prince William Sound	24	356	380	0.85
Harbor porpoise	Gulf of Alaska	12	64	76	0.24
Dall's porpoise	Alaska	40	40	80	[a] UND
Pacific white-sided dolphin	North Pacific	0	92	92	0.34
Killer whale [b]	Alaska Resident	0	60	60	3.13
	AT1 Transient				n/a
	Northern Resident				19.9
	West Coast Transient				17.2
Humpback whale	Hawaii	9	11	20	0.18
	Mexico-North Pacific	1	1	2	[a] UND
Minke whale	Alaska	0	2	2	[a] UND

[a] Stock size is undetermined.
[b] NMFS conservatively assumes that all takes may come from any stock, thus these numbers represent overestimates if multiple stocks occur. See discussion in Small Numbers section.

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. 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, as well as subsistence uses. This considers the nature of the potential adverse impact being mitigated (likelihood, scope, range). It further considers the likelihood that the measure will be effective if implemented (probability of accomplishing the mitigating result if implemented as planned), the likelihood of effective implementation (probability implemented as planned); and

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

ADOT&PF must ensure that construction supervisors and crews, the monitoring team and relevant ADOT&PF staff are trained prior to the start of all pile driving and DTH activities, so that responsibilities, communication procedures, monitoring protocols, and operational procedures are clearly understood. New personnel joining during the project must be trained prior to commencing work.

Protected Species Observers

ADOT&PF must employ NMFS-approved protected species observers (PSOs), who are independent of the construction contractor, and establish monitoring locations as described in the NMFS-approved Marine Mammal Monitoring Plans and Section 5 of the three PWS Project IHAs. ADOT&PF must monitor the project areas to the maximum extent possible based on monitoring locations and environmental conditions. If environmental conditions deteriorate such that the entirety of shutdown zones would not be visible (*e.g.,* fog, heavy rain, Beaufort sea state, etc.), all pile driving would be delayed until PSOs are confident that marine mammals in the shutdown zones could be detected. For each of PWS Project sites, ADOT&PF must employ at least two PSOs for vibratory pile driving and removal, impact pile driving and DTH. The placement of the PSOs during all pile driving and removal and DTH activities will ensure that the entire shutdown zone is visible.

Pre- and Post-Activity Monitoring

Prior to the start of daily in-water construction activities, or whenever a break in pile driving of 30 minutes or longer occurs, PSOs would observe shutdown and monitoring zones for a 30 minutes (pre-clearance monitoring) through 30 minutes post-completion of pile driving or DTH activities. Pre-clearance monitoring must be conducted during periods of visibility sufficient for the lead PSO to determine that the shutdown zones indicated in tables 18 through 20 are clear of marine mammals.

Soft-Start Procedures for Impact Driving

Soft-start procedures provide additional protection to marine mammals by providing warning and/or giving marine mammals a chance to leave the area prior to the hammer operating at full capacity. ADOT&PF must 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 must 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.

Shutdown Zones

Prior to the start of any in-water construction, ADOT&PF would establish shutdown zones for pile driving/removal and DTH activities. The purpose of a shutdown zone is to define an area within which construction would be delayed or halted upon sightings of a marine mammal in that defined area or in anticipation of a marine mammal entering that area. After construction is delayed or halted, pile driving/removal or DTH would not re-commence until marine mammals have cleared these established shutdown zones or have not been sighted for at least 15 minutes. Generally, shutdown zones vary in size based upon the activity type, duration, and the marine mammal hearing group. In most cases, shutdown zones are based on the estimated Level A harassment isopleth distances for each hearing group. However, in cases where ADOT&PF asserted that it would be impracticable to shut down at the Level A harassment isopleth due to excessive work stoppages, smaller shutdown zones are proposed. ADOT&PF's proposed shutdown zones would be smaller than Level A harassment zones for impact driving 30-inch (76 centimeters (cm)) piles at all PWS Project sites, DTH rock socketing for 24-inch (61 cm) piles at Chenega, impact driving and DTH rock socketing of 36-inch (91 cm) piles at Tatitlek, and DTH rock socketing for 30-inch (76 cm) piles at both Chenega and Tatitlek.

ADOT&PF anticipates that the maximum amount of activity within a given day may vary significantly at all PWS project sites. Given this uncertainty, ADOT&PF proposed a tiered system of shutdown zones for marine mammal hearing groups. This tiered system is based on the maximum expected number of piles to be installed (impact or vibratory pile driving) or the maximum expected DTH duration in a given day. At the start of each work day, ADOT&PF would determine the maximum scenario possible for that day (according to the defined duration intervals in tables 8 through 10), which will determine the appropriate Level A harassment isopleth and associated shutdown zone for that day. This Level A harassment zones (table 11) and associated shutdown zones (tables 18 through 20) must be implemented for the entire work day.

Additionally, in order to minimize the potential for impacts to the depleted AT1 stock of killer whales, ADOT&PF proposes to shut down at the estimated Level B harassment zone for any killer whales sighted during impact pile driving at all sites.

The placement of PSOs during all pile installation and removal, and DTH activities (described in detail in the Proposed Monitoring and Reporting section) will ensure that the entire shutdown zones are visible during pile installation. If a marine mammal is observed entering or within the shutdown zones indicated in tables 18 through 20, pile driving must be delayed or halted. If pile driving 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 zone (tables 18 through 20) or 15 minutes have passed without re-detection of the animal. Further, pile driving activity 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 within the harassment zone. However, if a marine mammal for which level A take has been authorized enters the Level A harassment area and the number of authorized takes has not been met, in-water activities would continue and PSOs would document Level A take for the animals present within the harassment zone.

All marine mammals would be monitored in Level B harassment zones and throughout the proposed project areas as far as visual monitoring is reasonably possible. If a marine mammal enters a Level B harassment zone, in-water activities would continue and PSOs would document Level B take for the animals present within the harassment zone.

ADOT&PF must also avoid direct physical interaction with marine mammals during construction activity. If a marine mammal comes within 10 m of such activity, operations must cease.

TABLE 18—PROPOSED SHUTDOWN ZONES AND LEVEL B HARASSMENT ZONES AT CORDOVA

Activity	Pile size	Minutes per pile or strikes per pile	Piles per day	Shutdown zones (meters)						Level B zones (meters)
				LF	HF (pacific white-sided dolphin)	HF (killer whale)	VHF	PW	OW	
Vibratory Installation	24-inch (61 cm)	30 minutes	4 piles	20	10		20	20	10	5,412
	30-inch (76 cm)	60 minutes	2 piles	40	20		30	50	20	11,659
Vibratory Removal	18-inch (46 cm)	60 minutes	4 piles	30	10		20	30	20	5,412
	24-inch (61 cm)	30 minutes	4 piles	20	10		20	20	10	
	30-inch (76 cm)	60 minutes	3 piles	50	20		40	60	20	11,659
Impact	30-inch (76 cm)	600 strikes	1 pile	900	110	1,585	300	300	280	1,585
			2 piles	900	110	1,585	300	300	280	

TABLE 19—PROPOSED SHUTDOWN ZONES AND LEVEL B HARASSMENT ZONES AT CHENEGA

Activity	Pile size	Minutes per pile or strikes per pile	Piles per day	Shutdown zones (meters)						Level B zones (meters)
				LF	HF (pacific white-sided dolphin)	HF (killer whale)	VHF	PW	OW	
Vibratory Installation	24-inch (61 cm)	15 minutes	4 piles	10	10		10	20	10	5,412
	30- and 36-inch (76 and 91 cm).	15 minutes	4 piles	20	10		20	30	10	11,659
Vibratory Removal	24-inch (61 cm)	30 minutes	4 piles	20	10		20	20	10	5,412
DTH (Rock Socket)	24-inch (61 cm)	60 minutes	Based on minutes of DTH.	240	40		300	220	90	5,817
		120 minutes			60					
		240 minutes			90					
		360 minutes			110					
		480 minutes			130					
DTH (Rock Socket)	30- and 36-inch (76 and 91 cm).	60 minutes	Based on minutes of DTH.	470	80		300	300	180	15,031
		120 minutes			120					
		240 minutes			170					
		360 minutes			220					
		480 minutes			260					
DTH (Tension Anchor)	8-inch (20 cm)	60 minutes	Based on minutes of DTH.	50	10		70	40	20	1,000
		120 minutes			20					
		180 minutes			20					
		240 minutes			20					
Impact	24-inch (61 cm)	50 strikes	2 piles	160	30	1,585	250	150	60	1,585
	30- and 36-inch (76 and 91 cm).	50 strikes	2 piles	250	40	1,585	300	230	90	1,585

TABLE 20—PROPOSED SHUTDOWN ZONES AND LEVEL B HARASSMENT ZONES AT TATITLEK

Activity	Pile size	Minutes per pile or strikes per pile	Piles per day	Shutdown zones (meters)						Level B zones (meters)
				LF	HF (pacific white-sided dolphin)	HF (killer whale)	VHF	PW	OW	
Vibratory Installation	24-inch (61 cm)	15 minutes	4 piles	10	10		10	20	10	5,412
	30- and 36-inch (76 and 91 cm).	15 minutes	2 piles	20	10		20	20	10	11,659
Vibratory Removal	20-inch (51 cm)	60 minutes	3 piles	20	10		20	30	10	5,412
	24-inch (61 cm)	30 minutes	4 piles	20	10		20	20	10	
	30-inch (76 cm)	60 minutes	4 piles	60	20		50	70	30	11,659
DTH (Rock Socket)	30- and 36-inch (76 and 91 cm).	60 minutes	Based on minutes of DTH.	470	80		300	300	180	15,031
		120 minutes			120					
		240 minutes			170					
		360 minutes			220					
		480 minutes			260					
DTH (Tension Anchor)	8-inch (20 cm)	60 minutes	Based on minutes of DTH.	50	10		70	40	20	1,000
		120 minutes			20					
		180 minutes			20					
		240 minutes			20					
Impact	30- and 36-inch (76 and 91 cm).	50 strikes	1 pile	160	30	1,585	250	140	60	1,585
			2 piles	250	40	1,585	300/390	230	90	

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

Proposed Monitoring and Reporting

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

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

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

• Nature, scope, or context of likely marine mammal exposure to potential stressors/impacts (individual or cumulative, acute or chronic), through better understanding of: (1) action or environment (*e.g.,* source characterization, propagation, ambient noise); (2) affected species (*e.g.,* life history, dive patterns); (3) co-occurrence of marine mammal species with the activity; or (4) biological or behavioral context of exposure (*e.g.,* age, calving or feeding areas);

• Individual marine mammal responses (behavioral or physiological) to acoustic stressors (acute, chronic, or cumulative), other stressors, or cumulative impacts from multiple stressors;

• How anticipated responses to stressors impact either: (1) long-term fitness and survival of individual marine mammals; or (2) populations, species, or stocks;

• Effects on marine mammal habitat (*e.g.,* marine mammal prey species, acoustic habitat, or other important physical components of marine mammal habitat); and,

• Mitigation and monitoring effectiveness.

Visual Monitoring

• Marine mammal monitoring during pile driving activities must be conducted by NMFS-approved PSOs in a manner consistent with the following:

• PSOs must be independent of the activity contractor (for example, employed by a subcontractor) and have no other assigned tasks during monitoring periods;

• At least one PSO would have prior experience performing the duties of a PSO during construction activity pursuant to a NMFS-issued incidental take authorization;

• Other PSOs may substitute education (degree in biological science or related field) or training for experience; and

• Where a team of three or more PSOs is required, a lead observer or monitoring coordinator would be designated. The lead observer would be required to have prior experience working as a marine mammal observer during construction.

• PSOs must be approved by NMFS prior to beginning any activities subject to this IHA.

PSOs should have the following additional qualifications:

• Ability to conduct field observations and collect data according to assigned protocols;

• Experience or training in the field identification of marine mammals, including the identification of behaviors;

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

• Writing skills sufficient to prepare a report of observations including but not limited to the number and species of marine mammals observed; dates and times when in-water construction activities were conducted; dates, times, and reason for implementation of mitigation (or why mitigation was not implemented when required); and marine mammal behavior; and

• Ability to communicate orally, by radio or in person, with project personnel to provide real-time information on marine mammals observed in the area as necessary.

During all pile driving, pile removal, and DTH activities, a minimum of 2 PSOs will visually monitor shutdown zones as well as Level A and B harassment zone at each of PWS project sites. PSOs would be positioned at suitable vantage points ensuring that at least one PSO would have an unobstructed view of all of the water within shutdown zones. During impact driving and DTH activities, the second PSO would monitor Level B harassment zones to the extent practicable. All PSOs would be stationed on elevated platforms to aid in monitoring marine mammals.

Monitoring would be conducted 30 minutes before, during, and 30 minutes after all in water construction activities. In addition, PSOs will record all incidents of marine mammal occurrence, regardless of distance from activity, and will document any behavioral reactions in concert with distance from piles being driven or removed. Pile driving activities include the time to install or remove a single pile or series of piles, as long as the time elapsed between uses of the pile driving equipment is no more than 30 minutes.

Reporting

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

• Dates and times (begin and end) of all marine mammal monitoring;

• Construction activities occurring during each daily observation period, including: (1) the number and type of piles that were driven and the method (*e.g.,* impact or vibratory); and, (2) total duration of driving time for each pile (vibratory driving) and number of strikes for each pile (impact driving);

• PSO locations during marine mammal monitoring;

• Environmental conditions during monitoring periods (at beginning and end of PSO shift and whenever conditions change significantly), including Beaufort sea state and any other relevant weather conditions including cloud cover, fog, sun glare, and overall visibility to the horizon, and estimated observable distance;

• Upon observation of a marine mammal, the following information: (1) name of PSO who sighted the animal(s) and PSO location and activity at time of sighting; (2) time of sighting; (3) identification of the animal(s) (*e.g.,* genus/species, lowest possible taxonomic level, or unidentified), PSO confidence in identification, and the composition of the group if there is a mix of species; (4) distance and location of each observed marine mammal relative to the pile being driven for each sighting; (5) estimated number of animals (min/max/best estimate); (6) estimated number of animals by cohort (adults, juveniles, neonates, group composition, etc.); (7) animal's closest point of approach and estimated time spent within the harassment zone; and, (8) description of any marine mammal behavioral observations (*e.g.,* observed behaviors such as feeding or traveling), including an assessment of behavioral responses thought to have resulted from the activity (*e.g.,* no response or changes in behavioral state such as ceasing feeding, changing direction, flushing, or breaching);

• Number of marine mammals detected within the harassment zones, by species; and,

• Detailed information about implementation of any mitigation (*e.g.,* shutdowns and delays), a description of specific actions that ensued, and resulting changes in behavior of the animal(s), if any.

A final report must be prepared and submitted within 30 calendar days following receipt of any NMFS comments on the draft report. If no comments are received from NMFS within 30 calendar days of receipt of the draft report, the report shall be considered final. All PSO data would be submitted electronically in a format that can be queried such as a spreadsheet or database and would be submitted with the draft marine mammal report.

In the event that personnel involved in the construction activities discover an injured or dead marine mammal, ADOT&PF would report the incident to the Office of Protected Resources (*PR.ITP.MonitoringReports@noaa.gov and ITP.hotchkin@noaa.gov*), NMFS and to the Alaska regional stranding coordinator as soon as 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 are appropriate to ensure compliance with the terms of the IHAs. ADOT&PF would not resume their activities until notified by NMFS.

The report would include the following information:

1. Time, date, and location (latitude/longitude) of the first discovery (and updated location information if known and applicable);
2. Species identification (if known) or description of the animal(s) involved;
3. Condition of the animal(s) (including carcass condition if the animal is dead);
4. Observed behaviors of the animal(s), if alive;
5. If available, photographs or video footage of the animal(s); and
6. 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 the species listed in table 4, and to all three project locations, given that the anticipated effects of this activity on these different marine mammal stocks are expected to be relatively similar in nature. 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.

Pile driving and DTH activities associated with these projects, as outlined previously, have the potential to disturb or displace marine mammals. Specifically, the specified activities may result in take, in the form of Level B harassment and, for some species (humpback whale, Dall's porpoise, harbor porpoise, harbor seal, and Steller sea lion), Level A harassment from underwater sounds generated by pile driving and DTH activities.

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

Take would occur within limited, confined areas of the stocks' ranges. The intensity and duration of take by Level A harassment and Level B harassment would be minimized through use of mitigation measures described herein. Further, the project is not anticipated to impact any known important habitat areas for any marine mammal species with the exception of a BIA for humpback whales, a small portion of critical habitat the Mexico DPS of humpback whales, and a small area of designated critical habitat for the Western DPS of Steller sea lion, discussed below.

Take by Level A harassment is proposed for authorization to account for the potential that an animal could enter and remain within the area between a Level A harassment zone and the shutdown zone for a duration long enough to be taken by Level A harassment. Any take by Level A harassment is expected to arise from, at most, a small degree of 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, and as noted previously, some subset of the individuals that are behaviorally harassed could also simultaneously incur some small degree of TTS for a short duration of time. Because of the small degree anticipated, though, any AUD INJ or TTS potentially incurred here would not be expected to adversely impact individual fitness, let alone annual rates of recruitment or survival.

Behavioral responses of marine mammals to pile driving at the project site, if any, are expected to be mild and temporary. Marine mammals within the Level B harassment zone may not show any visual cues if they are disturbed by activities or could become alert, avoid the area, leave the area, or display other mild responses that are not observable such as changes in vocalization patterns. Given the limited number of piles to be installed or extracted per day and that pile driving and removal would occur across approximately 60 days at the Cordova Project, 156 days at the Chenega Project, and 76 days at the Tatitlek Project within the 12-month authorization period, any harassment would be temporary.

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

Nearly all inland waters of southeast Alaska, including PWS, are included in the southeast Alaska humpback whale feeding BIA (Wild *et al.* 2023), though humpback whale distribution in southern Alaska varies by season and waterway (Dahlheim *et al.,* 2009). Designated critical habitat for humpback whales is also found throughout PWS. While humpback whales may be present within PWS during construction, underwater sound would be constrained to the shallow waters of Orca Inlet, Crab and Sawmill Bay, and Boulder Bay and truncated by land masses. The area of the BIA that may be affected by the proposed project is small relative to the overall area of the BIA. Humpback whales are the most prevalent in PWS in fall and winter from September through March (Rice et. al 2011). All three PWS Projects would start in the summer of 2027 and the best estimate of project duration would not exceed 156 days of in-water construction days over a four month period. Underwater sounds produced by the proposed construction activities would only affect a small proportion of the BIA and designated critical habitat, which is a small portion of the habitat available in southern Alaska. Therefore, the proposed project is not expected to have significant effects on humpback whales foraging in PWS.

The same regions are also a part of the Western DPS Steller sea lion ESA critical habitat. Steller sea lions are common in the Chenega project area and uncommon in both the Cordova and Tatitlek project areas. Of all three project sites, Chenega is the nearest to a haulout site, which is 14 km southwest. Given the distance from the project site to the haulout and the relatively small ensonified areas, the proposed project is not expected to have significant adverse effects on the critical habitat of Western DPS Steller sea lions. No areas of specific biological importance (*e.g.,* ESA critical habitat, other BIAs, or other areas) for any other marine mammal species are known to co-occur with the project areas.

In addition, it is unlikely that elevated noise in small, localized areas of habitat would have any effect on the stocks' annual rates of recruitment or survival. Specific to the AT1 stock of killer whales, which is depleted and numbers only seven individuals, no recruitment has occurred in this stock since 1984, and it is unlikely to recover (Young *et al.* 2025). In combination, we believe that these factors, as well as the available body of evidence from other similar activities, demonstrate that the potential effects of the specified activities will have only minor, short-term effects on individuals. The specified activities are not expected to impact rates of recruitment or survival, and would therefore not result in population-level impacts.

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

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

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 separately for each of the three proposed IHAs that the total marine mammal take from the proposed activities will have a negligible impact on all affected marine mammal species or stocks.

Small Numbers

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

Another circumstance in which NMFS considers it appropriate to make a small numbers finding is in the case of a species or stock that may potentially be taken but is either rarely encountered or only expected to be taken on rare occasions. In that circumstance, one or two assumed encounters with a group of animals (meaning a group that is traveling together or aggregated, and thus exposed to a stressor at the same approximate time) should reasonably be considered small numbers, regardless of consideration of the proportion of the stock (if known), as rare encounters resulting in take of one or two groups should be considered small relative to the range and distribution of any stock.

The AT1 stock of killer whales is exceptionally small, estimated to include only 7 individuals. While it is possible that AT1 whales could visit each site over the course of the summer, passive acoustic monitoring of several sites in PWS showed that the vast majority of killer whales detected were from the Alaska Resident stock, with AT1 whales detected only 1.6 percent of the time (Myers *et al.,* 2021). NMFS considers it reasonably likely that the AT1 stock may occur one time during the course of the project at this project site. Based on the rarity of encounters with this group expected at each site in each year, this represents small numbers for this stock.

There is no recent stock abundance estimate for the Mexico-North Pacific stock of humpback whale and the minimum population is considered unknown (Young *et al.,* 2024). There are two minimum population estimates for this stock that are over 15 years old: 2,241 (Martínez-Aguilar, 2011) and 766 (Wade, 2021). Using either of these estimates, the estimated 2, 5, and 2 takes proposed for authorization at Cordova, Chenega, and Tatitlek respectively, represent small numbers of the stock.

There is also no current abundance estimate of the Alaska stock of minke whale, but an abundance of 2,020 individuals was estimated on the eastern Bering shelf based on a 2010 survey (Friday *et al.,* 2013; Young *et al.,* 2024). Therefore, the estimated takes proposed for authorization at each project site (2 each at Cordova, Chenega, and Tatitlek) represent small numbers of this stock, even if each take occurred to a new individual.

For Dall's porpoise, the most recent stock assessment did not have a valid abundance estimate. The previous estimate for the Alaska stock was 83,400 between 1987 and 1991 (Young *et al.,* 2023). Surveys in the Northwestern Gulf of Alaska in 2013 and 2015 resulted in estimates of 15,432 (CV = 0.28) and 13,110 (CV = 0.22), respectively. Using the smallest of these abundance estimates, the 40, 100, and 80 estimated takes at Cordova, Chenega, and Tatitlek, respectively results in estimates of 0.31, 0.76, and 0.61 percent of the stock, representing small numbers.

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 separately for each of the three proposed IHAs 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.

Alaska Natives have traditionally harvested subsistence resources in PWS for many hundreds of years, particularly large terrestrial mammals, marine mammals, salmon, and other fish (NOAA 2013). In Cordova, harbor seals and sea otters are reported to be the marine mammal species most regularly harvested for subsistence by households. An estimated average of 68.9 harbor seals were harvested by Cordova residents every year from 2000 through 2008 (NOAA 2013). Hunting usually occurs in the late fall and winter (Alaska Department of Fish & Game (ADF&G) 2009). The Alaska Department of Fish and Game (ADF&G) has not documented harvest of cetaceans from Cordova (ADF&G 2022) and it is not known to occur.

Approximately 15.6 percent of Cordova residents identified as only or partially Alaska Native (U.S. Census 2020). Up to 74 percent of all Cordova households harvested wild resources in 2003, with nearly all Cordova households using salmon and halibut (NOAA 2013). All Project activities will take place in the vicinity of the ferry terminal adjacent to Cordova where subsistence activities do not generally occur. The Project will not have an adverse impact on the availability of marine mammals for subsistence use at locations farther away. Some minor, short-term disturbance of the harbor seals or sea otters could occur, but this is not likely to have any measurable effect on subsistence harvest activities in the region. No changes to availability of subsistence resources is expected to result from Project activities.

Harbor seals and sea otters are reported to be the marine mammal species most regularly harvested for subsistence by households in Chenega. An estimated average of 20 harbor seals were harvested by Chenega residents every year from 2000 through 2008 (NOAA 2013). Hunting usually occurs in the late fall and winter (ADF&G 2009). ADF&G has not documented harvest of cetaceans from Chenega (ADF&G 2022) and it is not known to occur.

Approximately 56.5 percent of Chenega residents identified as only or partially Alaska Native (U.S. Census 2020). Nearly 95 percent of all Chenega households reported harvesting some wild resources in 2003, with nearly all Chenega households using salmon, halibut, and marine invertebrates (NOAA 2013). Forty-four percent of Chenega households participated in the hunting, use, or receiving of marine mammals (NOAA 2013).

Approximately 85.5 percent of Tatitlek residents identified as only or partially Alaska Native (U.S. Census 2020). Nearly all Tatitlek households harvested wild resources in 2012, with Tatitlek households using halibut, salmon, non-salmon fish, and marine invertebrates (NOAA 2013). Forty-six percent of Tatitlek households participated in the hunting, use, or receiving of marine mammals in 2003, predominantly harvesting harbor seals and Steller sea lions (NOAA 2013). Interviews with residents conducted in May and June of 2024 have indicated that the harvest of Steller sea lions is less common, due to the logistics of harvesting an animal of that size.

Additionally, ADOT&PF is working with local residents in Cordova, Chenega, and Tatitlek to inform them about the Project, raise awareness, and collaborate on the Project within their communities. ADOT&PF has agreed to provide final monitoring reports to the Chugach Regional Resources Commission to help inform their marine mammal management program.

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 separately for each of the three proposed IHAs that there will not be an unmitigable adverse impact on subsistence uses from ADOT&PF's proposed activities.

Endangered Species Act

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

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

Proposed Authorization

As a result of these preliminary determinations, NMFS proposes to issue three separate IHAs to ADOT&PF for conducting the specified construction activities at Cordova, Chenega, and Tatitlek between January 1, 2027 and December 31, 2027, provided the previously mentioned mitigation, monitoring, and reporting requirements are incorporated. Drafts of the proposed IHAs can be found at: *https://www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-construction-activities.*

Request for Public Comments

We request comment on our analyses, the proposed authorization, and any other aspect of this notice of proposed IHAs for the proposed ferry terminal construction activities. We also request comment on the potential for renewals 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 subsequent renewal IHAs.

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:

• 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);

• 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; and

• 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 22, 2025.

Kimberly Damon-Randall,

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

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