Request for an Incidental Harassment Authorization

City and Borough of Sitka Gary Paxton Industrial Park Multipurpose Dock Project

Sawmill Cove, Sitka, Alaska

June 2017

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Acronyms and Abbreviations

CBS	City and Borough of Sitka
cm	centimeters
dB	decibels
DPS	distinct population segment
EDPS	eastern distinct population segment
ESA	Endangered Species Act
ft	feet
GPIP	Gary Paxton Industrial Park
Hz	hertz
IHA	Incidental Harassment Authorization
kHz	kilohertz
km	kilometer
LOA	Letter of Authorization
MMPA	Marine Mammal Protection Act
m	meter
mi	mile
NMFS	National Marine Fisheries Service
PSO	Protected Species Observer
rms	root mean square
PTS	permanent threshold shift
WDPS	western distinct population segment
WFA	Weighting Factor Adjustments
ZOI	Zone of Influence

1 DESCRIPTION OF THE ACTIVITY

A detailed description of the specific activity or class of activities that can be expected to result in incidental taking of marine mammals.

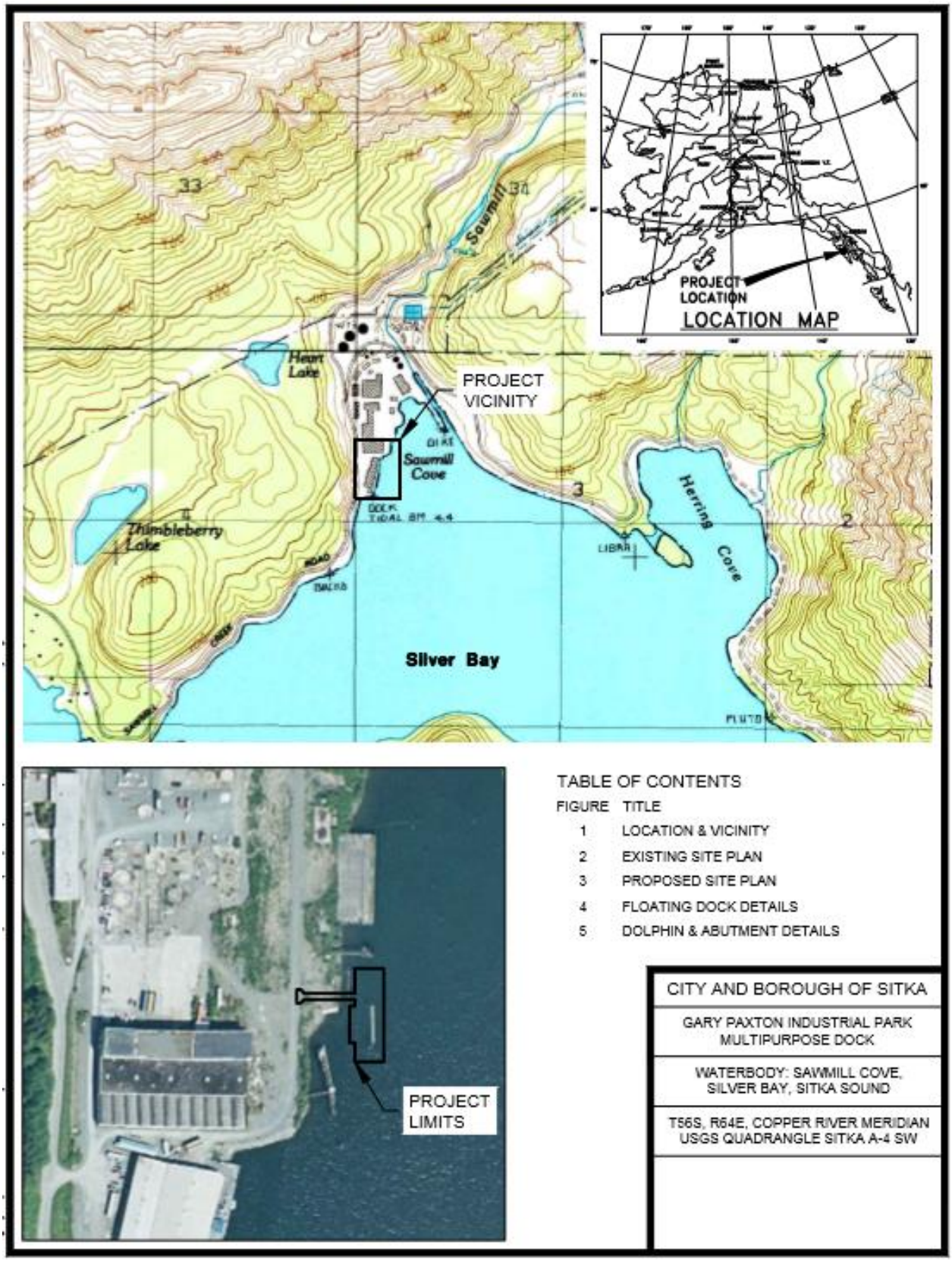
1.1 Introduction

The City and Borough of Sitka (CBS) is proposing to construct a multipurpose dock at the Gary Paxton Industrial Park (GPIP) in Sawmill Cove near Sitka, Alaska (Figure 1). Construction of the dock includes in-water pile driving and is the subject of this Incidental Harassment Authorization (IHA) request.

The proposed project will occur in marine waters that support several marine mammal species. The Marine Mammal Protection Act of 1972 (MMPA) prohibits the taking of marine mammals; take is defined as to "harass, hunt, capture or kill, or attempt to harass, hunt, capture or kill," except under certain situations. Section 101 (a)(5)(D) allows for the issuance of an IHA, provided an activity results in negligible impacts on marine mammals and would not adversely affect subsistence use of these animals.

Pile driving may result in the incidental taking by acoustical harassment (Level B take) and injury (Level A take) of marine mammals protected under the MMPA. The CBS is requesting an IHA for five marine mammal species: humpback whale (*Megaptera novaeangliae*), killer whale (*Orcinus orca*), harbor porpoise (*Phocoena phocoena*), harbor seal (*Phoca viutlina*), and Steller sea lion (*Eumetopias jubatus*) that may occur in the vicinity of the project. Level A and B take is requested for humpback whales, harbor porpoises, harbor seal, and Steller sea lions; level B take is requested for killer whale and harbor porpoise. As set out by 50 CFR 216.104, Submission of Requests, the specific items required for this application are provided in Sections 1 through 14 of this application.

Figure 1. Proposed GPIP Multipurpose Dock Location and Vicinity Map.



1.2 Proposed Action

1.2.1 Purpose and Need

The purpose of this project is to construct a multipurpose dock that will serve a wide variety of vessels, provide deep water port access to the GPIP, meet modern standards for safety, and promote marine commerce in the region.

This project is needed because the GPIP does not currently have a deep-water dock or a safe and useable multipurpose docking facility.

1.2.2 Physical and Biological Environment

Sawmill Cove is a small body of water located near Sitka, Alaska at the mouth of Silver Bay, which opens to the Sitka Sound and Gulf of Alaska (Figures 1 and 2). The area is an active marine commercial and industrial area. The dock footprint is previously disturbed with abandoned dock structures associate with the former Alaska Pulp Mill found throughout the area. A Silver Bay Seafoods processing plant is located adjacent to the project site. The plant processes herring and salmon (primarily pink salmon). Herring processing is a short but intense two-week season that usually takes place at the end of March. Salmon processing typically begins in June, is most intense toward the end of July into August, and ends in September. The plant does not process fish between October and March. The Blue Lake Hydroelectric Project is located on Sawmill Creek which empties into Sawmill Cove just east of the proposed dock site. The Medvejie Hatchery, located approximately 5.5 kilometers (km) (3.5 miles [mi]) from the project site in Bear Cove off Silver Bay, produces Chinook, chum, and coho salmon (NSRAA 2017).

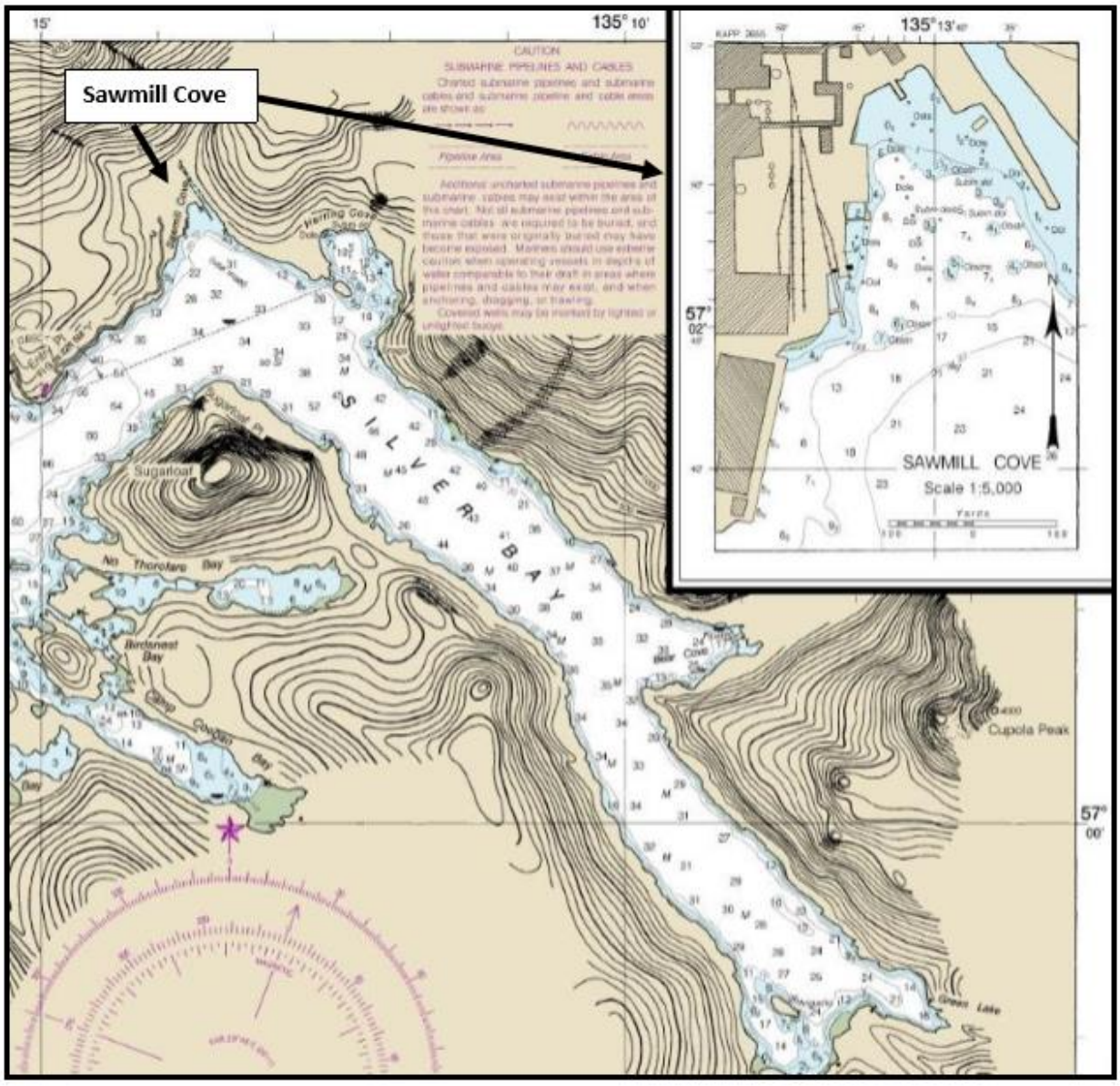
Figure 2. Aerial View of Proposed GPIP Multipurpose Dock Site in Sawmill Cove. (Source: GPIP 2017)

1.1.1.1 Sediment and Bathymetry

Sawmill Cove is located at the mouth of an alluvial delta. In the cove, 60-70 feet of unconsolidated sand overlies bedrock.

Bathymetry in Sawmill Cove shows a fairly even seafloor that gradually falls to a depth of approximately 15 meters (m; 50 feet [ft]). To the southeast, Silver Bay is approximately 0.8 km (0.5 mi) wide, 8.9 km (5.5 mi) long and between 46-76 m (150-250 ft) deep. The bay is fairly uniform with few rock outcroppings or islands (Figure 3). To the southwest, Eastern Channel opens to Sitka Sound. Eastern Channel drops off to depths of 120 m (400 ft) approximately 1.6 km (1 mi) southwest of the project site.

Figure 3. Chart of GPIP Multipurpose Dock Project Vicinity. (Source: NOAA 2016) Soundings in fathoms, fathoms and feet to 11 fathoms.



1.2.3 Project Description

The project would remove abandoned creosote treated piles and docks in Sawmill Cove and construct a barge dock with an attached small craft float. Construction includes the following activities over and in Sawmill Cove (Figures 4 and 5; detailed plans in Appendix A):

- Remove approximately 280 abandoned creosote treated piles and structures as funding allows;
- Install a 76.2 m (250 ft) by 22.5 m (74 ft) by 5.8 m (19 ft) floating dock (a repurposed barge) with an attached 3.6 m (12 ft) by 36.5 m (120 ft) small craft float, gangway, and 27.4 m (90 ft) by 7.6 m (25 ft) transfer bridge; and an abutment and retaining wall (Note: the retaining wall does not require sheet pile);
- Install 12 temporary 76.2 cm (30 in) diameter steel piles (Note: these piles serve as templates to guide proper installation of permanent piles and would be removed prior to project completion);
- Install two 3-pile dolphins to support the dock each consisting of 1 permanent 1.2 m (48 in) vertical piles; and 2 permanent 76.2 cm (30 in) batter piles; and
- Install bull rail, berthing fenders, mooring cleats, and three mast lights (Note: these components would be installed out of the water).

Figure 4. Proposed GPIP Multipurpose Dock Site Plan.

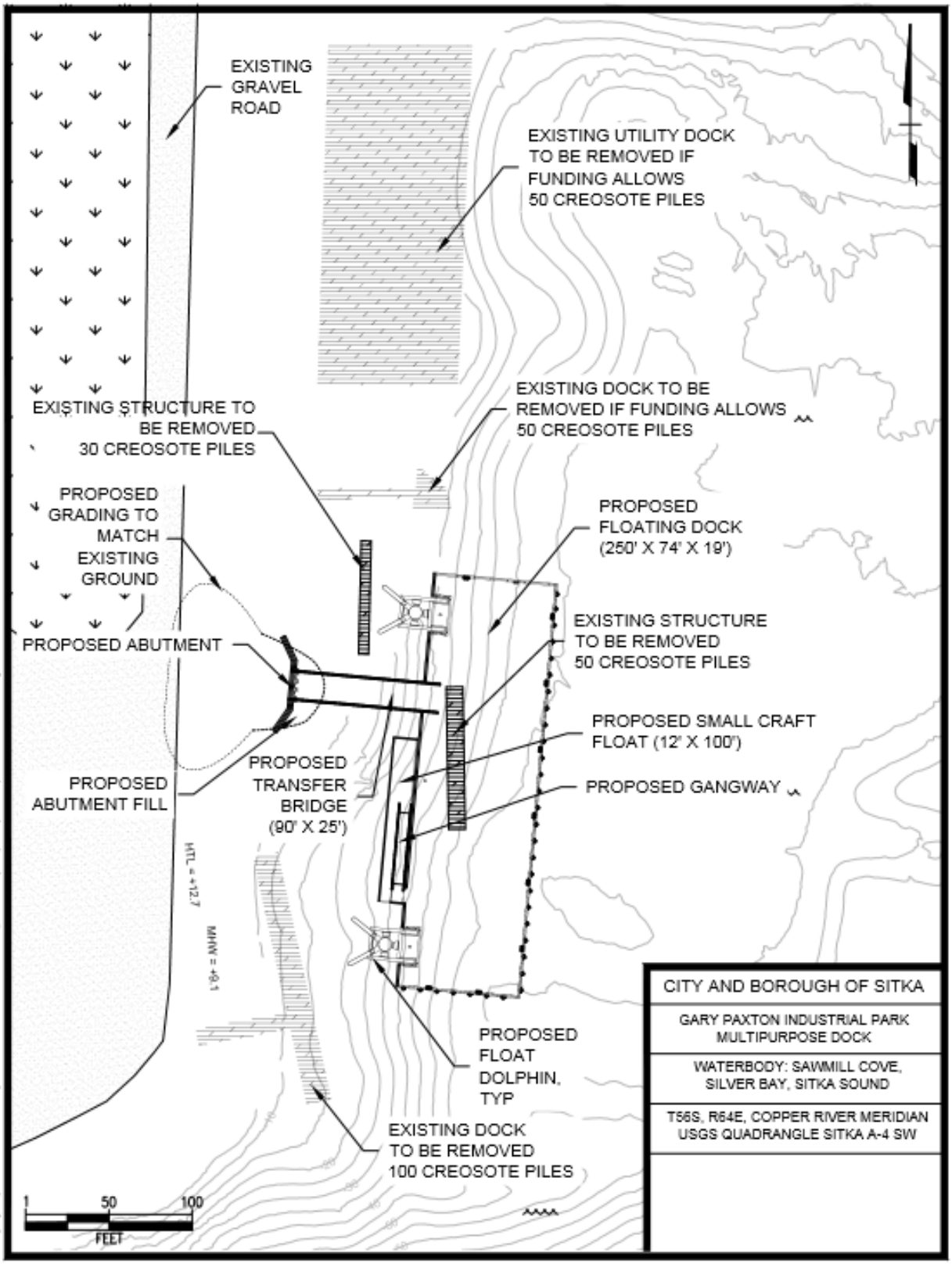
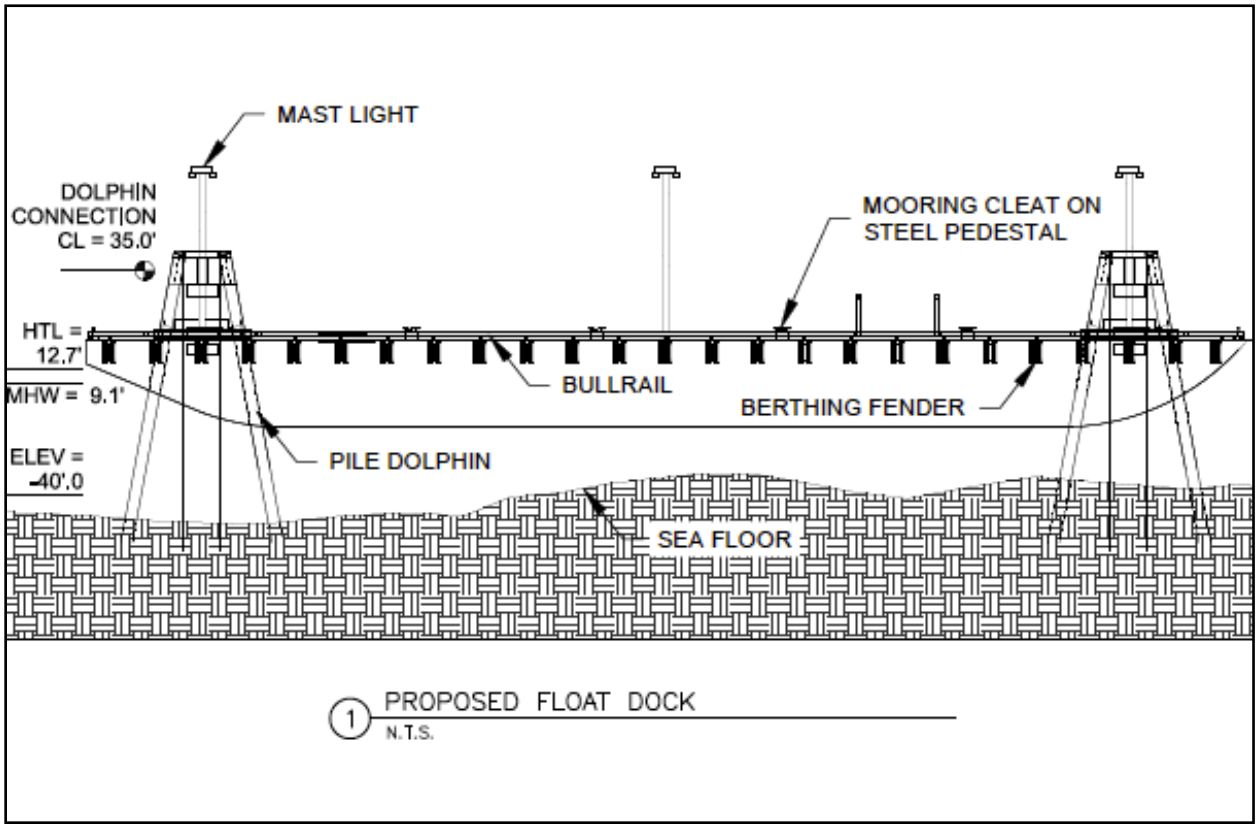


Figure 5. Proposed GPIP Multipurpose Dock Profile.



1.2.4 Equipment

Piles would be removed and installed with a vibratory hammer and proofed with an impact hammer. They would be secured into bedrock with a rock anchor drill. The following equipment would be used:

- Vibratory Hammer: ICE 44B/12,450 pounds static weight (operated at reduced energy)
- Diesel Impact Hammer: Delmag D46/Max Energy 107,280 ft-pounds
- Rock Anchor Drill: ICE 30-30,000 ft-pound

1.2.5 Construction Methods

Transport of Materials and Equipment

Materials and equipment, including the floating dock, would be transported to the project site by barge. While work is conducted in the water, anchored barges will be used to stage construction materials equipment, and 25 ft skiffs with 250 horse power motors will be used to support dock construction.

Removal of Existing Piles

The contractor would attempt to direct pull existing piles; if those efforts prove to be ineffective, a vibratory hammer would be used.

Installation and Removal of Temporary Piles
Temporary piles would be installed and removed with a vibratory hammer operated at a reduced energy setting. The distances to the Level A and B thresholds outlined in Table 4 are based on proxy source levels and do not account for this project's use of reduced energy settings.

Installation of Permanent Piles
Permanent piles would be driven through approximately 18-21 m (60-70 ft) of unconsolidated sand with a vibratory hammer operated at a reduced energy setting, impacted into bedrock, and then anchored into 7.6-12.2 m (25-40 ft) of bedrock with a rock anchor drill and grout. To anchor the piles, a 10-inch casing would be inserted in the center of the permanent pile and a 15.2 cm (6 inch) rock anchor drill would be lowered into the casing and used to drill into bedrock. Rock fragments would be removed through the top of the casing. Finally, the drill and casing would be removed and the hole would be filled with grout to secure the pile to bedrock. This anchoring process is expected to take 2 hours per permanent pile. The pile that the casing and drill will be lowered into will serve as a cofferdam and prevent drilling noise from propagating through the water column.

Construction Sequence
In-water construction will begin with the removal of existing piles followed by installation of the two dolphins that will support the floating dock. The dolphins will be constructed one at a time. Construction will be sequenced as follows:

First, the contractor will remove 280 existing wood piles, as funding allows. Existing pile removal ~~could take up to 14 consecutive~~will take approximately six days~~, with a maximum of 60 piles removed on any given day~~.

Next the contractor will construct the first three-pile dolphin. Construction of the dolphin will take approximately eight days, with six temporary piles being installed or removed, or 1 permanent pile being installed per day. Dolphin construction will alternate daily between installation of template pile/pile and welding the dolphin structure. Dolphin pile installation sequence is described below:

- Day 1: Vibrate 6 temporary 30-inch piles into place to create a template to guide later installation of permanent piles.
- Day 2: Weld frame around the temporary piles.
- Day 3: Vibrate and impact 1 permanent48-inch vertical pile into place.
- Day 4: Weld dolphin structure.
- Day 5: Vibrate and impact one 30-inch batter pile into place.
- Day 6: Weld dolphin structure.
- Day 7: Vibrate and impact the final 30-inch batter pile into place.
- Day 8: Weld dolphin structure and remove the six temporary piles.

The contractor will construct the second three-pile dolphin using the construction sequence described above.

Table 1 provides an estimate of the amount of time required for vibratory pile removal and vibratory and impact pile installation.

Table 1. GPIP Multipurpose Dock Pilings Number, Size, and Estimated Number of Hours Required for Vibratory and Impact Pile Driving.

Description	Project Component					
	Existing Pile Removal	Temporary Pile Installation	Temporary Pile Removal	Vertical Pile Installation	Batter Pile Installation	Total Installation/ Removal per Day
Pile Size (Diameter) and Type	12/16-inch wood	30-inch steel	30-inch steel	48-inch steel	30-inch steel	--
# of Piles	280	12	12	2	4	--
Vibratory Time Per Pile	5 minutes	30 minutes	10 minutes	2 hours	2 hours	--
Vibratory Time per day	5 hours	3 hours	1 hour	2 hours	2 hours	5 hours
Vibratory Time Total	23 hours	6 hours	2 hours	4 hours	8 hours	--
# of Strikes Per Pile	0	0	0	400 strikes	400 strikes	400 strikes
Impact Time Per Pile	0	0	0	10 minutes	10 minutes	--
Impact Time per Day	0	0	0	10 minutes	10 minutes	10 minutes
Impact Time Total	0	0	0	20 minutes	40 minutes	-----

1.3 Threshold Distances and Action Area

The proposed project will produce noise through vibratory pile driving and pile removal, impact pile driving, and rock anchor drilling. Vibratory and impact pile driving will generate in-water and in-air noise that may result in take of marine mammals. Rock anchor drilling will not result in the propagation of noise into the water column because it would be completed inside center of the permanent piles.

The National Marine Fisheries Service (NMFS) has developed waterborne noise guidelines for determining sound thresholds that can cause injury (Level A threshold) or disturbance (Level B threshold) in marine mammals. These waterborne thresholds are shown in Tables 2 and 3.

Distances to the Level A and B thresholds, as defined by sound isopleths, vary by pile size and installation and removal methods. Level A thresholds also vary by marine mammal hearing type. Calculated distances to threshold for this project are shown in Table 4 and range from approximately 1 m to 16 km. Please see Section 11 for figures that illustrate the monitoring and shutdown zones associated with these thresholds.

The action area for this project, defined as all areas affected directly by the action, has been determined by the distance to the farthest-reaching noise threshold. In this case, the distance where received noise levels from vibratory installation of 48-inch piles are expected to decline to 120 decibels (dB). As shown in Table 4, this distance is 16 km. However, the action area will be truncated where land masses obstruct underwater sound transmission, thus, the action area

is largely confined to marine waters within Sawmill Cove and Silver Bay, extending approximately 9,500 m to the end of Siler Bay and encompassing approximately 10.5 square kilometers (km^2; 4.04 square miles [mi^2]) (Figure 6).

Table 2. Summary In-water Permanent Threshold Shifts Onset Acoustic Thresholds (Level A Injury).

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

Adapted from: NMFS 2016

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

Note: Peak sound pressure (L pk) has a reference value of 1 µPa, and cumulative sound exposure level (L E) has a reference value of 1µPa2s. In this Table, thresholds are abbreviated to reflect American National Standards Institute standards (ANSI 2013). However, peak sound pressure is defined by ANSI as incorporating frequency weighting, which is not the intent for this Technical Guidance. Hence, the subscript "flat" is being included to indicate peak sound pressure should be flat weighted or unweighted within the generalized hearing range. The subscript associated with cumulative sound exposure level thresholds indicates the designated marine mammal auditory weighting function (LF, MF, and HF cetaceans, and PW and OW pinnipeds) and that the recommended accumulation period is 24 hours. The cumulative sound exposure level thresholds could be exceeded in a multitude of ways (i.e., varying exposure levels and durations, duty cycle). When possible, it is valuable for action proponents to indicate the conditions under which these acoustic thresholds will be exceeded.

Table 3. Summary of In-water Level B Harassment Onset Acoustic Thresholds.

	Level B Onset Acoustic Thresholds	
	Impulsive (Impact Pile Driving)	**Non-impulsive (Vibratory Pile Driving)**
All marine mammals	160 dB rms	120 dB rms

To calculate the acoustic thresholds for this project, pile installation and removal sound source levels were based on recommendations from NMFS Office of Protected Resources and come from sound source verification of similar sized piles. These data, the practical spreading model, and the recently released Technical Guidance (NMFS 2016) were used to derive the Level A harassment zones for marine mammals, following the user spreadsheet that accompanies the guidance (available at http://www.nmfs.noaa.gov/pr/acoustics/guidelines.htm). Further, these data, the practical spreading model, and a NMFS Zone of Influence (ZOI) spreadsheet were used to calculated the Level B harassment zones. Calculated distance to the Level A and B thresholds are shown in Table 4.

In addition, pinnipeds can be adversely affected by in-air noise. Loud noises can cause hauled-out pinnipeds to flush back into the water, leading to disturbance and possible injury. NMFS has established an in-air noise disturbance threshold of 90 dB RMS for harbor seals and 100 dB RMS for all other pinnipeds. Pile driving and removal associated with this project will generate in-air noise above ambient levels within Sawmill Cove. However, the predicted distances to the in-air noise disturbance threshold for hauled-out harbor seals (90dB) and sea lions (100 dB rms) will not extend more than 53 m (175 ft) and 17 m (56 ft) from any type of pile being driven or extracted, respectively. [1] Anecdotal evidence indicates that harbor seals and sea lions do not haul out in Sawmill Cove, and there are no natural or artificial haulouts or docks within the sea lion in-air noise disturbance zone (17 m; 56 ft). No in-air disturbance to hauled-out individuals is anticipated as a result of the GPIP Multipurpose Dock Project; thus, land area is not included in the action area.

Calculated distances to the Level A and B thresholds as outlined in Table 4, are highly conservative because:

- The proxy source levels used to estimate the thresholds do not account for site conditions. Sawmill Cove is located at the mouth of an alluvial delta and is characterized by deep soft sediments with 60-70 feet of unconsolidated sand overlying bedrock. These deep soft sediments will allow piles to be installed with the vibratory hammer run at reduced energy setting, reducing noise production. The presence of these deep soft sediments surrounding the pile will muffle noise produced during impact pile driving.
- Mitigation measures will be used to reduce pile driving noise. The vibratory hammer will be operated at a reduced energy setting (30 to 50 percent of its rated energy), which will produce less noise than when operated at full energy settings.
- Pile driving softening material will be used to minimize noise during vibratory and impact pile driving. Much of the noise generated during pile installation comes from contact between the pile being driven and the steel template used to hold the pile in place. The contractor will use high-density polyethylene (HDPE) or ultra-high-molecular-

[1] Predicted distances were based on source levels in Washington and Alaska. At Puget Sound, WA, Laughlin (2010) found in-air measurements averaged 96.5 dB root mean square at 15 m during vibratory installation of 30-inch steel piles. At the Port of Anchorage, AK, Austin et al. (2016) found source levels of 101 dB @15 m during impact installation of 48-inch diameter steel piles.

weight polyethylene (UHMW) softening material on all templates to eliminate steel on steel noise generation.

The impact hammer will be operated at reduced fuel setting as long as is practicable.

Table 4. Level A and B Threshold Distances for Pile Driving Associated with GPIP Multipurpose Dock Construction.

		Distance (m) to Level A and Level B Thresholds					
Source Activity and Duration	**Estimated Source Level at 10 meters (dB)**	**Level A Low-Frequency Cetaceans**	**Level A Mid- Frequency Cetaceans**	**Level A High- Frequency Cetaceans**	**Level A Phocid Pinnipeds**	**Level A Otariid Pinnipeds**	**Level B All NMFS Protected Species**
Vibratory Pile Driving							
12 and 16-inch wood removal (5 hours per day)	155	8.0	0.7	11.8	4.8	0.3	2,154
30-inch steel temporary installation (3 hours per day)	166	30.6	2.7	45.3	18.6	1.3	11,659*
30-inch steel temporary removal (1 hour per day)	166	14.7	1.3	21.8	8.9	0.6	11,659*
30-inch steel permanent installation (2 hours per day)	166	23.4	2.1	34.5	14.2	1.0	11,659*
48-inch steel permanent installation (2 hours per day)	168.2	32.7	2.9	48.4	19.9	1.4	16,343*
Impact Pile Driving							
30-inch steel permanent installation (10 minutes per day)	196	1,209.5	43.0	1,440.6	647.2	47.1	2,512
48-inch steel permanent installation (10 minutes per day	198.6	1,802.7	64.1	2,147.3	964.7	70.2	3,744

Injury zones calculated assuming:

Vibratory driving=5 hours per day for removal of 12 and 16-inch piles, 3 hours per day for installation of 30-inch diameter temporary steel piles, 1 hour per day for removal of 30-inch diameter temporary piles, 2 hours per day for installation of 30-inch diameter permanent piles, 2 hours per day for installation of 48-inch permanent piles; Weighting Factor Adjustments (WFA) 2.5 kilohertz (kHz)

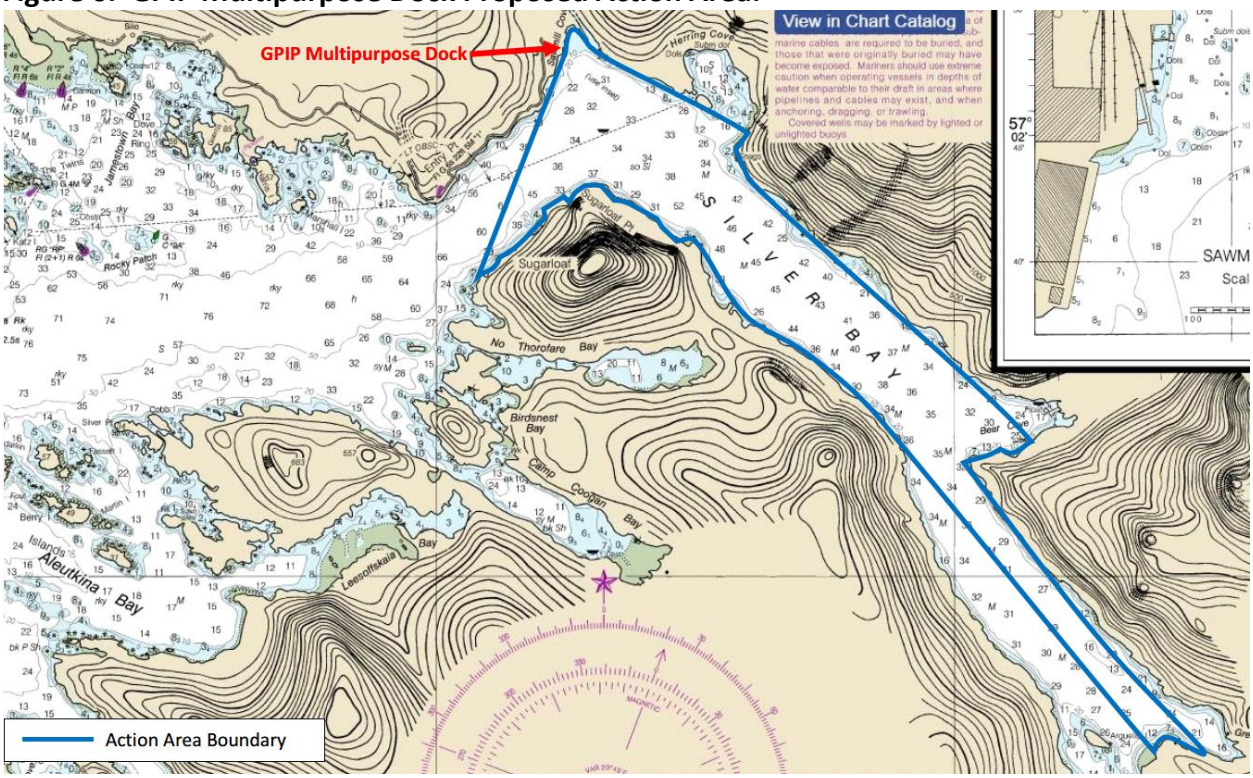
Impact driving=400 strikes per hour and 10 minutes of driving in 24-hour period, WFA 2 kHz

Source levels based on NMFS Office of Protected Resources recommendations as outlined below (NMFS 2017):

- Vibratory removal 12-inch timber pile: 155 dB
- Vibratory removal 16-inch timber pile: 155 dB
- Vibratory installation/removal 30-inch steel pile: 166 dB, proxy source 90% value measured at Ketchikan (Denes et al. 2016)
- Vibratory installation 48-inch steel pile: 168.2, proxy source Port of Anchorage (Austin et al. 2016)
- Impact installation 30-inch steel pile: 196 dB, proxy source 90% value measured at Ketchikan (Denes et al. 2016)
- Impact installation 30-inch steel pile: 196 dB, proxy source 90% value measures at Ketchikan (Denes et al. 2016)
- Impact installation 48-inch steel pile: 198.6 dB, proxy source Port of Anchorage (Austin et al. 2016)

*Calculated distances will be truncated where the land mass at the end of Silver Bay obstructs underwater sound transmission, approximately 9.500 m from the source.

Figure 6. GPIP Multipurpose Dock Proposed Action Area.



To minimize impacts to protected species, shutdown and monitoring of disturbance zones will be implemented to protect and document marine mammals in the action area. Please see Section 11 for various threshold distances and the attached Marine Mammal Monitoring and Mitigation Plan (Appendix B) for more details on mitigation and shutdown and monitoring procedures.

2 DATES, DURATION, AND REGION OF ACTIVITY

The date(s) and duration of such activity and the specific geographical region where it will occur.

2.1 Dates and Duration of Activities

Construction is expected to take 3 months beginning in October 2017.

Pile driving (removal and installation) is expected to take 44 hours over a period of ~~ten~~ sixteen days (not necessarily consecutive). No dredging or blasting is proposed as part of this project. The construction duration accounts for the time required to mobilize materials and resources and construct the project. The duration also accounts for potential delays in material deliveries, equipment maintenance, inclement weather, and shutdowns that could occur if marine mammals without take authorizations come within disturbance zones associated with the project area.

2.2 Geographical Setting

The proposed dock will be constructed in Sawmill Cove, a small body of water located near Sitka, Alaska at the mouth of Silver Bay, which opens to the Sitka Sound and Gulf of Alaska (Figure 1).

2.3 Seasonal Issues

Marine mammal species are present year-round in the project vicinity. Humpback whales are more common in the area in winter months. Please see Section 4.1.3 for more information on humpback whale presence. In winter, daylight is more limited and storms are more frequent than later in the year; therefore, the contractor would like to begin construction in the fall to take advantage of longer daylight hours and likely better weather.

3 SPECIES AND NUMBERS OF MARINE MAMMALS

The species and numbers of marine mammals likely to be found within the activity area.

The marine waters of Sawmill Cove, Silver Bay, and Sitka Sound support many species of marine mammals. The species listed by NMFS that may occur in the project vicinity are shown in Table 5, along with their stock or population, their estimated abundance, and their occurrence in the project area.

To determine the species and numbers of marine mammals likely to be found within the action area, marine biologist Jan Straley and people who have spent years working in the Sawmill Cove vicinity were consulted (Straley 2017, SolsticeAK 2017). Between September and May from 1994 to 2000, Straley conducted weekly land-based surveys of marine mammals from Sitka's Whale Park, located at the entrance to Silver Bay. Straley also conducted vessel-based surveys[2] in or near the project vicinity in various months throughout the year from 2000 to present. Please see Appendix C for the report summarizing these surveys.

These surveys, discussions with Straley, and discussions with others who worked near the project area all indicate that humpback whales, harbor seals, and Steller sea lions are residents of the project area and are frequently sighted foraging in the project vicinity (Straley 2017, SolsticeAK 2017). According to Straley's survey data, transient killer whales can also occur frequently in the project area (Straley and Pendell 2017); as they pass through to feed on marine mammals (Straley 2017). Harbor porpoise can occur in the action area, but sightings are infrequent. Exposure of these species to project impacts is likely, and their take is requested.

Although listed on the NMFS Mapper (NMFS 2017a), the other species listed in Table 5 are rare in the project vicinity: During Straley's surveys, three gray whales were observed and no fin whale, North Pacific right whale, sperm whale, Cuvier's beaked whale, minke whale, Dall's porpoise, or Northern fur seal were observed (Straley and Pendell 2017). Therefore, exposure of these species to project impacts is considered unlikely, and their take is not requested.

This IHA application is limited to humpback whales, killer whales, harbor porpoises, harbor seals, and Steller sea lions and assesses the potential impacts of the project on these five species, which are discussed more fully in Section 4.

[2] Vessel-based surveys occurred in February, March, July, August, October, and November.

Table 5. Marine Mammal Species with Ranges Extending into the Project Area.

Species [a]	Stock and Abundance Estimate	ESA Status	MMPA Status	Occurrence in Action Area [b]
Humpback Whale (*Megaptera novaeangliae*)	Hawaii DPS 11,398 [c]	Not listed	Strategic, depleted	Frequent
	Mexico DPS 3,264 [c]	Threatened	Strategic, depleted	Frequent
Harbor Seal (*Phoca vitulina*)	Sitka/Chatham Strait 14,855 [d]	Not listed	Not strategic, non-depleted	Frequent
Steller Sea Lion (*Eumatopia jubatus)*	EDPS 49,497 [d]	Not listed	Strategic, depleted	Frequent
	WDPS 36,551 [d]	Endangered	Strategic, depleted	Infrequent
Killer Whale (*Orcinus orca*)	West Coast Transient 243 [d]	Not listed	Not strategic, non-depleted	Frequent
	Gulf, Aleutian, Bering Transient 587 [d]	Not listed	Not strategic, non-depleted	Frequent
	Northern Resident (BC) 261 [d]	Not listed	Not strategic, non-depleted	Rare
	Alaska Resident 2,347 [d]	Not listed	Not strategic, non-depleted	Rare
Harbor Porpoise (*Phocoena phocoena*)	Southeast Alaska 11,146 [d]	Not listed	Strategic, non-depleted	Infrequent
Pacific White-Sided Dolphin (*Lagenorhynchus obliquidens*)	North Pacific 26,880 [d]	Not listed	Not strategic, non-depleted	Rare
Gray Whale (*Eschrichtius robustus*)	Eastern North Pacific 20,125 [e]	Not listed	Not strategic, non-depleted	Rare
Fin Whale (*Balaenoptera physalus*)	Northeast Pacific N/A [d]	Endangered	Strategic, depleted	Rare
N. Pacific Right Whale (*Eubalaena japonica*)	Eastern North Pacific 31 [d]	Endangered	Strategic, depleted	Rare
Sperm Whale (*Physeter macrocephalusI*)	North Pacific N/A [d]	Endangered	Strategic, depleted	Rare
Northern Fur Seal (*Callorhinus ursinus*)	Eastern Pacific 648,534 [d]	Not listed	Strategic, depleted	Rare
Cuvier's Beaked Whale (*Ziphius cavirostris*)	Alaska N/A [d]	Not listed	Not strategic, non-depleted	Rare
Dall's Porpoise (*Phocoenoides dalli*)	Alaska 83,400 [d]	Not listed	Not strategic, non-depleted	Rare
Minke Whale (*Balaenoptera acutorostrata*)	Alaska N/A [d]	Not listed	Not strategic, non-depleted	Rare

[s] Species listed with ranges extending into the project area derived from personal communication with David Gann, NMFS Alaska, and the NOAA online mapper <https://alaskafisheries.noaa.gov/mapping/esa/>.

[b] Occurrence in project area based on surveys from 1994 to present as reported in Straley and Pendell 2017 and personal communication with Straley 2017. Frequent = seen consistently; Infrequent=not seen consistently or seen more than three times; Rare=seen fewer than three times

[c] Wade et al. 2016.

[d] Muto, M. et al. 2015 Stock Assessment Report Summary Table <http://www.nmfs.noaa.gov/pr/sars/pdf/ak2015_summary_final.pdf>.

[e] NMFS 2015.

4 AFFECTED SPECIES STATUS AND DISTRIBUTION

A description of the status and distribution of each species or stocks or marine mammals likely to be affected by the activity.

4.1 Humpback Whale

4.1.1 Status

NMFS recently completed a global status review of humpback whales. After analysis and extensive public review, NMFS published a final rule on September 8, 2016 (81 FR 62260), recognizing 14 Distinct Population Segments (DPSs), designating 4 of these as endangered and 1 as threatened under the Endangered Species Act (ESA), with the remaining 9 as not warranting ESA listing status. The total population of humpback whales is at least 80,000.

Based on an analysis of migration between winter mating/calving areas and summer feeding areas using photo-identification, Wade et al. (2016) concluded that whales feeding in Alaskan waters belong primarily to the Hawaii DPS (now recovered), with small contributions of Mexico DPS (threatened) and Western North Pacific DPS (endangered) individuals. The GPIP Multipurpose Dock is located within what Wade et al. classifies as the summer feeding area of Southeast Alaska / Northern British Columbia. The total estimated abundance of humpback whales in this summer feeding area is 6,137. Based on probabilities reported in Wade et al., in the Southeast Alaska/Northern British Columbia area, Hawaii DPS individuals comprise 93.9 percent of the humpback whales present, Mexico DPS individuals comprise 6.1 percent, and Western North Pacific DPS individuals comprise 0 percent.

4.1.2 Distribution

The humpback whale is distributed worldwide in all ocean basins and a broad geographical range from tropical to temperate waters in the Northern Hemisphere and from tropical to near-ice-edge waters in the Southern Hemisphere.

Nearly all populations of humpback whales undertake seasonal migrations from their tropical calving and breeding grounds in winter to their high-latitude feeding grounds in summer. They may be seen at any time of year in Alaska, but most animals winter in temperate or tropical waters near Mexico, Hawaii, and in the western Pacific near Japan. In the spring, the animals migrate back to Alaska where food is abundant. They tend to concentrate in several areas, including Southeast Alaska, Prince William Sound, Kodiak, the Barren Islands at the mouth of Cook Inlet, and along the Aleutian Islands. The Chukchi Sea is the northernmost area for humpbacks during their summer feeding, although, in 2007, humpbacks were seen in the Beaufort Sea east of Barrow, which would suggest a northward expansion of their feeding grounds (Zimmerman and Karpovich 2008).

4.1.3 Presence in Project Area

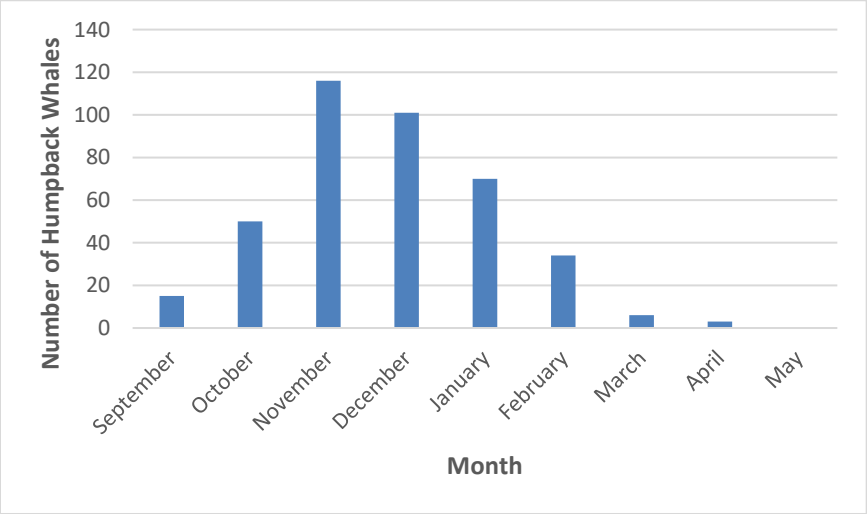
Although humpback whales are known to undertake seasonal migrations from their tropical calving and breeding grounds in winter to their high-latitude feeding grounds in summer, humpback whales have been observed in Southeast Alaska in all months of the year.

Humpback whales are most common in the GPIP Multipurpose Dock Project area in November, December, and January (Figure 7). In late fall and winter, herring sometimes overwinter in deep fjords in Silver Bay and Eastern Channel of Sitka Sound, and humpback whales aggregate in these areas to feed on them. In summer when prey is dispersed throughout Sitka Sound, humpback whales also disperse throughout the Sound and away from the project area (Straley 2017).

Between September and May between 1994 and 2000, marine biologist Jan Straley conducted weekly land-based surveys of marine mammals from Sitka's Whale Park, located at the entrance to Silver Bay. (No surveys were done in June, July, and August.) Many humpback whales were observed during these surveys. Based on Straley's surveys, humpback whale numbers are highest near the project area, in Silver Bay and Eastern Channel of Sitka Sound, from September to February (Straley and Pendell 2017) (Figure 7).

Survey data indicates that the typical group size for humpback whales in the area is between 2and 4 whales, and approximately 2.18 whales occur in the area per day. The maximum group size is unknown. When present in the area, humpback whales are foraging primarily on herring.

Figure 7. Humpback Whale Counts from Land-Based Surveys at Whale Park, Sitka from September Through May Between 1994 and 2000. (Adapted from Straley and Pendell 2017)



Most of the humpback whales that are found feeding in Sitka Sound in winter make the migration south across the North Pacific to their mating and calving grounds in Hawaii and Mexico; however, this likely occurs after herring have moved out of the project area. Humpback whales have been documented making this migration in under forty days, allowing whales to feed longer in Alaska before they migrate south for mating and calving activities (ASG 1997).

Given their widespread range and their opportunistic foraging strategies, humpback whales may be in the project vicinity during the proposed project activities.

4.1.4 Hearing Ability

Humpback whales are classified by NMFS as low-frequency cetaceans with a generalized hearing range of 7 hertz (Hz) to 35 kHz (NMFS 2016). However, because of the lack of captive subjects and logistical challenges of bringing experimental subjects into the laboratory, no direct measurements of mysticete hearing are available. Consequently, hearing in mysticetes is estimated based on other means such as vocalizations (Wartzok and Ketten, 1999), anatomy (Houser et al. 2001; Ketten 1997), behavioral responses to sound (Edds-Walton 1997), and nominal natural background noise conditions in their likely frequency ranges of hearing (Clark and Ellison 2004). The combined information from these and other sources strongly suggests that mysticetes are likely most sensitive to sound from perhaps tens of hertz to ~10 kHz. However, evidence suggests that humpbacks can hear sounds as low as 7 Hz (Southall et al. 2007), up to 24 kHz, and possibly as high as 30 kHz (Au et al. 2006; Ketten 1997).

4.2 Killer Whale

4.2.1 Status

Based on data regarding association patterns, acoustics, movements, and genetic differences, eight killer whale stocks are now recognized within the Pacific U.S. Exclusive Economic Zone, seven of which occur in Alaska and four of which can occur in Southeast Alaska: the West Coast transient stock; the Eastern North Pacific Gulf of Alaska, Aleutian Islands, and Bering Sea transient stock; the Eastern North Pacific Alaska resident stock; and the Eastern North Pacific northern resident stock (Muto et al. 2016).

At present, reliable data on trends in population abundance for the entire Alaska resident stock are unavailable (Muto et al. 2016); however, the population is not strategic or depleted under the MMPA.

4.2.2 Distribution

Killer whales have been observed in all oceans and seas of the world, but the highest densities occur in colder and more productive waters found at high latitudes. Killer whales are found throughout the North Pacific and occur along the entire Alaska coast, in British Columbia and Washington inland waterways, and along the outer coasts of Washington, Oregon, and California (NMFS 2016a).

The Alaska resident stock occurs from southeastern Alaska to the Aleutian Islands and Bering Sea; the Northern resident stock occurs from Washington State through part of southeastern Alaska; the Gulf of Alaska transient stock occurs mainly from Prince William Sound through the Aleutian Islands and Bering Sea; and the West Coast transient stock occurs from California through southeastern Alaska (Muto et al. 2016).

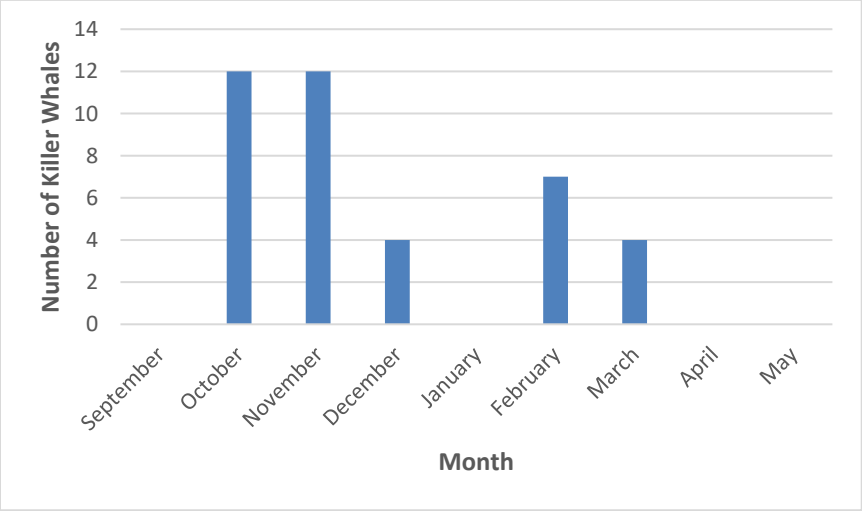
4.2.3 Presence in Project Area

Transient killer whales, primarily from the West Coast transient stock, occur frequently in the project area. Less often, whales from the Eastern North Pacific Gulf of Alaska, Aleutian Islands, and Bering Sea transient stock occur in the project area. The transient killer whales pass

through Sitka Sound and Silver Bay feeding on marine mammals. Because of their transient nature, it is difficult to predict when killer whales will be present in the area (Straley 2017). Whales from the Alaska resident stock and the Northern resident stock primarily feed on fish and do occur in Southeast Alaska; however, they are rare in the project area (Straley 2017).

Between September and May from 1994 to 2000, marine biologist Jan Straley conducted weekly land-based surveys of marine mammals from Sitka's Whale Park, located at the entrance to Silver Bay. Monthly tallies from these surveys show between 0 and 12 killer whales occurring in or near the project area each month (Straley and Pendell 2017; Figure 8). Survey data indicates a typical group size between 4 and 8 killer whales, a maximum group size of 8 whales, and approximately 0.22 whales occurring per day in the area.

Figure 8. Killer Whale Counts from Land-Based Surveys at Whale Park from September through May between 1994 and 2000. (Adapted from Straley and Pendell 2017)



4.2.4 Acoustics

The hearing of killer whales is well developed. Szymanski et al. (1999) found that they responded to tones between 1 and 120 kHz, with the most sensitive range between 18 and 42 kHz. Their greatest sensitivity was at 20 kHz, which is lower than many other odontocetes, but it matches peak spectral energy reported for killer whale echolocation clicks.

4.3 Harbor Porpoise

4.3.1 Status

In Alaska, harbor porpoises are currently divided into three stocks, based primarily on geography: the Bering Sea stock, the Southeast Alaska stock, and the Gulf of Alaska stock. In areas outside of Alaska, studies have shown that stock structure is more finely scaled than is reflected in the Alaska Stock Assessment Reports; however, no data are yet available to define stock structure for harbor porpoises on a finer scale in Alaska (Muto et al. 2016). Only the

Southeast Alaska stock is considered in this application because the other stocks occur outside the geographic area under consideration.

The Southeast Alaska stock is currently estimated at 11,146 individuals (Muto et al. 2016). However, according to the most recent stock report, the 1998 survey resulting in an abundance estimate for the Gulf of Alaska harbor porpoise stock of 10,489 is probably more representative of the size of the Gulf of Alaska harbor porpoise stock (Muto et al. 2016). No reliable information is available to determine trends in abundance.

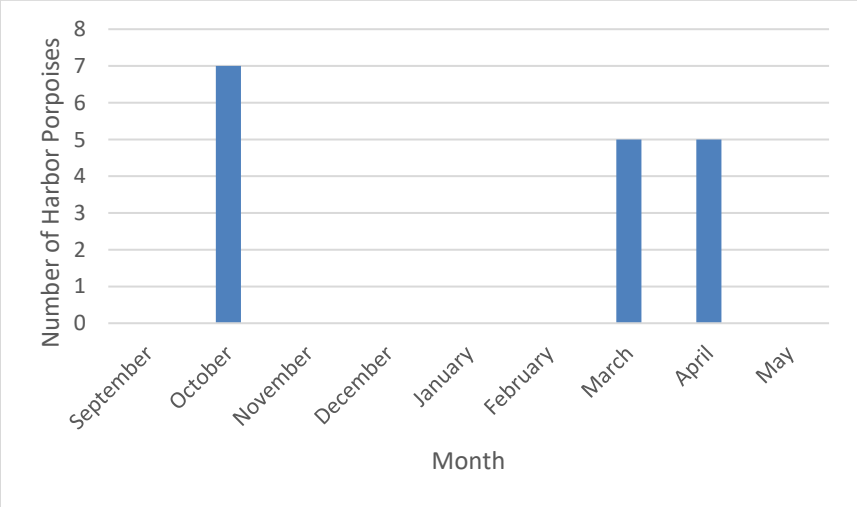
4.3.2 Distribution

In the eastern North Pacific Ocean, harbor porpoises range from Point Barrow, along the Alaska coast, and the west coast of North America to Point Conception, California. The Southeast Alaska stock ranges from Cape Suckling, Alaska to the northern border of British Columbia. Within the inland waters of Southeast Alaska, harbor porpoise distribution is clustered with greatest densities observed in the Glacier Bay/Icy Strait region and near Zarembo and Wrangell Islands and the adjacent waters of Sumner Strait (Dahlheim et al. 2009).

4.3.3 Presence in Project Area

Harbor porpoises commonly frequent nearshore waters, but are not common in the project vicinity. Between September and May from 1994 to 2000, marine biologist Jan Straley conducted weekly land-based surveys of marine mammals from Sitka's Whale Park, located at the entrance to Silver Bay. Monthly tallies from these surveys show between zero and seven harbor porpoises occurring in or near the action area each month (Straley and Pendell 2017; Figure 9). Survey data indicates a typical group size of 5 porpoises, a maximum group size of 8 porpoises, and approximately 0.09 harbor porpoises occurring in the area per day. As mentioned in Section 3, harbor porpoises are rare in the project vicinity. When they do occur, they exhibit feeding behavior (Straley 2017).

Figure 9. Harbor Porpoise Counts from Land-Based Surveys at Whale Park from September through May between 1994 and 2000. (Adapted from Straley and Pendell 2017)



4.3.4 Acoustics

The harbor porpoise has the highest upper-frequency limit of all odontocetes investigated. Kastelein et al. (2005) found that the range of best hearing was from 16 to 140 kHz, with a reduced sensitivity around 64 kHz. Maximum sensitivity (about 33 dB reference to one micro Pascal) occurred between 100 and 140 kHz. This maximum sensitivity range corresponds with the peak frequency of echolocation pulses produced by harbor porpoises (120–130 kHz).

4.4 Harbor Seal

4.4.1 Status

Harbor seals are listed neither as depleted under the MMPA nor as threatened or endangered under the ESA. The status of all 12 stocks of harbor seals identified in Alaska relative to their Optimum Sustainable Population size is unknown. The Sitka/Chatham Strait stock of harbor seals, the stock that would be expected in the project vicinity, is not classified as strategic.

The current statewide abundance estimate for Alaskan harbor seals is 205,090 based on aerial survey data collected between 1998 and 2011. The abundance estimate for the Sitka/Chatham Strait stock is 14,855, with a minimum estimate of 13,212 (Muto et al. 2016). Harbor seals have declined dramatically in some parts of their range over the past few decades, while in other parts their numbers have increased or remained stable. The population near Sitka was stable in the 1980s and 1990s (Small et al. 2003).

The current population trend for this stock is greater than 411 seals per year, with a probability that the stock is decreasing of 0.23 (Muto et al. 2016).

4.4.2 Distribution

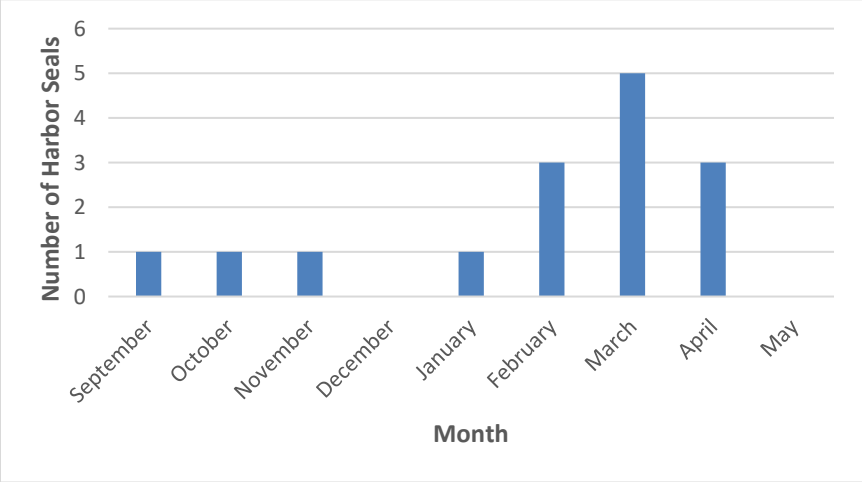
Harbor seals range from Baja California north along the west coasts of Washington, Oregon, California, British Columbia, and Southeast Alaska; west through the Gulf of Alaska, Prince William Sound, and the Aleutian Islands; and north in the Bering Sea to Cape Newenham and the Pribilof Islands. Distribution of the Sitka/Chatham Strait stock ranges from Cape Bingham south to Cape Ommaney, extending inland to Table Bay on the west side of Kuiu Island and north through Chatham Strait to Cube Point off the west coast of Admiralty Island, and as far east as Cape Bendel on the northeast tip of Kupreanof Island (Muto et al. 2016). In 2010, harbor seals in Alaska were partitioned into 12 separate stocks based largely on genetic structure (Allen and Angliss 2010). Only the Sitka/Chatham Strait stock is considered in this application because other stocks occur outside the geographic area under consideration.

4.4.3 Presence in Project Area

Harbor seals are common in the inside waters of southeastern Alaska. Between September and May from 1994 to 2000, marine biologist Jan Straley conducted weekly land-based surveys of marine mammals from Sitka's Whale Park, located at the entrance to Silver Bay. Monthly tallies from these surveys show between zero and five harbor seals occurring in or near the action area each month (Straley and Pendell 2017; Figure 10). Survey data indicates a typical group size between 1 and 2 seals, a maximum group size of 2 seals, and approximately 0.09 harbor

seals occurring in the area per day. Harbor seals are residents of the project vicinity and typically display feeding behaviors.

Figure 10. Harbor Seal Counts from Land-Based Surveys at Whale Park from September through May between 1994 and 2000. (Adapted from Straley and Pendell 2017)



4.4.4 Acoustics

Harbor seals respond to underwater sounds from approximately 1 to 180 kHz, with the functional high-frequency limit around 60 kHz and peak sensitivity at about 32 kHz (Kastak and Schusterman 1995). Hearing ability in the air is greatly reduced (by 25 to 30 decibels [dB]); harbor seals respond to sounds from 1 to 22.5 kHz, with a peak sensitivity of 12 kHz (Kastak and Schusterman 1995).

4.5 Steller sea lion

4.5.1 Status

The Steller sea lion was listed as a threatened species under the ESA on November 26, 1990 (55 FR 49204). In 1997, NMFS reclassified Steller sea lions as two DPSs based on genetic studies and other information (62 FR 24345; May 7, 1997). At that time, the eastern DPS (EDPS) (which includes animals born east of Cape Suckling, Alaska, at 144°W) was listed as threatened, and the western DPS (WDPS) (which includes animals breeding west of Cape Suckling, both in Alaska and Russia) was listed as endangered. On November 4, 2013, the EDPS was removed from the endangered species list (78 FR 66140).

As summarized most recently by Muto et al. (2016), the WDPS Steller sea lions decreased from an estimated 220,000-265,000 animals in the late 1970s to less than 50,000 in 2000. Factors that may have contributed to this decline include incidental take in fisheries, legal and illegal shooting, predation, exposure to contaminants, disease, and ocean regime shift/climate change (NMFS 2008; Miller and Trites 2005). The most recent comprehensive aerial photographic and land-based surveys of WDPS Steller sea lions in Alaska (DeMaster 2014) estimated a total Alaska population (both pups and non-pups) of 49,500 (Muto et al. 2016a). Although Steller sea lion

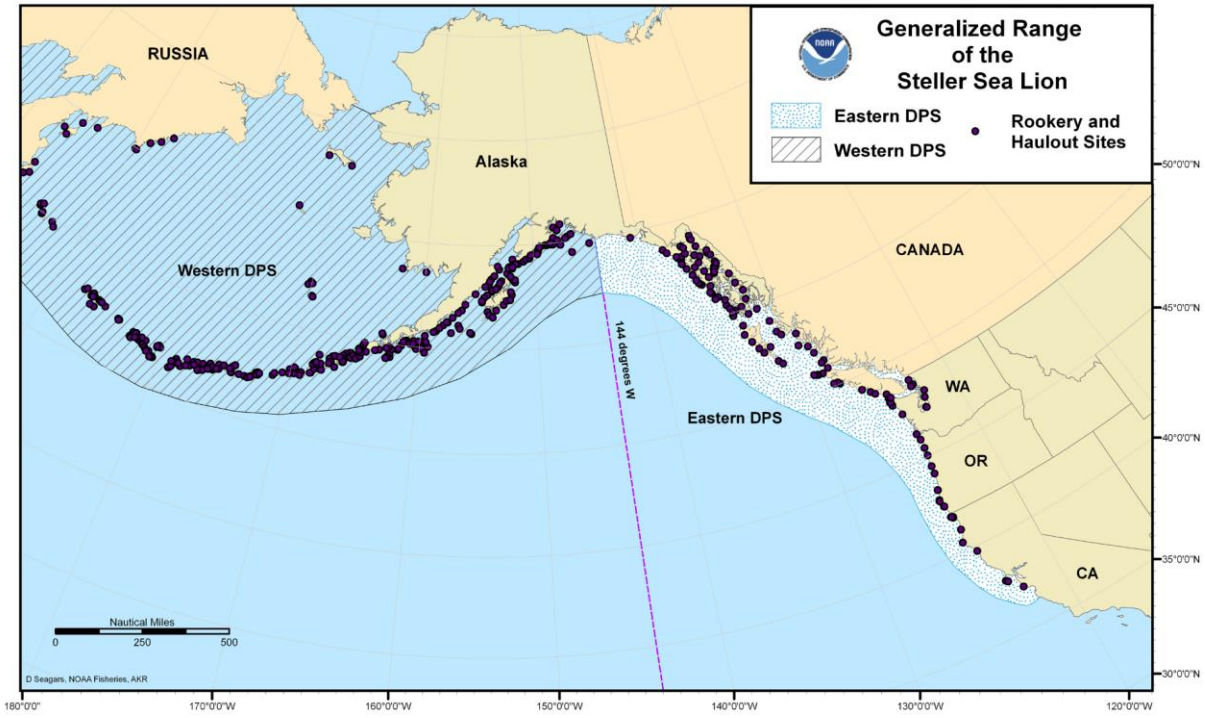
abundance continues to decline in the western Aleutians, numbers are thought to be increasing in the eastern part of the WDPS range.

4.5.2 Distribution

Steller sea lions range along the North Pacific Rim from northern Japan to California, with centers of abundance in the Gulf of Alaska and Aleutian Islands (Loughlin et al. 1984).

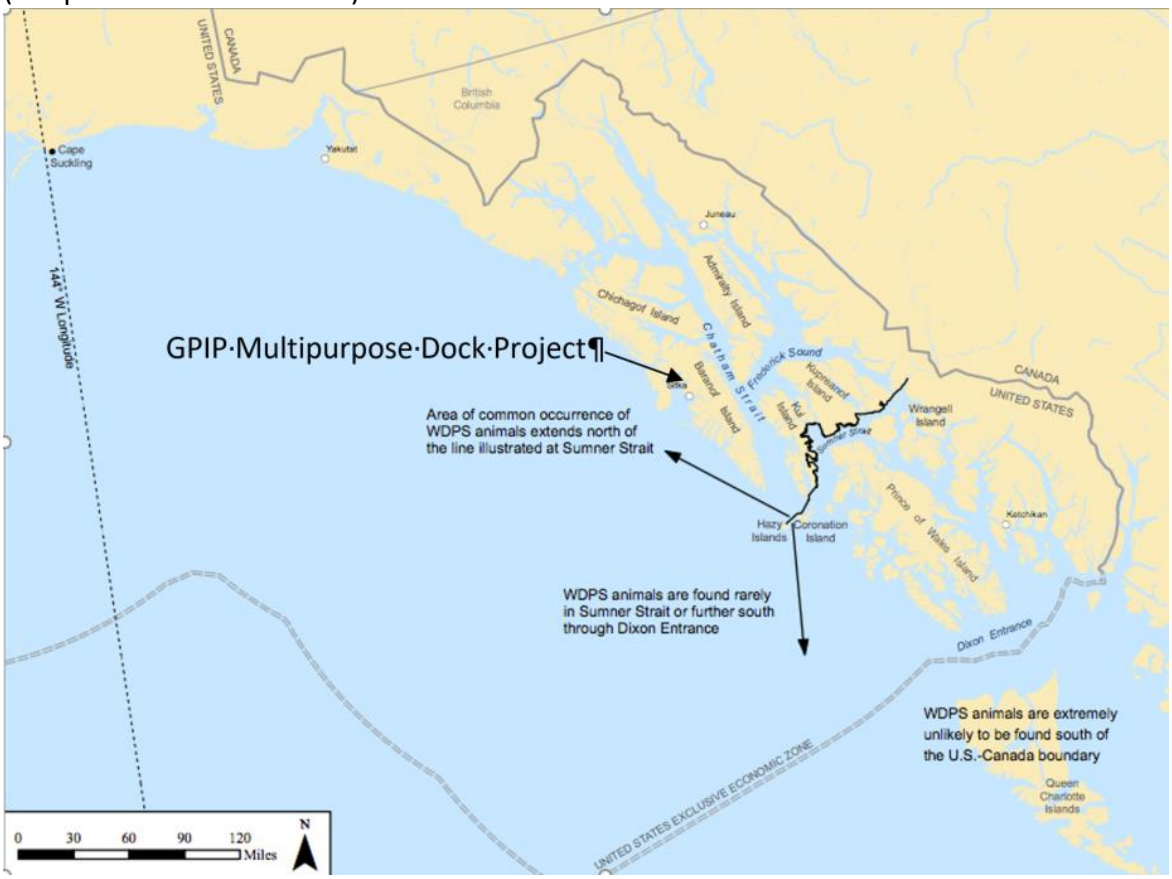
Of the two Steller sea lion populations in Alaska, the EDPS includes sea lions born on rookeries from California north through Southeast Alaska and the WDPS includes those animals born on rookeries from Prince William Sound westward, with an eastern boundary set at 144°W (NMFS 2017b) (Figure 11).

Figure 11. Generalized Ranges of WDPS and EDPS Steller Sea Lions. (Source: NMFS 2017b)



Steller sea lions are not known to migrate annually, but individuals may widely disperse outside of the breeding season (late-May to early-July) (Jemison et al. 2013; Allen and Angliss 2015). Jemison et al. (2013) found that there is regular movement of WDPS Steller sea lions across the 144°W boundary (Figure 12). The majority of the cross-boundary movements are temporary with individuals returning to their natal DPS for breeding; however, some females from the WDPS have likely emigrated permanently and have given birth to pups at White Sisters and Graves Rocks rookeries. The vast majority of confirmed sightings of WDPS animals have been in northern areas of Southeast Alaska, north of Frederick Sound (Jemison et al. 2013, NMFS 2013).

Figure 12. Area of Occurrence of WDPS Steller Sea Lions North and South of Summer Strait. (Adapted from NMFS 2013)



4.5.3 Presence in Project Area

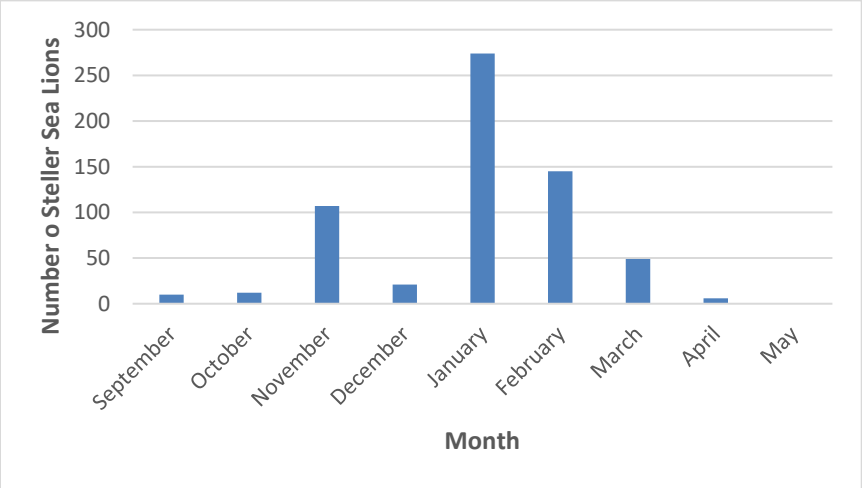
Steller sea lions occur year-round in the project area. Most are expected to be from the EDPS; however, it is likely that some Steller sea lions in the area are from the WDPS (Jemison et al. 2013; NMFS 2013).

From September and May between 1994 and 2000, marine biologist Jan Straley conducted weekly land-based surveys of marine mammals from Sitka's Whale Park, located at the entrance to Silver Bay. (These land based surveys were not performed in June, July, and August.) From 2000 to 2016, Straley also collected marine mammal data from small vessels or Allen Marine 100 foot (tourist wildlife viewing) catamarans throughout the year. Based on Straley's surveys, Steller sea lion numbers are highest near the project area, in Silver Bay and Eastern Channel of Sitka Sound, in January and February (Figure 13). Sea lions were often seen in groups of 4 or more; however, a group of more than 100 was sighted on at least 1 occasion (Straley and Pendell 2017).

Sea lions are residents of the project vicinity and commonly exhibit feeding behavior. Survey data indicates a typical group of 1-2 sea lions, a maximum group size of over 100 sea lions, and approximately 3.46 sea lions occurring per day. Anecdotal evidence also indicates that sea lions are common in Sawmill Cove near the project footprint. In recent years, one sea lion has

frequently been sighted near the Silver Bay Seafoods dock (adjacent to the project footprint) and in summer months it is common to see groups of up to ten sea lions in Sawmill Cove (SolsticeAK 2017).

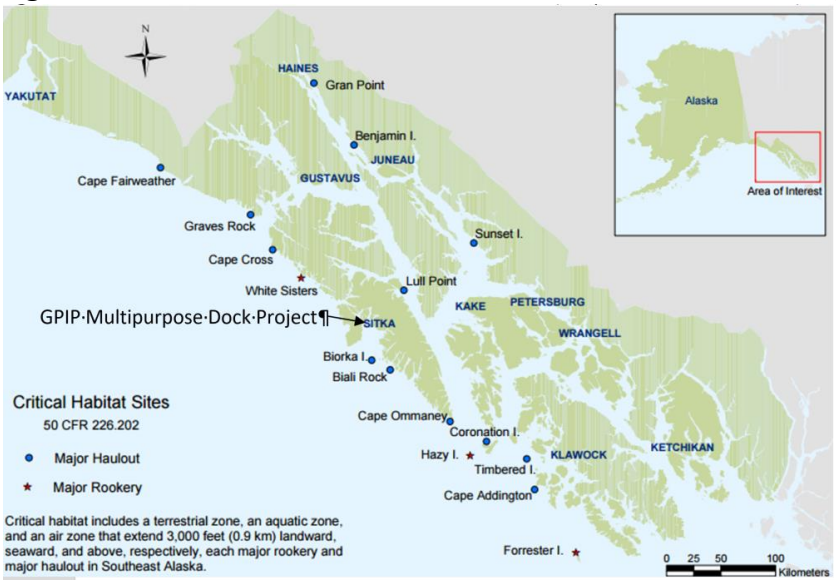
Figure 13. Steller Sea Lion Counts from Land-Based Surveys at Whale Park from September through May between 1994 and 2000. (Adapted from Straley and Pendell 2017)



4.5.4 Steller Sea Lion Critical Habitat

NMFS designated critical habitat for the Steller sea lion on August 27, 1993 (58 FR 45269). The project action area does not overlap Steller sea lion critical habitat. The Biorka Island haulout is the closest designated critical habitat in Southeast, Alaska and is over 25 km southwest of the project area (Figure 14). Steller sea lions also haul out on buoys and navigational markers in Sitka Sound and along the rocky shores of Sugarloaf south of the project site. These haulouts are far beyond in-air noise disturbance threshold for hauled-out pinnipeds as described in Section 1.3.

Figure 14. Steller Sea Lion Critical Habitat in Southeast Alaska (Adapted from NMFS 2017c).



4.5.5 Hearing Ability

The ability to detect sound and communicate underwater is important for a variety of Steller sea lion life functions, including reproduction and predator avoidance. NMFS categorizes Steller sea lions in the otariid pinniped functional hearing group, with an applied frequency range between 60 Hz and 39 kHz in water (NMFS 2016). Studies of Steller sea lion auditory sensitivities have found that this species detects sounds underwater between 1 to 25 kHz (Kastelein et al. 2005), and in air between 250 Hz and 30 kHz (Muslow and Reichmuth 2010; Reichmuth and Southall 2011). For this project, sound from pile installation and extraction operations are anticipated to be within the hearing range of Steller sea lions.

5 TYPE OF INCIDENTAL TAKE AUTHORIZATION REQUESTED

The type of incidental taking authorization that is being requested (i.e., takes by harassment only; takes by harassment, injury, and/or death) and the method of incidental taking.

The CBS requests the issuance of an IHA pursuant to Section 101(a)(5) of the MMPA for incidental take by Level A injury of four species (humpback whale, harbor porpoise, harbor seal, and Steller sea lion) and Level B harassment of five species (humpback whale, killer whale, harbor porpoise, harbor seal, and Steller sea lion) that may occur in the GPIP Multipurpose dock disturbance zone during the planned 3-month long construction period beginning October 1, 2017.

The activities outlined in Section 1 have the potential to take marine mammals by exposure to in-water sound. Take will potentially result from noise associated with vibratory and impact pile driving. Humpback whales, harbor seals, and Steller sea lions are residents in the project vicinity, and it is anticipated that they could be exposed to pile driving noise multiple times during the project. Killer whales transit through the project vicinity and harbor porpoises occur infrequently in the project vicinity; however, some take of these species may also occur.

The City requests an IHA for incidental take of marine mammals described within this application for 1 year, beginning on October 1, 2017 (or the issuance date, whichever is later). The City is not requesting a Letter of Authorization (LOA) at this time because the activities described herein are expected to be completed within 1 year from the date of authorization and are not expected to rise to the level of serious injury or mortality, which would require an LOA.

6 TAKE ESTIMATES FOR MARINE MAMMAL

By age, sex, and reproductive condition (if possible), the number of marine mammals (by species) that may be taken by each type of taking identified in Section 5, and the number of times such takings by each type of taking are likely to occur.

6.1 Background on Determining Take

Incidental take is estimated for each species considering the footprint of the project, the area and time animals are exposed to the stressor, the NMFS acoustic thresholds, and the density and abundance of the species of marine mammals in the area. The bullet points summarize where the abovementioned information is found in this application:

- Section 1 summarizes the GPIP Multipurpose Dock Project, including that the project involves removing approximately 280 abandoned creosote treated piles and constructing of a barge dock secured with piles that will be vibrated and impact driven into place in Sawmill Cove near Sitka, Alaska.
- Section 2 states that pile installation and removal is estimated to occur for a total of approximately 44 hours over the course of ~~ten~~ sixteen days starting in October 2017. Vibratory pile driving could occur for up to 5 hours per day for 1~~0~~60 days, and impact pile driving could occur for up to 10 minutes a day for 6 days.
- Section 1.3 outlines the distances to the Level A and B thresholds and Figures 6, 15, 16, and 17 show these areas.
- Section 1.3 also details the distances to the acoustic thresholds for Level A (injury) and Level B (harassment) take for vibratory and impact pile driving and how it varies by species, pile driving method and pile size, and is truncated by land in many areas.
- Section 4 explains the expected abundance of each species in the area. The take requests for this IHA are estimated using data from land based surveys at Whale Park, vessel based surveys in Sitka Sound and in or near the project vicinity, and professional opinions regarding species presence in Sawmill Cove (Straley and Pendell 2017; Straley 2017). Also, anecdotal evidence about species presence from employees who have spent years working in the Sawmill Cove vicinity are used (SolsticeAK 2017).
- Section 11 details Level A and Level B shut down areas (for species for which take is not requested) that will reduce the number of marine mammals that would be taken.

The calculation for marine mammal exposures is estimated by:

Exposure estimate = N (number of animals) × number of days animals are expected during pile driving activities

6.2 Estimated Incidental Takes

This section summarizes potential incidental take of marine mammals during construction of the GPIP Multipurpose Dock Project as described in Section 1 of this IHA.

6.2.1 Humpback Whale

Based on survey data and anecdotal evidence, humpback whales are common in the project area and are expected to be encountered during dock construction (Straley and Pendell 2017, SolsticeAK 2017). It is assumed that more than one group of humpback whales could be encountered in the Level B disturbance zone on any given day, and that one group of humpback whales could enter the Level A disturbance zone during impact pile driving. During surveys, humpback whales were often seen in groups of 2 to 4 individuals (Straley and Pendell 2017).

Because humpback whales are common in close proximity to the GPIP Multipurpose Dock site, it is anticipated that one group of whales may also be exposed to Level A take during two days of impact pile driving. For this analysis, under a conservative estimate, it is assumed that humpback whales could be present within the Level B disturbance zone on any day of pile driving. Humpback groups are expected to have 4 animals. Using these number, it is estimated that the following number of humpback whales may be present in the disturbance zones:

- Underwater Level A exposure estimate: 4 animals/day x 2 days of impact pile activity=8
- Underwater Level B exposure estimate: 4 animals/day × 16~~0~~ days of pile activity = ~~40~~64

Based on Wade et al. (2016; Section 4.1), the probability is that 93.9 percent of the humpback whales taken would be from the Hawaii DPS (not listed under ESA) and 6.1 percent of the humpback whales taken would be from the ESA-listed threatened Mexico DPS.

The CBS requests authorization for 8 Level A takes of humpback whale, with a probability of 7 Level A takes of the Mexico DPS of humpback whale and 1 level A take of the Hawaii DPS humpback whale. Further, the CBS requests authorization for ~~40~~ 64 Level B takes of humpback whale, with a probability of ~~38~~ 60 Level B takes of the Hawaii DPS humpback whale and ~~2~~ 4 Level B takes of the Mexico DPS humpback whale.

6.2.2 Killer Whales

Based on survey data, killer whales are expected to be in the Level B disturbance zone sporadically. It is assumed that a pod of killer whales could be encountered during dock construction. Typical pod size in the Sitka area varies from 4 to 8 whales (Straley and Pendell 2017). For this analysis, using a conservative estimate, it is assumed that 8 killer whales could be present on any 1 day during the 16~~0~~ days of pile driving. Using this number, it is estimated that the following number of killer whales may be present in the Level B disturbance zone:

- Underwater Level B exposure estimate: 8 animals/day × 2~~1~~ days of pile activity = 16~~8~~

The CBS requests authorization for 16~~8~~ Level B takes of killer whales. No Level A take of killer whales is requested under this authorization, since pile driving activities would be shut down if a killer whale is in the Level A take zone during the corresponding pile driving activity. (See Section 11 and Figure 15 for details on shutdown areas.)

6.2.3 Harbor Porpoises

Based on survey data, harbor porpoises are infrequent in the project area and are expected to be encountered in low numbers during dock construction. It is assumed that a group of harbor porpoises could be encountered in the Level A injury and Level B disturbance zone during dock construction. Typical group size in the project vicinity is five harbor porpoises (Straley and Pendell 2017). For this analysis, it is assumed that 5 harbor ~~seals~~ porpoises could be present on 2~~1~~ days during the 1~~60~~ days of pile driving. Using this number, it is estimated that the following number of harbor porpoises may be present in the injury and disturbance zones:

- Underwater Level A exposure estimate: 5 animals/day × 2~~1~~ day of pile activity = 10~~5~~
- Underwater Level B exposure estimate: 5 animals/day × 2~~1~~ day of pile activity = 10~~5~~

The CBS requests authorization for 10~~5~~ Level A takes and 10~~5~~ Level B takes of harbor porpoises.

6.2.4 Harbor Seals

Based on survey data, harbor seals are common in the project area and are expected to be encountered in low numbers during dock construction. Typical group size in the project vicinity is one to two harbor seals (Straley and Pendell 2017). Because harbor seals are common in close proximity to the GPIP Multipurpose Dock site, it is anticipated that some animals may be exposed to Level A take. It is anticipated that 2 harbor seals could be present within the level A zone every other day of the 6 days of impact pile driving. It is also assumed that a group of 2 harbor seals could be encountered in the Level B disturbance zone all days during the 1~~60~~ days of pile driving. Using these number, it is estimated that the following number of harbor seals may be present in the disturbance zones:

- Underwater Level A exposure estimate: 2 animals/day x 3 days of impact pile activity=6
- Underwater Level B exposure estimate: 2 animals/day × 1~~60~~ days of pile activity = ~~20~~32

As stated in Section 1.3, no in-air disturbance to hauled-out individuals are anticipated as a result of the GPIP Multipurpose Dock Project; thus, no in-air take is being requested.

The CBS requests authorization for 6 Level A takes of harbor seals and ~~20~~ 32 Level B takes of harbor seals.

6.2.5 Steller Sea Lions

Based on survey data and anecdotal evidence, Steller sea lion are common in the project area and are expected to be encountered during dock construction. Anecdotal evidence indicates that between 1 and 10 Steller sea lions can be present within Sawmill Cove (the Level A disturbance zone) on any day (SolsticeAK 2017). It is assumed that more than one group of Steller sea lions could be encountered in the Level B disturbance zone on any given day. During surveys, Steller sea lions were often seen in groups of 4 or more; however, a group of more than 100 was sighted on at least one occasion (Straley and Pendell 2017). Because Steller sea lions may occur in the project area daily, it is assumed that take requests will include multiple harassments of the same individual(s).

Because Steller sea lions are so common in close proximity to the GPIP Multipurpose Dock site, it is anticipated that some animals may be exposed to Level A take. To reduce Level A take of Steller sea lions, shutdowns will be implemented during vibratory and impact pile driving as summarized in Table 8 and shown in Figure 15. The CBS proposes to shut down for the entire Level A zone associated with vibratory pile driving and with 30-inch impact pile driving, and for a portion of the Level A zone associated with 48-inch impact pile driving. It is anticipated that 10 Steller sea lions could be present on any day of the 2~~6~~ days of 48-inch impact pile driving.

It is assumed that on any day of the 1~~0~~6 days of pile driving, 10 Steller sea lions could be present within Sawmill Cove and another group of 4 Steller sea lions could be present in the farther reaches of the disturbance zone, for a combined Level B exposure of 14 Steller sea lions on each day of pile driving. Using these number, it is estimated that the following numbers of Steller sea lions may be present in the disturbance zones:

- Underwater Level A exposure estimate: 10 animals/day x 2~~6~~ days of impact pile activity=2~~6~~0
- Underwater Level B exposure estimate: 14 animals/day × 1~~0~~60 days of pile activity = ~~140~~224

The CBS requests authorization for 2~~6~~0 Level A takes of Steller sea lion and ~~140~~ 224 Level B takes of Steller sea lion. The majority of Steller sea lion take is expected to be from the EDPS.

6.3 All Marine Mammal Takes Requested

This analysis for the GPIP Multipurpose Dock Project predicts 8 potential takes of humpback whales, 5 potential takes of harbor porpoises, 6 potential takes of harbor seals, and 2~~6~~0 potential takes of Steller sea lions that could be classified as Level A injury under the MMPA. The analysis also predicts 40 potential takes of humpback whales, 8 potential takes of killer whales, 5 potential takes of harbor porpoises, 20 potential takes of harbor seals, and 140 potential takes of Steller sea lions that could be classified as Level B harassment under the MMPA. The total number of takes for which Level A acoustical injury and Level B acoustical harassment authorization is requested is shown in Table 6.

Table 6. Level A Injury and Level B Harassment Take Requests for the GPIP Multipurpose Dock Project.

Species	Level A (Injury) Takes	Level B (Harassment) Takes
Humpback Whale	8	~~40~~64
Killer Whale	0	~~8~~16
Harbor Porpoise	~~5~~10	~~5~~10
Harbor Seal	6	~~20~~32
Steller Sea Lion	2~~6~~0	~~140~~224

7 ANTICIPATED IMPACT OF THE ACTIVITY

The anticipated impact of the activity to the species or stock of marine mammal.

CBS is requesting authorization for Level A and B take of marine mammals as listed in Table 6. Any incidental takes of Steller sea lion and harbor seal will very likely be multiple takes of individuals, rather than single takes of unique individuals. The stock take calculations below assume takes of individual animals, instead of repeated takes of a smaller number of individuals; therefore, the stock take percentage calculations are very conservative. Take requests in relation to the overall stock size of each species are summarized in Table 7.

Table 7. Level A and B Take Request Percent of Total Stock.

Species	Stock Size	Level A Take Request	Level A Take Request Percent of Stock	Level B Take Request	Level B Take Request Percent of Stock
Humpback Whale	11,398 Hawaii DPS 3,264 Mexico DPS	7 1	0.06 0.03	~~38~~60 ~~2~~4	0.~~53~~3 [a] 0.~~06~~12 [a]
Killer Whale	2,347 Alaska Resident 261 Northern Resident 587 Gulf, Aleutian, Bering Transient 243 West Coast Transient	0	0	~~8~~16	0 0 ~~0~~1.9 [b]
Harbor Porpoise	11,146	~~5~~10	0.0~~9~~4	~~5~~10	0.0~~9~~4
Harbor Seal	14,855	6	0.04	~~20~~32	0.~~13~~22
Steller Sea Lion	49,497 EDPS 36,551 WDPS	~~26~~0	0.~~12~~04 0.1~~5~~6	~~140~~224	0.~~28~~45 [c] 0.~~38~~61 [c]

Notes:

[a] Based on probabilities in Wade et al. 2016, the probability of encountering humpback whales in Southeast Alaska from the Hawaii DPS is 93.9 percent and Mexico DPS is 6.1 percent. See Section 4 for more information about stock distribution in Southeast Alaska.

[b] The majority of killer whale take is expected to be from the West Coast Transient stock; however, because actual numbers from each stock has not been determined within the project vicinity, take was determined from all transient stocks combined.

[c] The majority of Steller sea lion take is expected to be from the EDPS; however, percent of take of EDPE and WDPS is inflated because it was calculated for both stocks assuming no take from the other stocks.

Incidental Level A take could cause injury including permanent, partial, or full hearing loss if marine mammals are exposed to underwater sounds exceeding the injury threshold, which vary by species. Marine mammals exposed to high received sound levels may experience non-auditory physiological effect such as increased stress, neurological effects, bubble formation, resonance effects, and other types of organ or tissue damage.

It should be noted that for this project Level A take of humpback whales, harbor porpoises, harbor seals, and Steller sea lions would be minimized by the use of shutdown zones, which would be implemented for all species (Table 8 and Figure 15). With the use of Level A shutdown zones, Level A take would only occur during impact pile driving activities and would not occur during vibratory pile driving. Over a 6-day period, impact pile driving would occur for a total of 20 minutes when driving 48-inch piles and 40 minutes when driving 30-inch piles (Table 1). Because of the limited area and time over which humpback whales, harbor

porpoises, harbor seal, and Steller sea lions could experience Level A injury, it is not expected that there would be any impact on stock recruitment or survival, and therefore, there would be no impact on the stocks of these species.

Incidental Level B take is expected to result primarily in short-term changes in behavior, such as avoidance of the project area, changes in swimming speed or direction, and changes in foraging behavior. The activity would happen for no more than 5 hours a day over a 160-day period. Because of the limited time that humpback whales, killer whales, harbor porpoises, harbor seals, and Steller sea lions could be exposed to Level B harassment, GPIP Multipurpose Dock Project construction would be unlikely to have any impact on stock recruitment or survival, and therefore, would have a negligible impact on the stocks of these species.

8 ANTICIPATED IMPACTS ON SUBSISTENCE USES

The anticipated impact of the activity on the availability of the species or stocks of marine mammals for subsistence uses.

Alaska Natives have traditionally harvested subsistence resources, including sea lions and harbor seals, in Southeast Alaska for hundreds of years. Since surveys of harbor seal and sea lion subsistence harvest in Alaska began in 1992, there have been declines in the number of households hunting and harvesting seals in Southeast Alaska while the number of household hunting and harvesting sea lions has remained relatively constant at low levels (Wolf et al. 2013). In 2012, the community of Sitka had an estimated subsistence take of 49 harbor seals and 1 Steller sea lion (Wolf et al. 2013).

The proposed project is not likely to adversely impact the availability of any marine mammal species or stocks that are commonly used for subsistence purposes or to impact subsistence harvest of marine mammals in the region because construction activities are localized in the industrialized park, pile driving activities are limited and temporary, the project will not result in significant changes to availability of subsistence resources, and construction mitigation measures will be used to reduce impacts to marine mammals.

The Alaska Harbor Seal Commission, the Alaska Sea Otter and Steller Sea Lion Commission, and the Sitka Tribe of Alaska were contacted to discuss the project and request comments. Former Southeast Alaska Harbor Seal Commissioner Harold Martin commented that because the project duration is so short, he does not see that the project will harm anything. Current Harbor Seal Commissioner Mathew Kookesh did not have concerns about the project. The Sitka Tribe of Alaska Resource Protection Department Director Jeff Feldpausch referred to the Commissions for comments. Comments were not received from Lianna Jack, the executive director for the Alaska Sea Otter and Steller Sea Lion Commission.

9 ANTICIPATED IMPACTS ON HABITAT

The anticipated impact of the activity upon the habitat of the marine mammal populations and the likelihood of restoration of the affected habitat.

9.1 Impacts to Physical Habitat

9.1.1 Project Footprint

The GPIP Multipurpose Dock would be located in an active marine commercial and industrial area. The dock footprint is previously disturbed with abandoned dock structures associate with the former Alaska Pulp Mill in the area.

9.1.2 Turbidity/Sedimentation

During the estimated 44 hours of pile driving, a temporary and localized increase in turbidity near the seafloor will occur in the immediate area surrounding the area where piles are removed and placed (Table 1). As described in Section 1, the project footprint consists of deep soft sediments. These sediments will be disturbed during pile driving; however, according to *Decision Framework for Managing Navigation in Sawmill Cove* (1990) "special techniques would not be required for conventional pile driving, since any resuspension will be brief and very localized" (Foster Wheeler Environmental Corporation 1999).

Sediment suspension is not expected to impact Silver Bay, and the small and shallow Sawmill Cove does not support an abundance of prey for marine mammals. Thus, the temporary and localized turbidity associated with the GPIP Multipurpose Dock Project is unlikely to measurably affect marine mammals or their prey in the area.

9.2 Effects of Project Activities on Humpback Whale, Harbor Porpoise, Harbor Seal, and Steller Sea Lion Habitat

9.2.1 Animal Avoidance or Abandonment

Humpback whales, harbor seals, and Steller sea lions occur, and harbor porpoises occur infrequently in the project area and could experience a temporary loss of suitable habitat in the project vicinity if elevated noise levels associated with in-water construction result in their displacement from the area. Displacement of humpback whales, harbor porpoises, harbor seals, and Steller sea lions by noise is not expected to be permanent and will not result in long-term effects to the local population.

9.3 Effects of Project Activities on Killer Whale Habitat

9.3.1 Animal Avoidance or Abandonment

Killer whales can be frequent visitors to the project area. These species could experience a temporary loss of suitable habitat in the action area if elevated noise levels associated with in-water construction result in their displacement from the area. Displacement of killer whales by noise is not expected to be permanent and will not result in long-term effects to the local population.

9.4 Effects of Project Activities on Marine Mammal Prey Habitat

Essential Fish Habitat (EFH) exists within Sawmill Cove and Silver Bay for chum (*Oncorhynchus keta*), pink (*O. gorbuscha*), coho (*O. kisutch*), sockeye (*O.* nerka), and Chinook salmon (*O. tshawytscha)* (NMFS 2016b). In late fall and winter, herring (not an EFH species) sometimes overwinter in deep fjords in Silver Bay (Straley 2017).

The Alaska Department of Fish and Game identifies Sawmill Creek, which empties into Sawmill Cove just east of the proposed dock site, as an anadromous fish stream. Sawmill Creek provides spawning and rearing habitat for chum, pink, coho, and sockeye salmon and spawning habitat for steelhead (*O. mykiss*) (ADF&G 2016). In addition, four non-anadromous fish species have been observed or collected in Sawmill Creek. These include resident rainbow trout (*O. mykiss*; considered "resident" if between 250 and 490 mm in length), staghorn sculpin (*Leptocottus armatus*), prickly sculpin (*Cottus asper*), and Arctic grayling (*Thymallus arcticus*). Five other anadromous fish streams are located within 4.8 km (3 mi) of the project site along with a number of other creeks and deltas.

Fish populations in the project area that serve as marine mammal prey could be affected by noise from in-water pile-driving. High underwater sound pressure levels have been documented to alter behavior, cause hearing loss, and injure or kill individual fish by causing serious internal injury (Hastings and Popper 2005).

In general, impacts to marine mammal prey species are expected to be minor and temporary. The area likely impacted by the project is very small compared to the available habitat around Sitka. The most likely impact to fish will be temporary behavioral avoidance of the immediate area. Because fish habitat is not limited in the area because vibratory pile driving would last no longer than 5 hours a day for 10 day and impact pile driving would happen for no more than 10 minutes a day for 6 days, it is expected that fish and marine mammals would temporarily move to nearby locations and return to the area following cessation of in-water construction activities. Therefore, indirect effects on marine mammal prey during the construction is not expected to be substantial. Beneficial effects to prey species may include increased habitat resulting from removal of existing abandoned piles and structures in and near the project footprint.

10 ANTICIPATED EFFECTS OF HABITAT IMPACTS ON MARINE MAMMALS

The anticipated impact of the loss or modification of the habitat on the marine mammal populations involved.

The proposed project will occur within a previously disturbed footprint of an active marine commercial and industrial area and is not expected to result in a significant permanent loss or modification of habitat for marine mammals or their food sources. The most likely effects on marine mammal habitat for the proposed project will be temporary, short duration in-water noise, temporary prey (fish) disturbance, and localized, temporary water quality effects. The direct loss of habitat available to marine mammals during construction due to noise, water quality impacts, and other construction activity is expected to be short-term and minimal.

10.1 Loss of Marine Mammal Habitat Due to Noise

One potential impact on marine mammals associated with the project could be a temporary loss of habitat because of elevated noise levels. Displacement of marine mammals by noise would not be permanent and would not have long-term effects. The proposed project is not expected to have any habitat-related effects that could cause significant or long-term consequences for individual marine mammals or their populations, because pile driving and other noise sources will be temporary and intermittent.

10.2 Loss of Marine Mammal Habitat Due to Turbidity

Another potential impact on marine mammals associated with the project could be temporary sediment suspension and increased turbidity associated with pile driving and removal in Sawmill Cove. The temporary and localized turbidity associated with the GPIP Multipurpose Dock Project is unlikely to measurably affect marine mammals or their prey in the area.

10.3 Disturbance or Loss of Prey Species

As stated in Section 9, fish populations in the project area that serve as marine mammal prey could be affected by noise from in-water pile-driving. It is expected that most fish will be able to move away from the proposed activity to avoid harm and will still be available to marine mammals as a food source. The quantity, quality, and availability of adequate food resources are therefore not likely to be reduced (due to the small area affected, mobility of fish, anticipated recolonization, and the temporary nature of the project).

These temporary impacts on habitat were discussed in more detail in Section 9.

11 MITIGATION MEASURES

The availability and feasibility (economic and technological) of equipment, methods, and manner of conducting such activity or other means of effecting the least practicable adverse impact upon the affected species or stocks, their habitat, and their availability for subsistence uses, paying particular attention to rookeries, mating grounds, and areas of similar significance.

A number of proposed mitigation measures and construction techniques will be employed to minimize effects to marine mammal species. Proposed mitigation measures for the project include general construction mitigation measures, mitigation measures during pile removal and installation, and marine mammal shutdown zones. These measures are detailed below and in Section 12 and presented in detail in the GPIP Multipurpose Dock Project Marine Mammal Monitoring and Mitigation Plan (Appendix B).

11.1 General Construction Mitigation Measures

- The project uses the most compact design possible, while meeting the demands of the vessels that would use the facility.
- Wood that has been surface or pressure-treated with creosote or treated with pentachlorophenol will not be used. If treated wood must be used, any wood that comes in contact with water will be treated with waterborne preservatives in accordance with Best Management Practices developed by the Western Wood Preservers Institute. Treated wood will be inspected before installation to ensure that no superficial deposits of preservative material remain on the wood.
- The project uses a design that does not require dredging.
- Plans for avoiding, minimizing, and responding to releases of sediments, contaminants, fuels, oil, and other pollutants will be developed and implemented.
- Spill response equipment will be kept on-site during construction and operation.
- Floats or barges will not be grounded at any tidal stage.

11.2 Pile Driving and Removal Mitigation Measures

- The project has been designed to use the fewest piles practicable (alternative designs required significantly more piles). This design was selected to reduce noise impacts associated with the duration of pile driving.
- To minimize construction noise levels as much as possible, the contractor will first attempt to direct pull old, abandoned piles; if those efforts prove to be ineffective, they will proceed with a vibratory hammer.
- To reduce noise production, the vibratory hammer will be operated at a reduced energy setting (30 to 50 percent of its rated energy).
- Pile driving softening material will be used to minimize noise during vibratory and impact pile driving. Much of the noise generated during pile installation comes from contact between the pile being driven and the steel template used to hold the pile in place. The contractor will use high-density polyethylene (HDPE) or ultra-high-molecular-weight polyethylene (UHMW) softening material on all templates to eliminate steel on steel noise generation.

- Soft start procedures will be used prior to pile removal and installation, to allow marine mammals to leave the area prior to exposure to maximum noise levels. For vibratory hammers, the soft-start technique will initiate noise from the hammer for 15 seconds at a reduced energy level, followed by 1 minute waiting period and repeat the procedure 2 additional times. For impact hammers, the soft-start technique will initiate 3 strikes at a reduced energy level, followed by a 30-second waiting period. This procedure would also be repeated two additional times.
- The impact hammer will be operated at reduced fuel setting as long as is practicable.

11.3 Shutdown and Monitoring Zones

The CBS is requesting Level A take for humpback whale, harbor porpoise, harbor seal, and Steller sea lion and is requesting Level B take for humpback whale, killer whale, harbor porpoise, harbor seal, and Steller sea lion incidental to constructing the GPIP Multipurpose Dock. The CBS is not requesting take for any other marine mammal.

Shutdown and monitoring zones are described in the following sub-sections.

11.3.1 Level A Shutdown and Monitoring Zones

The CBS is requesting Level A take of humpback whales, harbor porpoises, harbor seals, and Steller sea lions. To mitigate project impacts to these species, during impact pile driving the CBS proposes to shut down for a portion of the Level A zones and monitor the remaining portion of the zone. Monitoring and shutdown zones are summarized in Table 8 and shown in Figures 15 and 16.

No other Level A take is authorized and pile driving would be shut down as summarized in Table 8 to avoid Level A take of other marine mammal species.

Table 8. Level A Shutdown and Monitoring Zones by Species, Pile Size, and Pile Driving Method.

	Level A Shutdown Zones in Meters				
Source	**Low-Frequency Cetaceans (humpback whale)**	**Mid-Frequency Cetaceans (killer whale)**	**High-Frequency Cetaceans (harbor porpoise)**	**Phocid Pinnipeds (harbor seal)**	**Otariid Pinnipeds (Steller sea lion)**
Vibratory Pile Driving					
12 and 16-inch wood (removal)	40	10	50	20	10
30-inch steel (removal and installation)	40	10	50	20	10
48-inch steel (removal and installation)	40	10	50	20	10
Impact Pile Driving					
30-inch steel (installation)	**Shut down: 200** [a] Monitoring: 1,210	50	**Shut down: 200** [a] Monitoring: 1,450	**Shut down: 150** [a] Monitoring: 650	50
48-inch steel (installation)	**Shut down: 200** [a] Monitoring: 1,810 /	100	**Shut down: 200** [a] Monitoring: 2,150	**Shut down: 150** [a] Monitoring: 1,000	**Shut down: 50** [a] Monitoring: 80

Numbers rounded to incorporate all of Level A take distances, unless specified below; see Table 4 for actual distances.
[a] Indicates a shutdown zone that does not encompass the entire Level A injury zone. The CBS is requesting Level A take of humpback whales, harbor porpoises, harbor seals, and Steller sea lions associated with impact pile driving.

Figure 15. GPIP Multipurpose Dock Project Level A Shutdown Zones Areas by Species, Pile Driving Method, and Pile Size.

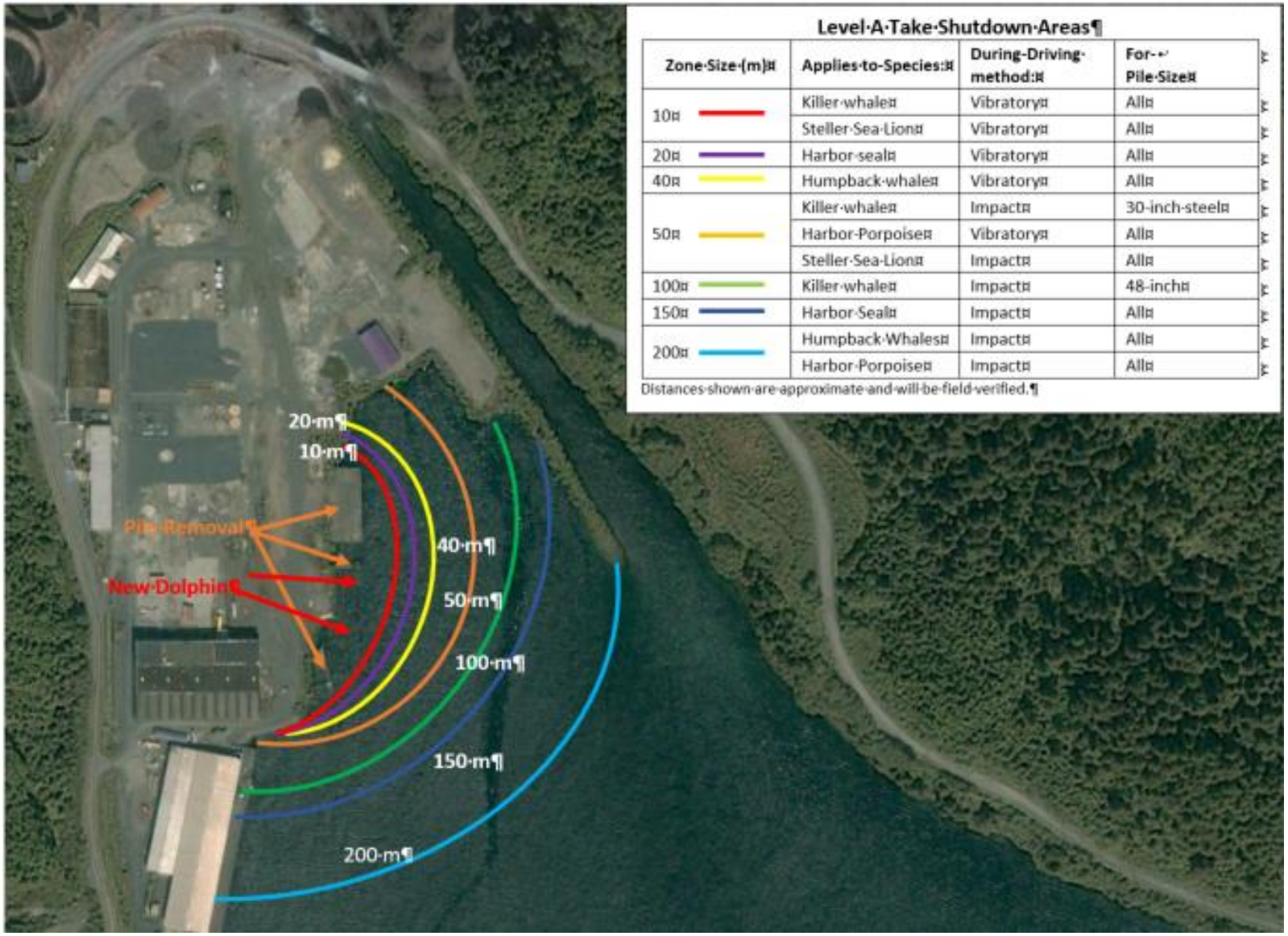
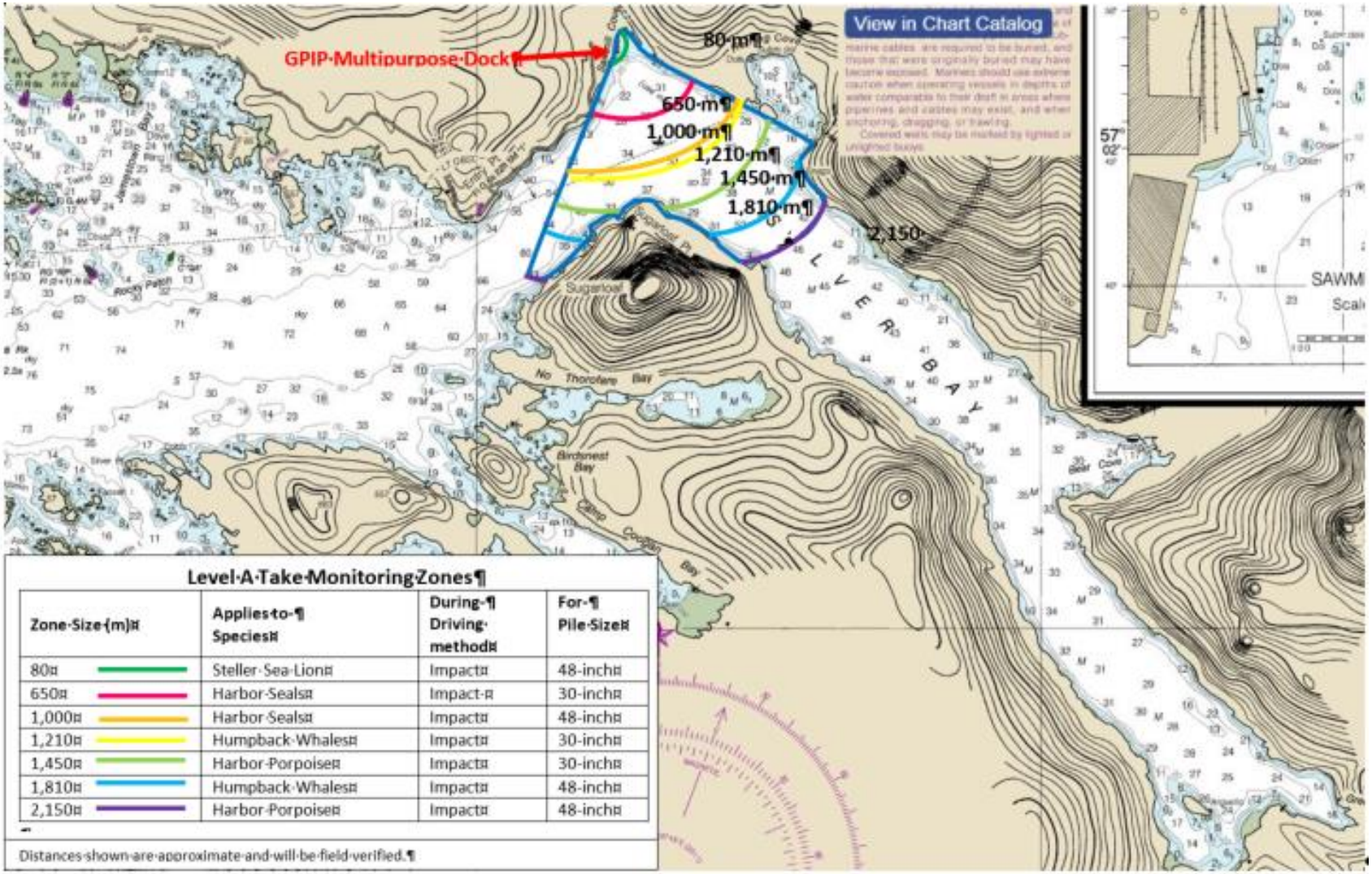


Figure 16. GPIP Multipurpose Dock Project Level A Take Monitoring Zones by Species, Pile Driving Method, and Pile Sizes.



11.3.2 Level B Shutdown and Monitoring Zones

The CBS is requesting Level B take of humpback whale, killer whale, harbor porpoise, harbor seal, and Steller sea lion incidental to constructing the GPIP Multipurpose Dock and shut downs associated with Level B harassment of these species are not proposed. The monitoring zones associated with Level B disturbance are outlined in Table 9 and Figure 17.

No other Level B take is authorized and pile driving would be shut down as summarized in Table 9 and Figure 17 to avoid Level B take of other NMFS-protected marine mammal species.

Table 9. Monitoring Zones for Level B Take and Shutdown Zones for all other NMFS Protected Species.

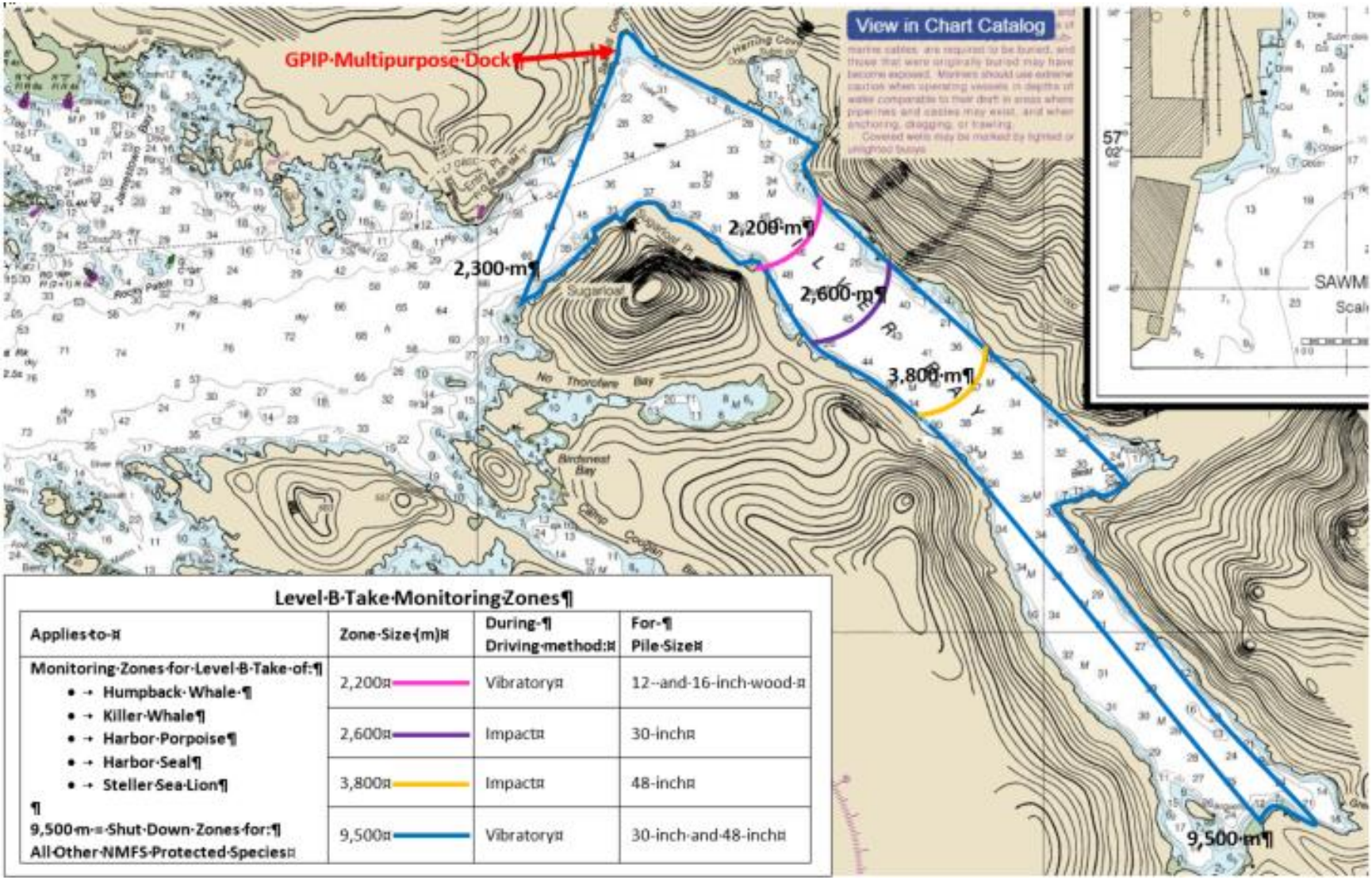
Pile Driving Noise Source	Monitoring Zones for Level B Take and Shutdown Zone for all other NMFS-Protected Species (m)
Vibratory Pile Driving	
12 and 16-inch wood (removal)	2,200
30-inch steel (installation and removal)	9,500 [a]
48-inch steel (installation and removal)	9,500 [b]
Impact Pile Driving	
30-inch steel (installation)	2,600
48-inch steel (installation)	3,800

Numbers rounded up to nearest 100 meters; see Table 4 for actual isopleth distances.

[a] Level B isopleth distance calculated to 11,659 m but would be truncated by landforms in project area to a maximum distance of 9,550 m.

[b] Level B isopleth distance calculated to 16,343 m but would be truncated by landforms in project area to a maximum distance of 9,500 m.

Figure 17. GPIP Multipurpose Dock Project Level B Take Monitoring and Shut Down Zones and by Species, Pile Driving Method, and Pile Sizes.



12 Arctic Plan of Cooperation

Where the proposed activity would take place in or near a traditional Arctic subsistence hunting area and/or may affect the availability of a species or stock of marine mammal for Arctic subsistence uses, submit either a plan of cooperation or information that identifies what measures have been taken and/or will be taken to minimize any adverse effects on the availability of marine mammals for subsistence uses. (This requirement is applicable only for activities that occur in Alaskan waters north of 60° North latitude.)

Although the project vicinity is located south of 60° North, the latitude NMFS regulations consider Arctic waters, and no activities will take place in or near a traditional Arctic subsistence hunting areas, there are subsistence uses of marine mammals in Southeast Alaska and in the community of Sitka. Alaska Natives have traditionally harvested subsistence resources, including sea lions and harbor seals, in Southeast Alaska for hundreds of years.

Section 8 details consultations with subsistence users in the project vicinity.

13 Monitoring and Reporting

The suggested means of accomplishing the necessary monitoring and reporting that will result in increased knowledge of the species, the level of taking or impacts on populations of marine mammals that are expected to be present while conducting activities and suggested means of minimizing burdens by coordinating such reporting requirements with other schemes already applicable to persons conducting such activity. Monitoring plans should include a description of the survey techniques that would be used to determine the movement and activity of marine mammals near the activity site(s) including migration and other habitat uses, such as feeding.

To minimize impacts of project activities on marine mammals, Protected Species Observers (PSOs) will be present in the GPIP Multipurpose Dock Project vicinity during vibratory pile removal and vibratory and impact pile installation. PSOs will search for, monitor, document, and track marine mammals within the Level A injury and Level B harassment zones (Figures 15, 16, and 17), and shut downs will be implemented if a marine mammal is likely to enter a specified shutdown zone (Section 11.3).

If the number of Steller sea lions, harbor porpoises, harbor seals, or humpback whales exposed to Level A or Level B harassment or if the number of killer whales and harbor porpoises exposed to Level B harassment approaches the number of takes allowed by the IHA, the CBS will notify NMFS and seek further consultation.

13.1 Monitoring Protocols

The following marine mammal monitoring protocols, adapted from NMFS *Guidance for Developing a Marine Mammal Monitoring Plan* will be implemented during pile driving and removal activities to help prevent and document acoustic effects on MMPA-listed marine mammals.

1. The PSO will have no other primary duties than watching for and reporting on events related to marine mammals.
2. The PSO will have the tools necessary to aid in determining the location of observed listed species, to take action if listed species are likely to enter a shutdown zone, and to record these events. These tools may include:
    a. binoculars
    b. spotting scope
    c. range finder
    d. GPS
    e. compass
    f. two-way radio communication with construction foreman/superintendent
    g. log book of all activities, which will be made available to U.S. Army Corps of Engineers and NMFS upon request
3. Prior to in-water pile driving and removal, monitoring and shutdown zones described in Section 11 will be field verified.

4. Pile driving and removal will not be conducted when weather conditions or darkness restrict clear, visible observation of all waters within and surrounding the shutdown zone.
5. Each day prior to commencing in-water work the PSO will conduct a radio check with the construction foreman or superintendent. The PSO will brief the foreman or supervisor as to the shutdown procedures if any of the listed species are observed likely to enter or within a shutdown zone, and will have the foreman brief the crew, requesting that the crew notify the PSO when a listed species is spotted.
6. The PSO will work in shifts lasting no longer than 4 hours with at least a 1-hour break between shifts, and will not perform duties as an PSO for more than 12 hours in a 24-hr period (to reduce PSO fatigue).
7. The PSO will remain onsite during in-water pile driving/removal.
8. One land-based PSO and one boat-based PSO will be used to monitor the area.
    a. The land-based PSO will be located at the GPIP construction site and will be able to view the area across Silver Bay to the west and east of Sugarloaf Point.
    b. If it is determined that the Level B harassment area cannot be monitored effectively by two PSOs, another PSO will be added to monitor the area.
9. The PSO will scan the monitoring zone for the presence of listed species for 30 minutes before any pile driving or removal activities take place, or if pile driving has not occurred for over one hour, specifically:
    a. Prior to any pile driving, the boat-based PSO will clear the action area. The PSO will transit to the head of Silver Bay to ensure that there are no marine mammals for which take is not authorized or to document species for with take is authorized.
    b. While the boat-based PSO is transiting to the head of the bay, the land-based PSO will monitor the mouth of Silver Bay to determine whether marine mammals enter the action area from East Channel of Sitka Sound.
    c. If any listed species are present within a shutdown zone, pile driving and removal activities will not begin until the animal(s) has left the shutdown zone or no listed species have been observed in the shutdown zone for 15 minutes (for pinnipeds) or 30 minutes (for cetaceans).
    d. The boat-based PSO will communicate with the construction foreman or superintendent once the area is determined to be clear and pile driving activities can begin.
    e. The boat-based PSO will then transit back to the construction site and spend the rest of the pile driving time monitoring the area from the boat.
10. Throughout all pile-driving activity, the land- and land-based PSO will continuously scan the shutdown zone to ensure that listed species do not enter it.
    a. If any listed species enter, or appear likely to enter, the shutdown zone during pile-driving activities, all driving activity will cease immediately. Pile-driving may resume when the animal(s) has been observed leaving the area on its own accord. If the animal(s) is not observed leaving the area, pile-driving activity may

begin 15 min (for pinnipeds) or 30 min (for cetaceans) after the animal is last observed in the area.

11. Once the shutdown zone has been cleared, ramp-up procedures will be applied prior to beginning pile driving activities each day and/or when pile driving hammers have been idle for more than 30 min:
    a. For impact pile-driving, contractors will be required to provide an initial set of three strikes from the hammer at 40 percent energy, followed by a 30-sec waiting period. This procedure will be repeated two additional times.
12. A data sheet will be used to record the species, behavior, date, and time of any marine mammal sightings. This data will be used to prepare a PSO report. A sample form is provided in Appendix B.

13.2 Monitoring Report

A final monitoring report will be provided to NMFS within 90 days of completion of pile driving. In general, reporting will include:

1. Numbers of days of observations.
2. Lengths of observation periods.
3. Locations of observation stations and dates used.
4. Numbers, species, dates, group sizes, and locations of marine mammals observed.
5. Descriptions of work activities, categorized by type of work taking place while marine mammals were being observed.
6. Distances to marine mammal sightings, including closest approach to construction activities.
7. Descriptions of any observable marine mammal behavior in the Level A and Level B harassment zones.
8. Actions performed to minimize impacts to marine mammals.
9. Times of shutdown events including when work was stopped and resumed due to the presence of marine mammals or other reasons.
10. Refined take estimates based on the numbers of humpback whales, killer whales, harbor porpoises, harbor seals, and Steller sea lions observed during the course of pile installation and removal activities.
11. Descriptions of the type and duration of any noise-generating work occurring and ramp-up procedures used while marine mammals were being observed.
12. Details of all shutdown events, and whether they were due to presence of marine mammals, inability to clear the hazard area due to low visibility, or other reasons.
13. Tables, text, and maps to clarify observations.
14. Full documentation of monitoring methods, an electronic copy of the data spreadsheets, and a summary of results will also be included in the report.
13. Final reports and reports of unauthorized take (detailed below) will be submitted to: NMFS Alaska Protected Resources Division and NMFS Office of Protected Resources.

13.3 Unauthorized Take

In the unanticipated event that the specified activity clearly causes the take of a marine mammal in a manner prohibited by the IHA, such as serious injury or mortality, the entity would immediately cease the specified activities and the take would be reported to NMFS within one business day (contact listed at item 15 above). PSO records for unauthorized take by project activities will include:

1. All the information that will be listed in the monitoring report (Section 13.2).
2. Number of listed animals taken by species.
3. The date and time of each take.
4. The cause of the take (e.g., ship-strike, failure to shut down, impact hammer operating at maximum energy, etc).
5. The time the animal(s) entered the shutdown zone, and, if known, the time it exited the zone.
6. Mitigation measures implemented prior to and after the animal entered the shutdown zone.

13.4 Qualifications for Marine Mammal Observers

The following NMFS-recommended qualifications for PSO will be implemented:

- Visual acuity in both eyes (correction is permissible) sufficient to discern moving targets at the water's surface with ability to estimate target size and distance. Use of binoculars or spotting scope may be necessary to correctly identify the target.
- Experience and ability to conduct field observations and collect data according to assigned protocols (this may include academic experience).
- Experience or training in the field identification of marine mammals (cetaceans and pinnipeds).
- Sufficient training, orientation or experience with vessel operation and pile driving operations to provide for personal safety during observations.
- Writing skills sufficient to prepare a report of observations. Reports should include such information as the number, type, and location of marine mammals observed; the number of takes by species; the behavior of marine mammals in the area of potential sound effects during construction; dates and times when observations and in-water construction activities were conducted; dates and times when in-water construction activities were suspended because of marine mammals, etc.
- 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 needed.

14 Suggested Means of Coordination

Suggested means of learning of, encouraging, and coordinating research opportunities, plans, and activities relating to reducing such incidental taking and evaluating its effects.

In-water and in-air noise generated by vibratory and impact pile driving at the GPIP Multipurpose Dock is the primary issue of concern to local marine mammals during this project. Potential impacts on marine mammals have been studied, with the results used to establish the noise criteria for evaluating take.

The data recorded during marine mammal monitoring for the proposed project will be provided to NMFS in the monitoring report (Section 13.2). The report will provide information on marine mammals use of the Sawmill Cove and Silver Bay, including numbers before, during, and after pile driving activities. The monitoring data may also inform NMFS and future permit applicants generally about the behavior of marine mammals during pile installation and removal for future projects of a similar nature.

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