Appendix C:

Biological Assessment

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April 5, 2021

Mr. Greg Balogh
National Marine Fisheries Service
PO Box 21668
Juneau, AK 99802

Subject: **Sitka SPB – Request for Formal Consultation under Section 7 of ESA**
Request for Concurrence with FAA Determinations

Dear Mr. Balogh:

Thank you for the discussion yesterday regarding the Federal Aviation Administration's (FAA's) Sitka Seaplane Base (SPB) Environmental Assessment (EA) and the Endangered Species Act (ESA) Section 7 Consultation process. As you know, the EA and the Biological Assessment (BA) in Appendix C evaluate the potential impacts of the proposed action, construction and operation of a seaplane base in Sitka Channel in Sitka, Alaska. Per the discussion yesterday, we are requesting your concurrence with our assessment and determination of potential effects of the proposed action on the federally-listed endangered species.

The proposed Sitka SPB would be constructed on Japonski Island and would include fill in marine waters, and installation of pile-supported infrastructure and floating ramps. The facilities and construction methods are discussed in more detail in the Sitka SPB EA and the BA included in Appendix C. The project area is defined as the areas that would be directly or indirectly affected by the proposed action, as shown in Figure 6 in the attached Revised BA.

These five species of marine mammals could be found within the project area:

- Mexico Distinct population segment (DPS) humpback whale
- Western DPS Steller sea lion
- Fin whale
- North Pacific right whale
- Sperm whale

The project area is not within any designated critical habitat but is within proposed critical habitat for Mexico DPS humpback whales.

The FAA has determined that the project warrants a May Affect, Not Likely to Adversely Affect determination for fin whales, North Pacific right whales, and sperm whales.

- Fin whales are rare in southeast Alaska inside waters and have not been observed in marine mammal survey conducted around Sitka Channel. They would not be expected in the shallow and narrow end of Sitka Channel near the proposed project. Further, if fin whales were to be sighted near the action area, pile driving activities would be halted.
- North Pacific right whales have not been observed in marine mammal surveys conducted around Sitka Channel. Further, if North Pacific right whales were to be sighted near the action area, pile driving activities would be halted.
- Sperm whales have not been observed in marine mammal surveys conducted around Sitka Channel. Further, if sperm whales were to be sighted near the action area, pile driving activities would be halted.

The FAA has determined that the project is Likely to Adversely Affect humpback whales and Steller sea lions.

- Noise associated with the project may expose humpback whales to level B harassment and Steller sea lions to level A and B harassment under the Marine Mammal Protection Act.
- These species may experience a temporary loss of suitable habitat if noise displaces them from the area.
- The displacement would not be permanent or result in long-term effects to the local population.
- Masking or acoustic effects on humpback whales are anticipated to be very small given the estimate of humpback whales occurring in the action area during project activities.
- There are no documented Steller sea lion haulouts in the action area and upland rock blasting will not exceed the Steller sea lion in-air noise threshold.
- The project has incorporated mitigation measures to minimize impacts to marine mammals from construction noise and to monitor for marine mammals during pile driving activities.
- The project would obtain an Incidental Harassment Authorization from NMFS Office of Protected Resources prior to beginning any in-water construction activities (e.t. pile driving and marine fill) in Sitka Channel.

Please see the BA attached for more detail on the construction process, the mitigation measures proposed, and the impacts on protected marine mammals.

FAA has delegated consultation to Solstice on behalf of the City and Borough of Sitka. Based on that delegation and our analysis documented in the BA, the FAA finds that the project is not likely to result in jeopardy to an endangered or threatened species or result in destruction or adverse modification of its designated critical habitat.

We seek your concurrence on our determinations. Thank you for your assistance in this matter. Please provide your response to Mr. Jack Gilbertsen, FAA Lead Environmental Protection Specialist, at jack.gilbertsen@faa.gov.

Sincerely,

Robin Reich

Robin Reich, President
Environmental Planner

Attachment(s): Revised Biological Assessment; FAA Delegation Letter (11/2/20)

c: Jack Gilbertsen, FAA; Kelli Cropper, CBS; Maryellen Tuttle, DOWL

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November 02, 2020

Mr. Jon Kurland
Director
NOAA Fisheries' National Marine Fisheries Service
PO Box 21668
Juneau, Alaska 99802

Re: Delegation of authority to City and Borough of Sitka, Alaska, DOWL, and Solstice Alaska Consulting to consult with the National Marine Fisheries Service on behalf of the U.S. Federal Aviation Administration

Dear Mr. Kurland:

The Federal Aviation Administration (FAA) is working with the City and Borough of Sitka (CBS), Alaska to fund the design, permitting, and construction of a new Sitka Seaplane Base (SPB). The FAA has currently authorized CBS to do concept planning and the environmental review for the project. A complete Environmental Assessment and Finding of No Significant Impact is required to issue additional grants for design, property acquisition, and construction.

The CBS has contracted with DOWL to provide concept planning and environmental review (Environmental Assessment) for the project. DOWL has subcontracted with Solstice Alaska Consulting to address biological resources and particularly marine biology issues under the Endangered Species Act and the Marine Mammal Protection Act.

The new SPB is located on the north shore of Japonski Island in Sitka Channel and will replace the existing facility on the eastern side of the channel (Figure 1). Construction of the new SPB includes the installation of piles to support a based seaplane dock, floating transient dock, landing gangway, wave attenuators, and a shore-access transfer span and trestle, discharge of fill to develop base uplands, upland blasting along the access road, and grading and casting for a seaplane haul-out ramp (Figure 2). The new SPB will address existing capacity, safety, and condition deficiencies for critical seaplane operations, and allow seaplanes to more safely transit Sitka Channel.

Detailed construction activities include the following:

- Install 30 temporary 18-inch-diameter steel piles as templates to guide proper installation of permanent piles (these temporary piles will be removed prior to project completion).
- Install 32 permanent 24-inch-diameter piles and 36 permanent 16-inch-diameter piles to support the base float, transient float, vehicle turnaround float, drive-down gangway, landing dock, and trestle.
- Construct and install 350-foot by 46-foot ramp float, 220-foot by 30-foot transient float, 120-foot by 12-foot drive-down gangway, 30-foot by 20-foot turnaround float, 120-foot by 46-foot landing dock, and 240-foot by 16-foot trestle (Table 2 and Figure 3)

- Install 50 permanent 24-inch-diameter piles to support two 20-foot by 600-foot wave attenuators (25 piles per wave attenuator).
- Install other SPB float components such as bull rail, floating fenders, mooring cleats, electricity connections, waterlines, lighting, passenger walkway, handrail, and mast lights. Additional upland features include a haul-out ramp, aviation fueling infrastructure, fuel storage, vehicle driveway, curb, gravel parking, security fencing, landscape buffer, and a covered shelter (Note: all upland components will be installed out of the water).
- Grade and install precast concrete panels for the seaplane haul-out ramp.
- Discharge fill to create 1.47 acres of base uplands.
- Conduct one month of blasting and rock excavation located at the end of the Seward Avenue in the southwest corner of the project uplands, approximately 150 to 200 feet from the high tide line.

FAA has determined that consultation under Section 7 of the Endangered Species Act is required for species under your jurisdiction. The FAA hereby designates Ms. Kelli Cropper of CBS, Ms. Maryellen Tuttell of DOWL, and Ms. Robin Reich of Solstice Alaska Consulting as FAA's non-federal representatives for the purpose of consulting with the National Marine Fisheries Service (NMFS) under 50 CRF §Part 402.08.

If there are any questions regarding this delegation, please contact FAA Alaskan Region's Lead Environmental Protection Specialist, Mr. Jack Gilbertsen at (907) 271-5453 or jack.gilbertsen@faa.gov.

Sincerely,

FAA Alaskan Region, Lead Environmental Protection Specialist, AAL-611

Cc: Kelli Cropper, City and Borough of Sitka
Maryellen Tuttell, DOWL
Robin Reich, Solstice Alaska Consulting

Endangered Species Act Section 7 Biological Assessment for Listed Species under the Jurisdiction of the National Marine Fisheries Service

City and Borough of Sitka

Sitka Seaplane Base

Sitka Channel, Sitka, Alaska

April 2021

Prepared for:
City and Borough of Sitka
6100 Lincoln St.
Sitka, AK 99835

Prepared by:
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Anchorage, Alaska 99503

Submitted to:
National Marine Fisheries Service

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APPENDICES

ACRONYMS AND ABBREVIATIONS

4MP	Marine Mammal Monitoring and Mitigation Plan
μPa	microPascal
ADEC	Alaska Department of Environmental Conservation
ADF&G	Alaska Department of Fish and Game
ANSI	American National Standards Institute
BA	Biological Assessment
BMP	Best Management Practice
CBS	City and Borough of Sitka
CV	critical value
dB	decibels
DPS	distinct population segment
DTH	down-the-hole
EDPS	Eastern distinct population segment
EFH	Essential Fish Habitat
ESA	Endangered Species Act
ESCA	Endangered Species Conservation Act
FAA	Federal Aviation Administration
GPIP	Gary Paxton Industrial Park
HDPE	high density polyethylene
HF	High-Frequency
Hz	hertz
IHA	Incidental Harassment Authorization
IPaC	Information, Planning, and Consultation
IPCC	Intergovernmental Panel on Climate Change
ITS	Incidental Take Statement
kHz	kilohertz
LE	cumulative sound exposure level
LF	Low-Frequency
Lpk	peak sound pressure level
m	meters
MLLW	mean lower low water
MMPA	Marine Mammal Protection Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
OW	Otariid Pinnipeds

PBR	potential biological removal
PR1	Permits and Conservation Division’s
PSO	Protected Species Observer
PTS	permanent threshold shift
PW	Phocid Pinnipeds
rms	root mean square
SEARHC	Southeast Alaska Regional Health Consortium
SEL	sound exposure level
SolsticeAK	Solstice Alaska Consulting Inc.
SPB	Seaplane Base
SPL	sound pressure level
TS	threshold shift
TTS	temporary threshold shift
Turnagain	Turnagain Marine Construction
UHMW	ultra-molecular weight polyethylene
USACE	United States Army Corps of Engineers
USCG	United States Coast Guard
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VHF	Very High-Frequency
WDPS	Western distinct population segment
Windward	Windward Project Solutions

1 INTRODUCTION

The City and Borough of Sitka (CBS) is proposing to construct a new seaplane base (SPB) in Sitka Channel on the northern shore of Japonski Island in Sitka, Alaska. The new SPB will replace the existing SPB (Federal Airline Administration [FAA] identifier A29) currently located on the eastern shore of Sitka Channel, near Eliason Harbor and downtown Sitka. The new SPB will address existing capacity, safety, and condition deficiencies for critical seaplane operations, and allow seaplanes to more safely transit Sitka Channel. Construction, which includes the installation of piles to support a floating ramp dock, floating transient dock, landing gangway, wave attenuators, and a shore-access transfer span and trestle, is anticipated to begin in May 2024 and be completed by April 2025.

Currently, the SPB A29 off Katlian Street is at the end of its useful life and has a number of shortcomings, including limited docking capacity. A29 has only eight spaces, four of which cannot be accessed during low tide. The facility also lacks on-site fueling infrastructure, is expensive to maintain, has wildlife conflicts with a nearby seafood processing plant, and requires pilots to navigate a busy channel with ship traffic. The new SPB will improve the safety of seaplane operation in the channel, along with reducing traffic and congestion in Sitka Channel. The proposed SPB will provide, among other improvements, 14 permanent slips, space for 5 transient planes, on-site fuel storage, a drive down ramp, a seaplane haul-out ramp, and upland seaplane and car parking.

This Biological Assessment (BA) for the Sitka Seaplane Base Project is being provided in compliance with Section 7 of the Endangered Species Act (ESA) of 1973. Section 7 establishes procedures designed to ensure continued existence of listed species and minimize the destruction or adverse modification of designated critical habitat for those species regulated under the ESA. Under section 7(a)(2) of the ESA, projects considered a Federal Action are required to consult with National Oceanic and Atmospheric Association (NOAA)'s National Marine Fisheries Service (NMFS) on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect listed species.

The NMFS endangered species and critical habitat mapper indicates five species of marine mammals that are listed under the ESA within the project area (NMFS 2020, Table 1). The project area does not fall within any designated critical habitat of an ESA-listed species, but is within proposed critical habitat for Mexico distinct population segment (DPS) humpback whales. A search of the United State Fish and Wildlife Service's (USFWS) Information for Planning and Conservation (IPaC) did not find any ESA-listed marine mammals within the project area under their jurisdiction (USFWS 2019).

Table 1. Determination of Effects on ESA-Protected Species under NMFS Jurisdiction.

Species	ESA Listing Status	Species Determination	Critical Habitat	Critical Habitat Determination
Mexico DPS Humpback Whale (*Megaptera novaeangliae*)	Threatened	Likely to Adversely Affect	Under Review	--
Western DPS (WDPS) Steller Sea Lion (*Eumetopias jubatus*)	Endangered	Likely to Adversely Affect	Designated	No Effect
Fin Whale (*Balaenoptera physalus*)	Endangered	Not Likely to Adversely Affect	Not Designated	--
North Pacific Right Whale (*Eubalaena japonica*)	Endangered	Not Likely to Adversely Affect	Designated	No Effect
Sperm Whale (*Physeter macrocephalus)*	Endangered	Not Likely to Adversely Affect	Not Designated	--

The action that is the subject of this BA is FAA funding of construction of the SPB Project in Sitka, Alaska. The consulting agency for this proposal is NMFS's Alaska Region. The action agency is the FAA. FAA has designated CBS, DOWL, and Solstice Alaska Consulting, Inc. (SolsticeAK) as their designated non-federal representatives to assist with these consultations.

2 PROJECT PURPOSE

The purpose of this project is to construct a new SPB on Japonski Island in Sitka Channel and address capacity, safety, operational, and condition deficiencies at the existing Sitka SPB. This project is needed to support critical seaplane operations and transportation in Southeast Alaska, to resolve existing seaplane and boat conflicts, and to replace the existing base which is 65 years old and in poor condition.

The CBS identified the need for a new SPB in 2002, and the planning process progressed as conditions at the facility continued to degrade. In 2002, CBS completed a Sitka Seaplane Base Master Plan to assess the need for a new SPB and layout a proposed facility and location (HDR Alaska, Inc. 2002). In 2012, CBS completed a Siting Analysis to reevaluate SPB sites and confirmed Japonski Island as the recommended location (DOWL KHM 2012). In 2016, CBS conducted another Siting Analysis which confirmed aviation stakeholder interest, resolved FAA funding concerns, and provided an economic impact study (DOWL 2016). The CBS has now received funding for planning and environmental review for the new SPB (CBS 2019).

Sitka's intrastate transportation infrastructure includes the Alaska Marine Highway System, the Sitka Airport, and seaplanes and other charter options (CBS 2020). Sitka functions as a central transit hub for more remote communities in Southeast Alaska, and seaplanes are an essential element of transportation for that system. Some communities in the southern portion of Southeast Alaska are without land runways and only have seaplane bases for aviation infrastructure. Within this subregional network of airports, A29 serves as a hub for access to essential medical services, facilitates a statewide aviation system through Sitka Rocky Gutierrez Airport, and expands retail opportunities for multiple communities (DOWL 2016). Transportation infrastructure is essential for the safety and security of Southeast communities, and deficiencies at the existing SPB are limiting the efficient use of seaplane resources in and around Sitka.

The first SPB in Alaska was established in 1937 on Japonski Island, built by the United States Navy (CBS 2018). With a long history in the region, seaplanes continue to serve Sitka's local economy, particularly the fishery and tourism sectors. As a vibrant community only accessibly by water or air, seaplanes facilitate both local and regional transportation. Forecasted growth of seaplane traffic in Sitka expects continued seaplane use and associated facility demands (DOWL 2016). Currently, there is competition for slip access between commercial and non-commercial operators. Given current capacity limitations, commercial operators require approval from the Harbormaster to pick up passengers at A29 (DOWL 2016). Both commercial and non-commercial seaplanes are in need of expanded base access.

Demand for the existing SPB has exceeded capacity, and the facility has had, at times, a multi-year waitlist with up to seven additional pilots seeking slip access (DOWL 2016). Given the deteriorated condition of the docks, only some slips are desirable to lease. Pilots have been concerned for multiple years over the condition of the dock, and some minimize use of the facility over concerns that unstable structures could damage aircraft. There is only one slip accessible to transient pilots, all other slips are leased full time. Boats are occasionally tied to the dock and float ramp, impeding seaplane access (AirNav 2020).

In addition to base demand exceeding current capacity, there are safety concerns from boat traffic surrounding A29 and an inadequate taxi lane for landing and takeoff, further hindering operation. The site's proximity to Sitka Sound Seafoods fish processing plant has created additional conflicts with foraging shorebirds in the SPB's vicinity. The failing docks also pose a safety hazard to pilots and passengers during loading and unloading, and walking to shore.

A29 lacks essential SPB infrastructure and is without necessary fueling facilities, requiring seaplane operators to carry and dispense fuel from their own containers. A29 is inadequate for commercial traffic because it has insufficient vehicle parking, lacks on-site aircraft maintenance, and does not have a drive-down ramp, passenger shelter, or equipment storage (DOWL 2016). The facility is also deteriorating, requiring costly municipal maintenance after pilings collapsed and temporarily closed the SPB in January 2016 (DOWL 2016).

3 PROPOSED ACTION

3.1 CONSTRUCTION DETAILS

Construction of the proposed project will include the installation of piles to support a based seaplane ramp float, transient seaplane float, drive-down gangway, landing dock, trestle, and wave attenuator(s), along with development of a haul-out ramp and upland facilities (Table 2-3 and Figure 1-2). The project will:

- Install 30 temporary 18-inch-diameter steel piles as templates to guide proper installation of permanent piles (these temporary piles will be removed prior to project completion).
- Install 32 permanent 24-inch-diameter galvanized steel piles and 36 permanent 16-inch-diameter galvanized steel piles to support the ramp float, transient float, vehicle turnaround float, drive-down gangway, landing dock, and trestle.
- Construct and install 350-foot by 46-foot ramp float, 220-foot by 30-foot transient float, 120-foot by 12-foot drive-down gangway, 30-foot by 20-foot turnaround float, 120-foot by 46-foot landing dock, and 240-foot by 16-foot trestle (Table 1-2 and Figure 5-6).
- Install 50 permanent 24-inch-diameter piles to support two 20-foot by 600-foot wave attenuators (25 piles per wave attenuator).
- Install other SPB float components such as bull rail, floating fenders, mooring cleats, electricity connections, waterlines, lighting, passenger walkway, hand rail, and mast lights. Additional upland features include a haul-out ramp, aviation fueling infrastructure, fuel storage, vehicle driveway, curb, gravel parking for seaplanes and vehicles, security fencing, landscape buffer, and a covered shelter (Note: all upland components will be installed out of the water).
- Conduct about two months of rock blasting and excavation of about 22,000 cubic yards of material extending from about 16 feet to 60 vertical feet above mean lower low water (MLLW; 0.00 datum) located at the end of the Seward Avenue in the southwest corner of the project uplands inland of the high tide line.
    - Rock blasting and excavation will extend 200 horizontal feet inland.
    - One blasting event per day on 24 days (not consecutive) at a maximum 90 decibels [dB] per event (Southeast Earth Movers 2020).
- Discharge of 1.7 acres of fill in Section 404 wetlands and waters of the US. The side slopes of fill will have ratio of 2 horizontal to 1 vertical (2H:1V) slopes with heavy open graded armor rock and interstitial spaces.

Table 2. New Sitka SPB Construction Components

Construction Component	Material	Dimensions (feet)	Distance Above Mean High Water (feet)
Based Seaplane Float	Treated timber, galvanized steel, coated polystyrene billets and polyethylene floatation tubs	350 x 46	2
Transient Seaplane Float	Treated timber, galvanized steel, coated polystyrene billets and polyethylene floatation tubs	200 x 30	2
Drive-Down Gangway	Marine grade aluminum, fiberglass and polyethylene	120 x 12	2-13 (sloped gangway)
Vehicle Turnaround Float	Treated timber, galvanized steel, coated polystyrene billets and polyethylene floatation tubs	30 x 20	2
Landing Dock	Treated timber, galvanized steel, coated polystyrene billets and polyethylene floatation tubs	120 x 46	2
Trestle	Galvanized steel and treated timber	240 x 16	13
Wave Attenuator(s)	Concrete	2 each @ 20 x 600	3
Haul-out Ramp	Concrete	Part of Uplands	N/A
Piles	Galvanized Steel	See Table 3	15 to top of pile

Table 3. New Sitka SPB Pile Installation and Removal Summary

Description	Project Component			
	Temporary Pile Installation	Temporary Pile Removal	Permanent Pile Installation	Permanent Pile Installation
Diameter of Steel Pile (inches)	18	18	24	16
# of Piles	30	30	82	36
Vibratory Pile Driving				
Total Quantity	30	30	82	36
Diameter (inches)	18	18	24	16
Max # Piles Vibrated per Day	4	4	4	4
Vibratory Time per Pile	15 min	15 min	15 min	15 min
Vibratory Time per Day	60 min	60 min	60 min	60 min
Number of Days (46 days)	8	8	21	9
Vibratory Time Total (44 hours 30 min)	7 hours 30 min	7 hours 30 min	20 hours 30 min	9 hours
Down-the-Hole Drilling/Socketing Pile Driving				
Total Quantity	--	--	82	36
Diameter (inches)	--	--	24	16
DTH/Socket Hole Diameter	--	--	33	33
Max # Piles DTH/Socketed per Day	--	--	2	2
DTH/Socketing Time per Pile	--	--	60 min	60 min
Total Time per Pile	--	--	5 hours	5 hours
DTH/Socketing Time per Day	--	--	2 hours (max)	2 hours (max)
Total Time per Day	--	--	10 hours (max)	10 hours (max)
Blows per Pile	--	--	54,000	54,000
Number of Days (59 days)	--	--	41	18
DTH/Socketing Time Total (590 hours)	--	--	410 hours	180 hours
Impact Pile Driving				
Total Quantity	30	--	82	36
Diameter (inches)	18	--	24	16
Max # Piles Impacted per Day	2	--	2	2
Strikes per Pile	35		35	35
Impact Time per Pile	5 min	--	5 min	5 min
Impact Time per Day	10 min	--	10 min	10 min
Number of Days (74 days)	15	--	41	18
Impact Time Total (12 hours 20 min)	2 hours 30 min	--	6 hours 50 min	3 hours

Figure 1. Proposed Action

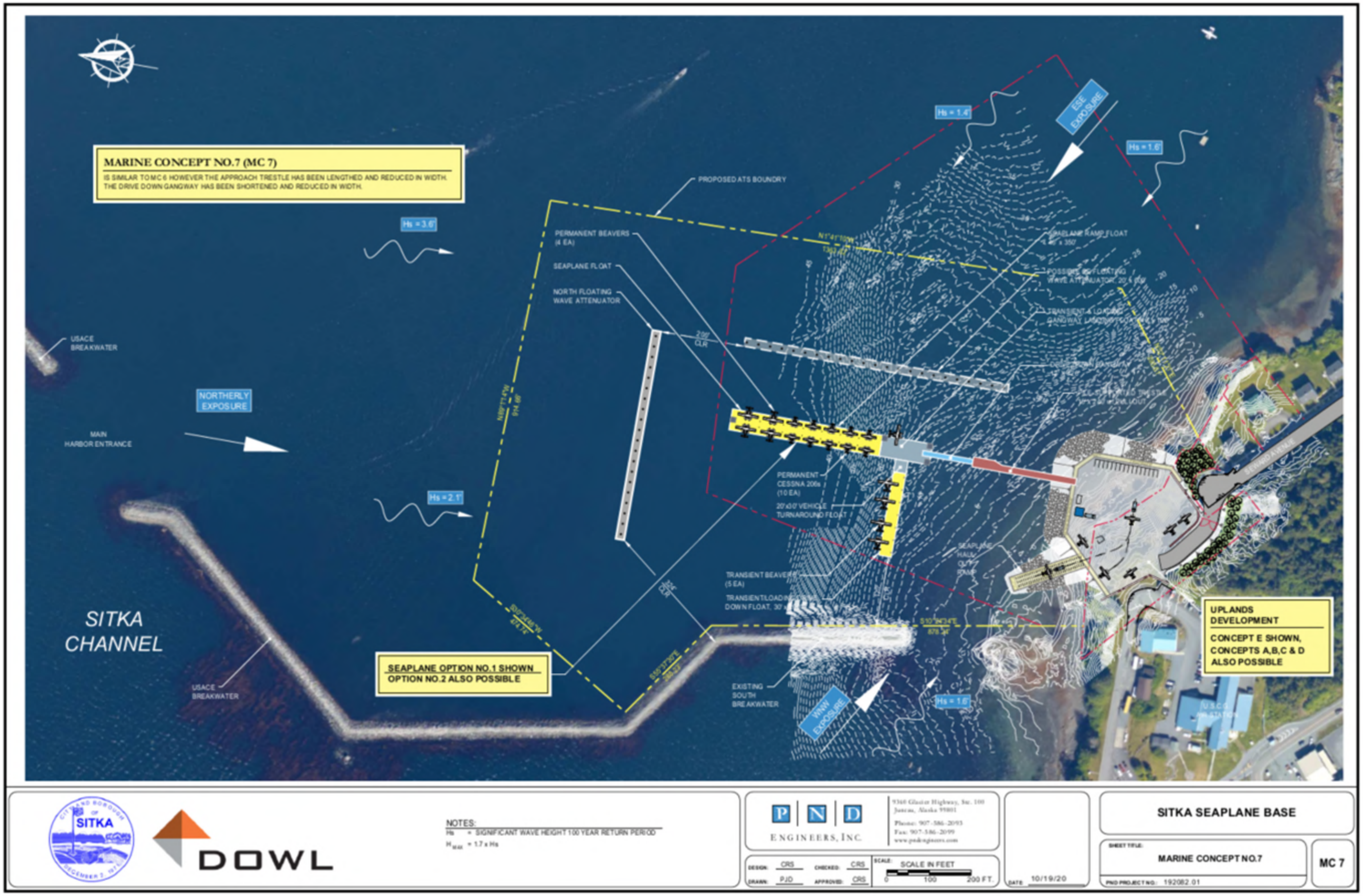
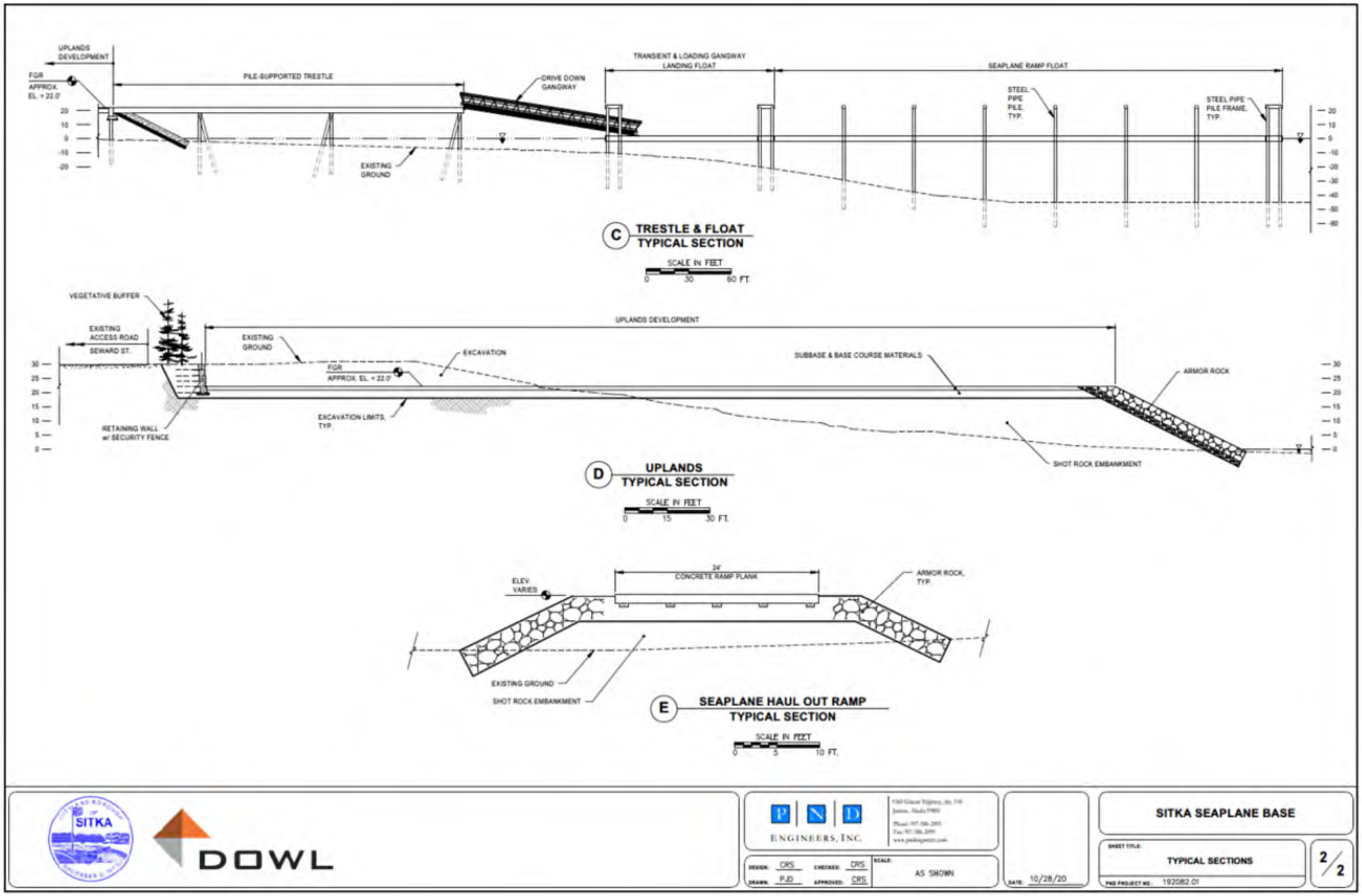


Figure 2. Side Profile of Proposed Action



3.2 PROJECT LOCATION

The new SPB will be located on the north shore of Japonski Island, along the eastern side of Sitka Channel, approximately 1.5 miles north of downtown Sitka, in Southeast Alaska; Township 55S, Range 63E, Sections 34 and 35, Copper River Meridian; United States Geologic Survey (USGS) Quad Map Sitka A-latitude 57.0575 and longitude -135.7382 (Figure 3-4) (Earthpoint 2020). Sitka Channel is a high traffic passage and the main way to access Sitka by water, a commonly used method of transportation in Southeast Alaska.

The proposed project will be located within the Channel Rock Breakwaters in the Sitka Channel on the northeast side of Japonski Island. The Channel Rock Breakwaters were built perpendicular to the Sitka Channel, a little more than half a mile northwest of Thomsen Harbor, in order to provide protection for the harbor and other facilities and structures located throughout the channel. The distance from Channel Rock Breakwaters to the James O'Connell Bridge is about 6,500 feet (ft), and Sitka Channel is about 150 ft wide and about 22 ft deep at the narrowest (NOAA 2020). The mean tide range is 7.7 ft, the diurnal tide range is 9.94 ft, and the extreme range is 18.98 ft (NOAA 2020a). The Sitka Channel connects to the larger Sitka Sound, an active fishery and transportation corridor.

Figure 3. New Sitka SPB Location

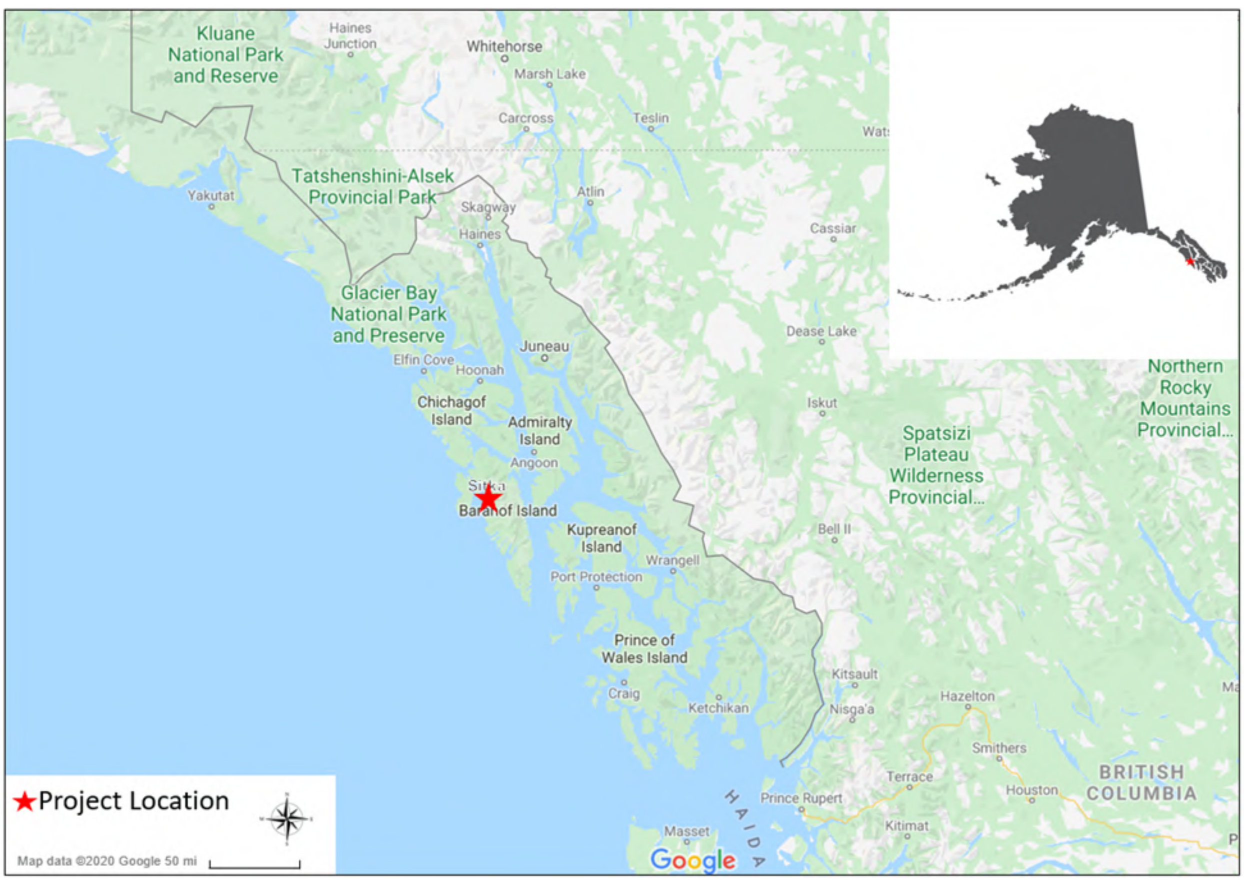
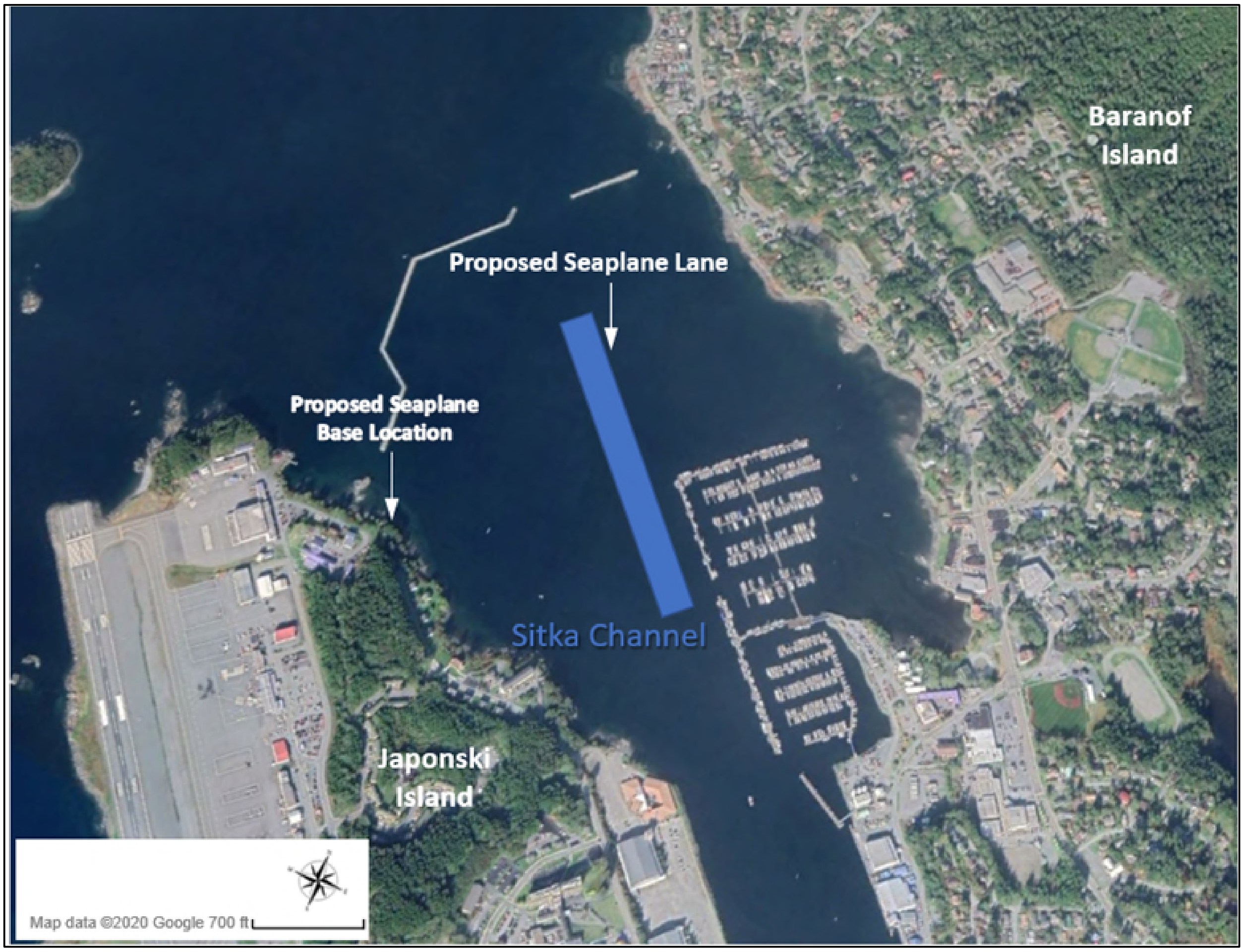


Figure 4. Location of New Sitka SPB in Sitka Channel



The project location will resolve multiple existing obstacles facing seaplane operation in Sitka Channel. The project location on Japonski Island is 3,400 feet from the nearest fish processing plant which will reduce wildlife conflicts with seabirds in the vicinity of fish processing plants (DOWL 2016). The proposed SPB should reduce conflicts with marine vessels during landing and takeoff with a relocated seaplane lane (Figure 4). The relocated seaplane lane moves taxi operations into a wider, less congested section of Sitka Channel.

3.2.1 Pile Installation Equipment

A number of acoustic sources are associated with the dock project including: vibratory pile driving, impact pile driving, and DTH hammering. Each of these elements generates in-water and in-air noise. The equipment listed in Table 4, or similar, is expected to be used. A final determination will be made by the selected contractor.

Three different pieces of pile driving equipment have been proposed for construction of the dock: the diesel impact hammer APE D36-42 for impact operations, the ICE 44B 1800VPM vibratory driver for vibratory, and the Holte 6000 Series for DTH hydro-hammering. Table 4 lists equipment details. Although DTH hydro-hammering has impulsive source components, the high frequency of 900 blows/minute combined with long continuous operation intervals of several minutes make its signature noise more like a non-impulsive source and therefore we treat it as such in this opinion.

Table 4. Construction Equipment

Driving Mechanism	Pile Driver	Properties
Impact Pile Driving	Diesel APE D36-42	Max rated energy 89,303 feet-pounds Speed (blows per minute) 34-53
Vibratory Pile Driving	ICE 44B 1800VPM	202 tons centrifugal force 207 tons driving force
DTH Hydro-Hammering	Holte 6000 series Rotary Top Head	84,000 ft/lbs continuous 100,000 ft/lbs intermittent 900 blows/minute (modeled at avg 15 strikes/sec)
Excavator	Hitachi 450-470	31 kNm rated energy

3.2.2 Pile Installation Methods

Installation and Removal of Temporary (Template) Piles

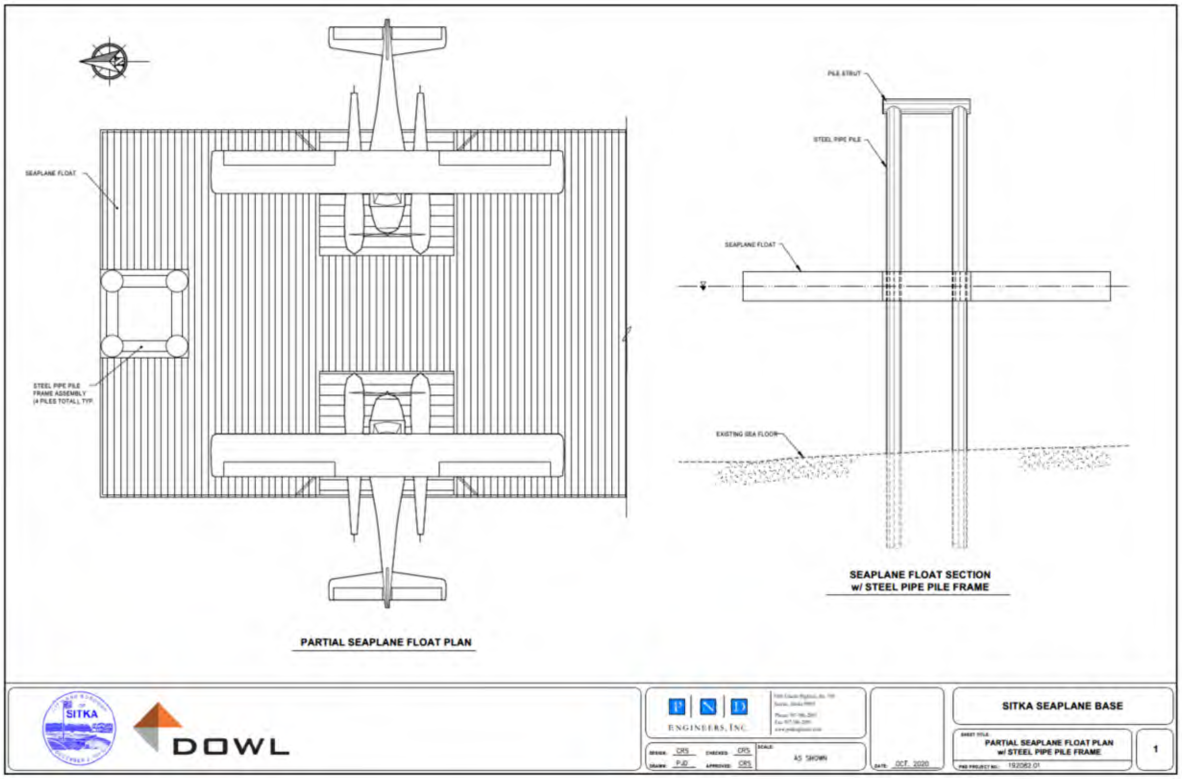
A maximum of 30 temporary 18-inch-diameter piles will be installed and removed using a vibratory hammer and impacting hammer in constructing the project trestle.

Installation of Permanent Piles

All permanent 24-inch-diameter and 16-inch-diameter piles will be initially installed with a vibratory hammer. After vibratory driving, piles will be socketed into the bedrock with DTH drilling equipment. Finally, piles will be driven the final few inches of embedment with an impact hammer.

Piles at the end of the based seaplane float and the corners of the landing dock will be installed as a steel pipe pile frame for added stability and reinforcement (Figure 5). Please see Table 3 for a conservative estimate of the amount of time required for pile installation and removal.

Figure 5. Steel Pipe Pile Frame



3.2.3 Construction Vessels

The following vessels are expected to be used to support construction:

- One material barge (approximately 250 feet by 76 feet by 15.5 feet) to transport materials from Washington to the project site and to be used onsite as a staging area during construction.
- One construction barge (crane barge 280 feet by 76 feet by 16 feet) to transport materials from Washington to the project site and to be used onsite to support construction.
- 1 skiff (25-foot skiff with a 125–250 horsepower outboard motor) transported to the project site on the material barge or acquired locally in Sitka to support construction activities.
- 1 skiff (25-35-foot skiff powered with a 35-50 horsepower outboard motor) transported to the project site on the material barge or acquired locally in Sitka to support Protected Species Observer (PSO) efforts.

3.2.4 Construction Sequence

In-water construction of the SPB will begin with installation of an approximately 240-foot-long trestle. Once the trestle is constructed, floats will be constructed. Trestle and float construction will use the following sequence:

1) Vibrate 30 temporary 18-inch-diameter piles for the trestle with a minimum of ten feet into overburden to create a template to guide installation of permanent piles.
2) Weld a frame around the temporary piles.
3) Within the frame, vibrate, DTH drill, and impact permanent 16-inch-diameter piles into place for the trestle; and vibrate, DTH drill, and impact permanent 16-inch and 24-inch-diameter piles into place for the gangways and floats.
4) Remove the frame and temporary piles.
5) Perform this sequence working further from the shoreline for each sequence.

After all piles are installed, construction will proceed with installation of the floating docks, gangways, mechanical systems, connections for electricity, water, and lighting, and other above-water components like the vehicle driveway, passenger walkway, and mast lights.

Please see Table 3 for a conservative estimate of the amount of time required for pile installation and removal.

3.2.5 Other In-water Construction and Heavy Machinery Activities

In addition to the activities described above, the proposed action will involve other in-water construction and heavy machinery activities. Examples of other types of activities include using standard barges, tug boats, or other equipment to place and position piles on the substrate via a crane (i.e., "stabbing the pile").

The seaplane floats (constructed elsewhere) of treated timber and galvanized steel fasteners. The submerged timber structural elements of the floats will be pressure treated with creosote because it is the only effective preservative for wood that will remain wet at all times. All other timber components that will not be fully submerged will be pressure treated with ammoniacal copper zinc arsenate. All preservative treatment will be in accordance with best management practices (BMPs) as set forth by the Western Wood Preservers Institute. Floatation includes closed cell expanded polystyrene billets covered with 100 percent solid polyurethane and/or polyethylene floatation tubs to protect from physical damage, water absorption, colonization by encrusting organisms, and other factors.

3.2.6 Project Operation Activities

The new SPB includes operation of a new seaplane takeoff and landing lane and taxi path, which will not require any construction. The new water lane is further north of the existing water lane, away from the O'Connell Bridge and seafood processing facilities. The new water lane is 4,000 feet long by 200 feet wide.

Use and operation of the SPB float will include seaplane loading and unloading, general maintenance, connections for water and electric power, and fueling. SPB uplands will provide above ground fuel tank storage, an access ramp for hauling out seaplanes, vehicle parking, general storage, and covered shelter for passenger waiting.

SPB operation protocols will incorporate BMPs to prevent or minimize contamination from seaplane accidents, general maintenance, fueling, and nonpoint source contaminants from upland facilities.

3.3 DEFINITION OF ACTION AREA

The vicinity of the project area that will be affected directly by the action, referred to as the action area in this document, has been determined by the area of water that will be ensonified above acoustic thresholds in a day. In this case, the action area is the area where received noise levels from vibratory, DTH drilling/socketing, and impact pile driving installation of 16-inch and 24-inch permanent piles and vibratory and impact pile installation and removal of 18-inch temporary piles (the farthest-reaching noise associated with the project) are expected to decline to 120 dB. As shown in Table 6, the noise from the pile driving methods and timing has the capacity to travel up to 11 kilometers from the source.

Project ensonification is truncated where land masses obstruct underwater sound transmission, thus, the action area is largely confined to marine waters within the northern half of Sitka Channel and extending approximately 1.5 miles (4,000 kilometers) from the western opening in the Channel Rock Breakwaters and over 1 mile (3,000 kilometers) from the eastern opening in the Channel Rock Breakwaters (Figure 6). Note, this document also refers to the project vicinity. This term refers to an area larger than the action area, which includes the waters surrounding Japonski Island and eastern Sitka Sound. This term is used because some of the information available about marine mammals in Sitka is based on sightings in the general vicinity of Sitka.

To minimize impacts to humpback whales, Steller sea lions, fin whales, north pacific right whales, and sperm whales, shutdown and monitoring of harassment zones will be implemented to protect and document listed marine mammals in the action area. Please see Table 6 for calculated distances to the Level A and B thresholds, Section 3.5 for mitigation information, shutdown and monitoring zones and figures, and the forthcoming Marine Mammal Monitoring and Mitigation Plan (4MP) for more details on mitigation, shutdown, and monitoring procedures (forthcoming, Appendix A).

Figure 6. New Sitka SPB Action Area and Pile Driving Location

3.3.1 Acoustic Thresholds and Ensonified Area

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

The proposed action area is the perimeter of ensonified impacts to the marine environment. Considerations and mitigation for marine mammals are based off of the action area.

Vibratory driving, DTH drilling/socketing, and impact pile installation, and vibratory and impact pile removal will generate in-water and in-air noise that exceeds acoustic thresholds for ESA-listed species in the area and may result in harassment takes of humpback whales and Steller sea lions.

3.3.2 Level A Harassment

NMFS' *Technical Guidance for Assessing the Effects of Anthropogenic Sounds on Marine Mammal Hearing Version 2.0* (NMFS 2018) identifies dual criteria to assess auditory injury (Level A harassment) to five different marine mammal groups (based on hearing sensitivity) as a result of exposure to noise from two different types of sources (impulsive or non-impulsive) (NMFS 2018). SPB construction activity includes the use of both impulsive (impact pile driving) and non-impulsive (vibratory pile driving and removal and DTH drilling/socketing) sources. The thresholds for auditory injury are provided in Table 5.

Table 5. Thresholds Identifying the Onset of PTS

	PTS Onset Thresholds*(received level)	
Hearing Group	**Impulsive (Impact Pile Driving)**	**Non-impulsive (Vibratory Pile Driving)**
Low-Frequency (LF) Cetaceans	Cell 1 $L_{pk,flat}$: 219 dB $L_{E,LF,24h}$: 183 dB	Cell 2 $L_{E,LF,24h}$: 199 dB
Mid-Frequency (MF) Cetaceans	Cell 3 $L_{pk,flat}$: 230 dB $L_{E,MF,24h}$: 185 dB	Cell 4 $L_{E,MF,24h}$: 198 dB
High-Frequency (HF) Cetaceans	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 2018

*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 (Lpk) has a reference value of 1 µPa, and cumulative sound exposure level 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, HF, and VHF 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.

3.3.3 Level B Harassment

NMFS predicts that all marine mammals are likely to be behaviorally harassed in a manner that is considered Level B harassment (disturbing behavioral patterns without injuring) when exposed to underwater anthropogenic noise above received levels of 120 decibels (dB) re 1µPa (microPascal) root mean square (rms) for continuous and above 160 dB re 1µPa rms for non-explosive impulsive sources (NMFS 2018).

In addition to underwater noise, 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 100 dB rms for Steller sea lions (NMFS 2018). According to the blasting plan (Southeast Earthmovers 2020), uplands rock blasting would not to exceed 90 dB at the center of the blast, which is below the in-air noise disturbance threshold for Steller sea lions. Pile driving and removal associated with this project will generate in-air noise above ambient levels within the action area but will not extend more than 69 meters and 22 meters from any type of pile being impacted or vibrated, respectively.[1] Given that there are no documented Steller sea lion haulouts in the action area, no in-air disturbance to hauled-out individuals are anticipated as a result of the proposed project; thus, land area is not included in the action area.

3.3.4 Calculated Distances to Level A and Level B Thresholds

For this project distances to the Level A and Level B thresholds were calculated based on various source levels for a given activity and pile type (e.g. vibratory removal 18-inch diameter steel pile, impact pile driving 24-inch diameter steel pile) and, for Level A harassment, accounted for the maximum duration of that activity per day using the practical spreading model in the spreadsheet tool developed by NMFS. Calculated distances to thresholds are shown in Table 6 and range from approximately 1 meter to 11 kilometers. Please see Section 3.5 for monitoring and shutdown zones associated with these thresholds, and attached threshold calculation spreadsheets (Appendix B).

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1 Predicted distances for in-air threshold distances. The Washington State Department of Transportation has documented un-weighted rms levels for a vibratory hammer (30-inch pile) to an average 96.5 dB and a maximum of 103.2 dB at 15 meters (Laughlin 2010). The Port of Anchorage, AK found source levels of 101 dB at 15 meters during impact installation of 48-inch-diameter steel piles (Austin et al. 2016). The maximum source level from these studies of 103.2 was used as a source level for this project.

Table 6. Distances to NMFS Level A and B Acoustic Thresholds

Activity	Received Level at 10 meters	Distance (in meters) to Level A and Level B[1] Thresholds			
		Level A[2]			Level B
		Low-Frequency Cetaceans	Mid-Frequency Cetacean	Otariid	
Vibratory Pile Driving/Removal					
18-inch steel temporary installation 15 min per pile, 60 minutes/day (8 days)	161 SPL RMS [3]	2.3	0.2	0.1	4,642
18-inch steel temporary removal 15 min per pile, 60 minutes/day (8 days)	161 SPL RMS [3]	2.3	0.2	0.1	4,642
16-inch steel permanent installation 15 min per pile, 60 minutes/day (18 days)	161 SPL RMS [3]	2.3	0.2	0.1	4,642
24-inch steel permanent installation 15 min per pile, 30 minutes/day (41 days)	161 SPL RMS [3]	2.3	0.2	0.1	4,642
DTH Drilling/Socketing Pile Driving					
16-inch steel permanent installation 5 hours per pile, 10 hours/ day (18 days)	146 SEL/ 173 PK [4]	13.6	8.2	8.4	11,659
24-inch steel permanent installation 15 min per pile, 30 minutes/day (41 days)	154 SEL/ 166 PK[5]	16.3	9.9	10.0	11,659
Impact Pile Driving					
16-inch steel permanent installation 5 min per pile, 10 minutes/day (18 days)	158 SEL/ 182 PK[6]	7.4	0.3	0.3	97
24-inch steel permanent installation 5 min per pile, 10 minutes/day (41 days)	177 SEL/ 203 PK[7]	136	4.8	5.3	97
18-inch steel temporary installation 15 min per pile, 60 minutes/day (8 days)	177 SEL/ 203 PK[7]	136	4.8	5.3	97

[1] Distances, in meters, refer to the maximum radius of the zone.
[2] The values provided here represent the distance at which an animal may incur PTS if that animal remained at that distance for the entire duration of the activity within a 24-hour period. For example, a harbor seal (phocid) will have to remain 1.4 meters from 24-inch piles being installed via vibratory methods for 1 hour for PTS to occur.
[3] The 16-inch, 18-inch, and 24-inch-diameter vibratory pile driving and 18-inch-diameter vibratory pile removal source level of 161 SPL is proxy from median received levels at 10 meters for vibratory pile driving of 24-inch steel

piles driven at the Naval Base Kitsap in Bangor, Washington (Naval Facilities Engineering Systems Command 2012) and from acoustic modeling of nearshore marine pile driving at Navy installations in Puget Sound (United States Navy 2015). Level A Distances calculated using NMFS Version 2.1 2020 User Spreadsheet Tab A.1 Vibratory Pile Driving.

[4] The 16-inch pile DTH drilling/socketing sound source level of 146 sound exposure level (SEL)/ 173 peak sound level (PK) is proxy from Underwater noise characterization of down-the-hole pile driving activities off Biorka Island, Alaska (Guan and Miner 2020). Level A Distances calculated using NMFS Version 2.1 2020 User Spreadsheet Tab E.2 DTH Pile Driving.

[5] The 24-inch pile DTH drilling/socketing sound source level of 154 sound exposure level (SEL)/ 190 peak sound level (PK) is proxy from Hydroacoustic Pile Driving Noise Study (Denes et al. 2016). Level A Distances calculated using NMFS Version 2.1 2020 User Spreadsheet Tab E.2 DTH Pile Driving.

[6] The 16-inch impact pile driving source level of 158 SEL/ 182 PK is proxy from Sound Mount Test Pile Project in Oakley, CA from Technical Guidance for Assessment and Mitigation of the Hydroacoustic Effects of Pile Driving on Fish (California Department of Transportation 2015). Level A Distances calculated using NMFS Version 2.1 2020 User Spreadsheet Tab E.1 Impact Pile Driving.

[7] The 18-inch and 24-inch impact pile driving source level of 178 SEL/ 203 PK is proxy from Rodeo Dock Repair in Rodeo, CA from Technical Guidance for Assessment and Mitigation of the Hydroacoustic Effects of Pile Driving on Fish (California Department of Transportation 2015). Level A Distances calculated using NMFS Version 2.1 2020 User Spreadsheet Tab E.1 Impact Pile Driving.

3.4 PROPOSED MITIGATION MEASURES

To minimize effects to listed species, CBS proposes to implement the mitigation measures outlined below.

3.4.1 General Construction Mitigation Measures

The project uses the most compact design possible, while meeting the demands of the vessels that will use the facility.

- The project uses a design that does not require dredging or in-water blasting and to the extent possible given project requirements, minimizes fill and on land blasting.
- The project uses a design that incorporates the smallest-diameter piles practicable while still minimizing the overall number of piles.
- Noise associated with in-water pile driving will be localized and occur over confined time intervals. In-water pile driving will occur over a 179-day period (not necessarily consecutive days). During that time, vibratory driving will occur for approximately 45 hours, DTH drilling/socketing will occur for approximately 590 hours, and impact pile driving will occur for approximately 13 hours. A maximum of 60 minutes of vibratory pile driving, 10 hours of DTH drilling/socketing, or 10 minutes of impact pile driving will occur each day of pile driving.
- Construction will be suspended before the likely start of the herring spawning season and will resume after the spawning season concludes (anticipated March 15 to April 30).
- Any treated wood that comes in contact with water will be treated in accordance with BMPs 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.

- 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.

3.4.2 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.
- 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.
- Before impact pile driving begins, the contractor will employ “soft start” procedures.
- When the impact hammer is used, a pile cushion will be placed inside the drive cap to reduce noise.

3.4.3 Marine Mammal Monitoring and Mitigation Measures

The CBS is developing a 4MP as a part of its IHA application. The 4MP is forthcoming, and is summarized below (Appendix A).

A minimum of three PSOs will be present during all in-water work. If marine mammals are observed within the shutdown or monitoring zones (Tables 7 and 8), the sighting will be appropriately documented as a Level A or B take. If the number of Steller sea lions or humpback whales observed within the Level A or B zones during noise-producing project activities approaches the number of takes authorized in the Incidental Take Statement (ITS), the CBS will notify NMFS and request that the USACE and NMFS PR1 reinitiate consultation. The project will also incorporate soft start or ramp-up procedures when beginning or resuming impacting pile installation and extraction activities after an interruption of activity lasting more than 30 minutes. These mitigation measures will decrease the likelihood that Steller sea lions and humpback whales will be exposed to SPLs that may result in injury.

3.4.3.1 Protected Species Observers

Qualified PSOs will be employed for marine mammal monitoring. PSOs will maintain verbal communication with the construction personnel to implement appropriate mitigation measures.

3.4.3.2 Proposed Monitoring

The proposed Level A and Level B disturbance zones will be monitored 30 minutes before, during, and 30 minutes after all in-water construction activity. If a humpback whale or Steller sea lion is observed within the Level A or B zones, the sighting will be documented as a Level A or B exposure, depending on location of take. If the number of Steller sea lions or humpback whales exposed to Level A or Level B harassment approaches the number of takes allowed by the IHA, the CBS will notify NMFS and seek further consultation.

3.4.3.3 Clearing the Shutdown Zones

Prior to the start of daily in-water construction activity, the PSO will clear the shutdown zones for a period of 30 minutes. Clearing the shutdown zone means a humpback whale or Steller sea lion has not been observed within their respective shutdown zones for that 30-minute period (Table 6). If a humpback whale or Steller sea lion is observed within the shutdown zones, a soft-start will not proceed until they have left the shutdown zone or has not been observed for 30 minutes.

3.4.3.4 Soft Start Procedures

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 will also be repeated two additional times.

3.4.3.5 Shutdown Procedures

Once pile driving has been initiated, if a humpback whale or Steller sea lion is observed approaching or within a shutdown zone, shutdown procedures will be implemented to prevent exposure. The shutdown zones are outlined in Table 7.

The animal will be considered clear if it has been observed leaving the shutdown zone or it has not been seen in the shutdown zone for 30 minutes.

3.5 MITIGATION MEASURES DESIGNED TO REDUCE IMPACTS TO LISTED SPECIES

- There will be a nominal 10-meter shutdown zone for construction-related activity where acoustic injury is not an issue. This type of work could include (but is not limited to) the following activities: (1) movement of the barge to the pile location; (2) positioning of the pile on the substrate via a crane (i.e., stabbing the pile); (3) removal of the pile from the water column/substrate via a crane (i.e., deadpull); or (4) the placement of sound attenuation devices around the piles. For these activities, monitoring will take place from 15 minutes prior to initiation until the action is complete.
- PSOs will be present in the action area during all vibratory pile removal and vibratory, impact, and drilling installation.
- To ensure that the action area has been surveyed for humpback whale and Steller sea lion presence, pile driving/removal will not begin until a PSO has given a notice to proceed.

- Piles will be driven with a vibratory hammer to the maximum extent possible (i.e., until the desired depth is achieved or to refusal) prior to DTH drilling/socketing and using an impact hammer.
- To reduce noise production, DTH drilling/socketing and impact hammering will use the minimum energy needed to safely install the piles.
- To minimize noise during vibratory, DTH drilling/socketing, and impact pile driving, pile caps (pile softening material) will be used. 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 HDPE or UHMW softening material on all templates to eliminate steel on steel noise generation.
- To minimize impacts, a “soft start” technique will be used when impact pile driving with an initial set of three strikes from the impact hammer at 40 percent energy, followed by a one-minute waiting period, then two subsequent 3-strike sets.
- The soft-start will be applied prior to the beginning of pile driving/removal activities each day or when pile driving/removal hammers have been idle for more than 30 minutes.
- Prior to pile driving, the action area will be surveyed for 30 minutes. If any humpback whale or Steller sea lion is sighted within a shutdown zone during this 30-minute survey period prior to pile driving, or during the soft-start, contractors will delay pile driving/removal until the animal(s) is confirmed to have moved outside of and on a path away from the area or if 30 minutes have elapsed since the last sighting of the marine mammal within the shutdown zone.
- Shutdowns will be implemented if a humpback whale or Steller sea lion appears likely to enter a shutdown zone (Section 3.5)

3.5.1 Level A Shutdown Zones

The CBS will implement shutdowns to protect Mexico DPS humpback whales and Steller sea lion from Level A harassment as shown in Table 7 and Figure 7. These shutdowns will prevent auditory injury during vibratory installation, vibratory removal, DTH drilling/socketing, and impact installation.

Table 7. Pile Driving Shutdown Zones Designed to Avoid Level A Take

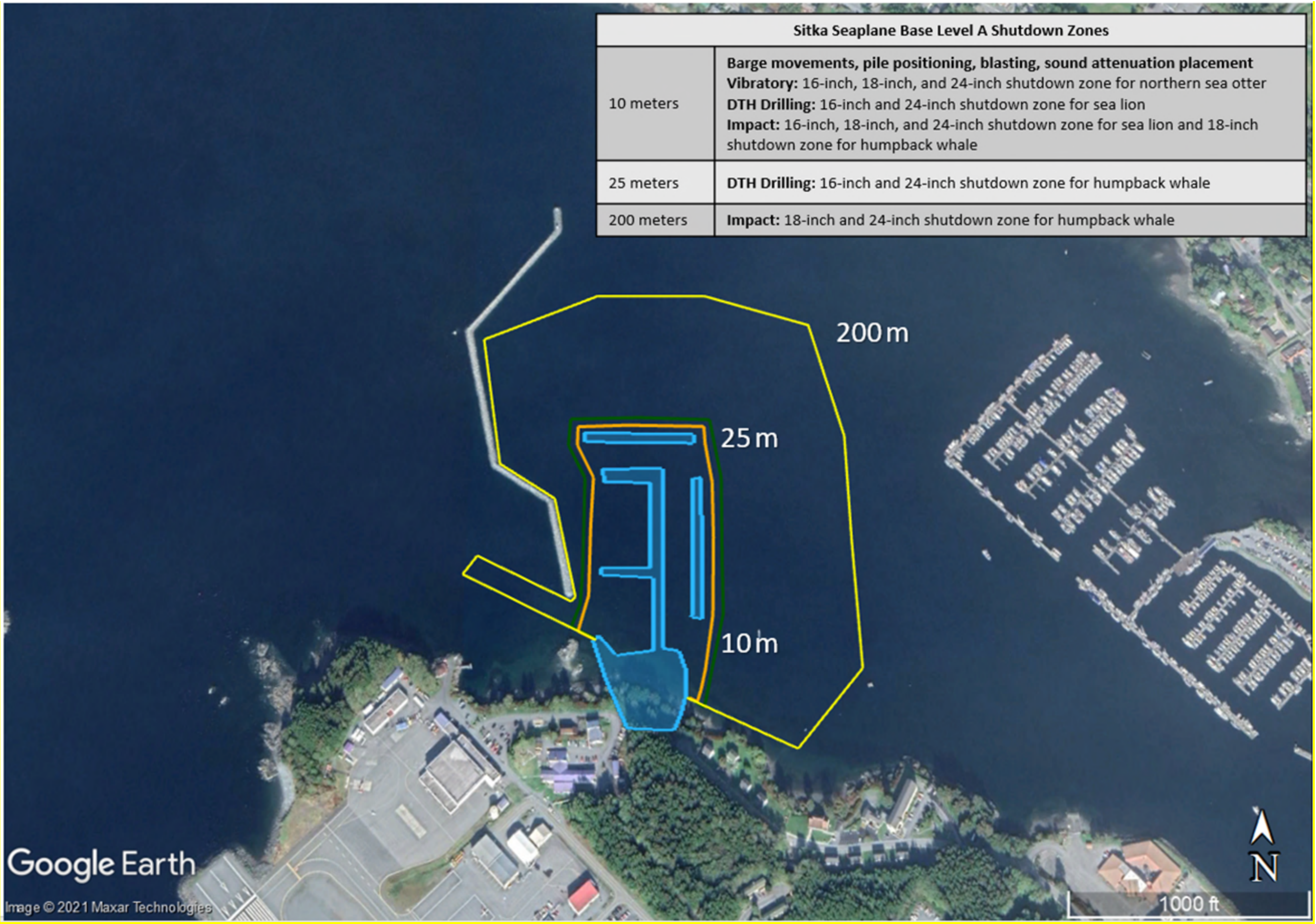
Source	Shutdown Zone (meters)	
	Humpback Whales	**Steller Sea Lions**
Barge movements, pile positioning, on land rock blasting, sound attenuation placement[1]	10	10
Vibratory Pile Driving/Removal		
18-inch steel temporary installation (30 piles; 60 min per day on 8 days)	10	10
18-inch steel temporary removal (30 piles; 60 min per day on 8 days)	10	10
16-inch steel permanent installation (36 piles; 60 min per day on 9 days)	10	10
24-inch steel permanent installation (82 piles; 60 min per day on 21 days)	10	10
DTH Drilling/Socketing Pile Driving		
16-inch steel permanent installation (36 piles; 10 hours per day on 18 days)	25	10
24-inch steel permanent installation (82 piles; 10 hours on 41 days)	25	10
Impact Pile Installation		
16-inch steel permanent installation (36 piles; 30 min per day on 18 days)	10	10
24-inch steel permanent installation (82 piles; 30 min per day on 41 days)	200	10
18-inch steel temporary installation (30 piles; 60 min per day on 8 days)	200	10

Shutdown zone distances, in meters, refer to the maximum radius of the zone and are rounded (see Table 6 for calculated distances).

[1] Although acoustic injury is not the primary concern with these construction activities, shutdowns will be implemented to avoid impacts to species.

[2] The farthest distance that sound will transmit from the source is 3,000 meters before transmission is stopped by Apple Islands. See Table 6 for calculated distances based on the practical spreading model.

Figure 7. Level A Shutdown Zone



Sitka Seaplane Base Level A Shutdown Zones	
10 meters	**Barge movements, pile positioning, blasting, sound attenuation placement** **Vibratory:** 16-inch, 18-inch, and 24-inch shutdown zone for northern sea otter **DTH Drilling:** 16-inch and 24-inch shutdown zone for sea lion **Impact:** 16-inch, 18-inch, and 24-inch shutdown zone for sea lion and 18-inch shutdown zone for humpback whale
25 meters	**DTH Drilling:** 16-inch and 24-inch shutdown zone for humpback whale
200 meters	**Impact:** 18-inch and 24-inch shutdown zone for humpback whale

3.5.2 Level B Monitoring Zones

The CBS is requesting Level B take of Mexico DPS humpback whales (during DTH drilling/socketing only) and Steller sea lions (during all pile driving) incidental to constructing the new SPB construction and shutdowns associated with Level B harassment of this species are not proposed. The monitoring zones associated with Level B disturbance are outlined in Table 8 and Figure 8.

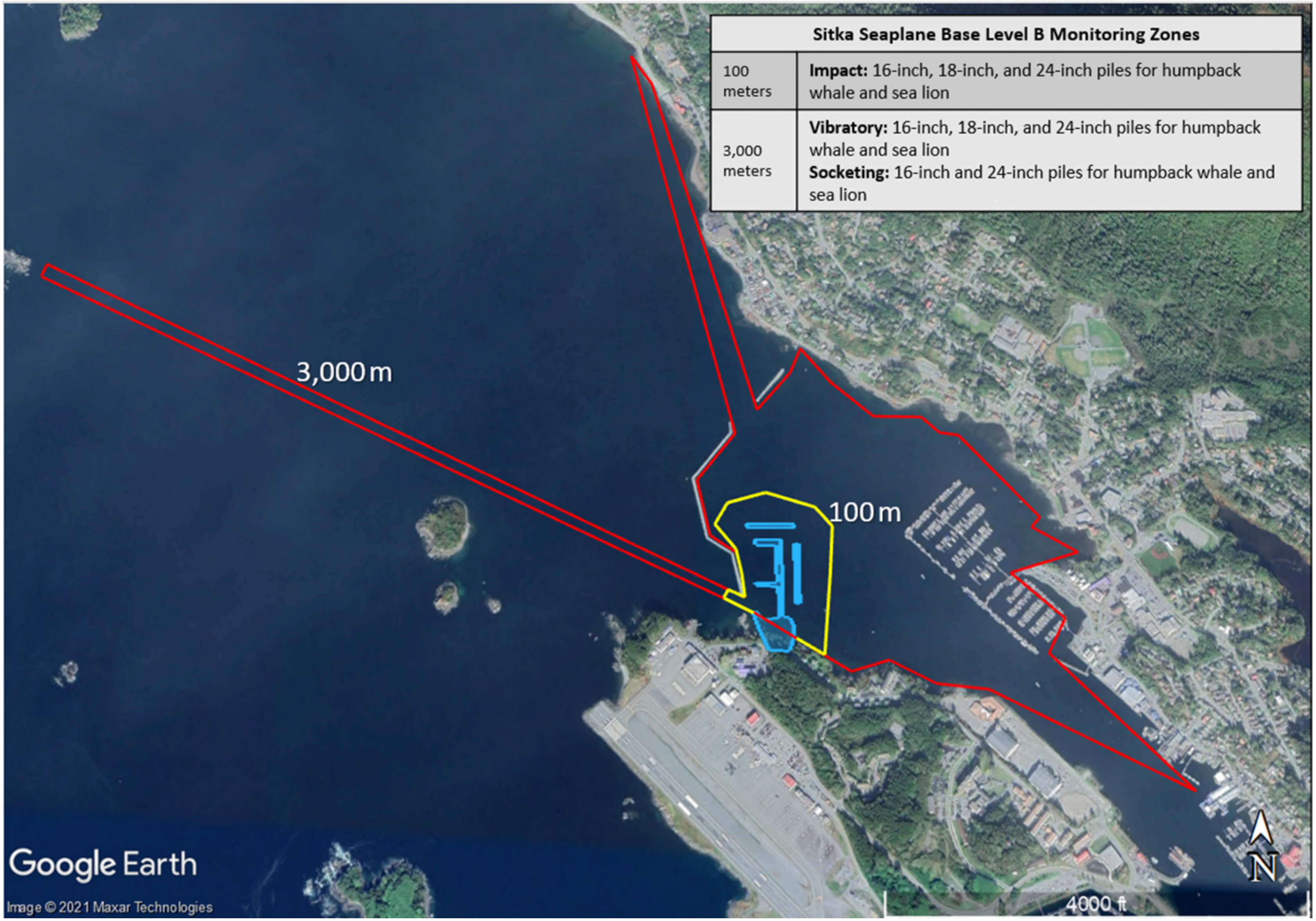
Table 8. Level B Monitoring Zones

Source	Monitoring Zones (m)
Vibratory Pile Driving/Removal	
18-inch steel temporary installation (30 piles; 30 min per day on 15 days)	3,000*
18-inch steel temporary removal (30 piles; 30 min per day on 15 days)	3,000*
16-inch steel permanent installation (36 piles; 30 min per day on 18 days)	3,000*
24-inch steel permanent installation (82 piles; 30 min per day on 41 days)	3,000*
DTH/Socketing Pile Driving	
16-inch steel permanent installation (36 piles; 10 hours per day on 18 days)	3,000*
24-inch steel permanent installation (82 piles; 10 hours on 41 day)	3,000*
Impact Pile Installation	
18-inch steel temporary installation (30 piles; 30 min per day on 15 days)	100
18-inch steel temporary removal (30 piles; 30 min per day on 15 days)	100
16-inch steel permanent installation (36 piles; 30 min per day on 18 days)	100
24-inch steel permanent installation (82 piles; 30 min per day on 41 days)	100

Shutdown zone distances, in meters, refer to the maximum radius of the zone and are rounded (see Table 6 for calculated distances).

* The farthest distance that sound will transmit from the source is 3,000 meters before transmission is stopped by Apple Islands. See Table 6 for calculated distances based on the practical spreading model.

Figure 8. Level B Monitoring Zones



4 DESCRIPTION OF THE SPECIES AND THEIR HABITAT

Five species of ESA-listed marine mammals under NMFS's jurisdiction may occur in the action area:

- Endangered Western DPS (WDPS) Steller sea lion (*E. jubatus*)
- Threatened Mexico DPS humpback whale (*M. novaeangliae*)
- Endangered fin whale (*B. physalus*)
- Endangered North Pacific right whale (*E. japonica*)
- Endangered sperm whale (*P. macrocephalus*)

Critical habitat has been designated for two of these species, the WDPS Steller sea lion and the North Pacific right whale (Table 1); however, the project action area does not encompass critical habitat of any ESA-listed species, and thus this project will have no effect on critical habitat. Critical habitat for threatened Mexico DPS humpback whale is proposed and undergoing the approval process. The proposed critical habitat will include the project action area.

4.1 SPECIES THE PROJECT IS NOT LIKELY TO ADVERSELY AFFECT

We reviewed the species listed above and conclude that the following species are not likely to be adversely affected by the proposed action: fin whale, North Pacific right whale, and sperm whale. These analyses are provided below. Some of the following sections contain direct excerpts from species information on the NMFS website.

4.1.1 Fin Whale

The fin whale was listed as an endangered species under the Endangered Species Conservation Act (ECSA) in 1970 (35 FR 18319; December 2, 1970) and continued to be listed as endangered following passage of the ESA in 1973. The fin whale is listed as depleted throughout its range under the MMPA of 1972. The main reason for listing is that fin whales were depleted by historic and modern whaling practices (NMFS 2015).

A migratory species, fin whales generally spend the spring and early summer feeding on krill and small fish in cold, high latitude waters as far north as the Chukchi Sea, with regular feeding grounds in the Gulf of Alaska, Prince William Sound, along the Aleutians Islands, and around Kodiak Island. In the fall, fin whales tend to return to low latitudes for the winter breeding season, though some may remain in residence in their high latitude ranges if food resources remain plentiful (Alaska Department of Fish and Game [ADF&G] 2008). In the eastern Pacific, fin whales typically spend the winter off the central California coast and into the Gulf of Alaska.

Fin whales are found in deep offshore waters. Panigada et al. (2005) found water depth to be the most significant variable in describing fin whale distribution, with more than 90 percent of sightings occurring in waters deeper than 2,000 m.

Fin whales are rare in the inside waters of southeastern Alaska (Neilson et al. 2012). Given that no fin whales have been observed in marine mammal surveys conducted around Sitka Channel, no fin whales are expected to occur within the action area (Straley and Pendell 2017).

Fin whales are not expected in the project area because of its location in the shallow and narrow at the north end of Sitka Channel. The CBS has not requested, and NMFS PR1 does not intend to authorize, any injury or harassment of fin whales in association with the project. Given their expected low density in the project area, the shallowness of the area relative to the species' preferred foraging depths (Panigada et al. 2005), and the implementation of shutdown procedures if a marine mammal is observed likely to enter the shutdown zone, we conclude that it is extremely unlikely to encounter a fin whale in the action area, and thus the Sitka SPB Project **is not likely to adversely affect fin whales**.

4.1.1.1 Fin Whale Critical Habitat

Critical habitat has not been designated for the fin whale.

4.1.2 North Pacific Right Whale

The North Pacific right whale was listed as an endangered species under the ECSA in 1970 (73 FR 12024; 2008) and continued to be listed as endangered following passage of the ESA in 1973. The North Pacific right whale is considered depleted throughout its range under the MMPA. In 2008, NMFS listed the endangered northern right whale (*Eubalaena spp.*) as two separate, endangered species: North Pacific right whale (*E. japonica*) and North Atlantic right whale (*E. glacialis*). The main reason for listing is that the whales were heavily exploited by whaling in the North Pacific (NMFS 2015a).

North Pacific right whales inhabit the Pacific Ocean, particularly between 20°N and 60°N. They primarily occur in coastal or shelf waters, although movements over deep waters are known. Few sightings of right whales occur in Alaska; those that do occur in Alaska are primarily in the central North Pacific and Bering Sea. Since 1996, right whales have been consistently observed in Bristol Bay (southeastern Bering Sea) during the summer months. Sightings have been reported as far south as central Baja California in the eastern North Pacific, as far south as Hawaii in the central North Pacific, and as far north as the sub-Arctic waters of the Bering Sea and Sea of Okhotsk in the summer (NMFS 2015a).

According to NMFS, right whales are the rarest of all large whale species. Depleted by whaling and illegal harvesting, only an estimated 30 North Pacific right whales remain in the eastern stock (the population of whales that summers in the southeastern Bering Sea and Gulf of Alaska) (NMFS 2015b).

Migratory patterns of the North Pacific right whale are unknown, although it is thought the whales spend the summer on high-latitude feeding grounds far from shore and migrate to more temperate waters during the winter. For much of the year, their distribution is strongly correlated to the distribution of their prey. The primary food sources are zooplankton, including copepods, euphausiids, and cyprids. Right whales are skimmers: they feed by removing prey from the water using baleen while moving with an open mouth through a patch of zooplankton (NMFS 2015a).

Given that no North Pacific right whales have been observed in marine mammal surveys conducted around Sitka Channel, no North Pacific right whales are expected to occur within the action area (Straley and Pendell 2017). North Pacific right whales are rare in the action area. During Straley et al.'s (2018) 190 hours of monitoring, no North Pacific right whales were observed in the O'Connell Bridge Lightering Float Pile Replacement Project action area, about 1500 meters away from the Sitka Seaplane Base Project area. The whales were not observed during the 21 days of monitoring during the construction of Gary Paxton Industrial Park Dock in October and November 2017 (Turnagain Marine Construction [Turnagain] 2017). They were not observed during the 8 days of monitoring during the construction of the Sitka Petro Dock in January 2017 (Windward Project Solutions [Windward] 2017). They were not sighted during monitoring at Biorka Island in June, July, August, or September 2018 (Turnagain 2018). Additionally, North Pacific right whales were not observed during limited monitoring conducted in September 2018 in the immediate vicinity of the O'Connell lightering Float (SolsticeAK 2018).

North Pacific right whales are not expected in the project area because they are so rare, and because the project location is not a documented feeding or calving area. The CBS has not requested, and NMFS PR1 does not intend to authorize, any injury or harassment of North Pacific right whales in association with the project. Given their expected low density in the project area and implementation of shutdown procedures if a marine mammal is observed likely to enter the shutdown zone, we conclude that it is extremely unlikely to encounter a North Pacific right whale in the action area, and thus the Sitka Seaplane Base Project **is not likely to adversely affect North Pacific right whales**.

4.1.2.1 North Pacific Right Whale Critical Habitat

In April 2008, because the North Pacific right whale was listed as a separate, endangered species (the "northern right whale"), and because this was a newly listed entity, NMFS was required to designate critical habitat for the "North Pacific right whale." The same two areas, within the Gulf of Alaska (just southeast of Kodiak Island) and within the Bering Sea (west of Bristol Bay and north of False Pass), that were previously designated as critical habitat (71 FR 38277; 2006) for the northern right whale are now designated as critical habitat for the North Pacific right whale (73 FR 19000, 2008) (NMFS 2015a; NMFS 2007).

The designated critical habitat in the Gulf of Alaska (located over 900 km [550 m] west of the proposed action) is the closest designated critical habitat for the North Pacific right whale and is well outside the action area. The project will have **no effect on North Pacific right whale critical habitat**.

4.1.3 Sperm Whale

The sperm whale was listed as an endangered species under the ECSA in 1969 (35 FR 18319; December 2, 1970) and continued to be listed as endangered following passage of the ESA in

1973. The sperm whale was listed as depleted under the MMPA of 1972. The main reason for its listing is that most sperm whale populations were depleted by modern whaling (NMFS 2010).

Sperm whales are found typically far from land throughout the world's oceans in deep waters between about 60°N and 60°S. They tend to inhabit areas with a water depth of 600 meters (1,968 ft) or more, and are uncommon in waters less than 300 meters (984 ft) deep (NMFS 2020a). Sperm whale calls have been detected year-round in the Gulf of Alaska (Mellinger et al. 2004). They can also be found in the Bering Sea and throughout the Aleutian Islands (ADF&G 2020).

Sperm whale distribution is dependent on their food source (primarily large squid, sharks, skates, and fishes) and suitable conditions for breeding, and varies with the sex and age composition of the group. The species abundance and migrations are not as predictable or well understood as migrations of most baleen whales. In some mid-latitudes, there seems to be a general trend to migrate north and south depending on the seasons (whales move poleward in the summer). However, in tropical and temperate areas, there appears to be no obvious seasonal migration. Females and young whales generally stay in tropical and temperate waters. Male sperm whales tend to migrate north in the summer to feed (NMFS 2020a).

Given that no sperm whales have been observed in marine mammal surveys conducted around Sitka Channel, no sperm whales are expected to occur within the action area (Straley and Pendell 2017). Sperm whales are not expected in the project area because of its location in the shallow and narrow north entrance of Sitka Channel. The CBS has not requested, and NMFS PR1 does not intend to authorize, any injury or harassment of sperm whales in association with the project. Given their expected low density in the project area, the shallowness of the area relative to the species' preferred habitat depths, and the implementation of shutdown procedures if a marine mammal is observed likely to enter the shutdown zone, we conclude that it is extremely unlikely to encounter a sperm whale in the action area, and thus the Sitka Seaplane Base Project **is not likely to adversely affect sperm whales**.

4.1.3.1 Sperm Whale Critical Habitat

Critical habitat has not been designated for the sperm whale.

4.2 SPECIES THE PROJECT IS LIKELY TO ADVERSELY AFFECT

After reviewing information about the Mexico DPS humpback Whale and WDPS Steller Sea Lion, it is likely these species will be adversely affected by the proposed action. Analyses are provided below. Some of the following sections contain direct excerpts from species information on the NMFS website and from NMFS biological opinions that evaluated humpback whales in Southeast Alaska (NMFS 2017, NMFS 2017a).

4.2.1 Mexico DPS Humpback Whale

4.2.1.1 Description, Status, and Range

Humpback whales are classified in the cetacean suborder Mysticeti, whales characterized by having baleen plates for filtering food from water. The humpback whale is one of the larger baleen whales, weighing up to 25-40 tons (22,000-36,000 kilograms; 50,000-80,000 pounds) and up to 18 meters (60 feet) long, with females larger than males. Newborns are about 4.5 meters (15 feet) long and weigh about 1 ton (900 kilograms; 2,000 pounds). Humpback whales reach sexual maturity at 4 to 7 years, and their lifespan can be 50 years or more. The species is well known for long pectoral fins, which can be up to 4.6 meters (15 feet) long. The body coloration is primarily dark grey, but individuals have a variable amount of white on their pectoral fins and belly. This variation is so distinctive that tail fluke pigmentation patterns are used to identify individual whales, analogous to human fingerprints.

Humpback whales filter feed on tiny crustaceans (mostly krill), plankton, and small fish; they can consume up to 3,000 pounds (1,360 kg) of food per day (Chenoweth et al. 2017). Well-documented North Pacific humpback whale prey include: krill, Pacific Herring, juvenile salmon, Capelin, Pacific Sandlance, juvenile Walleye Pollock, Eulachon, Pacific Sandfish, Surf Smelt and Lanternfish (Straley et al. 2017). Common hunting methods involve using air bubbles to herd, corral, or disorient fish.

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. In their summer foraging areas and winter calving areas, humpback whales tend to occupy shallower, coastal waters; during their seasonal migrations; however, humpback whales disperse widely in deep, pelagic waters and tend to avoid shallower, coastal waters (Winn and Reichley 1985). There is also evidence that a small number of whales have overwintered in SEA and did not undergo their winter migrations to breeding areas (Straley et al. 2018).

In 1970, the humpback whale was listed as endangered worldwide, under the ESCA of 1969 (35 FR 8491; June 2, 1970), primarily due to decimation from whaling. Congress replaced the ESCA with the ESA in 1973, and humpback whales continued to be listed as endangered. Following the cessation of most legal whale harvest, humpback whale numbers increased.

4.2.1.2 Abundance

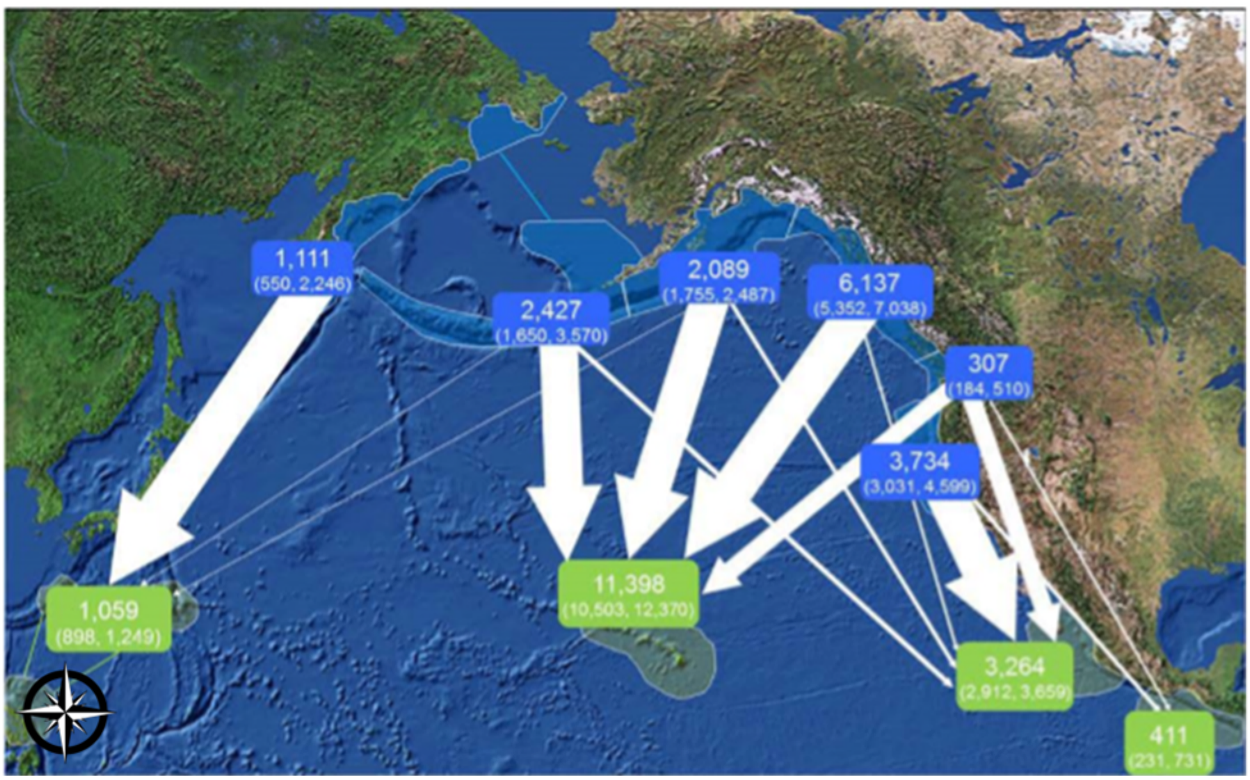
Within the summer feeding area of Southeast Alaska / Northern British Columbia, Wade et al. (2016) estimates the abundance of humpback whales to be 6,137 (critical value [CV] =0.07). Based on the probability of occurrence reported in Wade et al. (2016) (Table 3), it is likely that Southeast Alaska/Northern British Columbia may contain 5,763 whales from the non-listed Hawaii DPS (recovered) and 374 whales from the threatened Mexico DPS.

The humpback whale is distributed worldwide in all ocean basins, with a total population of at least 80,000. They have 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

(Allen and Angliss. 2015). Using fluke identification photographs from 2004 through 2006, Barlow et al. (2011) estimates that the abundance of humpback whales in the North Pacific is 21,063 animals. More recently, using a multi-strata analysis, Wade et al. (2016) estimates the abundance of humpback whales in the North Pacific is 16,132 for the winter areas and 15,805 for the summer areas. The population in the North Pacific has increased substantially after the cessation of major commercial whaling operations in the late twentieth century, and the current abundance estimate exceeds some pre-whaling estimates.

In 2015, NMFS conducted a global status review of humpback whales and changed the status of humpback whales under the ESA (Bettridge et al. 2015). The globally-listed species was divided into 14 DPS's, 4 of which are endangered and 1 is threatened, and the remaining 9 are no longer listed under the ESA (81 FR 62260; September 8, 2016). Wade et al. (2016) provides information on the basis for DPS designation and the status of each DPS. Figure 9 depicts humpback whale abundance and migratory patterns.

Figure 9. Humpback Whale Abundance



Note: Migratory destinations from feeding area (blue) to breeding area (green) are indicated by arrows with the width of arrow proportional to the percentage of whales moving into winter breeding area (Wade et al. 2016).

Humpback whales 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, near Kodiak Island, 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, suggesting a northward expansion of their feeding grounds (Zimmerman and Karpovich 2008).

4.2.1.3 Humpback Whales in Southeast Alaska

Based on an analysis of migration between winter mating/calving areas and summer feeding areas using photo-identification, Wade et al. (2016) concluded that humpback 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 probability of encountering whales from each of the four North Pacific DPS's in various feeding areas is summarized in Table 9 below (NMFS 2016).

Table 9. Probability of Encountering Humpback Whales from each DPS in the North Pacific Ocean in Various Feeding Areas (Adapted from Wade et al. 2016)

	North Pacific Distinct Population Segments			
Summer Feeding Areas	**Western North Pacific DPS (endangered)**	**Hawaii DPS (not listed)**	**Mexico DPS (threatened)**	**Central America DPS (endangered)**
Kamchatka	100%	0%	0%	0%
Aleutian Islands, Bering, Chukchi, Beaufort	4.4%	86.5%	11.3%	0%
Gulf of Alaska	0.5%	89.0%	10.5%	0%
Southeast Alaska / Northern British Columbia	0%	93.9%	6.1%	0%
Southern British Columbia / Washington	0%	52.9%	41.9%	14.7%
Oregon/California	0%	0%	89.6%	19.7%
NOTE: For the endangered DPS's, these percentages reflect the upper limit of the 95 percent confidence interval of the probability of occurrence in order to give the benefit of the doubt to the species and to reduce the chance of underestimating potential takes.				

Whales from the Western North Pacific, Mexico, and Hawaii DPS overlap on feeding grounds off Alaska and are not visually distinguishable. In the action area the vast majority of humpback whales (94%) are likely to be from the recovered Hawaii DPS and about 6% are likely to be from the threatened Mexico DPS.

In recent decades, humpback whales have been steadily increasing in southeast Alaska. The southeast Alaska-specific rate of increase is approximately 5.6% annually (Calambokidis et al. 2008) and the latest estimate of abundance for Southeast Alaska and northern British Columbia is between 3,005 and 6,137, depending on the modeling approach employed. As previously mentioned, humpback whales in Southeast Alaska are 94% comprised of the Hawaii DPS (not listed) and 6% of the Mexico DPS (threatened; Wade et al. 2016). Given Wade et al. (2016), in this assessment, we use 6% to approximate the percentage of humpback whales observed in the action area that will be from the Mexico DPS.

The Mexico DPS is comprised of approximately 3,264 (CV=0.06) animals (Wade et al. 2016) with an unknown population trend, though likely to be in decline (81 FR 62260).

Within Southeast Alaska, humpback whales are found throughout all major waterways and in a variety of habitats, including open-ocean entrances, open-strait environments, near-shore waters, area with strong tidal currents, and secluded bays and inlets. They tend to concentrate in several areas, including northern Southeast Alaska. Patterns of occurrence likely follow the spatial and temporal changes in prey abundance and distribution with humpback whales adjusting their foraging locations to areas of high prey density (Allen and Angliss 2012).

During 190 hours of observation from 1994 to 2002 from Sitka's Whale Park, 440 humpback whales were observed (Straley et al. 2018). During 21 days of monitoring during the construction of Gary Paxton Industrial Park (GPIP) Dock between October 9 and November 9, 2017, 39 humpback whales were observed (Turnagain 2017). No humpback whales were observed within Sitka Channel and in the vicinity of the O'Connell float during the 8 days of monitoring in January 2017 during the construction of the Sitka Petro Dock (Windward 2017). Near Biorka Island, about 25 kilometers south of the project, 22, 3, 0, and 2 humpback whales were sighted in June, July, and August, and September, 2018, respectively (Turnagain 2018). Humpback whales were not observed during recent monitoring conducted for short periods over 8 days in September 2018 within a 400-meter radius surrounding the O'Connell Bridge Lightering Float (SolsticeAK 2018).

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

4.2.1.4 Hearing Ability

Humpback whales are classified by NMFS as low-frequency cetaceans with a generalized hearing range of 7 hertz (Hz) to 35 kilohertz (kHz) (NMFS 2018). However, because of the lack of captive subjects and logistical challenges of bringing experimental subjects into the laboratory, no direct measurements of mysticetes 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).

4.2.1.5 Critical Habitat

Critical habitat for the Threated Mexico DPS humpback whale is proposed and undergoing the approval process. The proposed critical habitat will include the project action area and is assumed to designate prey as the essential physical or biological feature for species conservation (NMFS 2019). Humpback whale diets are dominated by euphausiid species and small pelagic fish, including Pacific Herring which are found in the project action area.

Pacific Herring serve an important ecological role within Sitka Sound and are known to spawn on intertidal and subtidal substrates within the project area in the spring (ADF&G 2019). They provide an abundant, high energy food source. Herring are also commercially important and support a roe fishery in Sitka that remains one of the largest and most valuable roe fisheries in Alaska. Given that Sitka Channel is an active marine transportation corridor and a small part of Sitka Sound, most herring fishing takes place outside of Sitka Channel.

4.2.2 WDPS Steller Sea Lion

4.2.2.1 Description and Status

Steller sea lions belong to the family Otariidae meaning “eared” seals. Steller sea lions, the largest otariids, show marked sexual dimorphism with males 2-3 times larger than females. On average, adult males weigh 681 kilograms (1,501 pounds) and adult females are much smaller, weighing on average 273 kilograms (602 pounds) (Winship et al. 2001).

Steller sea lions are opportunistic predators, feeding primarily on a wide variety of fishes and cephalopods, including Atka Mackerel, Walleye Pollock, Pacific Herring, Capelin, Pacific Cod, Pacific Sand Lance, and salmon (Pitcher 1981; Merrick et al. 1997). They occasionally feed on other marine mammals and birds (Pitcher and Fay 1982; NMFS 2008). The foraging strategy of Steller sea lions is strongly influenced by seasonality of sea lion reproductive activities on rookeries and the ephemeral nature of many prey species.

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 DPS’s 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 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. (2016a), 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).

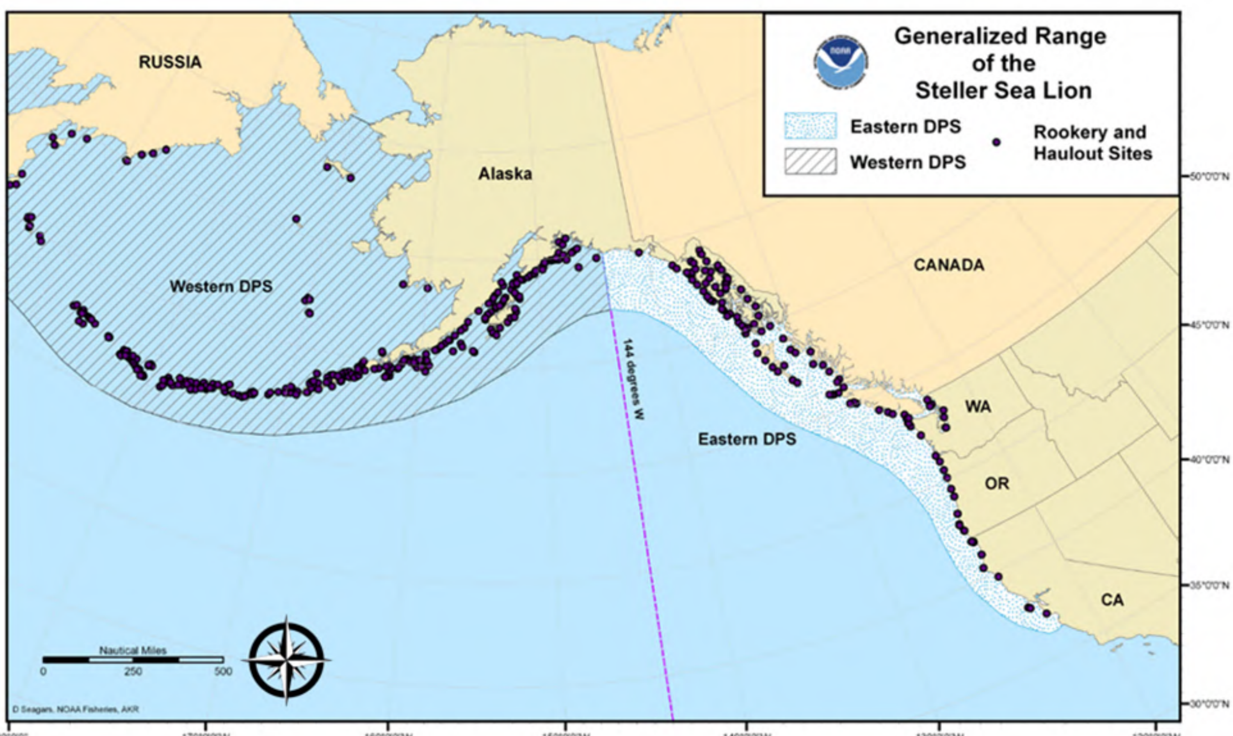
Although Steller sea lion abundance continues to decline in the western Aleutians, numbers are thought to be increasing in the eastern part of the WDPS range (Muto et al. 2020).

4.2.2.2 Range

Steller sea lions prefer the colder temperate to sub-Arctic waters of the North Pacific Ocean. They 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). Although Steller sea lions seasonally inhabit coastal waters of Japan in the winter, the only breeding rookeries located outside the U.S. are found in Russia (Burkanov and Loughlin 2005).

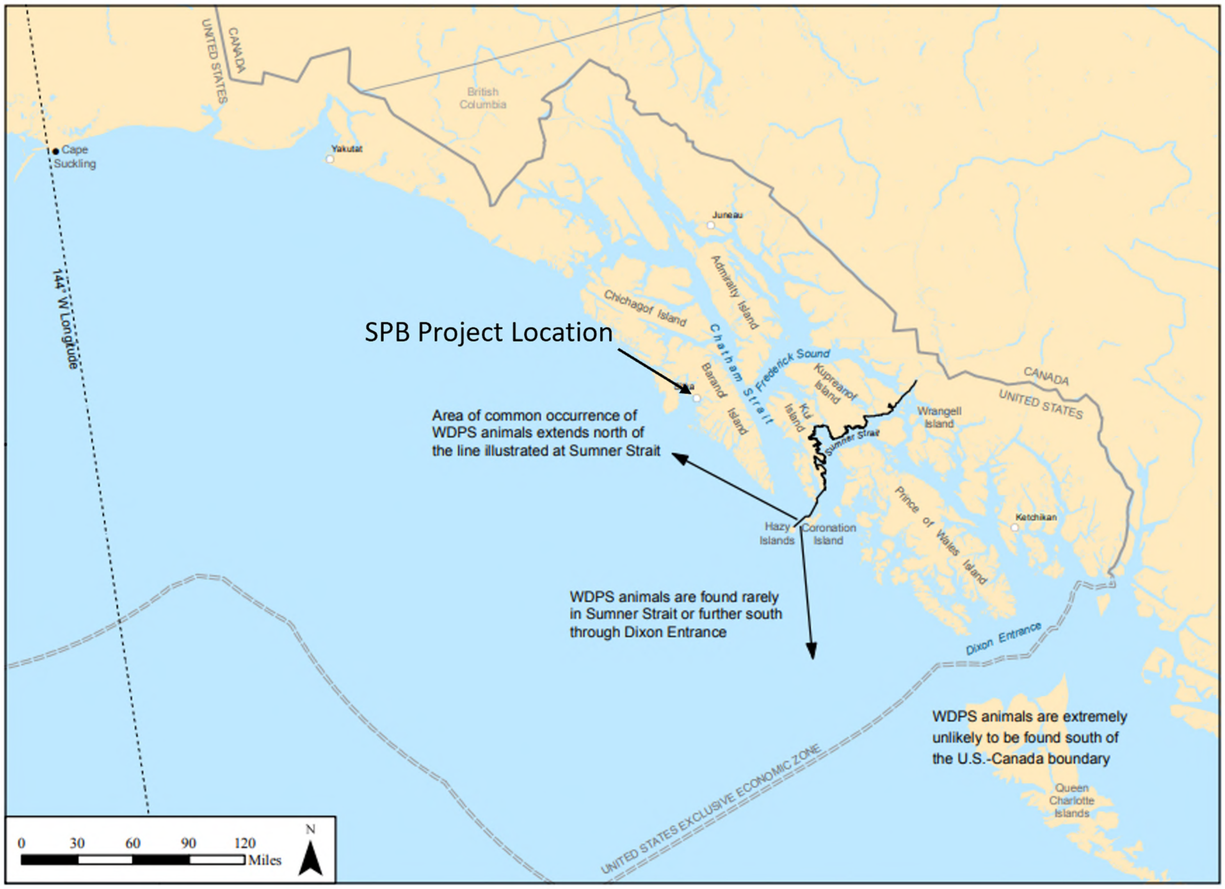
Of the two Steller sea lion populations in Alaska, the EDPS includes sea lions born on rookeries from California north through Southeast Alaska and the WDPS includes those animals born on rookeries from Prince William Sound westward, with an eastern boundary set at 144°W (NMFS 2017b) (Figure 10).

Figure 10. 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 11). The majority of the cross-boundary movements are temporary with individuals returning to their natal DPS for breeding, but 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).

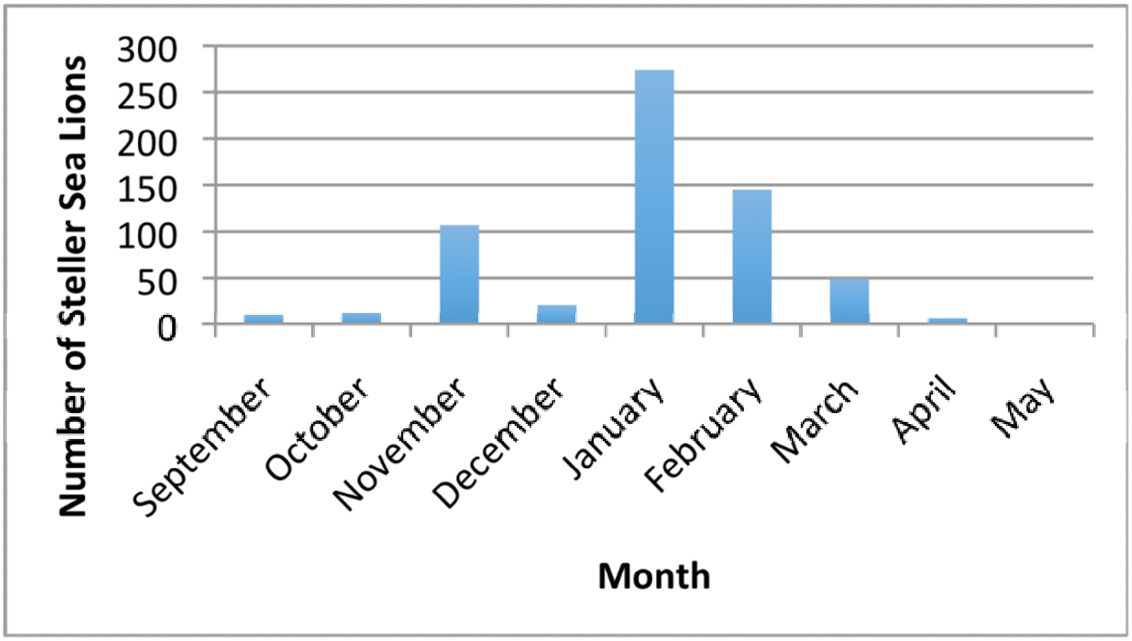
Figure 11. Area of Occurrence of WDPS Steller Sea Lions North and South of Summer Strait (Adapted from NMFS 2013)



4.2.2.3 Distribution in the 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 action area are from the WDPS (Jemison et al. 2013; NMFS 2013). Jemison et al. (2013) estimated an average annual breeding season movement of Western DPS Steller sea lions to southeast Alaska of 917 animals. Based on surveys and analysis conducted by Hastings et al (2019), an estimated 2.2 percent of Steller sea lions in the vicinity of the project are WDPS Steller sea lions.

Figure 12. 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)



From 2000 to 2016, Straley also collected marine mammal data from small vessels or Allen Marine 100-foot 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 12). 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).

Steller sea lions were seen during every month of monitoring (September to May) between 1994 and 2002. In 2016 and 2017 land-based surveys and aerial photographs were utilized to research the western Steller sea lion's breeding seasons. The area of research included six regions; eastern, central, and western Gulf of Alaska and eastern, central, and western Aleutian Islands. The findings observed about 11,952 pups and about 42,315 non-pups. At Whale Park, located southeast of the proposed project location, January was the most abundant month with about 190 Steller sea lions spotted. February and November were next with about 170 and 120 Steller sea lions spotted respectively. The fewest Steller sea lions were spotted in the month of May (1995-2002). During the Petro Marine Dock construction on the Sitka Channel in 2017, 3 Steller sea lions were spotted (Straley et al. 2018).

Individual sea lions were seen on 19 of 21 days in Silver Bay and Easter Channel during monitoring for GPIP dock construction between October and November 2017 (Turnagain 2017). Near Biorka Island, sea lions were seen infrequently; six, two, and zero sea lions were sighted in June, July, and August 2018, respectively (Turnagain 2018). During 8 day of monitoring for the Petro Marine dock in January 2017, individual sea lions were seen on 3 days (Windward 2017). Steller sea lions were observed 5 of 8 days during monitoring conducted for 15-minute periods over 8 days in September 2018 within a 400-meter radius surrounding the O'Connell Bridge

Lightering Float (SolsticeAK 2018). In-water construction work for the O'Connell Bridge Lightering Float Pile Replacement Project occurred from June 9 to June 12, 2019. Construction activities included deadpull removal, vibratory hammering, and drilling. 42 Steller sea lions were sighted from June 9 to June 11, 2019. The Steller sea lion's behavior resembled swimming, traveling, foraging, and milling (SolsticeAK 2018). Anecdotal evidence also indicates that sea lions are common in Sitka Channel near the project footprint.

During Straley's surveys, Steller sea lions were often seen in groups of 2 to 3; however, a group of more than 100 was sighted on at least one occasion (Straley et al. 2018). Steller sea lions in groups ranging from 1 to 8 individuals were observed around Sitka GPIP dock construction. All Steller sea lions were alone in Sitka Channel during Petro Marine Dock construction monitoring (Windward. 2017). SolsticeAK (2018) observed a group of four sea lions on one day; however, most sea lions were alone during the September 208 monitoring period.

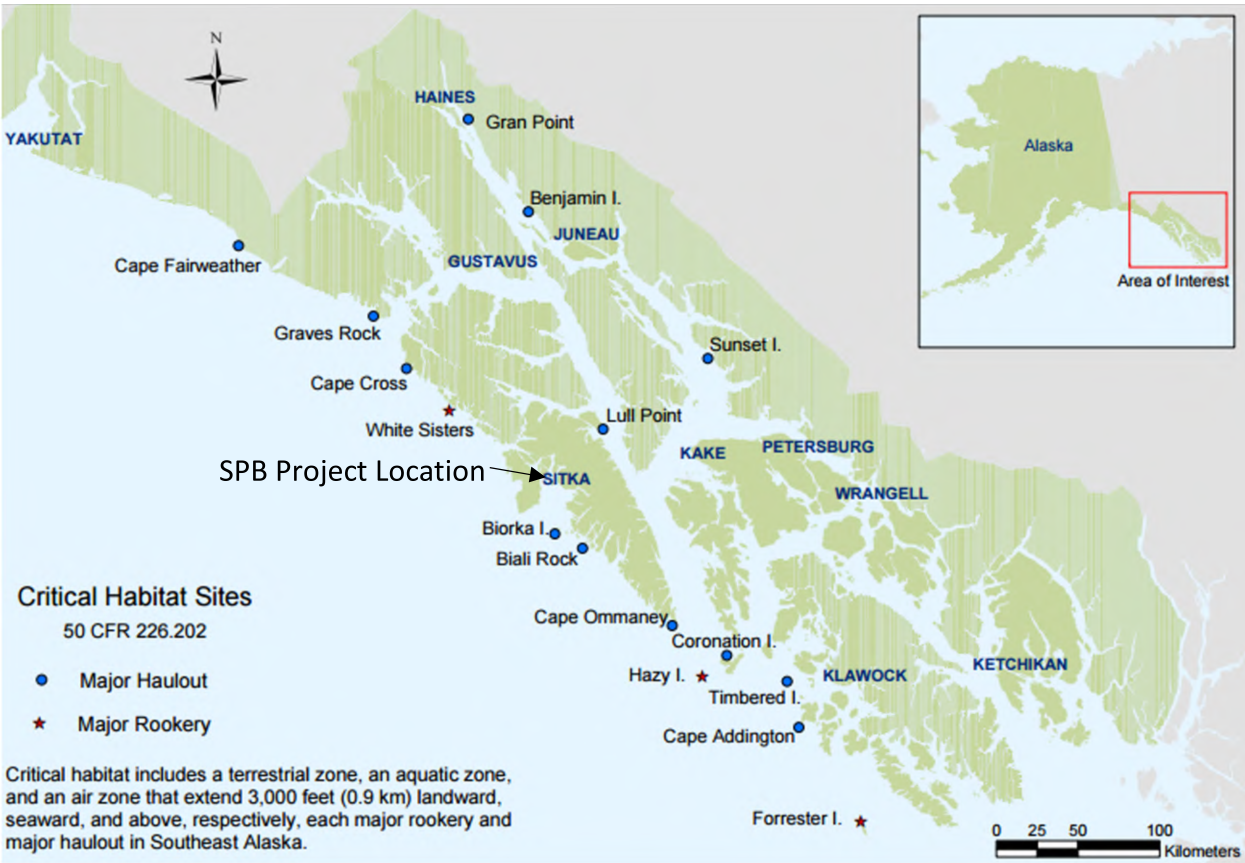
4.2.2.4 Hearing Ability

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 2018). 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.

4.2.2.5 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 haul out (over 20 km southwest of the proposed action area; Figure 13) is the closest designated critical habitat in Southeast, Alaska and is well outside the action area. The project will have **no effect on Steller sea lion critical habitat.**

Figure 13. Steller Sea Lion Critical Habitat in Southeast Alaska (Adapted from NMFS 2017c)



5 ENVIRONMENTAL BASELINE

The environmental baseline considers the past and present impacts of all Federal, state, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early Section 7 consultation, and the impact of state or private actions that are contemporaneous with the consultation in process (50 CFR § 402.02).

The project vicinity is an area of high human use and habitat alteration. Ongoing human activity in the action area that impacts marine mammals includes marine vessel activity, pollution, climate change, noise (e.g., aircraft, vessel, pile-driving, etc.), and coastal zone development.

5.1 PHYSICAL ENVIRONMENT

The Sitka Seaplane Base Project is located on the north shore of Japonski Island (1.467 square km) in the Sitka Channel near the Sitka Rocky Gutierrez Airport Terminal, a United States Coast Guard (USCG) Air Station, Mount Edgecumbe High School, Mt. Edgecumbe Medical Center, and the University of Alaska Southeast Sitka campus. Sitka Channel separates Japonski Island from Sitka Harbor and downtown Sitka on the much larger Baranof Island (4,160 square km). The mean tide range in the Sitka Channel is 7.7 feet, the diurnal tide range is 9.94 feet, and the extreme range is 18.98 feet (NOAA 2020a).

The Sitka Channel is located on the eastern shore of Sitka Sound, west of Crescent Bay and adjacent to Whiting Harbor. Sitka Channel is bookended by the Channel Rock Breakwaters to the north and the James O'Connell Bridge to the south, a distance of about 2,200 meters. Sitka Channel is approximately 150 feet wide and about 22 feet deep at its narrowest, which is on the east side of Harbor Rock of the breakwaters (NOAA 2020). USACE first constructed the breakwaters in 2007 with three distinct segments and two vessel entrances. Following a review in 2012, the opening between the south and main breakwaters was closed to reduce excessive wave energy in the channel harbors (USACE 2012).

The majority of the project footprint is previously undisturbed, but proximal to recent construction on the Channel Rock Breakwaters (approximately 500 feet). Currently there is no infrastructure or active development at the site. Facilities associated with the Mt. Edgecumbe Medical Center and the Southeast Alaska Regional Health Consortium (SEARHC) are immediately to the south of the project site. The USCG Air Station Sitka is located due west of the project site, beside the Sitka Rocky Gutierrez Airport Terminal.

The channel is characterized by multiple marine habitats that support a wide variety of fish and wildlife species. Habitats in the channel range from calm protected embayments to high energy wave-swept exposed coastlines. Much of the developed Sitka waterfront area has a rocky shoreline (USACE 2012). The seafloor in the channel contains a mosaic of bottom types including a mixed-soft bottom (mixture of silt, sand, pebbles, cobbles, boulders, and shell) and bedrock outcrops.

According to the ShoreZone Mapper (ShoreZone 2019), the shoreline at the proposed project site in Sitka Channel has the following characteristics:

- Habitat Class: protected/partially mobile/ sediment or rock and sediment; protected/mobile/sediment; semi-protected/partially mobile or rock and sediment; semi-protected/ anthropogenic permeable
- Coastal Class: ramp with gravel/sand beach; cliff with gravel/sand beach; sand and gravel flat fan; gravel beach, narrow; man-made permeable
- Biological Wave Exposure: protected; semi-protected; semi-exposed

5.2 FISH AND ESSENTIAL FISH HABITAT

The waters off the north shore of Japonski Island in Sitka Channel are designated as Essential Fish Habitat (EFH) under the Magnuson Stevens Fisheries and Conservation Management Act for 23 species of ground fish and all 5 species of Pacific salmon. These ground fish species include: Coho Salmon, Chum Salmon, Pink Salmon, Chinook Salmon, Sockeye Salmon, Aleutian Skate, Pacific Cod, Walleye Pollock, Shortspine Thornyhead Rockfish, Shortraker Rockfish, Pacific Ocean Perch, Redbanded Rockfish, Black Rockfish, Dusky Rockfish, Silvergrey Rockfish, Quillback Rockfish, Redstriped Rockfish, Rosethorn Rockfish, Sablefish, Yellow Irish Lord, Great Sculpin, Bigmouth Sculpin, Arrowtooth Flounder, Northern Rock Sole, Dover Sole, Yellowfin Sole, Alaska Plaice, and octopus (NMFS 2020b). Alaska Department of Fish and Game and NMFS have also identified Pacific herring and Pacific halibut as important in the project area (ADF&G 2019).

There are no anadromous streams that flow directly into the SPB site. The Alaska Department of Fish and Game Catalog of Waters Important for Spawning, Rearing, or Migration of Anadromous Fishes lists one anadromous stream that flows into the action area. Peterson Creek is anadromous (113-41-10185) for all five species of salmon and Dolly Varden and located along the eastern perimeter of the action area (ADF&G 2020a). Since the proposed project will be exclusively located in marine waters opposite Sitka Channel from Peterson Creek, direct impacts to the creek are not anticipated from this project. According to the NMFS EFH mapper, Sitka Channel does not have any designated Habitat Areas of Particular Concern.

5.3 MARINE VESSEL ACTIVITY

The action area experiences high levels of marine vessel traffic with highest volumes occurring May through September. Marine vessels that use the action area include passenger ferries, commercial freight vessels/barges, commercial tank barges, cruise ships, commercial fishing boats, charter vessels, recreational vessels, kayaks, and floatplanes (Nuka 2019). The Alaska Marine Highway operates year-round in Sitka with sailings multiple days a week and provides transit to numerous communities in Southeast Alaska, Washington state, and Canada.

The waters of the Inside Passage support marine cargo transportation. According automatic identification system passage-line data plots obtained from the Marine Exchange of Alaska, in 2011 1,489 vessels moved north or south between Alaska and British Columbia. The data show that 288 vessels moved east or west between the Dixon Entrance and the Pacific Ocean during the year. Cargo ships calling at Prince Rupert dominated the east-west large vessel traffic. Cruise ships, tugs, and ferries dominated the north-south traffic (Nuka 2012). In 2018, 644 unique commercial vessels were working in or transiting through Southeast Alaska traveling 2,297,966 tracked nautical miles (Nuka 2019).

From analysis of 2018 vessel traffic in Southeast Alaska, Sitka had the second highest number of commercial vessel port calls (~1,800) following Ketchikan (Nuka 2019). The most common type of vessel traffic was cargo, followed by cruise ships. In 2018, 45.5 million pounds of cargo transited Sitka port totally $61 million (NOAA 2020b).

Cruise ships are the largest vessels that routinely use the action area. After renovations to the Old Sitka Dock in 2018, Sitka can see two to three ships a day during peak traffic in the summer (May to September). Cruise ship traffic in Sitka peaked in 2008 with nearly 290,000 visitors (KCAW 2018) and saw the second highest number of visitors in 2019 after receiving 210,000 visitors during the cruise season (Alaska Public Media 2019).

Numerous commercial and charter fishing vessels and recreational craft, such as powerboats and sailboats, operate in the project vicinity. The CBS Harbor Department operates and maintains the following 5 boat harbors: Crescent Harbor, Sealing Cove Harbor, ANB Harbor, Thomsen Harbor and Eliason Harbor.

5.4 Fishery Interactions Including Entanglements

Marine mammal entanglement, or by-catch, is a documented source of injury and mortality to cetaceans, including humpback whales. The International Whaling Commission recently listed by-catch as a primary concern. Entanglement may result in only minor injury or may potentially significantly affect individual health, reproduction, or survival (NMFS 2019a, NMFS 2018a).

Entanglement in marine debris is a contributing factor to marine mammal injury and mortality. The sources of these entanglements are extensive and diverse. Actively-fished gear, marine debris, abandoned fishing gear, and non-fishery-related gear, and other gear types have been involved in marine animal entanglements. Other gear interactions with humpback whales in Alaska have occurred with purse seine fisheries, anchoring systems and mooring lines, and marine debris. Every year, humpback whales are reported entangled in fishing gear in Alaska, particularly crab and shrimp pot gear and gill net fishing gear (NMFS 2019a).

Entanglement is considered one of the primary causes of anthropogenic mortality in humpback whales (NMFS. 2016a). Bettridge et al. (2015) report that fishing gear entanglements may moderately reduce the population size or the growth rate of the Hawaii, Central America, and Mexico DPS. Between 2009 and 2013, there were two known mortalities of humpback whales in the Bering Sea/Aleutian Islands pollock trawl fishery and one in the Bering Sea/Aleutian Islands flatfish trawl fishery (Allen and Angliss. 2015). One humpback whale was also injured in the Hawaii shallow set longline fishery in 2011. Minimum estimated mean annual mortality to Western North Pacific humpback whales caused by entanglement from fishing gear was 0.8 whales for the period of 2011 to 2015. This number is greater than 10% of the potential biological removal (PBR) for this stock (3.0), and therefore, cannot be considered insignificant (Muto et al. 2016).

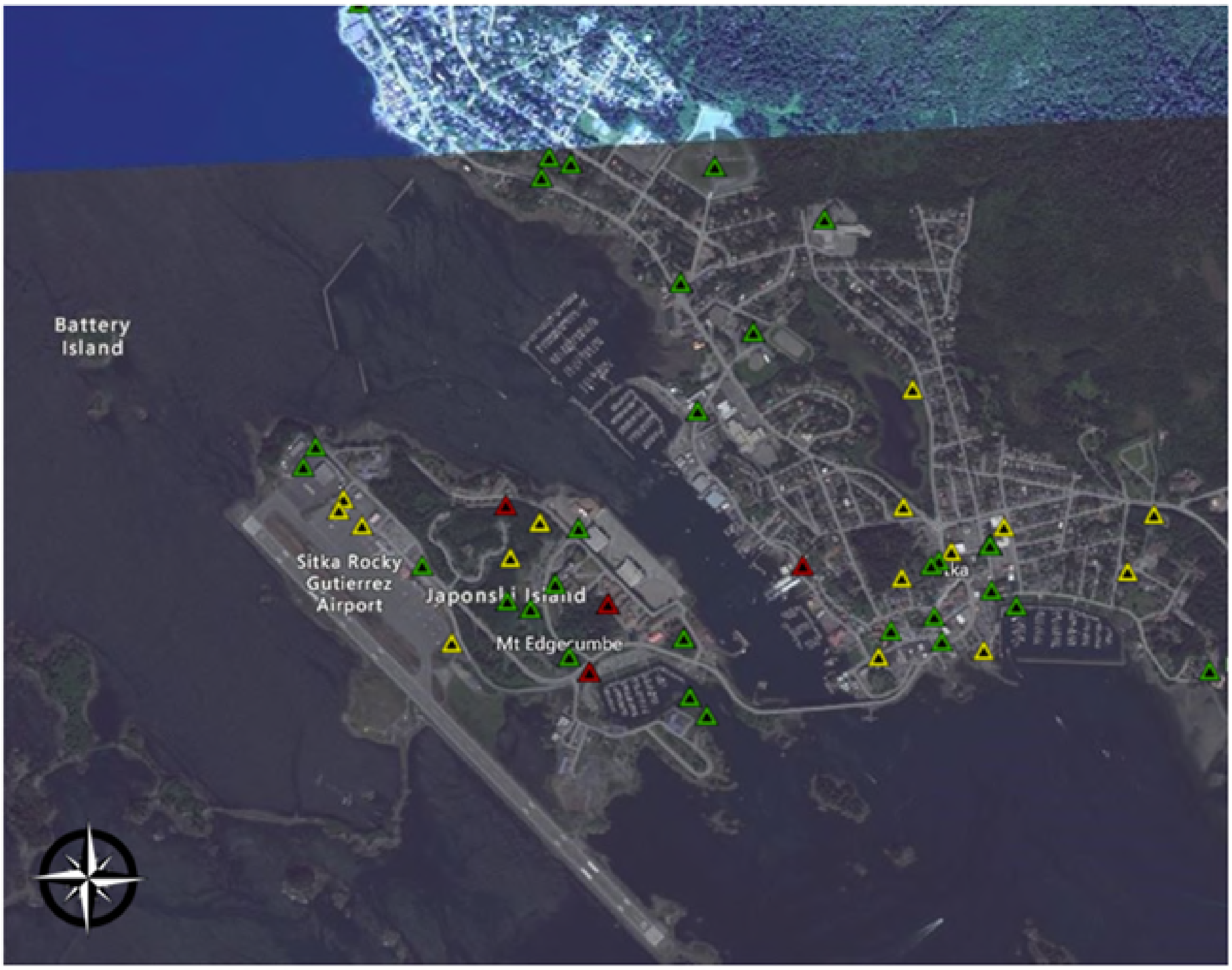
A substantial proportion of the materials entangling Steller sea lions in Southeast Alaska is from marine sources. Helker et al. (2017) found that Steller sea lions were the most common species reported in human-caused mortality and serious injury events between 2011 and 2015, and the Western DPS Steller sea lions were primarily subject to injuries caused by federal groundfish trawl fisheries (n=66). Constricting entanglements by marine debris and other fishery gear were a major contributing factor to human-caused mortality events. The average annual mortality and serious injury rate caused by U.S. commercial fisheries in 2011-2015 is 31 Western DPS Steller sea lions. As this is less than 10% of the PBR for the species calculated by Muto et al. (2019; PBR level = 320), this number can be considered insignificant. However, as not all fisheries are monitored, this number is likely a gross underestimation. Most entangling materials are unidentifiable because of being deeply embedded in the animal's flesh; however, when visible, the most commonly identified materials are plastic packing bands, rubber straps from crab pots, and various netting, ropes, and monofilament line (Raum-Suryan et al. 2017).

5.5 Pollution

The action area is not a water quality impaired water body according to the Alaska Department of Environmental Conservation (ADEC) water quality database and the water quality is expected to be good (ADEC 2020). A search of the ADEC contaminated sites database does not list any active or clean-up complete sites in the immediate action area (Figure 14). There are multiple contaminated sites near the action area, as well as cleanup complete and cleanup complete-institutional control sites. The following sites are located on land near the vicinity of the project area (ADEC 2020a).

- Actively contaminated- SEARHC Mount Edgecumbe Building 211A; hazard ID 26823, approximately 100 meters outside the action area. Soil samples indicated that the amount of diesel range organics that are in the soil are above ADEC clean up range. There were also races of residual range organics. This site was added to the database on December 26, 2017.
- Cleanup complete-institutional controls-Sitka NOB-Area G-Igarotte Housing Area; hazard ID 25736, approximately 100 meters outside the action area. Soils were contaminated with petroleum and lead. An agreement of a follow up every five years has been settled for the site.
- Cleanup complete-Sitka NOB-Area H-Seaplane Dock; hazard ID 25737, approximately 100 meters outside the action area. Underground fuel lines and the tank truck loading rack were the main sources of soil contamination however the concentrations were not considered significant in reports for the site.

Figure 14. Alaska DEC Contaminated Sites Mapper (ADEC 2020a)



A number of intentional and accidental discharges of contaminants pollute the marine waters of Alaska annually. Intentional sources of pollution, including domestic, municipal, and industrial wastewater discharges, are managed and permitted by the ADEC (ADEC 2020b). Within the action area, there are ADEC-permitted seafood processing discharges associated with two seafood processing plants. Seafood Producers Cooperative Sitka Seafood Plant (onshore processor) within Sitka Channel, approximately 1.1 kilometers southeast from the project location and outside the action area, discharges 5.4 million gallons of fish processing waste annually (permit number AKG520101). North Pacific Seafoods Sitka Plant (onshore processor) within Sika Channel, approximately 1.3 kilometers southeast from the project location and outside the action area, discharges 4.1 million gallons of fish processing waste annually (permit number AKG520065).

Further, the CBS discharges treated community domestic wastewater approximately 2 kilometers southwest of the project site and outside the action area in Sitka Sound's Middle Channel (EPA 2001).

5.6 Climate and Ocean Regime Change

Since the 1950s the atmosphere and oceans have warmed, glaciers and sea ice have diminished, sea level has risen, and concentrations of greenhouse gases have increased. The time period between 1983 and 2012 was likely the warmest 30-year period in the Northern Hemisphere in the last 1,400 years. This warming is thought to lead to increased decadal and inter-annual variability and increases in extreme weather events (Intergovernmental Panel on Climate Change [IPCC] 2013; Mann et al. 2017). The likelihood of further global-scale changes in weather and climate events has a well-established scientific consensus (Overland and Wang 2007; IPCC 2013; Salinger et al. 2013).

Effects to marine ecosystems from increased atmospheric carbon dioxide and climate change include ocean acidification, expanded oligotrophic gyres, shifts in temperature, circulation, stratification, dangerous marine heatwaves, and disrupted nutrient input (IPCC 2019; Doney et al. 2012). Altered oceanic circulation and warming cause reduced subsurface oxygen concentrations (IPCC 2019; Keeling et al. 2010). These large-scale shifts have the potential to disrupt existing trophic pathways as change cascades from primary producers to top level predators (Doney et al. 2012; Salinger et al. 2013).

The strongest warming is expected in the Arctic, exceeding the estimate for mean global warming and attributed in part to the “ice-albedo feedback.” The “ice-albedo feedback” is a positive feedback loop as reflective Arctic ice and snow retreats, surface albedo diminishes and the earth absorbs more heat, further accelerating warming and snow and ice retreat (NRC 2014, Thackeray and Hall 2019). Climate change is projected to have substantial direct and indirect effects on individuals, populations, species, and the structure and function of marine, coastal, and terrestrial ecosystems in the foreseeable future (NRC 2014).

Climate change may impact marine mammals through changes in the distribution of temperatures suitable for rearing young, the distribution and abundance of prey, and the distribution and abundance of competitors or predators. Salmon may lose habitat through thermal refuge, increase in the intensity of rainfall, and an increase in saltwater intrusion may affect rearing and deteriorate spawning habitats (Haufler et al. 2010; NMFS 2019b).

Shifts in ocean climate are the most parsimonious underlying explanation for the broad suite of ecosystem changes that have been observed in the North Pacific Ocean in recent decades (Trites et al. 2007; Miller et al. 2005). Changes in ocean climate are hypothesized to have affected the quantity, quality, and accessibility of prey, which in turn may impact populations of marine mammals, including humpback whales and Steller sea lions (Trites et al. 2007; Miller et al. 2005). Sea level rise has altered El Niño-Southern Oscillation, complex annual weather patterns in the Pacific Ocean, which also affects Steller sea lion and humpback whale prey abundance and geographic distribution. Additionally, sea level rise means that shallow islands are at risk of being submerged by rising waters which will affect active rookery and haul out sites for Steller sea lions (NMFS 2020c).

Increased ocean acidification has negatively impacted marine life and disrupts predator prey relationships. An oceanographer for NOAA's Pacific Marine Environmental Laboratory explained that waters in Southeast Alaska are naturally more acidic when compared to other areas due to glacial discharge (Juneau Empire 2019). Glacial runoff dilutes the water's alkalinity which enables the surface water to absorb carbon dioxide which decreases the pH in the water (NPS 2018). Another factor that naturally increases acidification is the marine dependent communities that are in the area (Juneau Empire 2019).

5.7 Coastal Zone Development

Coastal zone development results in the loss and alteration of nearshore marine mammal habitat and any changes in habitat quality. Increased development may prevent marine mammals from reaching or using important feeding, breeding, and resting areas. The shoreline in the immediate project area is primarily developed with impervious surfaces directly adjacent to the shoreline of the project footprint. Few areas of natural shoreline exist in the project site, mostly near the proposed upland parking area and haul out ramp. There is little opportunity for further development within in the community as the SPB is located between USCG Air Strip facility and SEARHC facilities.

5.8 IN-WATER NOISE

The project area is subject to noise from many anthropogenic sources, including marine vessels, seafood processing, shoreline and dock construction, aircraft, and land vehicles. Beyond Sitka Channel and the Channel Rock Breakwaters, the project action area extends into highly trafficked marine vessel routes in Sitka Sound.

6 EFFECTS OF THE ACTION

"Effects of the action" means the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action, that will be added to the environmental baseline (50 CFR 402.02). The effects from noise associated with pile driving and removal on the Mexico DPS of humpback whales and WDPS Steller sea lions are discussed below.

6.1 DIRECT EFFECTS

Direct effects defined under the ESA are immediate effects caused by the proposed action and occurring concurrently with the proposed action. Direct effects from the proposed action include noise associated with the removal of existing piles and construction of the new structures and operation of support vessels. Direct impacts such as physical destruction or alteration of habitat for humpback whales or Steller sea lions are not anticipated to occur from the Sitka SPB Project because the small project footprint and location in shallow water near the western extremity of the Channel Rock Breakwaters.

6.1.1 Acoustic Disturbance/Noise from Pile Extraction and Installation

Sounds above auditory thresholds may cause discomfort or tissue damage to auditory or other biological systems of all animals, including humans (National Institute of Health 2014). Marine mammals exposed to high intensity sound repeatedly or for prolonged periods can experience hearing threshold shift (TS), which is the loss of hearing sensitivity at certain frequency ranges (Southall et al. 2007). A TS can be permanent, in which hearing sensitivity is not recoverable, or temporary, in which the animal's hearing threshold can recover over time (Southall et al. 2007).

Marine mammals depend on acoustic cues for vital biological functions (e.g., orientation, communication, finding prey, avoiding predators); thus, temporary threshold shifts (TTS) may reduce an afflicted animal's fitness in survival and reproduction. However, this depends on the frequency and duration of TTS, as well as the biological context in which disruption occurs (Kastak et al. 2005). A TTS of limited duration, occurring in a frequency range that does not coincide with those used for recognition of important acoustic cues, will have little to no effect on an animal's fitness. NMFS classifies TTS as disturbance (Level B) harassment because repeated TTS sound exposure could cause PTS, which constitutes a lasting injury, (Southall et al. 2007; NMFS 2018; Southall et al. 2019).

Direct impacts of noise to marine mammals depend not only on sound magnitude but also on the species receiving the sound, exposure type (e.g., continuous vs. pulse), duration, site characteristics, and individual animal characteristics such as habituation, season, or motivation (Ellison et al. 2012). Some of the in-water sound source levels from pile installation and removal from the proposed action will generate noise loud enough to harm or harass Mexico DPS humpback whales at certain distances. Possible impacts include injury and disturbance ranging from mild (e.g., startle response, or masking of species relevant sounds) to severe (e.g., abandonment of habitat). Disruptive ambient noise from increased vessel traffic is likely responsible for masking humpback whale communication with implications for vital life functions, including foraging success, calf rearing, and social behavior (Gabriele et al. 2018).

Auditory interference, or masking, occurs when an interfering noise is similar in frequency and loudness to (or louder than) the auditory signal received by an animal while it is processing echolocation signals or listening for acoustic information from other animals. Masking can interfere with an animal's ability to gather acoustic information about its environment, such as predators, prey, conspecifics, and other environmental cues (Francis and Barber 2013). The exact way that humpback whale prey is impacted by noise sources at various levels is not yet clear, but the available information is sufficient to indicate that underwater noise is posing a management concern for many fish and invertebrate species (Hawkins and Popper 2017).

The impacts of masking may be greater for cetaceans, which produce complex vocalizations for different purposes and across multiple modes, such as whistling, echolocation click production, calling, and singing. Exposure to anthropogenic noise may result in changes to cetacean vocalization behavior. For example, in the presence of potentially masking signals, humpback whales and killer whales have been observed to increase the length of their songs (Fristrup et al. 2003; Foote et al. 2004), while right whales have been observed to shift the frequency content of their calls upward while reducing the rate of calling in areas of increased anthropogenic noise (Parks et al. 2007).

The Sitka SPB Project construction activities could mask vocalizations or other important acoustic information. This could affect communication among individuals or affect their ability to receive information from their environment. However, the primary effects of project activities will occur in an industrialized channel, where masking from vessel sounds and dock activity likely occur frequently. Project activities contributing to masking in the surrounding environment will likely be very small relative to the existing conditions.

As explained in Section 3.3, the above-ambient sound of pile driving and removal is anticipated to radiate from the SPB into Sitka Channel and a narrow portion of Sitka Sound. All pile driving and removal associated with the project is estimated to occur for a total of 647 hours over 179 days (not necessarily consecutive days) (Section 3.3 and Table 4). Additionally, there are no documented Steller sea lion haulouts in the action area and uplands rock blasting will not exceed the Steller sea lion in-air noise threshold; therefore, in-air noise is not included in estimated takes. See estimated level B takes in Table 10 below.

Table 10. Estimated Species Occurrence in Action Area and Take Calculation

Species	Estimated Number of Sightings per Day	Estimated Typical Group Size	Estimated Max Group Size	Level B Take Calculation
Humpback Whale [1]	Occasional	1-2	4	2 animals per group x 0.5 group per day x 105 days=105[2]
Steller Sea Lion [3]	Daily	4-8	8	8 animals per group x 1 group per day x 179 days=1432

[1] Most humpback whales observed in the area were solitary. Straley's survey data reports a typical group size of 2-4 whales (Straley et al 2018). During work on GPIP Dock, groups of 5 and 10 individuals were seen a few times, but most of the time, single whales were observed near the mouth of Silver Bay (Turnagain 2017).
[2] Only requesting level B takes during vibratory and DTH drilling/socketing pile driving (105 days).
[3] During Straley's surveys, Steller sea lions were often seen in groups of 2 to solitary or in groups of 2; however, a group of more than 100 was sighted on at least one occasion (Straley et al. 2018). During GPIP dock construction, Steller sea lions were observed in groups of 1 to 8 individuals. During Petro Marine Dock construction monitors observed solitary sea lions (Windward 2017). During monitoring at the O'Connell Float SolsticeAK (2018) observed a group of four sea lions on one day; but most sea lions were solitary.

Given the estimate of 6[2] Mexico DPS humpback whales occurring within the action area during project activities, we anticipate any masking or acoustic effects to Mexico DPS humpbacks to be very small.

Approximately 2.2 percent of Steller sea lions in the project area are expected to be from the ESA-listed WDPS, or 32 takes (Hastings et al. 2019). Masking is likely less of a concern for Steller

[2] The CBS has requested Level B take of 105 humpback whales. Based on the probabilities described in Wade et al. 2016 (shown in Table 3), we anticipate that 6% (or 6) of the humpback whales in the action area will be from the Mexico DPS.

sea lions, which vocalize both in air and water and do not echolocate or communicate with complex underwater "songs." Vocalizing is important on land at rookeries and haul-out sites, and noise is considered a possible threat to Steller sea lions (NOAA 2019).

6.1.2 Turbidity/Sedimentation

During the estimated 647 hours of in-water project construction, a temporary and localized increase in turbidity near the seafloor will occur in the immediate area surrounding each of the piles driven and removed. Although prey species such as herring and salmon can congregate in Sitka Sound, the project site does not support a consistent abundance of prey for humpback whales or Steller sea lions. Thus, the temporary and localized turbidity associated with the berth expansion project is unlikely to measurably affect humpback whales or Steller sea lions, or their prey, in the action area.

6.1.3 Marine Vessel Activity

Tugs and barges will be used to deliver materials to the project site and will remain onsite during project construction. Additionally, a small skiff will be used for day-to-day project construction. After all piles are placed and the SPB is operational, overall vessel traffic in the action area is not expected to increase, but seaplane traffic is expected to be redistributed along a different route in Sitka Channel. There is the potential for some increase in seaplane traffic with improved and updated base facilities, but an increase in large vessels (like the yachts, fish processors, and research vessels) is not expected as a result of this project. Despite an increase in seaplane traffic, this project will provide more appropriate and safe space for operation and likely will reduce conflicts with marine mammals and overall vessel congestion in Sitka Channel. As a result of this project, marine mammals in the area will be exposed to some additional marine vessel traffic during construction, but not likely to encounter increased conflicts from SPB operation once the base is completed.

Vessels transiting the marine environment have the potential to collide with, or strike, marine mammals (Laist et al. 2001; Nielsen et al. 2012). As mentioned above, Sitka Sound is a medium-risk area for humpback whale-vessel collisions and the probability of strike events depends largely on vessel speed (Laist et al. 2001). Vessels associated with the project will follow well-established, frequently utilized navigation lanes as they cross Sitka Sound and enter Eastern and Middle Channel and Sitka Channel, and they will be traveling at slow speeds. Humpback whales and sea lions in the action area have been previously exposed to ship traffic, and are unlikely to change their behavior in response to vessel traffic associated with this project.

Ongoing activities within the waters near the community of Sitka, including frequent vessel traffic, contribute to elevated background levels of underwater noise in the action area. Tugs and barges can emit significant noise levels, around 171-176 dB (Richardson et al. 1995; Kipple and Gabriele 2004). Marine mammals in the area are currently exposed to such sounds, yet they continue to use the waters. Given the transitory nature of vessels used for this project, any disturbance of a particular individual by a project-associated vessel will be very limited in space and time.

Vessel strikes of humpback whales is a general concern for the population. An examination of all known ship strikes for large (baleen and sperm) whales from all shipping sources indicates vessel speed is a principal factor in whether a vessel strike results in death (Laist et al. 2001; Vanderlaan and Taggart 2007). In assessing records with known vessel speeds, Laist et al. (2001) found a direct relationship between the occurrence of a whale strike and the speed of the vessel involved in the collision. The authors concluded that most deaths occurred when a vessel was traveling in excess of 14.9 miles per hours (mph) (13 knots).

Inside Sitka Channel is a no wake zone, requiring vessels to go 5 mph or slower however, outside the channel in Sitka Sound, ships may be travelling much faster (CBS 2020a). The largest ships usually travel at speeds between 23-27 miles per hour (20-24 knots).

This project will not increase marine vessel activity or the likelihood of accidental ship strikes, which may cause injury or mortality of marine species. There are no known Steller sea lion rookeries or haul outs near the action area (Figure 10) and sea lions are habituated to vessel traffic in this busy area; therefore, the chances of injury or stress due to increased vessel traffic associated with construction will be minimal.

Neilson et al. (2012) summarized 108 reported whale-vessel collisions in Alaska from 1978 to 2011, none of which were from seaplanes. Most strikes (86%) involved humpback whales. Small vessel strikes were most common (<15 meters, 60%), but medium (15–79 meters, 27%) and large (≥80 meters, 13%) vessels also struck humpback whales. Most strikes (91%) occurred in May through September, and there were no reports from December or January. The majority of strikes (76%) were reported in southeastern Alaska. The number of humpback whale collisions detected in Southeast Alaska increased by 5.8% annually from 1978 to 2011, which closely matches the 6.8% annual growth rate of the humpback whale population in southeastern Alaska between 1986 and 2008. The report identifies whale-vessel collision hotspots in southeastern Alaska and does not classify the action area or surrounding waters as areas where such hotspots occur. In August of 2017, the Princess Cruises Ship Grand Princess came into the port of Ketchikan with a humpback whale carcass on its bow, NOAA later performed a necropsy to determine the cause of death (NOAA 2017).

From 2007 to 2013, there were four documented cases of Steller sea lions killed or injured by vessel strikes in Alaska, none from seaplanes (NMFS 2020c). Vessel activity can disturb sea lions, instigating mass stampedes that can crush or injure smaller animals and disrupt normal nursing cycles in rookeries. Vessel traffic and associated noise can also disrupt feeding and other water activities (NMFS 2020c).

6.1.4 Pollution

Permitted and un-permitted sources have the potential to produce pollutants in the action area. Additionally, there is potential for an oil or pollution spill from activities associated with the project; however, the risk of spills and pollutants related to the project will be mitigated by implementing BMPs and policies to prevent accidental spills. If a spill were to occur, plans will be in place, and materials will be available for cleanup activities. The probability of project effects to Mexico DPS humpback whales of Steller sea lions from accidental spills or other pollution sources is very small. We do not anticipate pollution to cause adverse effects to marine mammals in Sitka Channel or Sitka Sound, an area which represents a very small fraction of the range of Mexico DPS humpback whales and WDPS Steller sea lions.

6.1.5 Habitat Loss or Modification

Mexico DPS humpback whales and WDPS Steller sea lions could experience a temporary loss of suitable habitat in the action area if elevated noise levels associated with in-water construction results in their displacement from the area. Displacement of either mammal by noise will not be permanent and will not result long-term effects to the local population. A loss of habitat from the project is not anticipated because of the relatively small size of the project footprint and since there are no documented sightings of either mammal in the project footprint, only in the action area.

6.2 INDIRECT EFFECTS

Indirect effects defined under the ESA are effects from the proposed action that occur at a later time, but are still reasonably certain to occur. Indirect effects from the seaplane base includes impacts from noise on habitat.

6.2.1 Effects of Noise on Habitat

Fish populations in the project area that serve as Mexico DPS humpback whale and WDPS Steller sea lion prey could be affected by noise from in-water pile-driving. High underwater sound pressure levels (SPL) 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 proposed project is relatively small compared to the available habitat around Sitka. The most likely impact to fish from the proposed project will be temporary behavioral avoidance of the immediate area. Any behavioral avoidance by fish of the immediate area will still leave large areas of fish and foraging habitat in the action area. Further, mitigation measures will be implemented to reduce impacts of noise on habitat. Therefore, indirect effects on Mexico DPS humpback whale or WDPS Steller sea lion prey during the proposed project are not expected to be substantial.

6.3 CUMULATIVE EFFECTS

“Cumulative effects” are those effects of future state, local, tribal, or private activities, not involving Federal activities, that are reasonably certain to occur within the action area (50 CFR § 402.02). Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to Section 7 of the ESA.

Reasonably foreseeable future activities within and immediately adjacent to the dock will likely involve the placement of fill, dredging, or structures in the area, requiring authorization from the USACE and consultation pursuant to Section 7 of the ESA. Therefore, such activities do not meet the ESA definition of cumulative effects and are not addressed here.

7 Determination of Effect

The proposed Sitka SPB Project is likely to adversely affect the ESA-listed Mexico DPS humpback whales and WDPS Steller sea lions due to the noise associated with the pile-driving. Noise associated with the project may reach levels exposing Mexico DPS humpback whales and WDPS Steller sea lions to Level A and B harassment under the MMPA, and therefore, cannot be considered having insignificant or discountable effects on the species. However, mitigation measures described in Section 3.5 will be implemented throughout the duration of the project to reduce exposure to noise associated with the pile-driving. These mitigation measures include minimization of construction noise, marine mammal monitoring, safety radii, clearing the safety radii, soft-starts procedures, and shut-down procedures to eliminate any Level A takes and minimize Level B takes. An IHA for Level B take for the proposed project will be submitted for take of marine mammals including Mexico DPS humpback whales and WDPS Steller sea lions to NMFS Office of Protected Resources and construction of the project will not begin until the IHA is approved.

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