UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
P.O. Box 21668
Juneau, Alaska 99802-1668

Endangered Species Act (ESA) Section 7(a)(2) Biological Opinion
City of Hoonah Marine Industrial Center Cargo Dock Project at Hoonah, Alaska
NMFS Consultation Number: AKRO-2020-03675

Action Agencies: National Marine Fisheries Service Office of Protected Resources, Permits and Conservation Division,
US Army Corps of Engineers (POA-1985-00696-M5),
Economic Development Administration

Affected Species and Determinations:

ESA-Listed Species	Status	Is the Action Likely to Adversely Affect Species?	Is the Action Likely to Adversely Affect Critical Habitat?	Is the Action Likely To Jeopardize the Species?	Is the Action Likely To Destroy or Adversely Modify Critical Habitat?
Steller Sea Lion, Western DPS (*Eumetopias jubatus)*	Endangered	Yes	No	No	No
Humpback Whale, Mexico DPS (*Megaptera novaeangliae*)	Threatened	Yes	No	No	N/A
Sperm Whale (*Physeter macrocephalus*)	Endangered	No	No	No	N/A

Consultation Conducted By: National Marine Fisheries Service, Alaska Region

Issued By:

for James W. Balsiger, Ph.D.
Regional Administrator

Date: May 4, 2021

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TERMS AND ABBREVIATIONS

µPa	Micro Pascal
AKR	Alaska Region
BA	Biological Assessment
CI	Confidence Interval
CNP	Central North Pacific
CPUE	Catch Per Unit Effort
CSEL	Cumulative Sound Exposure Level
dB re 1µPa	Decibel referenced 1 microPascal
DPS	Distinct Population Segment
ESA	Endangered Species Act
EZ	Exclusion Zone
Hz	Hertz
IHA	Incidental Harassment Authorization
IPCC	Intergovernmental Panel on Climate Change
ITA	Incidental Take Authorization
ITS	Incidental Take Statement
IWC	International Whaling Commission
kHz	Kilohertz
km	Kilometers
kn	Knots
L	Liter
m	Meter
mi	Mile
MMPA	Marine Mammal Protection Act
µPa	Micro Pascal
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
PTS	Permanent Threshold Shift
RMS	Root Mean Square
SSL	Steller Sea Lion

1. INTRODUCTION

Section 7(a)(2) of the Endangered Species Act of 1973, as amended (ESA; 16 U.S.C. § 1536(a)(2)) requires each Federal agency to ensure that any action it authorizes, funds, or carries out is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of critical habitat of such species. When a Federal agency's action "may affect" a protected species, that agency is required to consult with the National Marine Fisheries Service (NMFS) or the U.S. Fish and Wildlife Service (USFWS), depending upon the endangered species, threatened species, or designated critical habitat that may be affected by the action (50 CFR § 402.14(a)). Federal agencies may fulfill this general requirement informally if they conclude that an action may affect, but "is not likely to adversely affect" endangered species, threatened species, or designated critical habitat, and NMFS or the USFWS concurs with that conclusion (50 CFR § 402.14(b)).

Section 7(b)(3) of the ESA requires that at the conclusion of consultation, NMFS and/or USFWS provide an opinion stating how the Federal agency's action is likely to affect ESA-listed species and their critical habitat. If incidental take is reasonably certain to occur, section 7(b)(4) requires the consulting agency to provide an incidental take statement (ITS) that specifies the impact of any incidental taking, specifies those reasonable and prudent measures necessary or appropriate to minimize such impact, and sets forth terms and conditions to implement those measures.

In this document, the action agencies and their proposed actions are:

- Economic Development Administration (EDA) is funding the City of Hoonah's construction project;
- National Marine Fisheries Service (NMFS) Office of Protected Resources Permits and Conservation Division (PR1) is proposing issuance of an Incidental Harassment Authorization (IHA) to take marine mammals by harassment under the Marine Mammal Protection Act (MMPA) incidental to construction of the Hoonah Cargo Dock; and
- U.S. Army Corps of Engineers (USACE), Alaska District is proposing issuance of a Rivers and Harbors Act Section 10 and Clean Water Act Section 404 permit for the construction of a dock and associated construction activities (POA-1985-00696-M5).

Additional roles and agency involvement include the following:

- The consulting agency for the proposed actions is NMFS's Alaska Region Protected Resources Division (NMFS AKR);
- The applicant is the City of Hoonah (COH); and
- The non-Federal representative is Solstice Alaska Consulting, Inc. (Solstice).

This document represents NMFS's biological opinion (opinion) on the effects of this proposal on endangered and threatened species and their designated critical habitat. The opinion and ITS were prepared by NMFS Alaska Region in accordance with section 7(b) of the ESA (16 U.S.C. § 1536(b)), and implementing regulations at 50 CFR part 402. The opinion and ITS are in compliance with the Data Quality Act (44 U.S.C. § 3504(d)(1)) and underwent pre-dissemination review.

1.1. Background

This opinion is based on information provided in the Biological Assessment (Solstice, 2021a), and the proposed IHA (86 FR 12630) issued by PR1 on March 4, 2021. Other sources of information include the Marine Mammal Monitoring and Mitigation Plan (4MP) (Solstice, 2021b and Appendix A to this opinion), emails, sound source verification studies (SSV), stock assessment reports, previous consultations, and monitoring reports. A complete record of this consultation is on file at NMFS's Juneau, Alaska office.

The proposed action involves improvements to the city-owned Hoonah Marine Industrial Center (HMIC) in Port Frederick Inlet on Chichagof Island in Hoonah, Alaska (Figure 1). A more detailed project map is included as Figure 2.

Figure 1. The City of Hoonah, existing harbors and boat ramps, and surrounding waters of Port Frederick, Icy Strait, and Chatham Strait.

Figure 2. Location of the Hoonah Marine Industrial Complex (HMIC) cargo dock project.

This opinion considers the effects of the proposed actions on the endangered western distinct population segment (DPS) Steller sea lion (*Eumetopias jubatus*), threatened Mexico DPS humpback whale (*Megaptera novaeangliae*), and sperm whale (*Physeter macrocephalus*). No critical habitat has been designated for sperm whales. No designated Steller sea lion critical habitat is located within the action area. The nearest Steller sea lion rookery is on the White Sisters Islands near Sitka and the nearest major haulouts are at Benjamin Island, Cape Cross, and Graves Rocks. The White Sisters rookery is located on the west side of Chichagof Island, about 72 km southwest of the project area. Benjamin Island is about 60 km northeast of Hoonah. Cape Cross and Graves Rocks are both about 70 km west of Hoonah. The nearest critical habitat for Mexico DPS humpback whales is in the vicinity of Prince William Sound, hundreds of kilometers from Hoonah (86 FR 21082).

1.2. Consultation History

NMFS AKR received a request to initiate formal consultation and a biological assessment from USACE in August 2020. Through conversations with the COH and USACE, it was determined that since the EDA is funding the project, EDA would serve as the lead action agency. In letters dated October 28, 2000 and August 20, 2020, the EDA and USACE respectively informed AKR that they designated Solstice Alaska Consulting, Inc. as their non-Federal representative. As a result of pre-consultation meetings and information requests, AKR received updated versions of the assessment in December 2020 and February 2021. NMFS received a request for initiation from PR1 on March 4, 2021. NMFS AKR began formal consultation with PR1, EDA, and USACE on March 4, 2021. This opinion is the result of formal consultation with these three action agencies.

2. DESCRIPTION OF THE PROPOSED ACTION AND ACTION AREA

2.1. Proposed Action

"Action" means all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by Federal agencies in the United States or upon the high seas. 50 CFR § 402.02.

This opinion considers the effects of construction and improvements to the city-owned Hoonah Marine Industrial Center (HMIC) in Port Frederick Inlet on Chichagof Island in Hoonah, Alaska, to be permitted by the USACE, NMFS PR1's issuance of an IHA to take marine mammals by harassment under the MMPA, and the EDA's funding of the project.

2.2. Proposed Activities

The city of Hoonah, Alaska, is only accessible by air and water. Small amounts of cargo are transported into the community by plane; however, the majority is delivered weekly by barges from April through September (AML 2020). When weather permits, front load barges utilize a gravel landing located next to the existing city dock (Figure 3). The gravel landing provides a makeshift location to unload heavy cargo using a ramp and forklifts. During winter months, inclement weather events, and for more frequent deliveries, COH has relied on the Alaska Marine Highway System (AMHS) ferries and the local ferry terminal. AMHS has recently decreased its service to Hoonah, placing increasing reliance on barge deliveries.

The existing gravel landing at HMIC was not originally designed for barges and requires an additional ramp and favorable weather conditions to safely unload cargo. Even during favorable weather, the design of the current landing (limited space and shallow depth) places the barges and crew at risk. With the decrease in AMHS ferry service to and from Hoonah, the community is increasingly dependent on barge service to receive goods.

The purpose of HMIC Cargo Dock project is to make improvements to the existing gravel landing to enable barges to land during all weather conditions. Once the project is completed, Hoonah will be able to reliably receive goods year-round and in all weather conditions.

The HMIC cargo dock is one component of a phased approach to enhance the Hoonah waterfront and to provide infrastructure to support various maritime industries (Figure 4).

Figure 3. View south from the current gravel loading ramp.

Completion of the cargo dock phase will include constructing a sheet pile bulk head cargo dock, three breasting dolphins, and the addition of fender piles to the new cargo dock. This work will include in-water pile driving of steel and sheet piles, and the placement of fill in marine waters. No blasting is proposed as a part of this project.

Next we'll review the specific proposed construction activities associated with each of these activities, including pile driving and removal and down-the-hole drilling.

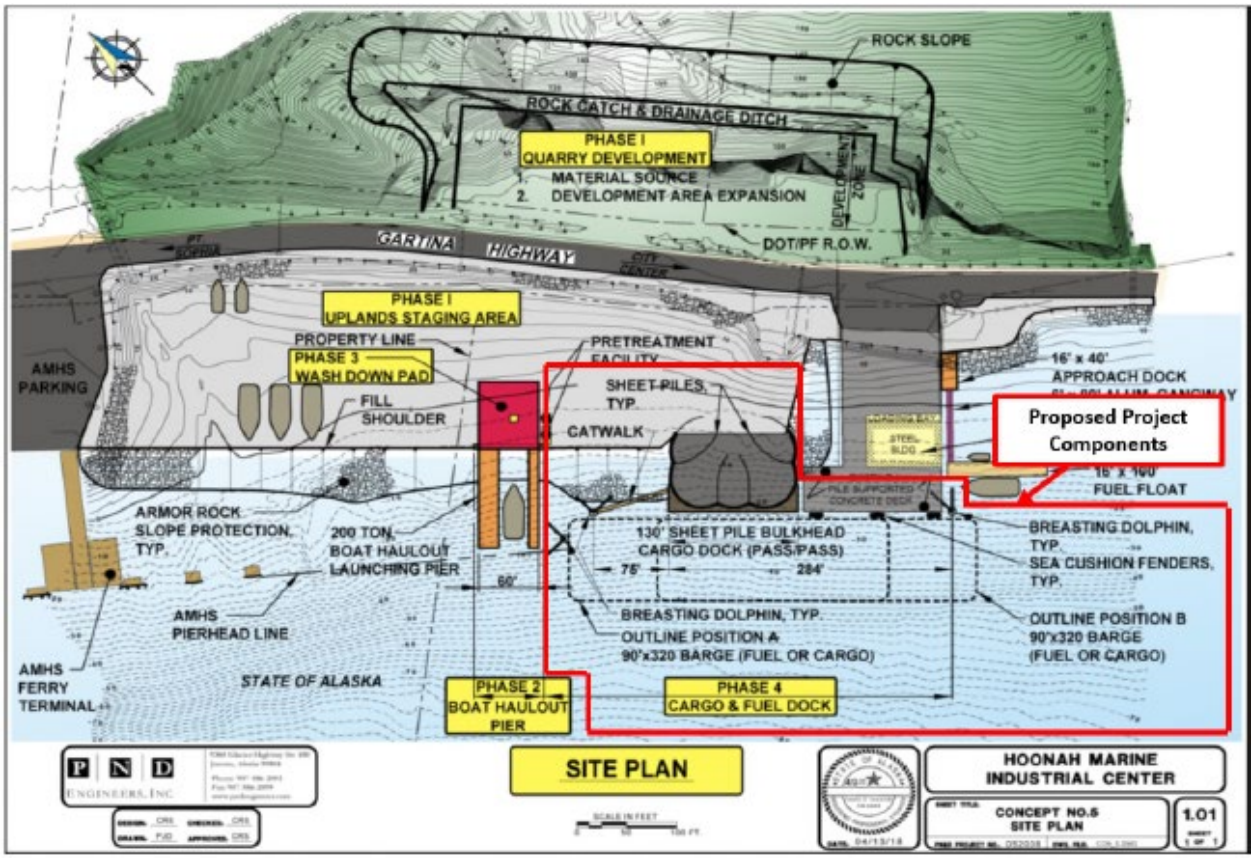

Figure 4. Site plan including proposed cargo dock.

2.3. Proposed Construction Activities

2.3.1. Constructing the three breasting dolphins would involve:

- Installing 10 temporary 30-inch-diameter steel piles as templates to guide proper installation of permanent piles (these piles would be removed prior to project completion);
- Installing 9 permanent 36-inch-diameter steel piles, including:
    - Breasting Dolphin 1
        - One vertical 36-inch steel pile
        - Two 36-inch battered steel piles
    - Breasting Dolphin 2
        - One vertical 36-inch steel pile
        - Two 36-inch battered steel piles
    - Breasting Dolphin 3
        - One vertical 36-inch steel pile

  - Two 36-inch battered steel piles
- Installing an 80-foot slatted above-water catwalk

2.3.2. Constructing the bulk cargo dock would involve:

- Installation of 20 temporary 30-inch-diameter steel piles as templates to guide proper installation of 12 permanent H-piles (these piles would be removed prior to project completion);
- Installation of 12 permanent H-piles to guide proper installation of sheets;
- Installation of 500 permanent sheet piles (130 linear feet each)
- Filling the newly constructed cargo dock frame with 9,600 cubic yards of fill

2.3.3. Installing the fender piles at the existing city dock would include:

- Installing 20 temporary 30-inch-diameter steel piles as templates to guide proper installation of permanent fender piles (these piles would be removed prior to project completion). The contractor will use the same 30-inch-diameter temporary piles to place these fender piles as they did for the 36-inch dolphin piles and for the H-piles, in order to avoid having to bring in different sized temporary piles to the construction area.
- Installing 6 permanent 20-inch-diameter fender piles

2.3.4. Construction sequence

In-water construction of the HMIC cargo dock components is expected to occur via the following sequence:

1. Vibrate twenty 30-inch temporary piles to use as a guide to install H-piles for the cargo dock.
2. Vibrate and impact 12 H-piles to depth to hold the sheets into place.
3. Remove the temporary piles.
4. Using the H-piles as a guide, vibrate and impact 500 sheets into place to create a barrier prior to placing fill.
5. Using an excavator, place 9,600 cubic yards of fill within the newly constructed cargo dock frame.

After the completion of the cargo dock, the barge will move over to install the six fender piles at the existing city dock face using the following sequence:

1. Vibrate 20 temporary 30-inch piles a minimum of ten feet into bedrock to create a template to guide installation of the permanent piles.
2. Weld a frame around the temporary piles.
3. Within the frame: vibrate, impact, and down-the-hole drill (DTH) six permanent 20-inch fender piles into place.

4. Remove the frame and temporary piles.
5. Perform this sequence at the other six fender pile locations.

The three breasting dolphins will be constructed as the barge moves off shore and will install temporary and permanent piles as follows:

1. Vibrate 10 temporary 30-inch piles a minimum of ten feet into bedrock to create a template to guide installation of the permanent piles.
2. Weld a frame around the temporary piles.
3. Within the frame: vibrate, impact, and DTH one vertical and two battered 36-inch piles into place.
4. Remove the frame and temporary piles.
5. Repeat this sequence at the second and third locations.

2.3.5. Pile Installation Methods

2.3.5.1. Installation and Removal of Temporary (Template) Piles

Temporary 30-inch-diameter piles would be installed and removed using a vibratory hammer.

2.3.5.2. Installation of Permanent Piles

The permanent H-piles, 20-inch, and 36-inch piles would be installed through sand and gravel with a vibratory hammer until advancement stops. Then, the pile will be driven to depth with an impact hammer. If design tip elevation is still not achieved, the contractor will utilize a drill to secure the pile. This socketing method is referred to as down-the-hole drilling (DTH) throughout this document. Pile depths are expected to be approximately 40 to 70 feet below the mudline and estimated to take approximately 1.25-10.5 hours per pile to complete.

The permanent sheets would be installed using a vibratory hammer and impact hammer following the same criteria as above to achieve design tip elevation. It is expected that it will take around 20 minutes to install each sheet.

2.3.6. Dates and Duration of Activities

All pile driving and removal associated with the project is estimated to occur for a total of less than or equal to 443 hours over a maximum of 110 days of non-consecutive in-water work (Table 1). Construction may begin as early as in May 2021. Regardless of start date, construction will occur within a 4-month (maximum) work window. This opinion covers activities during the period of May through September.

Table 1. Pile driving and removal activities.

	Project Component					
	Temporary Pile Installation	**Temporary Pile Removal**	**Permanent Pile Installation**			
Vibratory Hammer						
Diameter of Steel Pile (inches)	30	30	36	H-piles	Sheets	20
# of Piles	50	50	9	12	500 (130lf)	6
Max # Piles Vibrated per Day	4	4	4	4	30	3
Vibratory Time per Pile (min)	15	15	15	15	15	15
Vibratory Time per Day (min)	60	60	60	60	450 (7.5 hr)	45
Number of Days	12.5	12.5	2.25	3	17	2
Vibratory Time Total	12 hrs 30 mins	12 hrs 30 mins	2 hr 15 mins	3 hrs	292 hrs	1 hr 30 min
Impact Hammer						
Diameter of Steel Pile (inches)	-	-	36	H-piles	Sheets	20
# of Piles	-	-	9	12	500 (130lf)	6
Max # Piles Impacted per Day	-	-	2	5	5	2
Impact Time per Pile (min)	-	-	15	5	5	5
Impact Time per Day (min)	-	-	30	20	25	10
Number of Days	-	-	4.5	3	17	3
Impact Time Total	-	-	2 hr 15 mins	1 hr	1 hr 30 mins	30 min
DTH Drilling						
Diameter of Steel Pile (inches)	-	-	36	H-Piles	-	20
Total Quantity	-	-	9	12	-	6
Anchor Diameter	-	-	33	20	-	20
Max # Piles Anchored per Day	-	-	2	2	-	2
Time per Pile	-	-	5-10 hrs	3-4 hrs	-	1 hr
Actual Time Spent Driving per Pile	-	-	60 min	60 min	-	60 min
Time per Day	-	-	12 hrs (max)	12 hrs (max)	-	12 hrs (max)
Actual Time Spent Driving per Day	-	-	72 mins (1 hr 12 mins; max)	2 hrs (max)	-	1 hr (max)
Blows per pile	-	-	27,000-54,000	20,000	-	15,000
Number of Days	-	-	15	17	-	3
Drilling Total Time	-	-	45-90 hours	20 hours	-	4 hours

2.3.7. Transportation and equipment movement

COH will employ the following number and types of vessels for construction operations:

- 1 material barge (approximately 250 ft by 76 ft x 15.5 ft);
- 1 construction barge (crane Barge 280 ft by 76 ft by 16 ft);
- 1 skiff (25-foot skiff with a 125–250 horsepower outboard motor): and
- 1 skiff (25-35-foot skiff powered with a 35-50 horsepower outboard motor).

2.3.7.1. Materials and Equipment

Materials and equipment are expected to be transported from Washington to the project site by barge. While work is conducted in the water, the barge will be secured in place by four anchors. The anchors will be below the surface and would not be a hazard to navigation. Local barge moves to the next pile installation area (approximately 60 feet away) would occur at a speed of less than 2 miles per hour.

2.3.7.2. Workers to and from Work Platform

Workers will be transported from shore to the barge work platform by a 25-foot skiff with a 125–250 horsepower motor (expected). The travel distance will be less than 100 feet. There could be multiple shore-to-barge trips during the day; however, the distance of travel will be extremely short, brief, and close to shore.

2.3.7.3. 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; and positioning piles on the substrate via a crane (i.e., “stabbing the pile”), and heavy machinery to place fill.

2.3.8. Acoustic Sources

A number of acoustic sources are associated with the dock project including: vibratory pile driving, impact pile driving, and DTH. Each of these elements generates in-water and in-air noise. COH expects to use the equipment listed in Table 2 or similar. A final selection will be made by the project 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 operations, and the Holte 6000 Series for DTH (Table 2). Sound source levels for these activities are reviewed in Section 6.1.2.

Table 2. Construction Equipment that will produce noise

Driving mechanism	Pile driver	Properties
Impact pile driving	Diesel APE D36-42	Max 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)

2.3.8.1. Impact Hammer

An impact hammer is a steel device that works like a piston. The pile is first moved into position and set in the proper location using a choker cable or vibratory hammer. The impact hammer is held in place by a guide (lead) that aligns the hammer with the pile. A heavy piston moves up and down, striking the top of the pile and driving it into the substrate. Once the pile is set in place, pile installation with an impact hammer can take less than 15 minutes under good substrate conditions. However, under poor conditions, such as glacial till and bedrock or exceptionally loose material, piles can take longer to set.

2.3.8.2. Vibratory Hammer

After a pile is placed into position using a choker and crane, a vibratory hammer vibrates at between 1,200 and 2,400 cycles per minute. The vibrations are transmitted down the pile and liquefy the sediment surrounding the pile, allowing it to penetrate to the required seating depth, or to be removed.

2.3.8.3. Down-the-Hole Drilling (DTH)

DTH pile installation includes drilling (non-impulsive sound) and hammering (impulsive sound) to penetrate rocky substrates (Denes *et al*. 2016; Denes *et al*. 2019; Reyff and Heyvaert 2019). DTH pile installation was initially thought to be a primarily non-impulsive noise source. However, Denes et al. (2019) concluded that DTH should be characterized as impulsive based on Southall *et al*. (2007), who stated that signals with a >3 dB difference in sound pressure level in a 0.035-second window compared to a 1-second window can be considered impulsive. Therefore, DTH pile installation is treated as both an impulsive and non-impulsive noise source.

2.4. Mitigation Measures

To minimize impacts to marine mammals, including ESA-listed species, COH proposes to implement the mitigation measures outlined below during vibratory and impact pile driving, pile

removal, DTH, and other in-water work. These activities will be referred to in this opinion generically as "pile driving activities". The following monitoring and mitigation measures were compiled based upon information provided in the BA, IHA application, draft IHA, and the 4MP included as Appendix A.

2.4.1. General Mitigation Measures

1. The applicant will notify NMFS as soon as practicable prior to the start of construction.

2.4.2. Protected Species Observer (PSO) Requirements

2. PSOs will have the following prior experience and skills:
   a. be in good physical condition and be able to withstand harsh weather conditions for an extended period of time;
   b. must have vision correctable to 20-20;
   c. sufficient to conduct field observations and data collection according to assigned protocols;
   d. writing skills sufficient to prepare understandable reports of observations and technical skills to complete data entry forms accurately; and
   e. identifying marine mammals in Alaskan waters by species and marine mammal behavior.
3. Absent prior experience and skills stipulated in Item 2 above, PSOs will complete project specific training prior to deployment to the project site (taught by an experienced trainer following a course syllabus approved by NMFS). This course will include training in:
   a. field identification of marine mammals and marine mammal behavior;
   b. ecological information on Alaska's marine mammals and specifics on the ecology and management concerns of those marine mammals;
   c. ESA and MMPA regulations;
   d. mitigation measures outlined in the LOC;
   e. proper equipment use;
   f. methodologies in marine mammal observation and data recording and proper reporting protocols; and
   g. identify PSO roles and responsibilities.
4. PSOs will work in shifts lasting no longer than 4 hours with at least a 1-hour break from marine mammal monitoring duties between shifts. PSOs will not perform PSO duties for more than 12 hours in a 24-hour period. Note that during the 1-hour break for a PSO, a crew member can be assigned to be the observer as long as they do not have other duties at that time and they have received instructions and tools to allow them to make marine mammal observations.
5. PSOs will have the ability to effectively communicate orally, by radio and in person, with project personnel to provide real-time information on marine mammals.

6. PSOs will have the ability and authority to order appropriate mitigation response to avoid takes of all marine mammals.
7. The PSOs will have the following equipment to facilitate their duties:
    a. Range finder;
    b. Annotated chart and compass;
    c. Inclinometer;
    d. Two-way radio communication, or equivalent, with onsite project manager;
    e. Appropriate personal protective equipment;
    f. Daily tide tables for the project area;
    g. Watch or chronometer;
    h. Binoculars (7x50 or higher magnification) with built-in rangefinder or reticles (rangefinder may be provided separately);
    i. Handheld global positioning system;
    j. A copy of this LOC and all appendices, printed on waterproof paper and bound; and
    k. Observation Record forms printed on waterproof paper, or weatherproof electronic device allowing for required PSO data entry.
    l. PSOs will have no other primary duties beyond watching for, acting on, and reporting events related to marine mammals.
8. Prior to commencing in-water work or at changes in watch, PSOs should establish a point of contact with the construction crew. The PSO will brief the point of contact as to the shutdown procedures if marine mammals are observed and likely to enter or are within the shutdown zone, and shall request that the point of contact instruct the crew to notify the PSO when a marine mammal is observed. If the point of contact goes "off shift" and delegates his duties, the PSO must be informed and brief the new point of contact.

2.4.3. Shutdown Zones

9. PSOs will be located onsite throughout pile-driving activities**.** PSOs will monitor the relevant zones indicated for each activity **(**Table 3**).** Where requirements for immediate actions/responses are noted, the requirements do not apply if they would create an imminent and serious threat to a person or vessel. In that event, actions/responses will be taken as soon as possible. Additional mitigation measures for each activity are listed in subsections below.

The purpose of a shutdown zone is to define an area within which work will cease (shutdown of the activity occurs upon sighting of a marine mammal or in anticipation of an animal entering the defined area).

Table 3. Level A Shutdown Zones.

Pile size, type, and method	Shutdown Zones by Functional Hearing Groups (m)	
	Low-Frequency Cetaceans	Otariid
Vibratory Pile Driving/Removal		
20-in steel fender pile installation	10	10
30-in steel pile temporary installation	10	10
30-in steel pile removal	10	10
36-in steel permanent installation	25	10
H-pile installation	25	10
Sheet pile installation	25	10
Impact Pile Driving		
36-in steel permanent installation	625	25
20-in fender pile installation	10	10
H-pile installation	25	10
Sheet pile installation	25	10
DTH		
36-in steel permanent installation	1,230	50
20-in steel fender pile installation	265	15
H-pile installation	265	15

No take by Level A harassment of humpback whales is proposed for authorization or expected to occur due to their large size and ability to be visibly detected in the project area if an animal should approach the Level A harassment zone. No level A harassment of Steller sea lions is proposed for authorization or expected to occur due to the small shutdown zones and the presence of observers watching for them.

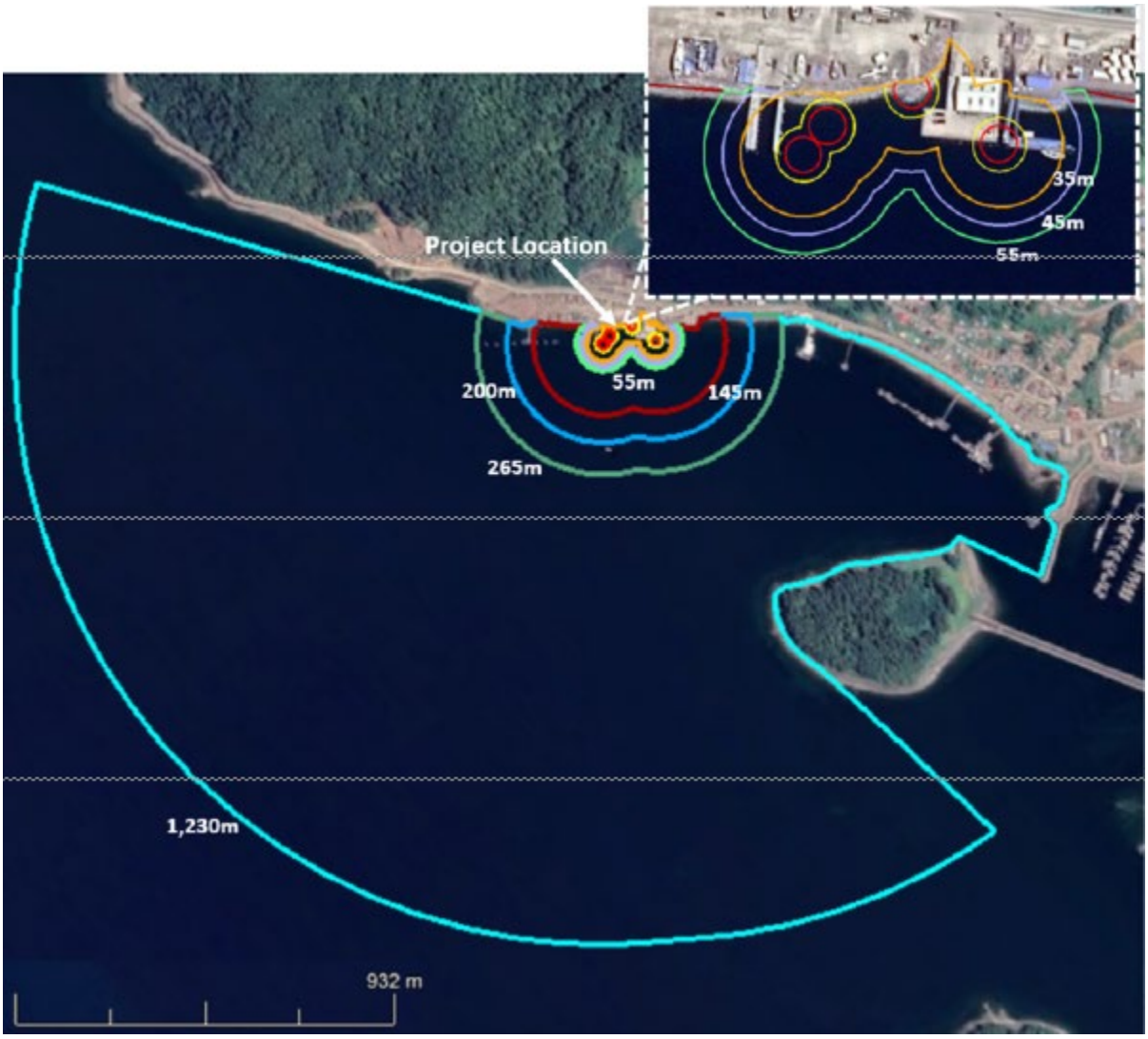

Figure 5. Distances to Level A shutdown Zones for various species and noise sources.

10. PSOs will be positioned such that the entire shutdown zone and adjacent waters for each activity is visible (e.g., situated on a platform, elevated promontory, boat or aircraft). This location, with optimal viewing of the harassment zones, will be verified prior to pile driving activities, startup procedures, or initiation of other activities.

Observers and their positions are designed to ensure that there is full coverage of the entire action area during all in-water activities. Three PSOs will be onsite during all in-water activities associated with the HMIC Cargo Dock Project, with locations as follows (Figure 6):

- PSO 1: stationed at the pile site on the existing City Dock
- PSO 2: stationed on Halibut Island facing south

- PSO 3: stationed on a vessel running a transect through southern portion of the action area in Port Frederick[1]

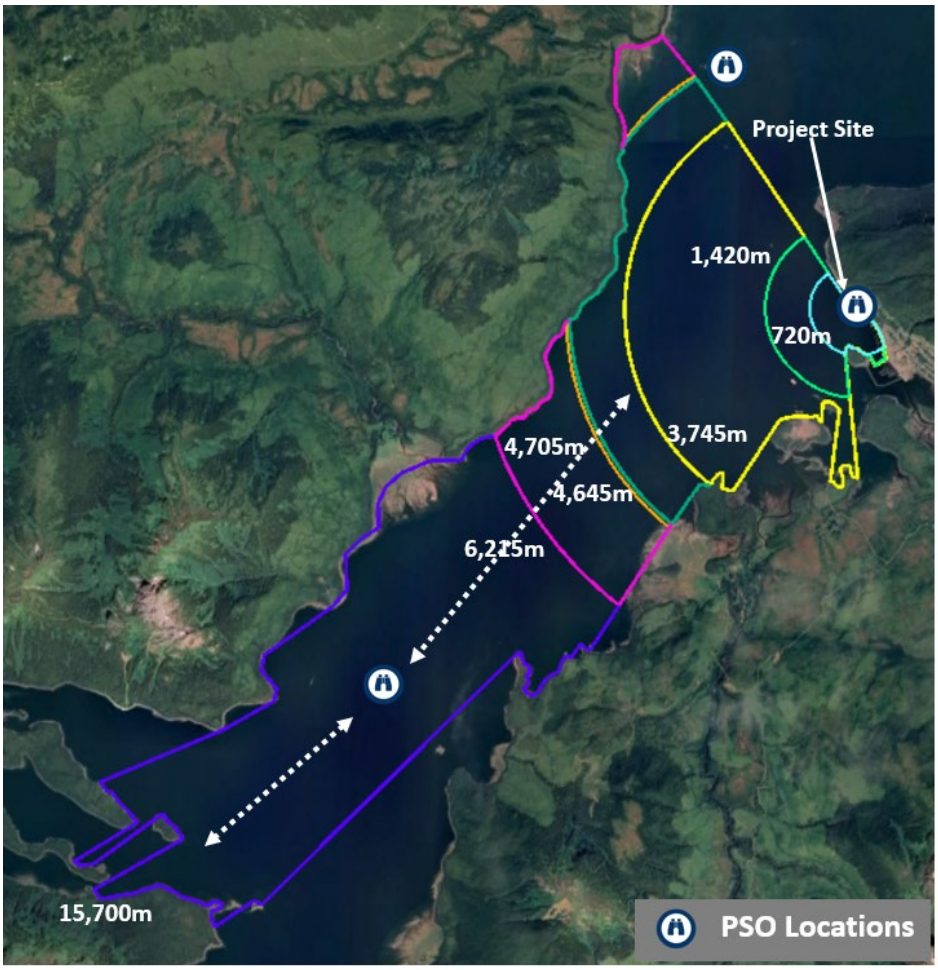

Figure 6. PSO Locations.

11. Prior to commencing pile driving activities, PSOs will scan waters within the pile driving shutdown zones and confirm no listed marine mammals are observed to be present within the shutdown zones for 30 minutes prior to initiation of the in-water activity. If one or more listed marine mammals are observed within the shutdown zone, pile driving will not begin until the marine mammals exit the shutdown zones of their own accord, and the zones have remained clear of marine mammals for 30 minutes immediately prior to activity.
12. The PSOs will continuously monitor the shutdown zones during pile driving activities for the presence of marine mammals.

[1] A separate individual will serve as a boat captain. The boat captain can also be approved as a PSO to rotate with the vessel-based PSO to ensure mitigation measures to prevent observer fatigue are followed.

13. In-water activities will take place during daylight conditions and with a Beaufort Sea State of 4 or less, with adequate visibility to see the entire shutdown zone and adjacent waters to effective shutdown activities prior to a marine mammal entering a shutdown zone.
14. If visibility degrades to where the PSO determines that he/she cannot ensure that a marine mammal does not enter the shutdown zone during pile driving activities, the crew will cease activity until the entire shutdown zone is visible and the PSO has indicated that the zone has remained devoid of marine mammals for 30 minutes prior to additional activity.

Icy Strait often experiences increased sea states and more frequent inclement weather compared to the relatively protected Port Frederick Inlet. Halibut Island's exposure to Icy Strait may make it unsafe to place an observer at this location during increased sea state events. If this occurs, Long Island may be used as an alternate location for that monitoring period (Figure 7). The lead PSO will document the change and takes will be extrapolated.

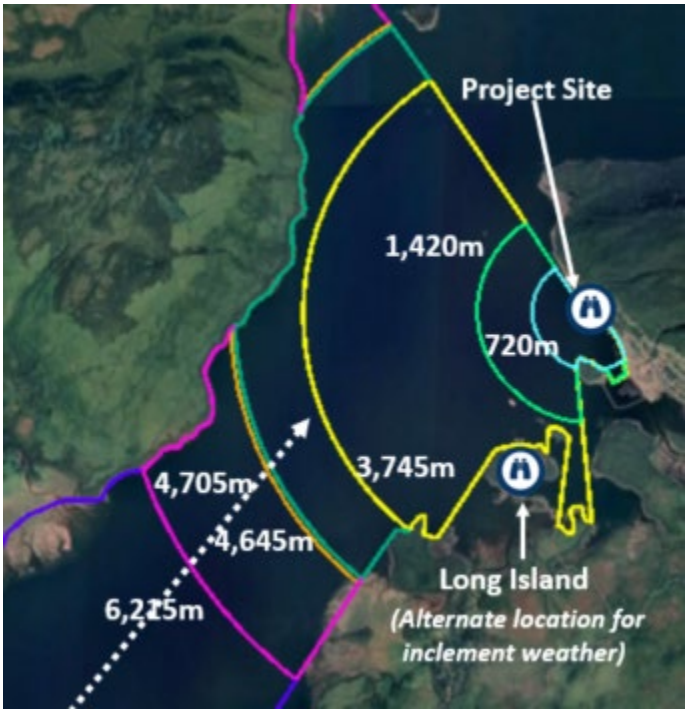

Figure 7. Alternate location for PSO in case of inclement weather.

15. The PSO will order the pile driving activities to immediately cease if one or more marine mammals appears likely to enter, or is observed within, the appropriate shutdown zone. The PSO on duty will immediately call or radio the operators and initiate a shutdown of pile driving activities. If direct communication with the operators is not practical, the construction crew point of contact will relay the shutdown order to the equipment operators.
16. Following shutdown of pile driving activities for less than 30 minutes due to the presence of marine mammals in the shutdown zone, pile driving may commence when the PSO provides assurance that listed marine mammals were observed exiting the shutdown zone or have not been seen in the shutdown zone for 30 minutes (for cetaceans) or 15 minutes (for pinnipeds).

We include a slightly longer period for cetaceans to accommodate their ability to hold their breath longer than pinnipeds.

17. Following a lapse of pile driving activities of more than 30 minutes (due to time spent welding a new section of pipe, low visibility conditions, shutdown due to presence of marine mammals, mechanical delays or other causes), the PSO will authorize resumption of activities (using soft-start procedures if applicable) only after the PSO provides assurance that listed marine mammals have not been present in the shutdown zone for at least 30 minutes immediately prior to resumption of operations.

If a marine mammal is observed within a shutdown zone (see Table 3), or is otherwise harassed, harmed, injured, or disturbed, PSOs will report that occurrence to NMFS using the contact specified in Item 42**.** Alternately, crew members may report incidences of harassment, harm, injury, or disturbance of marine mammals to a PSO who has been designated as the point of contact between crew members and NMFS.

No take by Level A harassment of humpback whales is proposed for authorization or expected to occur due to their large size and ability to be visibly detected in the project area if an animal should approach the Level A harassment zone. No level A harassment of Steller sea lions is proposed for authorization or expected to occur due to the small shutdown zones and the presence of observers watching for them.

2.4.4. Pile driving

18. If no listed marine mammals are observed within the pile driving activities' shutdown zone for 30 minutes, soft-start procedures will be implemented immediately prior to impact pile driving activities.
    a. For impact pile driving, a soft-start is comprised of an initial set of three strikes from the hammer at about 40 percent energy, followed by a 30-second waiting period, then two subsequent three-strike sets with associated 30-second waiting periods at the reduced energy.

Soft start procedures for vibratory pile driving will not be implemented and are not required. Following this soft-start procedure, impact or vibratory pile driving at operational power may commence provided marine mammals remain absent from the pile driving monitoring zone.

19. If visibility degrades to where the PSO determines that he/she cannot ensure that a marine mammal does not enter the shutdown zone during pile driving, the crew may continue to drive the section of pipe that was being driven to its target depth, but will not drive additional piles or sections of piling. If pile driving is suspended (to weld on a new section, for example) when the monitoring zone is not visible, the crew will not resume pile driving until visibility is determined to be adequate by the PSO and the PSO has indicated that the zone has remained devoid of marine mammals for 30 minutes prior to additional pile driving.

2.4.5. Placement of Fill

20. Fill material will consist of rock fill that is free of fine sediments to the extent practical, to reduce suspended materials from entering the water column during tidal cycles. Fill material will also be free of invasive marine and terrestrial vegetation species.

21. Dredged material that is fine (greater than 50 percent passing a no. 200 sieve) will only be placed above the MHHW to minimize turbidity and other water quality effects while draining

2.4.6. Vessel Transit

22. Vessel operators will maintain a vigilant watch for marine mammals to avoid vessel strikes.
23. Consistent with NMFS marine mammal viewing guidelines (https://alaskafisheries.noaa.gov/pr/mm-viewing-guide), operators of vessels will, at all times, avoid approaching marine mammals within 100 yards. Operators will observe direction of travel and attempt to maintain a distance of 100 yards or greater between the animal and the vessel by working to alter course or slowing the vessel. If a North Pacific right whale is sighted, avoidance measures will be taken to maintain at least 800 m distance between the whale and the vessel.
24. Vessels will stay at least 300 m away from cow-calf pairs, feeding aggregations, or whales that are engaged in breeding behavior.
25. The vessel operator will avoid separating members of a group of marine mammals from other members of that group. A group is defined as being three or more whales observed within a 500-m (1641-ft) area and displaying behaviors of directed or coordinated activity (e.g., group feeding).
26. If the vessel approaches within 1.6 km (1 mi) of observed whales, except when providing emergency assistance or in other emergency situations, the vessel operator will take reasonable precautions to avoid potential interaction with the whales by taking one or more of the following actions, as appropriate: Reducing vessel speed to less than 5 knots (9 km/hour) within 274 m (300 yards or 900 ft) of the whale(s).
    a. Steering around the whale(s) if possible.
    b. Operating the vessel(s) to avoid causing a whale to make changes in direction.
    c. Checking the waters immediately adjacent to the vessel(s) to ensure that no whales will be injured when the propellers are engaged.
    d. Reducing vessel speed to 9 knots (17 km/hour) or less when weather conditions reduce visibility to less than 274 m (300 yards or 900 ft) to avoid the likelihood of injury to whales.
27. Vessels in the monitoring and shutdown zones shall not exceed speeds of 10 knots in order to reduce potential marine mammal strikes whether marine mammals have been observed or not.
28. If a whale approaches the vessel and if maritime conditions safely allow, the engine will be put in neutral and the whale will be allowed to pass beyond the vessel. If the vessel is taken out of gear, vessel crew will ensure that no whales are within 50 m of the vessel when propellers are re-engaged, thus minimizing risk of marine mammal injury.
29. When weather conditions require, such as when visibility drops, support vessels must reduce speed and change direction as necessary (and as operationally practicable), to avoid the likelihood of injury to marine mammals.
30. Vessels should take reasonable steps to alert other vessels in the vicinity of whale(s).

31. Vessels will not allow tow lines to remain in the water, and no trash or other debris will be thrown overboard, thereby reducing the potential for marine mammal entanglement.
32. The applicant will implement measures to minimize risk of spilling hazardous substances. These measures will include: avoiding operation of watercraft in the presence of sea ice to the extent practicable and using fully-operational vessel navigation systems composed of radar, chartplotter, sonar, marine communication systems, and satellite navigation receivers, as well as Automatic Identification System (AIS) for vessel tracking.
33. The transit route for the vessels will avoid known biologically important areas and designated critical habitat to the extent practicable.

2.4.7. Vessel Transit Through Steller Sea Lion Critical Habitat/Near Major Rookeries and Haulouts

34. The vessel operator will not purposely approach within 3 nautical miles (nm; 5.5 km) of major Steller sea lion rookeries or haulouts where vessel safety requirements allow and/or where practicable. Vessels will remain 3 nm (5.5 km) from all Steller sea lion rookery sites listed in paragraph 50 CFR 224.103 (d)(1)(iii).

2.4.8. Data Collection & Reporting

35. PSOs will record observations on data forms or into electronic data sheets, electronic copies of which will be submitted to NMFS in a digital spreadsheet format at the end of the project.
36. PSOs will use NMFS-approved Observation Records (a sample observation record data sheet is provided as Appendix B to this opinion). Observation Records will be used to record the following:
    a. The date and start and stop time for each PSO shift;
    b. Date and time of each significant event (e.g., a marine mammal sighting, operation shutdown, reason for operation shutdown, change in weather)
    c. Weather parameters (e.g., percent cloud cover, percent glare, visibility) and sea state where the Beaufort Wind Force Scale will be used to determine sea-state (https://www.weather.gov/mfl/beaufort);
    d. Species, numbers, and, if possible, sex and age class of observed marine mammals, along with the date, time, and location of the observation;
    e. The predominant sound-producing activities occurring during each marine mammal sighting;
    f. Marine mammal behavior patterns observed, including bearing and direction of travel;
    g. Behavioral reactions of marine mammals just prior to, or during sound producing activities;
    h. Location of marine mammals, distance from observer to the marine mammal, and distance from the predominant sound-producing activity or activities to marine mammals;

i. Whether the presence of marine mammals necessitated the implementation of mitigation measures to avoid acoustic impact, and the duration of time that normal operations were affected by the presence of marine mammals.

j. Geographic coordinates for the observed animals, with the position recorded by using the most precise coordinates practicable (coordinates must be recorded in decimal degrees, or similar standard, and defined coordinate system).

2.4.9. Vessel Collision Reporting

37. Though take of marine mammals by vessel collision is not authorized, if a listed marine mammal is struck by a vessel, it must be reported to NMFS within 24 hrs (Item 42). The following will be included when reporting vessel collisions with marine mammals:

a. Information that would otherwise be listed in the PSO vessel report

b. Number and species of marine mammals involved in collision.

c. The date, time, and location of the collision.

d. The cause of the take (e.g., vessel strike).

e. The time the animal(s) was first observed and last seen.

f. Mitigation measures implemented prior to and after the animal was taken.

g. Contact information for PSO on duty at the time of the collision, ship's Pilot at the time of the collision, or ship's Captain.

2.4.10. Unauthorized Take Reporting

38. If a listed marine mammal is determined by the PSO to have been disturbed, harassed, harmed, injured, or killed (e.g., a listed marine mammal(s) is injured or killed or is observed entering the shutdown zone before operations can be shut down), it must be reported to NMFS within one business day (contact listed below, Item 42). These PSO records must include:

a. Information that must be listed in the PSO report (see Item 37).

b. Number of listed animals affected.

c. The date and time of each event.

d. The cause of the event (e.g., humpback whale approached within 1230 m of active down-the-hole drilling).

e. The time the animal(s) entered the harassment zone, and, if known, the time it exited the zone.

f. Mitigation measures implemented prior to and after the animal entered the harassment zone.

2.4.11. Stranded, Injured, Sick or Dead Marine Mammal (not associated with the project)

39. If PSOs observe an injured, sick, or dead marine mammal (i.e., stranded marine mammal), they shall notify the Alaska Marine Mammal Stranding Hotline at 877-925-7773 (Item 42). The PSOs will submit photos and data that will aid NMFS in determining how to respond to the stranded animal. Data submitted to NMFS in response to stranded marine mammals will include date/time, location of stranded marine mammal, species and number of stranded marine mammals, description of the stranded marine mammal's condition, event type (e.g., entanglement, dead, floating), and behavior of live-stranded marine mammals.

2.4.12. Oil Spill Response

40. In the event of an oil spill in the marine environment, the permittees shall immediately report the incident to: the U.S. Coast Guard 17th District Command Center at 907-463-2000, and NMFS AKR, Protected Resources Division Oil Spill Response Coordinator at 907-586-7630 and/or email (sadie.wright@noaa.gov).

2.4.13. Final Report

41. A final report will be submitted to NMFS within 90 calendar days of the completion of the project summarizing the data recorded as per **Item 37** and submitted to Greg Balogh, NMFS PRD ANC supervisor, at greg.balogh@noaa.gov. The report will summarize all activities associated with the proposed action, and results of marine mammal monitoring conducted during the in-water project activities. The final technical report will include items from the list above as well as the following:

    a. Summaries of monitoring efforts including total hours, total distances, and marine mammal distribution through the study period, accounting for sea state and other factors that affect visibility and detectability of marine mammals.

    b. Analyses on the effects from various factors that may have influenced detectability of marine mammals (e.g., sea state, number of observers, fog, glare, and other factors as determined by the PSOs).

    c. Species composition, occurrence, and distribution of marine mammal sightings, including date, water depth, numbers, age/size/gender categories (if determinable), group sizes, and ice cover.
    Effects analyses of the project activities on listed marine mammals.

    d. Number of marine mammals observed (by species) during periods with and without project activities (and other variables that could affect detectability), such as:

        i) Initial marine mammal sighting distances versus project activity at time of sighting.

        ii) Observed marine mammal behaviors and movement types versus project activity at time of sighting.

        iii) Numbers of marine mammal sightings/individuals seen versus project activity at time of sighting.

iv) Distribution of marine mammals around the action area versus project activity at time of sighting.

42. Digital, queryable documents containing PSO observations and records, and digital, queryable reports will be submitted to: Greg Balogh at greg.balogh@noaa.gov and to Kristin Mabry at Kristin.Mabry@noaa.gov. In the event that this contact information becomes obsolete, call 907-271-5006 for updated reporting contact information.

2.4.13.1. Summary of Agency Contact Information

Reason for Contact	**Contact Information**
Consultation Questions Final Reports & Data Submittal	Kristin Mabry; Kristin.Mabry@noaa.gov
Stranded, Injured, or Dead Marine Mammal	Stranding Hotline (24/7 coverage) 877-925-7773
Oil Spill Response	U.S. Coast Guard 17th District Command Center: 907-463-2000 Sadie Wright: 907-586-7630, sadie.wright@noaa.gov
In the event that this contact information becomes obsolete	NMFS Anchorage Main Office: 907-271-5006

2.4.14. Level B Monitoring Zones

COH is requesting authorization for Level B take of Steller sea lions and humpback whales incidental to constructing the HMIC Cargo Dock Project. Shutdowns associated with Level B harassment of these species are not proposed.

Utilizing the practical spreading loss model (NMFS 2018), COH determined underwater noise will fall below the behavioral effects threshold of 120 dB rms for marine mammals at the distances shown in Table 9 for vibratory pile driving/removal and DTH. Note that Figure 8 shows were land masses block sound transmission, and reduce the zone accordingly. For DTH, the largest radial distance was 11,659 m. For calculating the Level B harassment zone for impact driving, the practical spreading loss model was used with a behavioral threshold of 160 dB rms. The maximum radial distance of the Level B harassment zone for impact piling equaled 3,744 m for 36-in piles m. Table 4 below provides all Level B harassment radial distances (m) during COH's proposed activities, and the zones are depicted in Figure 9.

Table 4. Level B Harassment Zones

Activity	Received Level at 10 meters	Level B Harassment Zone (m)*
Vibratory Pile Driving/Removal		
20-inch steel fender pile installation	161.9 SPL	6,215 (calculated 6,213)
30-inch steel temporary installation	161.9 SPL	6,215 (calculated 6,213)
30-inch steel removal	161.9 SPL	6,215 (calculated 6,213)
36-inch steel permanent installation	168.2 SPL	15,700[a] (calculated 16,343)
H-pile installation	168 SPL	15,700[a] (calculated 17,434)
Sheet pile installation	160 SPL	4,645 (calculated 4,642)
Impact Pile Driving		
20-inch fender pile installation	161 SEL/174.8 SPL	100 (calculated 97)
36-inch steel permanent installation	186.7 SEL/ 198.6 SPL	3,745 (calculated 3,744)
H-pile and Sheet pile installation	163 SEL/177 SPL	205 (calculated 204)
DTH		
20-inch steel fender pile installation	166 SPL	11,660 (calculated 11,659)
36-inch steel temporary installation	166 SPL	11,660 (calculated 11,659)
H-pile installation	166 SPL	11,660 (calculated 11,659)

* Numbers rounded up to nearest 5 meters. These specific rounded distances are for monitoring purposes rather than take estimation.
[a] Although the calculated distance to Level B harassment thresholds extends these distances, all Level B harassment zones are truncated at 15,700m from the source where land masses block sound transmission.

As discussed previously and shown in Figure 6, observers will monitor the Level B harassment zone from three locations, including a vessel moving along transects in the southern portion of Port Frederick. NMFS expects that observers will first observe humpback whales and Steller sea lions from the two positions located at the mouth of Port Frederick and will communicate that information to the third observer on the boat. Then, the maximum distance at which PSOs will be expected to observe humpback whales and Steller sea lions in the southern portion of Port Frederick's Level B harassment zone is around 5,000 meters.

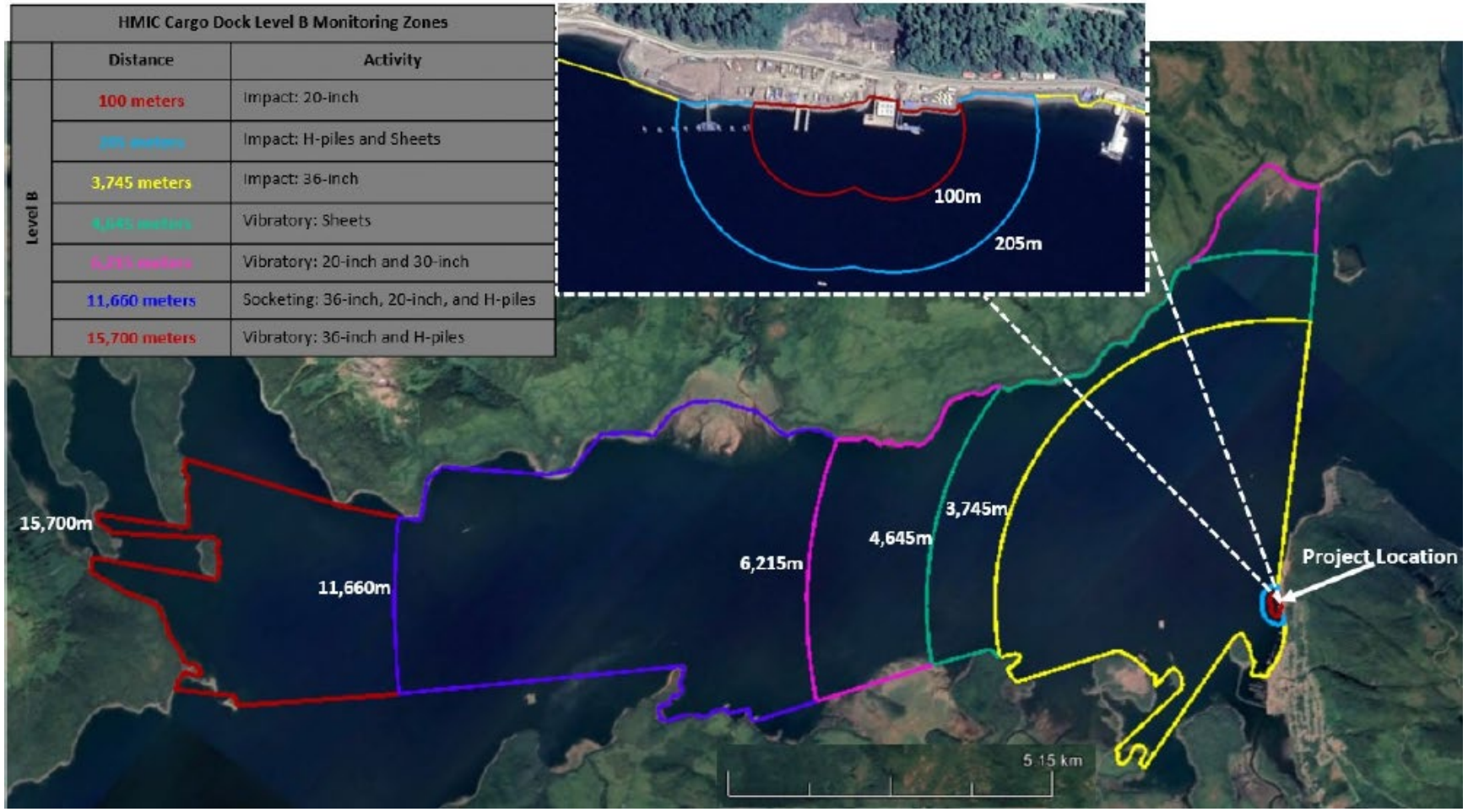

Figure 8. Level B Monitoring Zones

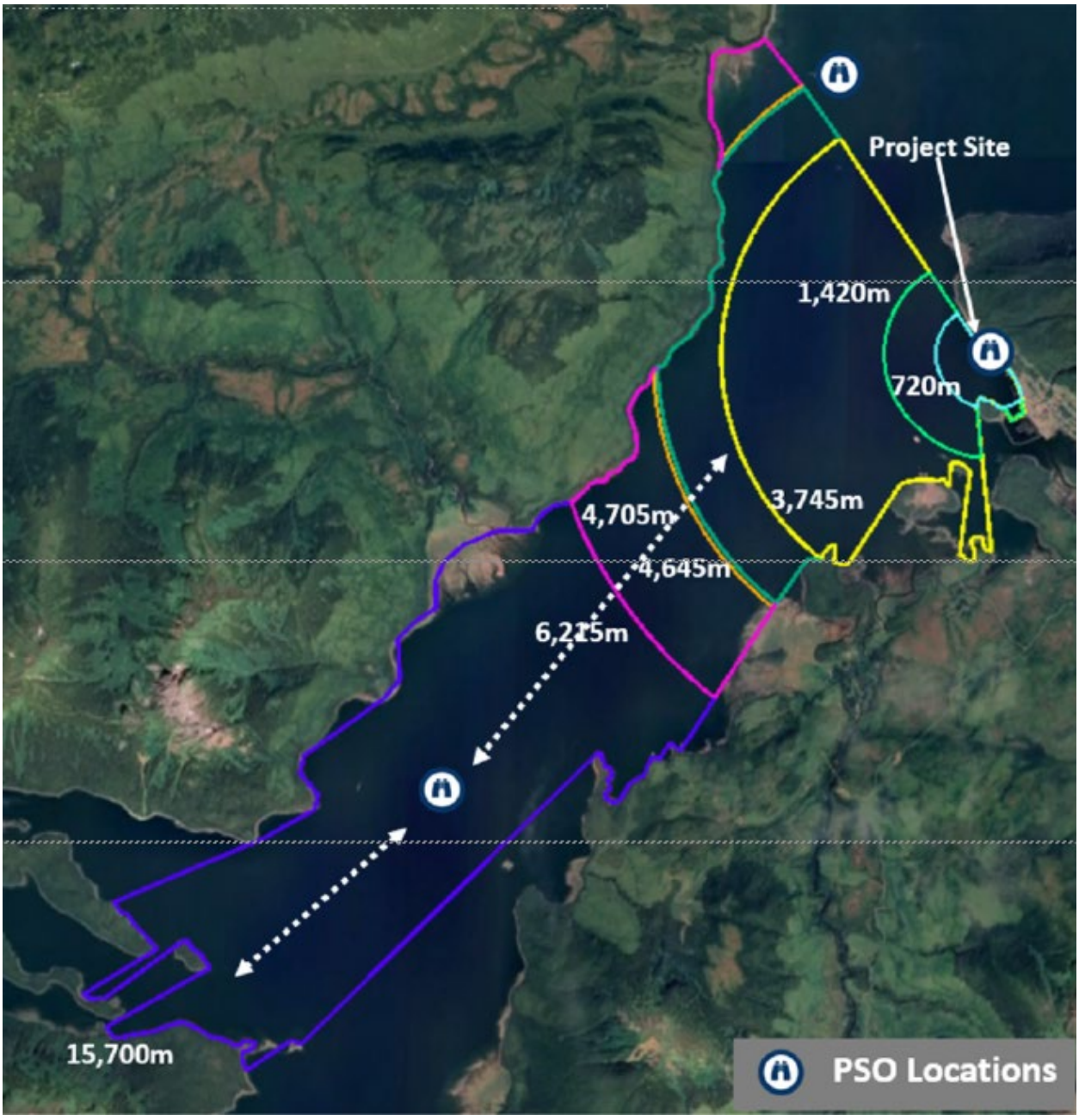

Figure 9. PSO locations and Level B Monitoring Zones.

2.5. Action Area

"Action area" means all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR § 402.02). For this reason, the action area is typically larger than the project area and extends out to a point where no measurable effects from the proposed action occur.

The action area for the proposed dock project includes the maximum area within which project-related noise levels are expected to reach or exceed 120 dB re 1 µPa rms (henceforth 120 dB), i.e., ambient noise levels, where no measurable effect from the project would occur. Based on reported source levels (Denes *et al*., 2016 and Austin *et al*., 2016) and calculated sound propagation estimates (Table 12), noise disturbance from project-related sounds may occur at a maximum distance of 15,700 m from the source, where the transmission of sound in truncated by land (Table 4 and Figure 9).

The action area includes: (1) the area in which construction activities will take place, (2) an ensonified area around the pile removal and installation activities, and (3) the transit routes between the two barges' ports of origin in Washington and either Ketchikan or Juneau and the project site. The action area includes approximately 50 square kilometers in Port Frederick Inlet (Figure 10), plus a 2 kilometer sound and safety buffer around the transit routes (Figure 11). We assume the routes depicted in Figure 11 are the likely transit routes for the material barge between Washington and Hoonah, and the construction barge between either Juneau or Ketchikan and Hoonah. Because the second barge could come from either Juneau or Ketchikan, we've include both in the action area.

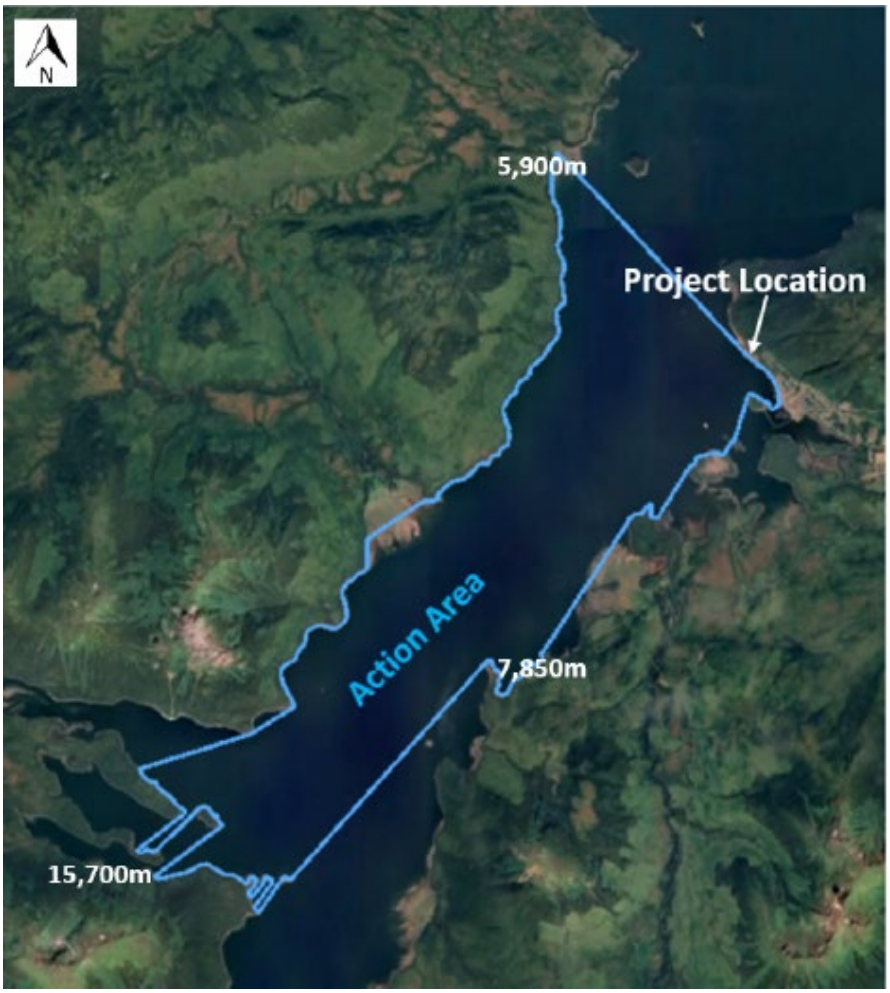

Figure 10. The portion of the action area in Port Frederick Inlet is outlined by blue.

Figure 11. Presumed barge transit routes to the project area are shown in green. These transit routes are part of the action area.

3. APPROACH TO THE ASSESSMENT

Section 7(a)(2) of the ESA requires Federal agencies, in consultation with NMFS, to ensure that their actions are not likely to jeopardize the continued existence of endangered or threatened species, or adversely modify or destroy their designated critical habitat. The jeopardy analysis considers both survival and recovery of the species. The adverse modification analysis considers the impacts to the conservation value of the designated critical habitat.

To jeopardize the continued existence of a listed species means to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species (50 CFR § 402.02). As NMFS explained when it promulgated this definition, NMFS considers the likely impacts to a species' survival as well as likely impacts to its recovery. Further, it is possible that in certain, exceptional circumstances, injury to recovery alone may result in a jeopardy biological opinion (51 FR 19926, 19934; June 3, 1986).

Under NMFS's regulations, the destruction or adverse modification of critical habitat means a direct or indirect alteration that appreciably diminishes the value of critical habitat as a whole for the conservation of a listed species (50 CFR § 402.02).

The designation(s) of critical habitat for Steller sea lions use(s) the term primary constituent element (PCE) or essential features. The 2016 critical habitat regulations (81 FR 7414; February 11, 2016) replaced this term with physical or biological features (PBFs). The shift in terminology does not change the approach used in conducting a "destruction or adverse modification" analysis, which is the same regardless of whether the original designation identified PCEs, PBFs, or essential features. In this biological opinion, we use the term PBF to mean PCE or essential feature, as appropriate for the specific critical habitat.

We use the following approach to determine whether the proposed action described in Section 2 of this opinion is likely to jeopardize listed species or destroy or adversely modify critical habitat:

Identify those aspects (or stressors) of the proposed action that are likely to have effects on listed species or critical habitat. As part of this step, we identify the action area – the spatial and temporal extent of these effects.

Identify the rangewide status of the species and critical habitat likely to be adversely affected by the proposed action. This section describes the current status of each listed species and its critical habitat relative to the conditions needed for recovery. We determine the rangewide status of critical habitat by examining the condition of its PBFs - which were identified when the critical habitat was designated. Species and critical habitat status are discussed in Section 4 of this opinion.

Describe the environmental baseline including: past and present impacts of Federal, state, or private actions and other human activities *in the action area*; expected impacts of proposed Federal projects that have already undergone formal or early section 7 consultation, and the impacts of state or private actions that are contemporaneous with the consultation in process. The

environmental baseline is discussed in Section 5 of this opinion.

Analyze the effects of the proposed action. Identify the listed species that are likely to co-occur with these effects in space and time and the nature of that co-occurrence (these represent our *exposure analyses*). In this step of our analyses, we try to identify the number, age (or life stage), and gender of the individuals that are likely to be exposed to stressors and the populations or subpopulations those individuals represent. NMFS also evaluates the proposed action's effects on critical habitat PBFs. The effects of the action are described in Section 6 of this opinion with the exposure analysis described in Section 6.2 of this opinion.

Once we identify which listed species are likely to be exposed to an action's effects and the nature of that exposure, we examine the scientific and commercial data available to determine whether and how those listed species are likely to respond given their exposure (these represent our *response analyses*). Response analysis is considered in Section 6.3 of this opinion.

Describe any cumulative effects. Cumulative effects, as defined in NMFS's implementing regulations (50 CFR § 402.02), are the effects of future state or private activities, not involving Federal activities, that are reasonably certain to occur within the action area. Future Federal actions that are unrelated to the proposed action are not considered because they require separate section 7 consultation. Cumulative effects are considered in Section 7 of this opinion.

Integrate and synthesize the above factors to assess the risk that the proposed action poses to species and critical habitat. In this step, NMFS adds the effects of the action (Section 6) to the environmental baseline (Section 5) and the cumulative effects (Section 7) to assess whether the action could reasonably be expected to: (1) appreciably reduce the likelihood of both survival and recovery of the species in the wild by reducing its numbers, reproduction, or distribution; or (2) appreciably diminish the value of critical habitat for the conservation of the species. These assessments are made in full consideration of the status of the species and critical habitat (Section 4). Integration and synthesis with risk analyses occurs in Section 8 of this opinion.

Reach jeopardy and adverse modification conclusions. Conclusions regarding jeopardy and the destruction or adverse modification of critical habitat are presented in Section 9. These conclusions flow from the logic and rationale presented in the Integration and Synthesis Section 8.

If necessary, define a reasonable and prudent alternative to the proposed action. If, in completing the last step in the analysis, NMFS determines that the action under consultation is likely to jeopardize the continued existence of listed species or destroy or adversely modify designated critical habitat, NMFS must identify a reasonable and prudent alternative (RPA) to the action.

4. RANGEWIDE STATUS OF THE SPECIES AND CRITICAL HABITAT

This opinion considers the effects of the proposed action on the species and designated critical habitats specified in Table 5. No designated critical habitat is within the action area. The nearest Steller sea lion rookery is on the White Sisters Islands near Sitka and the nearest Steller sea lion major haulouts are at Benjamin Island, Cape Cross, and Graves Rocks. The White Sisters rookery is located on the west side of Chichagof Island, about 72 km southwest of the project area. Benjamin Island is about 60 km northeast of Hoonah. Cape Cross and Graves Rocks are both about 70 km west of Hoonah.

Table 5. Listing status and critical habitat designation for species considered in this opinion.

Species	Status	Listing	Critical Habitat
Humpback Whale, Western North Pacific DPS *(Megaptera novaeangliae)*	Endangered	NMFS 2016, 81 FR 62260	*Proposed:* NMFS 2019, 84 FR 54354
Sperm Whale (*Physeter macrocephalus*)	Endangered	NMFS 1970, 35 FR 18319	Not designated
Steller Sea Lion, Western DPS *(Eumetopias jubatus)*	Endangered	NMFS 1997, 62 FR 24345	NMFS 1993, 58 FR 45269

4.1. Species and Critical Habitat Not Likely to be Adversely Affected by the Action

NMFS uses two criteria to identify those endangered or threatened species or critical habitat that are likely to be adversely affected. The first criterion is exposure or some reasonable expectation of a co-occurrence between one or more potential stressors associated with the proposed activities and a listed species or designated critical habitat. The second criterion is the probability of a response given exposure.

We applied these criteria to the species and critical habitats listed above and determined that the following species and designated critical habitats are not likely to be adversely affected by the proposed action: sperm whales and Steller sea lion critical habitat. Below we discuss our rationale for those determinations.

4.2. Sperm Whales

Tagged sperm whales have been tracked within the Gulf of Alaska. Of 31 sperm whales tagged in the Gulf of Alaska between 2007 and 2016, only two sperm whales were tracked (in 2014 and 2015) along vessel transit routes in the action area, in Chatham Strait and Icy Strait. This Southeast Alaska Sperm Whale Avoidance Project (SEASWAP) tracking data is shown in Figure 12. Tagged whales did not enter the ensonified area. More recently, four Sperm whales were observed in southern Lynn Canal in November 2018, and two in March 2019 (Whale Alert unpublished data). On March 20, 2019, NMFS performed a necropsy on a sperm whale in Lynn Canal that died from trauma consistent with a ship strike. This is the only documented strike of a sperm whale in southeast Alaska.

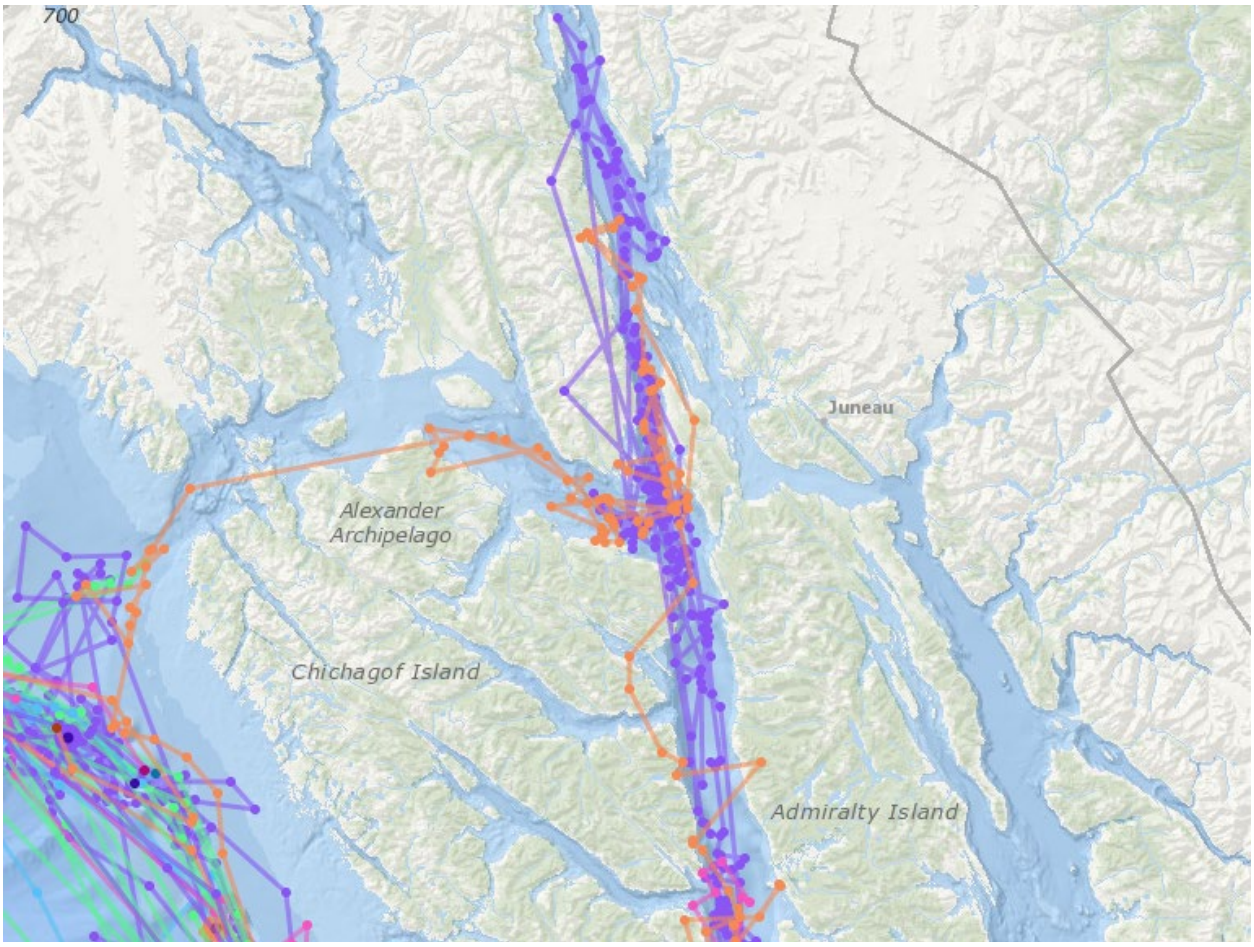

Figure 12. SEASWAP data of sperm whales moving in and around Southeast Alaska. This research is conducted under NOAA Permit Number 18529, issued to Jan Straley.

Tagging studies primarily show that sperm whales use the deep water slope habitat extensively for foraging (Mathias et al. 2012). Interaction studies between sperm whales and the longline fishery have been focused along the continental slope of the eastern Gulf of Alaska in water depths between about 1,970 and 3,280 ft (600 and 1,000 m) (Straley et al. 2005, Straley et al. 2014). The action area for this project includes sperm whale habitat (these shelf-edge/slope waters of the Gulf of Alaska) only for transportation of equipment to the project site near Hoonah, Alaska.

It is possible that sperm whales may be encountered during barge transit from Washington and Juneau or Ketchikan to the construction site in Port Frederick. Therefore, the species could be at-risk for vessel strike. However, it is extremely unlikely that project vessels will strike sperm whales for the following reasons:

- Few, if any, sperm whales are likely to be encountered because they are generally found in deeper waters than those in which most activities associated with the project will occur;

- There have been no documented strikes of sperm whales in the action area;
- The material barge and the construction barge will only transit through sperm whale habitat once to get to the project area, and once to leave (Figure 11). They will not make multiple trips. Barges are slow moving vessels, further reducing the potential for collisions;
- The two skiffs associated with the project will not transit through sperm whale habitat; and
- All vessels associated with this action will follow NMFS's guidelines for approaching marine mammals which discourage vessels approaching within 100 yards of marine mammals.

While it is possible (although unlikely) that a sperm whale may be in the general area of construction activities, it is highly unlikely that a sperm whale will be exposed to project-related noises for the following reasons:

- There have been no sightings of sperm whales within the area that will be ensonified, and they are not expected to inhabit the shallow and protected waters of Port Frederick.
- The seasonal timing of the observations of sperm whales in Lynn Canal described above does not overlap with the proposed timing of project activities.
- The only additional noise which may be affiliated with the project is the vessel noise associated with the barges and skiffs. The mitigation measures include best practices for reducing vessel-related harassment.
- The mitigation measures require PSOs to call an immediate shutdown of pile driving activities should a species that is not authorized to be taken (such as sperm whale) be observed approaching the harassment zones.

For these reasons, we conclude the stressors associated with the proposed action would either have no effect or immeasurably small effects on sperm whales. Sperm whales are not anticipated to overlap in time and space with project activities thus are not anticipated to be exposed to project-related noise, and the effects of ship strike are extremely unlikely to occur. Therefore, sperm whales are not likely to be adversely affected by this action.

4.3. Steller Sea Lion Critical Habitat

NMFS designated critical habitat for Steller sea lions on August 27, 1993 (58 FR 45269). The following PBFs were identified at the time of listing:

1. Alaska rookeries, haulouts, and associated areas identified at 50 CFR 226.202(a), including:
   a. Terrestrial zones that extend 914 m (3,000 ft) landward
   b. Air zones that extend 914 m (3,000 ft) above the terrestrial zone
   c. Aquatic zones that extend 914 m (3,000 ft) seaward from each major rookery and major haulout east of 144º W. longitude

d. Aquatic zones that extend 37 km (23 mi) seaward from each major rookery and major haulout west of 144° W. longitude

2. Three special aquatic foraging areas identified at 50 CFR 226.202(c):

a. Shelikof Strait
b. Bogoslof
c. Seguam Pass

The action area associated with the project does not overlap with designated Steller sea lion critical habitat. The nearest rookery is on the White Sisters Islands near Sitka and the nearest major haulouts are at Benjamin Island, Cape Cross, and Graves Rocks. The White Sisters rookery is located on the west side of Chichagof Island, about 72 km southwest of the project area. Benjamin Island is about 60 km northeast of Hoonah. Cape Cross and Graves Rocks are both about 70 km west of Hoonah. Transit routes to and from the construction site may include waters in the vicinity of haulouts (Figure 11), but mitigation measures require all vessels associated with the project to avoid the 3,000 ft (914 m) aquatic zone surrounding any designated Steller sea lion critical habitat in Southeast Alaska (east of 144° W longitude).

Figure 13. Designated critical habitat for Steller sea lions in Southeast Alaska.

It is unlikely that vessel transit will impact critical habitat surrounding haulouts and rookeries to any measurable degree considering vessels will avoid designated aquatic zones. We conclude

any impacts to these PBFs are likely to be undetectable. Therefore, we conclude Steller sea lion critical habitat is not likely to be adversely affected by this action.

4.4. Climate Change

One potential threat common to all of the species we discuss in this opinion is global climate change. Because of this commonality, we present this narrative here rather than in each of the species-specific narratives that follow.

The timeframe for the proposed action is a maximum of four months, which is a relatively short duration to detect any noticeable climate change impacts. We present potential climate change effects on listed species and their habitat below.

The average global surface temperature rose by 0.85º C from 1880 to 2012, and it continues to rise at an accelerating pace (IPCC 2014b). The 15 warmest years on record since 1880 have occurred in the 21st century, with 2015 being the warmest (NCEI 2016). The warmest year on record for average ocean temperature is also 2015 (NCEI 2016). Since 2000, the Arctic (latitudes between 60º and 90º N) has been warming at more than twice the rate of lower latitudes (Jeffries et al. 2014) due to "Arctic amplification," a characteristic of the global climate system influenced by changes in sea ice extent, atmospheric and oceanic heat transports, cloud cover, black carbon, and many other factors (Serreze and Barry 2011).

Direct effects of climate change include increases in atmospheric temperatures, decreases in sea ice, and changes in sea surface temperatures, oceanic pH, patterns of precipitation, and sea level. Indirect effects of climate change have impacted, are impacting, and will continue to impact marine species in the following ways (IPCC 2014b):

- Shifting abundances
- Changes in distribution
- Changes in timing of migration
- Changes in periodic life cycles of species

Further, ocean acidity has increased by 26 percent since the beginning of the industrial era (IPCC 2013) and this rise has been linked to climate change (Foreman and Yamanaka 2011, GAO 2014, Murray et al. 2014, Okey et al. 2014, Secretariat of the Convention on Biological Diversity 2014, Andersson et al. 2015). Climate change is also expected to increase the frequency of extreme weather and climate events including, but not limited to, cyclones, heat waves, and droughts (IPCC 2014a). Climate change has the potential to impact species abundance, geographic distribution, migration patterns, timing of seasonal activities (IPCC 2014a), and species viability into the future. Climate change is also expected to result in the expansion of low oxygen zones in the marine environment (Gilly et al. 2013). Though predicting the precise consequences of climate change on highly mobile marine species, such as many of those considered in this opinion, is difficult (Simmonds and Isaac 2007), recent research has indicated a range of consequences already occurring.

Climate change is likely to have its most pronounced effects on species whose populations are already in tenuous positions (Isaac 2009). Therefore, we expect the extinction risk of at least

some ESA-listed species to rise with global warming. Marine species ranges are expected to shift as they align their distributions to match their physiological tolerances under changing environmental conditions (Doney et al. 2012). Cetaceans with restricted distributions linked to water temperature may be particularly exposed to range restriction (Learmonth et al. 2006, Isaac 2009). Hazen et al. (2012) examined top predator distribution and diversity in the Pacific Ocean in light of rising sea surface temperatures using a database of electronic tags and output from a global climate model. He predicted up to a 35 percent change in core habitat area for some key marine predators in the Pacific Ocean, with some species predicted to experience gains in available core habitat and some predicted to experience losses. MacLeod (2009) estimated, based upon expected shifts in water temperature, 88 percent of cetaceans would be affected by climate change, with 47 percent likely to be negatively affected.

For ESA-listed species that undergo long migrations, if either prey availability or habitat suitability is disrupted by changing ocean temperature regimes, the timing of migration can change or negatively impact population sustainability (Simmonds and Eliott. 2009). Low reproductive success and body condition in humpback whales may have resulted from the 1997/1998 El Niño (Cerchio et al. 2005).

The effects of these changes to the marine ecosystems of the Gulf of Alaska, and how they may affect Steller sea lions are uncertain. Warmer waters could favor productivity of some species of forage fish, but the impact on recruitment of important prey fish of Steller sea lions is unpredictable. Recruitment of large year-classes of gadids (e.g., pollock) and herring has occurred more often in warm than cool years, but the distribution and recruitment of other fish (e.g., osmerids) could be negatively affected (NMFS 2008b).

As temperatures in the Arctic and subarctic waters are warming and sea ice is diminishing, there is an increased potential for harmful algal blooms that produce toxins to affect marine life (see Figure 6). Biotoxins like domoic acid and saxitoxin may pose a risk to marine mammals in Alaska. In addition, increased temperatures can increase Brucella infections. In the Lefebvre et al. (2016) study of marine mammal tissues across Alaska, 905 individuals from 13 species were sampled including humpback whales, bowhead whales, beluga whales, harbor porpoises, northern fur seals, Steller sea lions, harbor seals, ringed seals, bearded seals, spotted seals, ribbon seals, Pacific walruses, and northern sea otters. Domoic acid was detected in all 13 species examined and had a 38% prevalence in humpback whales, and a 27% prevalence in Steller sea lions. Additionally, fetuses from a beluga whale, a harbor porpoise, and a Steller sea lion contained detectable concentrations of domoic acid documenting maternal toxin transfer in these species. Saxitoxin was detected in 10 of the 13 species, with the highest prevalence in humpback whales (50%) and a 10% prevalence in Steller sea lions (Lefebvre et al. 2016).

Figure 14. Algal toxins detected in 13 species of marine mammals from Southeast Alaska to the Arctic from 2004 to 2013 (Lefebvre et al. 2016).

4.5. Status of Listed Species and Critical Habitat Likely to be Adversely Affected by the Action

This opinion examines the status of each species and critical habitat that is likely to be adversely affected by the proposed action. Species status is determined by the level of extinction risk that the listed species face, based on parameters considered in documents such as recovery plans, status reviews, and listing decisions. This informs the description of the species' likelihood of both survival and recovery. The species status section also helps to inform the description of the species' current "reproduction, numbers, or distribution" as described in 50 CFR § 402.02. The opinion also examines the condition of critical habitat throughout the designated area, and discusses the current function of the essential PBFs that help to form that conservation value.

For each of the endangered and/or threatened species that may be adversely affected by the proposed action, we present a summary of information on the population structure and distribution of the species, to provide a foundation for the exposure analyses that appear later in this opinion. Then we summarize information on the threats to the species and the species' status given those threats to provide points of reference for the jeopardy determinations we make later in this opinion. That is, we rely on a species' status and trend to determine whether an action's effects are likely to increase the species' probability of becoming extinct. For designated critical habitat, we present a summary of the critical habitat designation, the geographical area of the designation, and any physical or biological features essential to the conservation of the species, as well as any relevant threats and management considerations. That is, we rely on the status of

critical habitat and its function as a whole to determine whether an action's effects are likely to diminish the value of critical habitat as a whole for the conservation of listed species.

4.6. Humpback Whale – Mexico DPS

4.6.1. Population Structure, Status, and Trends

More detailed background information on the status of the Mexico DPS of humpback whales can be found in the latest stock assessment report (Muto *et al.* 2019) and the Humpback Whale Recovery Plan (NMFS 1991). Information on humpback whale biology, threats, and habitat is available online at: https://www.fisheries.noaa.gov/species/humpback-whale .

The humpback whale was listed as endangered under the Endangered Species Conservation Act (ESCA) on December 2, 1970 (35 FR 18319). Congress replaced the ESCA with the ESA in 1973, and humpback whales continued to be listed as endangered. NMFS recently conducted a global status review and changed the status of humpback whales under the ESA. The globally listed species was divided into 14 DPSs, four of which are endangered and one is threatened, and the remaining 9 are not listed under the ESA (81 FR 62260; September 8, 2016). The Mexico DPS is threatened, and 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).

The probability of encountering whales from each of the four North Pacific DPSs in various feeding areas is summarized in Table 6 (NMFS 2016a, Wade *et al.* 2016).Whales from the Western North Pacific, Mexico, and Hawaii DPSs overlap on feeding grounds off Alaska, and are not visually distinguishable without photo identification linking a specific whale to its breeding ground. In the project area where all activities other than vessel transit will occur, 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.

4.6.2. Distribution

Humpback whales migrate seasonally between warmer, tropical or sub-tropical waters in winter months where they breed and give birth to calves, and cooler, temperate or sub-Arctic waters in summer months where they feed (see Figure 11). 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).

Table 6. Probability of encountering humpback whales from each DPS in the North Pacific Ocean (columns) in various feeding areas (on left); adapted from Wade et al. (2016)

Summer Feeding Areas	North Pacific Distinct Population Segments			
	Western North Pacific DPS (endangered)[1]	Hawaii DPS (not listed)	Mexico DPS (threatened)	Central America DPS (endangered)[1]
Kamchatka	100%	0%	0%	0%

Summer Feeding Areas	North Pacific Distinct Population Segments			
	Western North Pacific DPS (endangered)[1]	Hawaii DPS (not listed)	Mexico DPS (threatened)	Central America DPS (endangered)[1]
Aleutian I/Bering/Chukchi	4.4%	86.5%	11.3%	0%
Gulf of Alaska	0.5%	89%	10.5%	0%
Southeast Alaska / Northern BC	0%	93.9%	6.1%	0%
Southern BC / WA	0%	52.9%	41.9%	14.7%
OR/CA	0%	0%	89.6%	19.7%

[1]For the endangered DPSs, these percentages reflect the 95% 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.

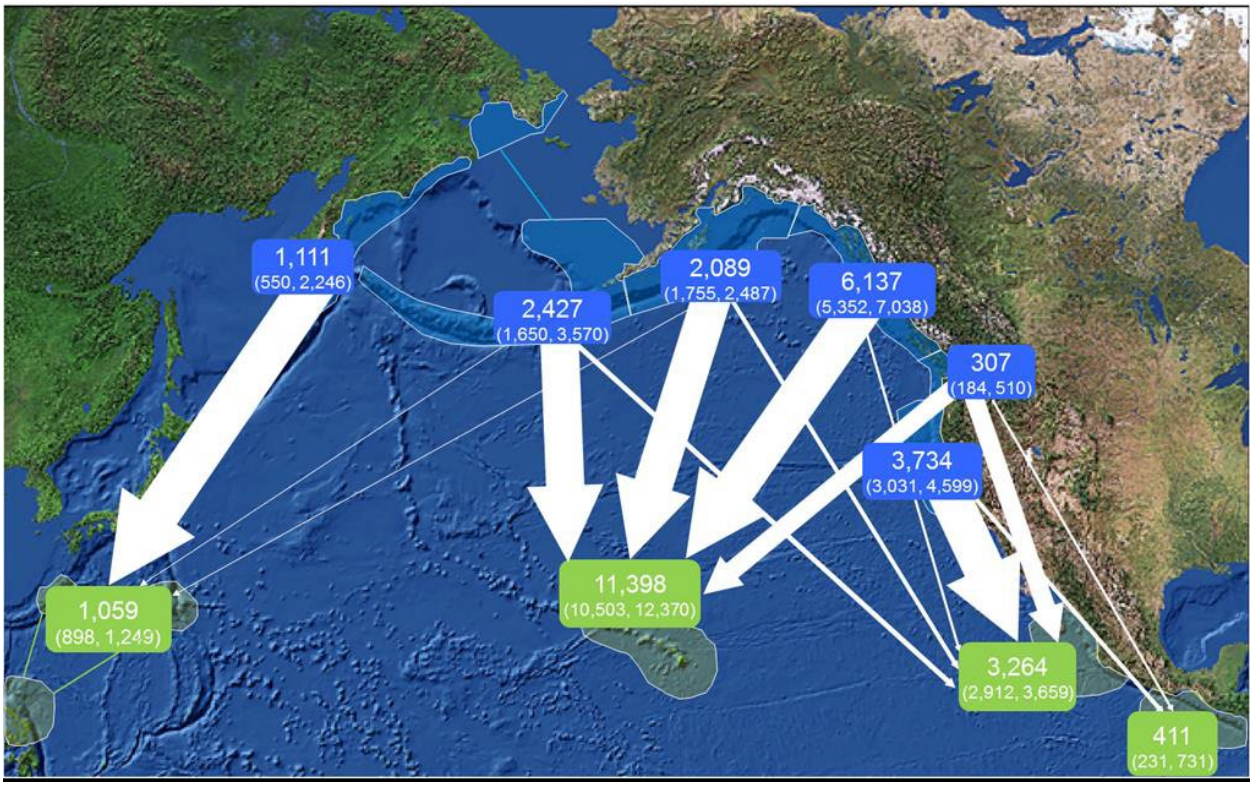

Figure 15. Abundance by summer feeding areas (blue), and winter breeding areas (green), with 95% confidence limits in parentheses. Migratory destinations from feeding area to breeding area are indicated by arrows with width of arrow proportional to the percentage of whales moving into winter breeding area (Wade *et al.* 2016).

Mexico DPS humpback whales breed along the Pacific coast of mainland Mexico, the Baja California Peninsula, and the Revillagigedo Islands. They are primarily distributed in feeding

grounds from northern British Columbia/Southeast Alaska, the Gulf of Alaska, and in the Bering Sea, but may be found in between Washington and Russia (Muto *et al.* 2019).

North Pacific humpback whales in the Gulf of Alaska may be experiencing nutritional stress from reaching or exceeding carrying capacity, resulting in some humpbacks skipping the annual migration to the breeding grounds to stay in Alaska overwinter and spend more time feeding (Straley *et al.* 2018).

4.6.3. Occurrence in the Action Area

Humpback whales are present in Icy Strait in all months of the year. Dalheim *et al.* (2009) conducted cetacean surveys of Southeast Alaska spring through fall periodically between 1991 and 2007, and found humpback whales throughout all major waterways across all three seasons (Figure 16). Humpbacks were consistently seen near or inside Port Frederick.

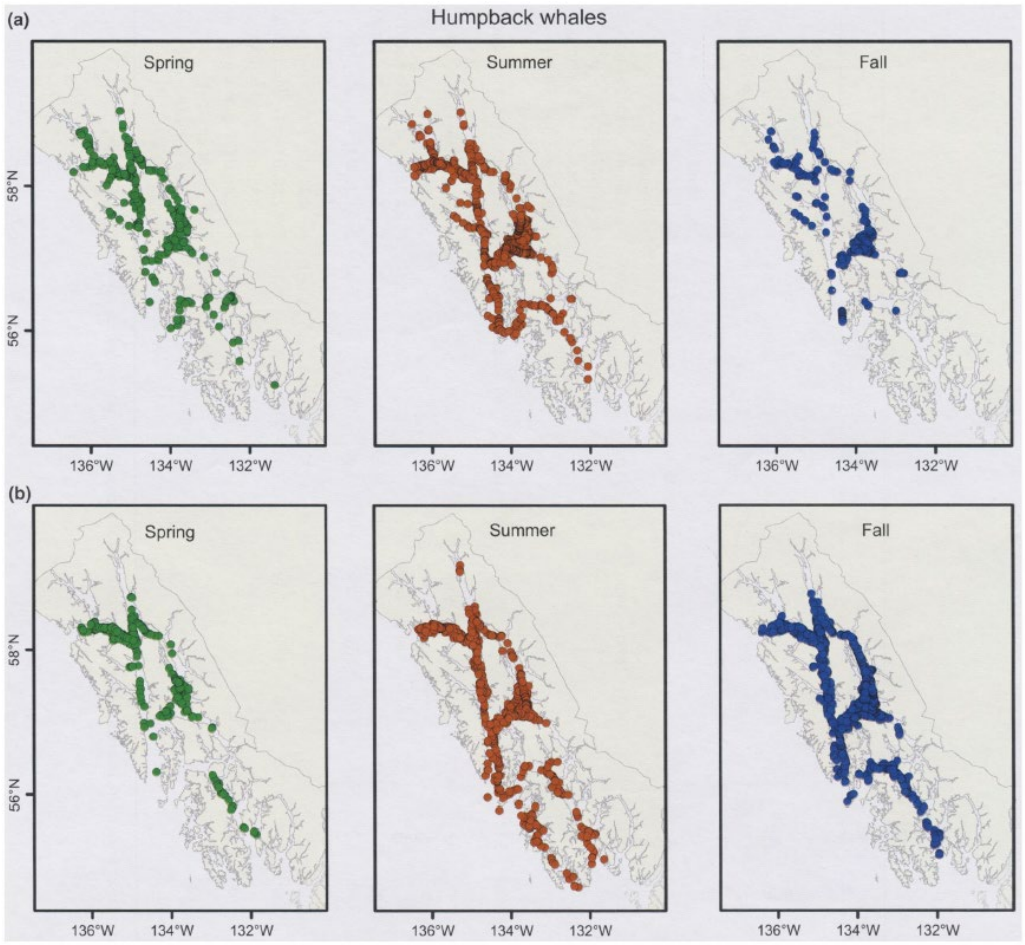

Figure 16. Seasonal distribution of humpback whales in Southeast Alaska, with each dot indicating a group sighting/encounter. (a) 1991, 1992, 1993, 2006 and 2007, representing five spring, five summer, and four fall surveys; (b) 1994-2005, representing four spring, nine summer, and eleven fall surveys (Reproduced from Dalheim *et al.* 2009).

Most Southeast Alaska humpback whales winter in low latitudes, but some individuals skip annual migration south to breeding locations and instead overwinter in Alaska, following herring into deeper waters to continue foraging (Liddle 2015, Straley *et al.* 2018). Late fall and winter whale habitat in Southeast Alaska appears to correlate with areas that have over-wintering herring (such as lower Lynn Canal, Tenakee Inlet, Whale Bay, Ketchikan, and Sitka Sound), none of which are in the ensonified area (Baker *et al.* 1985, Straley 1990, Straley *et al.* 2018).

Given their widespread range and their opportunistic foraging strategies, humpback whales may be in the project vicinity during the proposed construction activities. 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), we use 6% in this analysis to approximate the percentage of humpbacks observed in the action area that are from the Mexico DPS.

4.6.4. Reproduction and Growth

Humpbacks give birth and presumably mate on low-latitude wintering grounds in January to March in the Northern Hemisphere. Females attain sexual maturity at five years in some populations and exhibit a mean calving interval of approximately two years (Clapham 1992, Barlow and Clapham 1997). Gestation is about 12 months, and calves probably are weaned by the end of their first year (Perry *et al.* 1999).

4.6.5. Feeding and Prey Selection

Humpback whales are relatively generalized in their feeding compared to some other baleen whales. In the Northern Hemisphere, known prey includes: euphausiids (krill); copepods; juvenile salmonids; herring; Arctic cod; walleye pollock; pteropods; and cephalopods (Johnson and Wolman 1984, Perry *et al.* 1999, Straley *et al.* 2018).

According to the Biologically Important Areas dataset (Ferguson *et al*, 2015), the ensonified area and surrounding waters are important feeding habitat for humpback whales throughout the spring, summer, and fall. Feeding habitat from March through May exists just outside Port Frederick and thus outside the ensonified area, but present in the vessel transit portion of the action area (Figure 17). From June through August, important areas for humpback whales include most of Port Frederick and the ensonified area (Figure 18). In the fall from September through November, important feeding habitat for humpback whales shifts along the eastern side of Port Frederick (Figure 19).

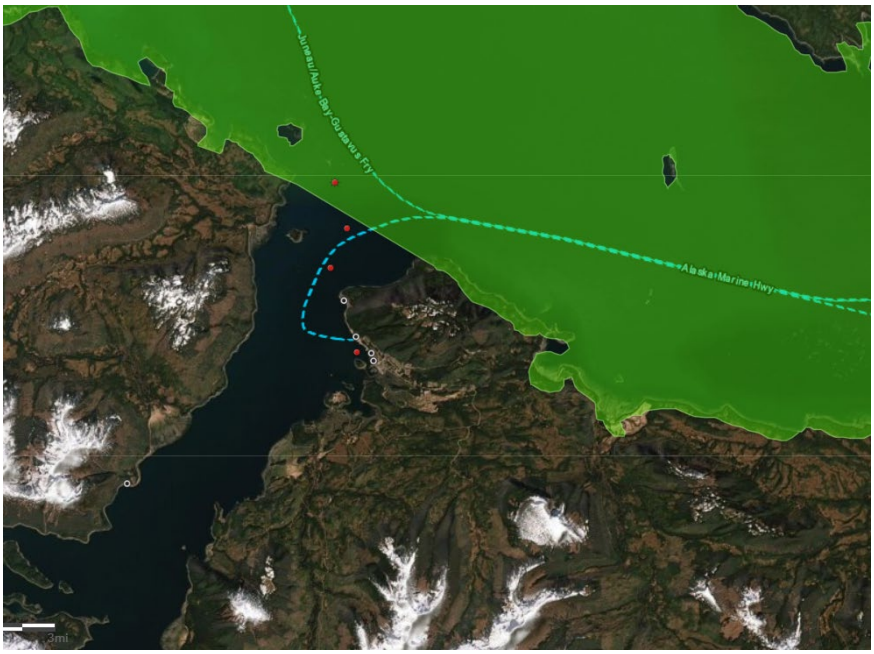

Figure 17. Important feeding areas for humpback whales from March through May shaded in light green (Ferguson *et al*, 2015) and typical vessel routes depicted with dotted lines.

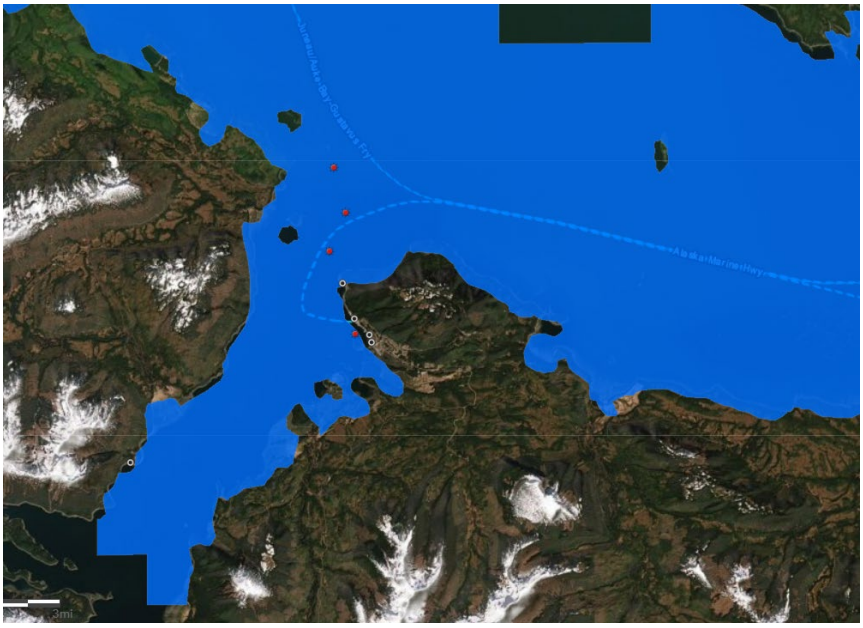

Figure 18. Important feeding areas for humpback whales from June through August shaded in blue (Ferguson *et al*, 2015) and typical vessel routes depicted with dotted lines.

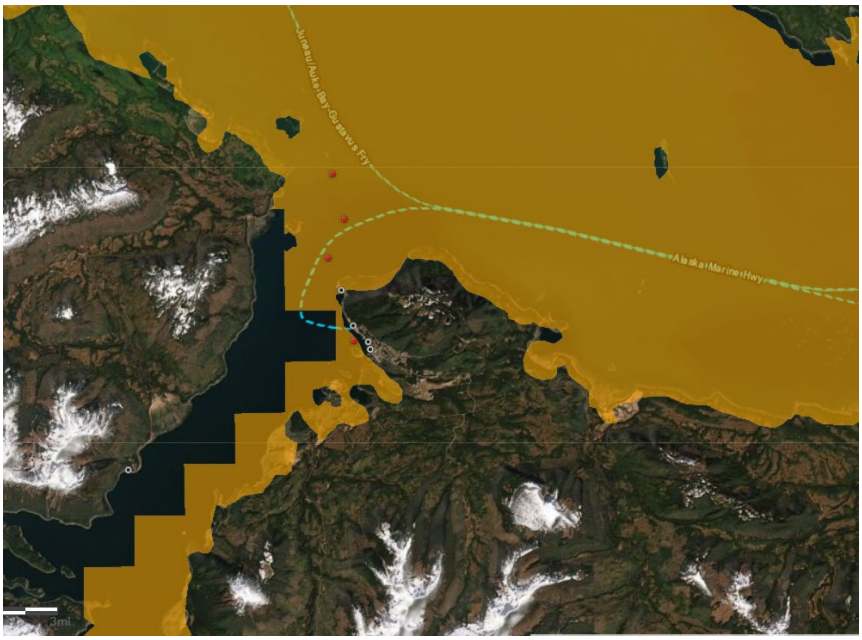

Figure 19. Important feeding areas for humpback whales from September through November shaded in orange (Ferguson *et al*, 2015) and typical vessel routes depicted with dotted lines.

4.6.6. Diving Behavior

Dives appear to be closely correlated with the depths of prey patches, which vary from location to location. In the north Pacific (southeast Alaska), most dives were of fairly short duration (<4 min) with the deepest dive to 148 m (Dolphin 1987).

4.6.7. Vocalization and Hearing

Humpback whales may react to and be harassed by in-water noise. NMFS categorizes humpback whales in the low-frequency cetacean functional hearing group, with a generalized hearing range between 7 Hz and 35 kHz (NMFS 2018a). Baleen whales have inner ears that appear to be specialized for low-frequency hearing. In a study of the morphology of the mysticete auditory apparatus, Ketten (1997) hypothesized that large mysticetes have acute infrasonic hearing.

Humpback whales produce a wide variety of sounds ranging from 20 Hz to 10 kHz. During the breeding season males sing long, complex songs, with frequencies in the 20-5000 Hz range and intensities as high as 181 dB (Payne 1970, Winn *et al.* 1970, Thompson *et al.* 1986). Source levels average 155 dB and range from 144 to 174 dB (Thompson *et al.* 1979). The songs appear to have an effective range of approximately 10 to 20 km. Animals in mating groups produce a variety of sounds (Tyack 1981, Silber 1986b).

Social sounds in breeding areas associated with aggressive behavior in male humpback whales are very different than songs and extend from 50 Hz to 10 kHz (or higher), with most energy in components below 3 kHz (Tyack and Whitehead 1983, Silber 1986a). These sounds appear to have an effective range of up to 9 km (Tyack and Whitehead 1983).

Humpback whales produce sounds less frequently in their summer feeding areas. Feeding groups produce distinctive sounds ranging from 20 Hz to 2 kHz, with median durations of 0.2-0.8 seconds and source levels of 175-192 dB (Thompson *et al.* 1986). These sounds are attractive and appear to rally animals to the feeding activity (D'Vincent *et al.* 1985, Sharpe and Dill 1997).

In summary, humpback whales produce at least three kinds of sounds:

1. Complex songs with components ranging from at least 20 Hz–24 kHz with estimated source levels from 144–174 dB; these are mostly sung by males on the breeding grounds (Winn *et al.* 1970, Richardson *et al.* 1995, Au *et al.* 2000, Frazer and Mercado 2000, Au *et al.* 2006);
2. Social sounds in the breeding areas that extend from 50Hz to more than 10 kHz with most energy below 3kHz (Tyack and Whitehead 1983, Richardson *et al.* 1995); and
3. Feeding area vocalizations that are less frequent, but tend to be 20 Hz–2 kHz with estimated sources levels in excess of 175 dB re 1 Pa at 1m (Thompson *et al.* 1986, Richardson *et al.* 1995).

4.6.8. Threats to the Species

Brief descriptions of natural and anthropogenic threats to humpback whales follow. More detailed information can be found in the Humpback Whale Recovery Plan (NMFS 1991; https://www.fisheries.noaa.gov/resource/document/final-recovery-plan-humpback-whale-megaptera-novaeangliae), NMFS Stock Assessment Reports (https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports-species-stock#cetaceans---large-whales), Global Status Review (Fleming and Jackson 2011; https://repository.library.noaa.gov/view/noaa/4489), and the ESA Status Review (Bettridge *et al.* 2015; https://repository.library.noaa.gov/view/noaa/4883).

4.6.9. Natural Threats

There is limited information on natural phenomena that kill or injure humpback whales. Humpback whales are killed by orcas (Whitehead and Glass 1985, Dolphin 1987b, Florezgonzalez et al. 1994, Naessig and Lanyon 2004), and are probably killed by false killer whales and sharks. Calves remain protected near mothers or within a group and lone calves have been known to be protected by presumably unrelated adults when confronted with attack (Ford and Reeves 2008).

Out of 13 marine mammal species examined in Alaska, domoic acid was detected in all species examined with humpback whale showing 38% prevalence. Saxitoxin was detected in 10 of the 13 species, with the highest prevalence in humpback whales (50%) and bowhead whales (32%) (Lefebvre et al. 2016). The occurrence of the nematode *Crassicauda boopis* appears to increase the potential for kidney failure in humpback whales and may be preventing some populations from recovering (Lambertsen 1992).

4.6.10. Anthropogenic Threats

4.6.10.1. Vessel Strikes and Disturbance

Vessel strikes (Fleming and Jackson 2011) are listed as one of the main threats and sources of anthropogenic impacts to humpback whales in Alaska. Ship strikes on humpback whales are typically identified by evidence of massive blunt trauma (fractures of heavy bones and/or hemorrhaging) in stranded whales, propeller wounds (deep slashes or cuts into the blubber), and fluke/fin amputations on stranded or live whales (NMFS 2011). Neilson *et al.* (2012) summarized 108 large whale ship-strike events in Alaska from 1978 to 2011, 25 of which are known to have resulted in the whale's death; 86% of those reports involved humpback whales. Most ship strikes of humpback whales are reported from Southeast Alaska (Helker *et al.* 2019). In 2019, five humpbacks were reported stranded in Alaska with evidence of injury from vessel strikes (Savage 2020).

4.6.10.2. Fishery Interactions including Entanglements

Fishing gear entanglement (Fleming and Jackson 2011, Bettridge *et al.* 2015) is also listed as one of the main threats and sources of anthropogenic impacts to humpback whales in Alaska. Entanglement may result in only minor injury or may potentially significantly affect individual health, reproduction, or survival (NMFS 2011). Every year, humpback whales are reported entangled in fishing gear in Alaska, particularly pot gear and gill net gear. Other gear interactions with humpback whales in Alaska have occurred with purse seine fisheries, anchoring systems and mooring lines, and marine debris. From 2012 to 2016, there were 52 entanglements of humpback whales in Alaska, which comprised the majority of all large whale serious injuries and mortalities in Alaska (Helker *et al.* 2019). In 2019, nine entangled humpback whales were reported to the Alaska Marine Mammal Stranding Program (Savage 2020).

4.6.10.3. Subsistence, Illegal Whaling, or Resumed Legal Whaling

Historically, commercial whaling represented the greatest threat to every population of humpback whales and was ultimately responsible for listing humpback whales as an endangered species. In 1965, the International Whaling Commission banned commercial hunting of humpback whales in the Pacific Ocean, and as a result this threat has largely been curtailed. No whaling occurs within the range of Mexico DPS humpbacks, but some "commercial bycatch whaling" has been documented in both Japan and South Korea (Bettridge *et al.* 2015). Alaskan subsistence hunters are not authorized to take humpback whales.

4.6.10.4. Pollution

Humpback whales can accumulate lipophilic compounds (e.g., halogenated hydrocarbons) and pesticides (e.g. DDT) in their blubber, as a result either of feeding on contaminated prey (bioaccumulation) or inhalation in areas of high contaminant concentrations (e.g. regions of atmospheric deposition; Barrie *et al.* 1992, Wania and Mackay 1993). Organochlorines, including PCB and DDT, have been identified from humpback whale blubber (Gauthier *et al.* 1997). Overall levels of PCB concentrations in North Pacific humpback whales are on par with other baleen whales, which are generally lower than odontocete cetaceans (Elfes *et al.* 2010). Although the health effects of different doses of contaminants are currently unknown for

humpback whales (Krahn *et al.* 2004), available information does not suggest contaminant levels in humpback whales are having a significant impact on their persistence (Elfes *et al.* 2010).

4.6.10.5. Acoustic Disturbance

Low-frequency sound comprises a significant portion of ocean noise and stems from a variety of sources including shipping, research, naval activities, and oil and gas exploration (Weilgart 2007). Betteidge *et al.* 2015 identified underwater noise from human activity as a threat and suggested that exposure is likely chronic and at relatively high levels, caveating that overall population-level effects of exposure to underwater noise are not well-established. It does not appear that humpback whales are often involved in strandings related to noise events. There is one record of two humpback whales found dead with extensive damage to the temporal bones near the site of a 5,000-kg explosion, which likely produced shock waves that were responsible for the injuries (Ketton 1995). Other detrimental effects of anthropogenic noise include masking and temporary threshold shifts (TTS).

4.6.11. Recovery Goals

The 1991 Final Recovery Plan for the Humpback Whale identifies the following four recovery goals for the species.

- Maintain and enhance habitats used by humpback whales currently or historically
- Identify and reduce direct human-related injury and mortality
- Measure and monitor key population parameters
- Improve administration and coordination of recovery program for humpback whales

4.6.12. Critical Habitat

NMFS designated critical habitat for Mexico DPS humpback whales on April 21, 2021 (86 FR 21082). The nearest designated critical habitat for Mexico DPS humpback whales is in the vicinity of Prince William Sound, hundreds of kilometers from Hoonah.

4.7. Steller Sea Lion – Western DPS

More detailed background information on the status of wDPS Steller sea lions can be found in the latest stock assessment report (Muto *et al.* 2019) and the recovery plan for Steller sea lions (NMFS 2008). Information on Steller sea lion biology, threats, and habitat (including critical habitat) is available online at: https://www.fisheries.noaa.gov/species/steller-sea-lion.

4.7.1. Population Structure, Status, and Trends

On November 26, 1990, NMFS issued the final rule to list Steller sea lions as a threatened species under the ESA (55 FR 49204). In 1997, NMFS reclassified Steller sea lions as two DPSs based on genetic studies and other information (62 FR 24345; May 5, 1997; Figure 17). At that time, the eastern DPS was listed as threatened, and the western DPS was listed as endangered. On November 4, 2013, the eastern DPS was removed from the endangered species list (78 FR 66140).

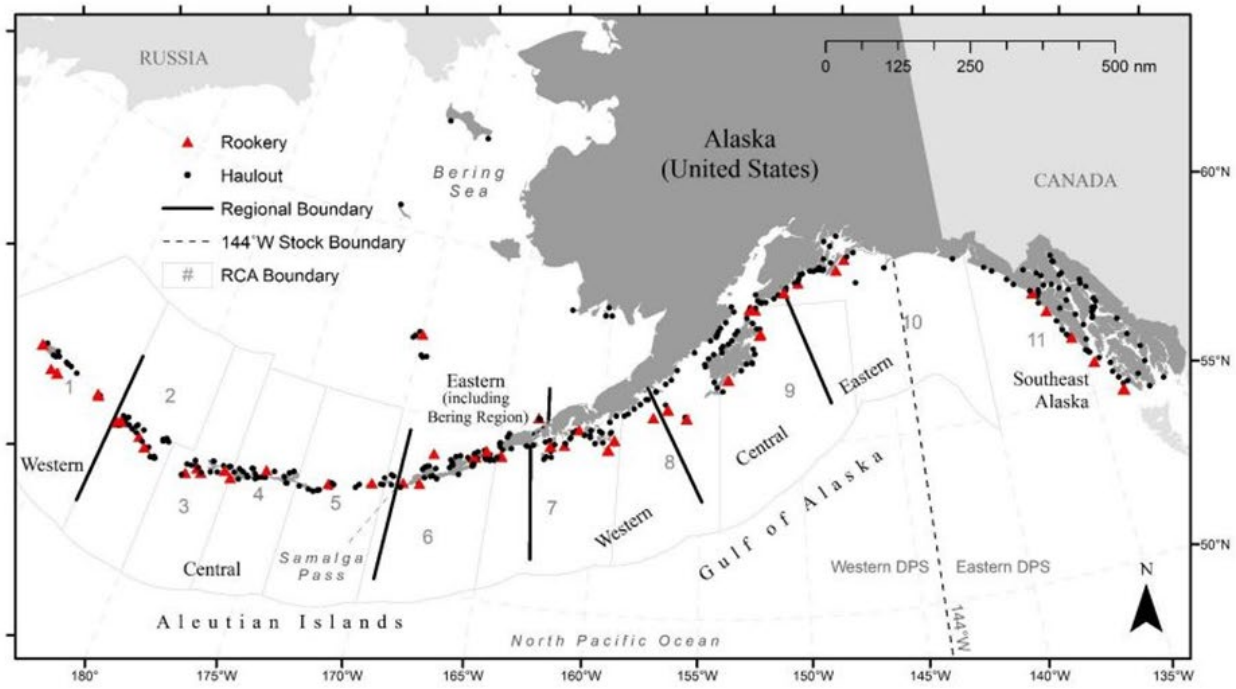

Figure 20. NMFS Steller sea lion survey regions, rookeries, haulouts, and line at 144W depicting the separation of eastern and western distinct population segments. (Fritz et al, 2016).

Data from 1978-2017 suggest wDPS Steller sea lions were at their lowest levels in 2002 but have shown an increasing trend in abundance in much of their range since then, although strong regional differences exist. While most regions show positive trends, regions of the Aleutian Islands exhibit generally negative trends (Muto *et al.* 2019). Contrary to the general population increase since 2002, pup counts in the eastern (-33%) and central (-18%) Gulf of Alaska declined sharply between 2015 and 2017. The most recent surveys of wDPS Steller sea lions in Alaska suggest a minimum population estimate of 54,267 individuals; estimates for wDPS in Russia suggest there may be approximately 23,000 animals, which is less than the 1960 levels but more than the low in 2005 (Muto *et al.* 2019). Overall, the wDPS Steller sea lion population in Alaska (non-pups only) was estimated to be increasing at about 2.14 percent per year from 2002-2017 (Muto *et al.* 2019).

Estimated annual mortality is 0.22 for ages 0 to 2, dropping to 0.07 at age 3, then increasing gradually to 0.15 by age 10 and 0.20 by age 20 (York 1994). Population modeling suggests decreased juvenile survival likely played a major role in the decline of sea lions in the central Gulf of Alaska during 1975-1985 (Pascual and Adkison 1994, York 1994, Holmes and York 2003).

4.7.2. Distribution

Additional information on Steller sea lion distribution can be found at https://www.fisheries.noaa.gov/species/steller-sea-lion, in the Steller Sea Lion Recovery Plan at

https://www.fisheries.noaa.gov/resource/document/recovery-plan-steller-sea-lion-revision-eastern-and-western-distinct-population, and in the most recent stock assessment report at https://repository.library.noaa.gov/view/noaa/20606.

The western DPS of Steller sea lions includes animals west of Cape Suckling, Alaska (144° W; 62 FR 24345). However, individuals move between rookeries and haul out sites regularly, even over long distances between eastern and western DPS locations (Calkins and Pitcher 1982a, Raum-Suryan et al. 2002, Raum-Suryan et al. 2004). Most adult Steller sea lions occupy rookeries during the summer pupping and breeding season and exhibit a high level of site fidelity. During the breeding season, some juveniles and non-breeding adults occur at or near the rookeries, but most are on haulouts (sites that provide regular retreat from the water on exposed rocky shoreline, gravel beaches, and wave-cut platforms or ice; (Rice 1998a, Ban 2005, Call and Loughlin 2005). Adult males may disperse widely after the breeding season. Males that breed in California move north after the breeding season and are rarely seen in California or Oregon except from May through August (Mate 1973). During fall and winter many sea lions disperse from rookeries and increase use of haulouts, particularly on terrestrial sites but also on sea ice in the Bering Sea.

4.7.3. Steller Sea Lion Occurrence in Action Area

Within the action area, Steller sea lions are anticipated to be predominantly from the eDPS, but a small number of wDPS Steller sea lions may occur. Based upon genetic analyses, Hastings *et al.* (2020) indicates that 1.4% of all non-pup Steller sea lions found in the Lynn Canal region (which encompasses the action area) had mitochondrial DNA haplotypes suggesting they were born in the wDPS region. Therefore, for the purposes of this opinion, NMFS considers that 1.4% of the total Steller sea lions in the action area are from the endangered wDPS and the remaining 98.6% are from the delisted eDPS.

Steller sea lions do not migrate, but they often disperse widely outside of the breeding season. An area of high occurrence extends from the shore to water depths of 273 fathoms (500 m). In the Gulf of Alaska, foraging habitat is primarily shallow, nearshore, and continental shelf waters 4.3 to 13 nm offshore with a secondary occurrence inshore of the 3,280 ft. (1,000 m) isobath, and a rare occurrence seaward of the 3,280 ft. (1,000 m) isobath. Steller sea lion occurrence in the action area during the summer period is considered likely.

Womble *et. al.* (2005, 2009) and Straley et al. (2017) have studied the seasonal ecology of Steller sea lions in Southeast Alaska by relating the distribution of sea lions to prey availability. Figure 21 depicts a likely seasonal foraging strategy for Steller sea lions in Southeast Alaska. Their results suggest that seasonally aggregated high-energy prey species, such as eulachon and herring in late spring and salmon in summer and fall, influence the seasonal distribution of Steller sea lions in some areas of Southeast Alaska. Concentrated numbers of Steller sea lions in the action area are most likely to occur during seasonal prey aggregation. Herring, walleye pollock, salmon, and eulachon are among the species that congregate ephemerally. Similarly, the NMFS 2014 Status Review of Southeast Alaska Pacific Herring generalizes that sea lions forage on herring aggregations in winter, on spawning herring and eulachon in spring, and on various other species throughout the year. Kruse (2000) report that herring fishery managers use the presence of Steller sea lions on the spring spawning grounds as an indicator that spawning is

imminent, even though herring have been in deeper adjacent waters for weeks prior to arrival of Steller sea lions.

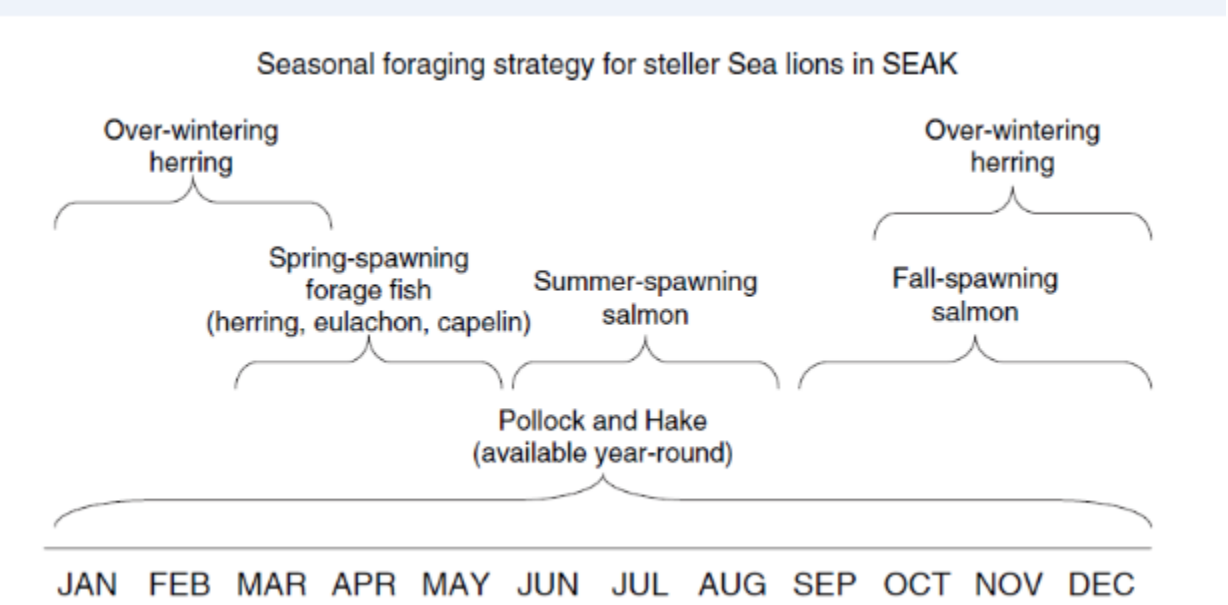

Figure 21. Seasonal foraging ecology of SSL. Reproduced with permission from Womble et. al., 2009.

There are several anadromous waters inside and very near the action area as coded in the Alaska Department of Fish and Game's anadromous waters catalog (Figure 19); waters that support important prey items for Steller sea lions. Eulachon and herring spawning occur in Port Frederick in April or May (NMFS 2006).

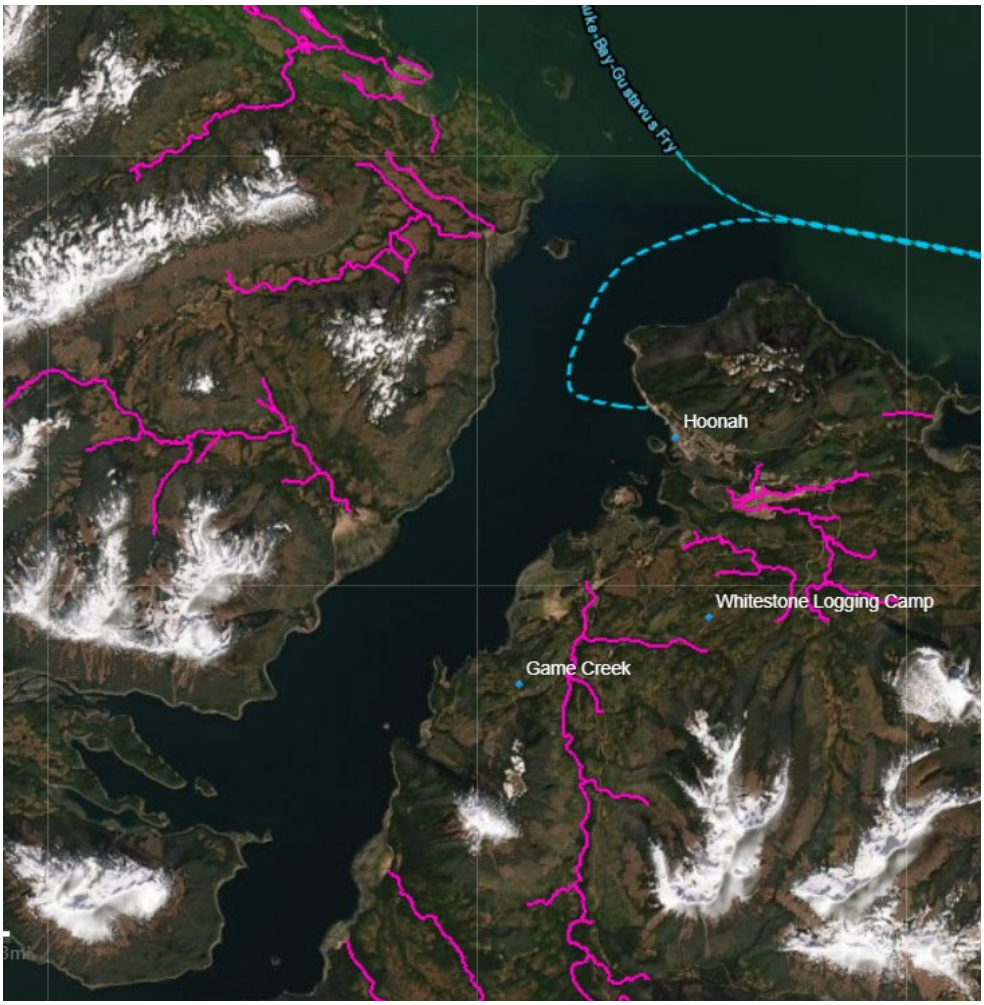

Figure 22. Anadromous streams (shown in pink from ADF&G Anadromous Waters Catalog) and Alaska Marine Highway System routes (shown as dotted lines from AMHS).

NMFS expects that Steller sea lion presence in the action area will vary due to their spatial distribution during breeding versus non-breeding seasons. In April and May, Steller sea lions are likely feeding on herring in the action area. By June, it is likely that most Steller sea lions will have moved to the rookeries along the outside coast of Chichagof Island (more than 50 miles away from the action area) for breeding season. They are likely to be back in the action area in greater numbers again after breeding season in August and later months for late-summer salmon runs (J. Womble, NPS, personal communication, March 2019). Sea lions are also opportunistic predators and their presence can be hard to predict.

4.7.4. Reproduction and Growth

Female Steller sea lions reach sexual maturity and first breed between three and eight years of age and the average age of reproducing females (generation time) is about 10 years (Pitcher and Calkins 1981, Calkins and Pitcher 1982, York 1994). They give birth to a single pup from May through July and then breed about 11 days after giving birth. For more information see our website (https://www.fisheries.noaa.gov/species/steller-sea-lion), the Steller Sea Lion Recovery

Plan (https://www.fisheries.noaa.gov/resource/document/recovery-plan-steller-sea-lion-revision-eastern-and-western-distinct-population), and the most recent stock assessment report (https://repository.library.noaa.gov/view/noaa/20606).

4.7.5. Feeding and Prey Selection

Steller sea lions consume a variety of demersal, semi-demersal, and pelagic prey, indicating a potentially broad spectrum of foraging styles, probably based primarily on availability. Overall, the available data suggest two types of distribution at sea by Steller sea lions: 1) less than 20 km (12 mi) from rookeries and haulout sites for adult females with pups, pups, and juveniles, and 2) much larger areas (greater than 20 km [12 mi]) where these and other animals may range to find optimal foraging conditions once they are no longer tied to rookeries and haulout sites for nursing and reproduction. Loughlin (1993) observed large seasonal differences in foraging ranges that may have been associated with seasonal movements of prey, and Merrick (1995) concluded on the basis of available telemetry data that seasonal changes in home range were related to prey availability.

4.7.6. Diving and Social Behavior

Steller sea lions are very vocal marine mammals. Roaring males often bob their heads up and down when vocalizing. Adult males have been observed aggressively defending territories. Steller sea lions gather on haulouts year-round and rookeries during the breeding season and regularly travel as far as 250 miles to forage for seasonal prey. However, females with pups likely forage much closer to their rookery. Diving is generally to depths of 600 feet or less and diving duration is usually 2 minutes or less.

4.7.7. Vocalization and Hearing

The ability to detect sound and communicate underwater is important for a variety of Steller sea lion life functions, including reproduction and predator avoidance. Steller sea lions have similar hearing thresholds in-air and underwater to other otariids. In-air hearing ranges from 0.250-30 kHz, with their best hearing sensitivity at 5-14.1 kHz (Muslow and Reichmuth 2010). An underwater audiogram shows the typical mammalian U-shape. Higher hearing thresholds, indicating poorer sensitivity, were observed for signals below 16 kHz and above 25 kHz (Kastelein *et al.* 2005).

4.7.8. Threats

Brief descriptions of threats to Steller sea lions follow. More detailed information can be found in the Steller sea lion Recovery Plan (available at: http://alaskafisheries.noaa.gov/protectedresources/stellers/recovery/sslrpfinalrev030408.pdf), the Stock Assessment Reports (available at: http://www.nmfs.noaa.gov/pr/sars/species.htm), and the Alaska Groundfish Biological Opinion (NMFS 2014). Table 7 lists potential threats and their potential impact on wDPS Steller sea lions' recovery.

Table 7. Potential threats and impacts to wDPS Steller sea lion recovery (reproduced from Muto et al. 2019).

Threat	Impact on Recovery	Level of Uncertainty	Reference Examples
Environmental variability	Potentially high	High	Trites and Donnelly 2003, Fritz and Hinckley 2005
Competition with fisheries	Potentially high	High	Fritz and Ferrero 1998, Hennen 2004, Fritz and Brown 2005, Dillingham et al. 2006
Predation by killer whales	Potentially high	High	Springer et al. 2003, Williams et al. 2004, DeMaster et al. 2006, Trites et al. 2007
Toxic substances	Medium	High	Calkins et al. 1994, Lee et al. 1996, Albers and Loughlin 2003, Rea et al. 2013
Incidental take by fisheries	Low	High	Wynne et al. 1992, Nikulin and Burkanov 2000, Perez 2006
Subsistence harvest	Low	Low	Haynes and Mishler 1991, Loughlin and York 2000, Wolfe et al. 2005
Illegal shooting	Low	Medium	Loughlin and York 2000, NMFS 2001
Entanglement in marine debris	Low	Medium	Calkins 1985
Disease and parasitism	Low	Medium	Burek et al. 2005
Disturbance from vessel traffic and tourism	Low	Medium	Kucey and Trites 2006
Disturbance or mortality due to research activities	Low	Low	Calkins and Pitcher 1982, Loughlin and York 2000, Kucey 2005, Kucey and Trites 2006, Atkinson et al. 2008, Wilson et al. 2012

4.7.8.1. Vessel Disturbance

Vessel traffic, sea lion research, and tourism may disrupt sea lion feeding, breeding, or aspects of sea lion behavior. The Steller Sea Lion Recovery Plan (NMFS 2008) ranked disturbance from these sources as a low threat to the recovery of the WDPS. Disturbance from these sources are not likely affecting population dynamics in the WDPS.

4.7.8.2. Risk of Vessel Strike

NMFS Alaska Region Stranding Program has records of four occurrences of Steller sea lions being struck by vessels in Southeast Alaska; three were near Sitka. Vessel strike is not considered a major threat to Steller sea lions.

4.7.9. Recovery Goals

In the 2008 recovery plan, NMFS outlined a strategy to meet its goal of promoting the recovery of the Western DPS and its ecosystem to a level that would warrant delisting (NMFS 2008). Since the early 1990s when management actions reduced incidental takes from commercial fishing and legal and illegal shooting of sea lions, recovery efforts have focused on implementing fishery management plans aimed at reducing the impact of commercial fishing on Steller sea lion prey. While counts of pups and non-pups at rookeries in western Alaska increased at a rate of over 2 percent per year between 2003 and 2016, it is unclear if fisheries regulations implemented in the late 1990s contributed to this trend by limiting the catch of prey species or if the management changes and the positive population trend are simply coincidental (National Marine Fisheries Service 2008, Fritz et al. 2016, Muto et al. 2018). See Section

3.1.10.6 (Anthropogenic Threats) for more information on this topic.

The highest priority goal set by NMFS is to continue to improve estimates of population abundance, trends, distribution, health, and essential habitat characteristics through monitoring and research and to identify key threats to the population. In addition to identifying individual threats, research needs to expand our understanding of how multiple interrelated threats combine to create long-term cumulative impacts on the Western DPS. Given the correlation between implementation of fishery management practices and the stabilizing (or slightly increasing) trend in the Western DPS, a second priority in the recovery plan is to maintain the current or similar fishery conservation measures (NMFS 2008).

4.7.10. Critical Habitat

On August 27, 1993, NMFS designated critical habitat for Steller sea lions based on the location of terrestrial rookery and haulout sites, spatial extent of foraging trips, and availability of prey items (58 FR 45269). Designated critical habitat is listed in 50 CFR § 226.202, and includes 1) a terrestrial zone that extends 3,000 ft (0.9 km) landward from the baseline or base point of each major rookery and major haulout; 2) an air zone that extends 3,000 ft (0.9 km) above the terrestrial zone of each major rookery and major haulout, measured vertically from sea level; 3) an aquatic zone that extends 3,000 ft (0.9 km) seaward in state and federally managed waters from the baseline or basepoint of each major rookery and major haulout in Alaska that is east of 144° W longitude; 4) an aquatic zone that extends 20 nm (37 km) seaward in state and federally managed waters from the baseline or basepoint of each major rookery and major haulout in Alaska that is west of 144° W longitude; and 5) three special aquatic foraging areas in Alaska: the Shelikof Strait area, the Bogoslof area, and the Seguam Pass area.

There are designated haulouts and rookeries in northern Southeast Alaska (Figure 20), but no designated critical habitat exists within the action area. The nearest Steller sea lion rookery is on the White Sisters Islands near Sitka and the nearest major haulouts are at Benjamin Island, Cape Cross, and Graves Rocks. The White Sisters rookery is located on the west side of Chichagof Island, about 72 km southwest of the project area. Benjamin Island is about 60 km northeast of Hoonah. Cape Cross and Graves Rocks are both about 70 km west of Hoonah. Therefore, the action will have no effect on critical habitat.

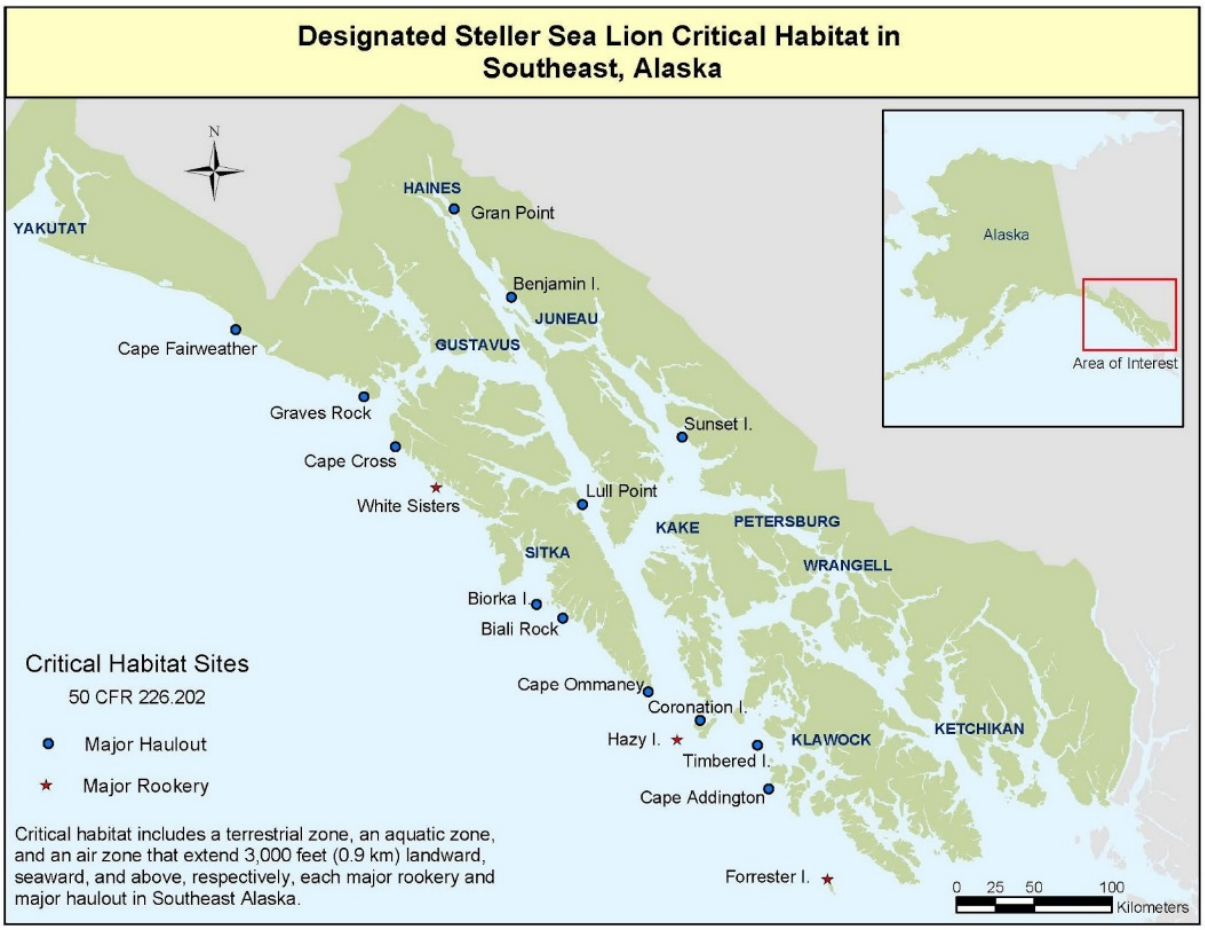

Figure 23. Designated Steller sea lion critical habitat in southeast Alaska.

5. ENVIRONMENTAL BASELINE

The "environmental baseline" refers to the condition of the listed species or its designated critical habitat in the action area, without the consequences to the listed species or designated critical habitat caused by the proposed action. The environmental baseline includes the past and present impacts of all Federal, state, or private actions and other human activities in the action area, the expected impacts of all proposed Federal projects in the action areas that have already undergone formal or early section 7 consultation, and the impact of state or private actions which are contemporaneous with the consultation process. The consequences to listed species or designated critical habitat from ongoing agency activities or existing agency facilities that are not within the agency's discretion to modify are part of the environmental baseline (50 CFR § 402.02).

Focusing on the impacts of activities specifically within the action area allows us to assess the prior experience and condition of the animals that will be exposed to effects from the actions under consultation. This focus is important because individuals of ESA-listed species may commonly exhibit, or be more susceptible to, adverse responses to stressors in some life history states, stages, or areas within their distributions than in others. These localized stress responses or baseline stress conditions may increase the severity of the adverse effects expected from proposed actions.

5.1. Factors Affecting Species within the Action Area

A number of human activities have contributed to the current status of populations of ESA-listed species in the action area. The factors that have likely had the greatest impact are discussed in the sections below. For more information on all factors affecting the ESA-listed species considered in depth in this opinion, please refer to the following documents:

2018 Alaska Marine Mammal Stock Assessments (Muto *et al.* 2019), available at https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports-region,

Recovery Plan for the Steller Sea Lion, Eastern and Western Distinct Population Segments (*Eumetopias jubatus*) (NMFS 2008), available at https://www.fisheries.noaa.gov/resource/document/recovery-plan-steller-sea-lion-revision-eastern-and-western-distinct-population, and

Status Review of the Humpback Whale (*Megaptera novaeangliae*) (Bettridge *et al.*2015), available at https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports-region.

The project vicinity is an area of moderately high human use and some habitat alteration. The primary ongoing human activity in the action area likely to impact marine mammals includes climate change, coastal zone development, pollution, marine vessel activity, and noise (e.g., vessel, pile-driving, equipment, etc.).

5.1.1. Climate Change

The effects of climate changes to the marine ecosystems of the Gulf of Alaska, including northern Lynn Canal, and how they may affect marine mammals are uncertain. The effects of climate change would result from changes in the distribution of temperatures suitable for the distribution and abundance of prey and the distribution and abundance of competitors or predators. For example, variations in the localized recruitment of herring in or near the action area caused by climate change could change the distribution and localized abundance of humpback whales. However, we have no information to indicate that this has happened to date.

The Steller Sea Lion Recovery Plan ranks environmental variability as a potentially high threat to recovery of the western DPS (NMFS 2008). The Bering Sea and Gulf of Alaska are subjected to large-scale forcing mechanisms that can lead to basin-wide shifts in the marine ecosystem resulting in significant changes to physical and biological characteristics, including sea surface temperature, salinity, and sea ice extent and amount. Physical forcing affects food availability and can change the structure of trophic relationships by impacting climate conditions that influence reproduction, survival, distribution, and predator-prey relationships at all trophic levels. Warmer waters could favor productivity of some species of forage fish, but the impact on recruitment of important prey fish of Steller sea lions is unpredictable. Recruitment of large year-classes of gadids (e.g., pollock) and herring has occurred more often in warm than cool years, but the distribution and recruitment of other fish (e.g., osmerids) could be negatively affected (NMFS 2008). Populations of Steller sea lions in the Gulf of Alaska and Bering Sea

have experienced large fluctuations due to environmental and anthropogenic forcing (Mueter *et al.* 2009). As we work to understand how these mechanisms affect various trophic levels in the marine ecosystem, we must consider the additional effects of global warming, which are expected to be most significant at northern latitudes (Mueter *et al.* 2009, IPCC 2013)

5.2. Stressors that affect Humpback Whales in the Action Area

5.2.1. Entanglement in Fishing Gear

As discussed above, entanglement in fishing gear is a geographically wide-spread threat to humpback whales. The minimum average annual mortality and serious injury rate due to interactions with all fisheries in 2013-2017 is 18 Central North Pacific stock of humpback whales (9.5 in commercial fisheries + 0.4 in recreational fisheries + 0.4 in subsistence fisheries + 7.7 in unknown fisheries) (Muto *et al.* 2019).

An assessment by Neilson et al. (2009) found that 78% of whales in northern southeastern Alaska had been non-lethally entangled in fishing gear. Between 2003 and 2004, 8% of whales in the Glacier Bay and Icy Strait area acquired new entanglement related scars (Neilson et al., 2009). Calves were found to have lower scarring rates but are thought to have more lethal encounters with entanglement. The results of the study also show that males may have a higher rate of entanglement than females, but it is not known why this difference exists or if it is real and will persist over time (Neilson et al., 2009).

5.2.2. Vessel Strikes and Disturbance

The action area experiences moderate levels of marine vessel traffic with highest volumes occurring May through September. Marine vessels that use the action area include passenger ferries, whale watching tour boats, charter fishing vessels, cruise ships, and kayaks (NMFS 2015). The Alaska Marine Highway System (AMHS) offers year-round service to Hoonah, although it has decreased frequency of service recently, which largely prompted this construction activity. The state ferry docks at HMIC, and it also serves local fishing boats and other private marine vessels.

Cruise ships are the largest vessels that routinely use the action area. The historic Hoonah Packing Company Cannery was redeveloped in the early 2000s by the Huna Totem Corporation at Icy Strait Point, as a cruise ship destination and tourist attraction. With the completion of the first cruise ship birth in 2016, ship visits increased from 34 in 2004 to 122 visits in 2019. With the new berth, Icy Strait Point averaged one cruise ship mooring per day in the high tourism season of 2019 (May-September). In May 2019, construction began on a second cruise ship dock at Icy Strait Point. It was scheduled to open during the 2020 cruise season, which did not occur due to the global pandemic.

5.2.2.1. Vessel Strikes

Available evidence suggests that ship strikes are increasing in Alaska (Gabriele et al., 2007). From 1978-2006, 62 collisions were reported in Alaskan waters, involving a wide range of vessel types and large whale species (Gabriele et al., 2007). The most commonly reported vessel type

was small private boats less than 15m in length. However, this trend may be influenced by reporting and not accurately reflect the true frequency of vessel type involved. Of the 62 collisions, 49 had unknown outcomes and 11 collisions resulted in death of the whale. 46 of the 62 reported collisions involved humpback whales (Gabriele et al., 2007). The average annual number of mortalities and serious injuries from ship strike between 2013 and 2017 was 2.3 whales per year Ship strikes were estimated to account for 1.8 mortality/serious injuries per year in 2013 (Muto *et al.* 2019).

Neilson et al (2012) summarized 93 total (reported) humpback-vessel collisions in Alaska from 1978–2011, of which 17 are known to have resulted in the whale's death. Analysis of all whale species and vessel collisions showed that small vessel strikes were most common (<15 m, 60%), but medium (15–79 m, 27%) and large (≥80 m, 13%) vessels also struck whales. They found a significant increase in the number of reports over time between 1978 and 2011 (regression, $r2 = 0.6999$, $df = 32$, $P<0.001$). Most strikes (n = 98, 91%) occurred in May through September and there were no reports from December or January. The majority of strikes (n = 82, 76%) were reported in southeastern Alaska, where the number of humpback whale collisions increased 5.8% annually from 1978 to 2011.

Confirmed reports of vessel strikes in and near the action area are shown in Figure 24 and Figure 25. These include:

- one strike in the immediate vicinity of the project construction in June 2017 by a 40’ recreational vessel observing bubble-feeding humpback whales,
- two additional strikes near the vessel route into Port Frederick, one in August 2010 by a vessel transiting 10 knots, and one in May 2018 by a whale-watching vessel;
- and an additional strike near the mouth of Port Frederick in July 2011 when a whale surfaced under a sailboat (Figure 25).

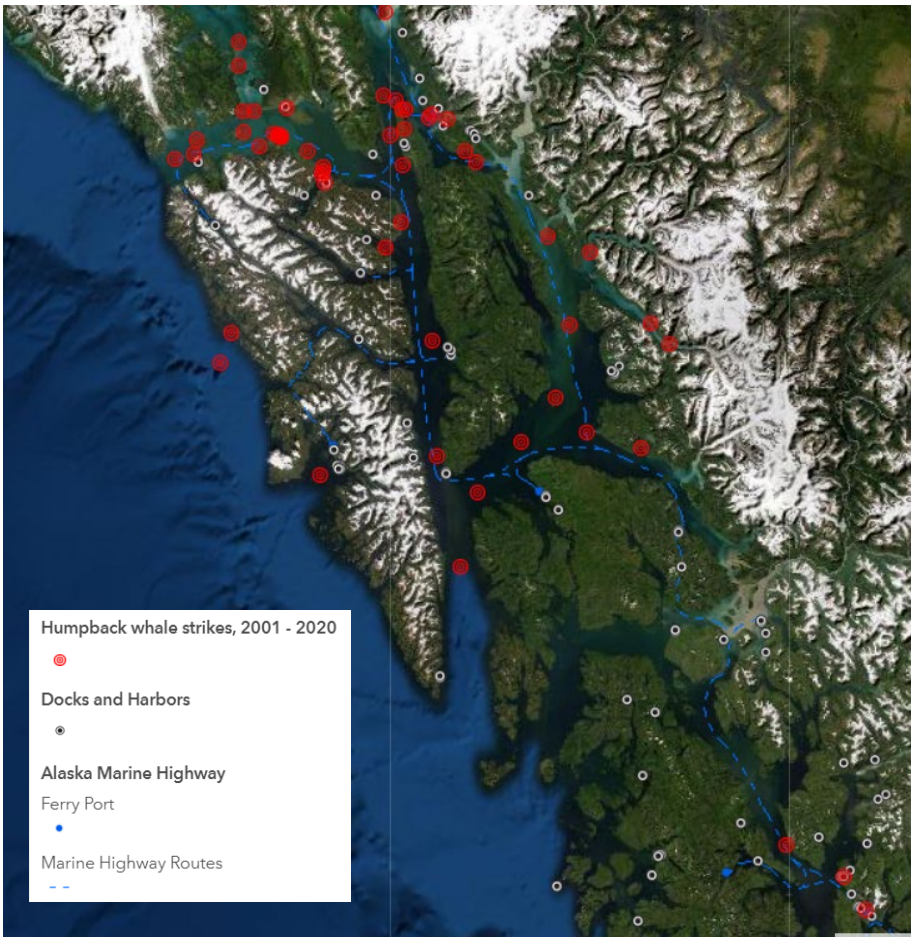

Figure 24. Locations of reported humpback whale strikes in southeast Alaska, 2001 - 2020. Unpublished data from NMFS Alaska stranding program[2].

[2] The data drawn in the figure represents a summary of all confirmed reports received by the Alaska Regional Stranding Network of humpback whales between 2001 and 2020. Please be aware of the uncertainty associated with the summarized reports. Marine mammal stranding reports are made by expert members of the marine mammal community as well as members of the general public with varying degrees of knowledge regarding marine mammal biology and ecology. All of the summarized reports have been confirmed, which means they are accompanied by some level of verification. However, the degree of confirmation, and associated uncertainty, ranges from low to high. Low confirmation describes reports that are dependable, firsthand accounts lacking evidence or notes. High confirmation includes concrete evidence or an event witnessed, with no element of doubt. It is also important to recognize that the reports represent effort that has varied substantially over time and location, particularly during earlier reporting periods and in areas with low population density. Consequently, both precise and imprecise data co-exist in the database, resulting in an assortment of both well-documented and anecdotal reports. Given that any or all of these factors may contribute to the misinterpretation of Alaska stranding data, NOAA Fisheries provides these records as *provisional* data that is conditional and subject to change.

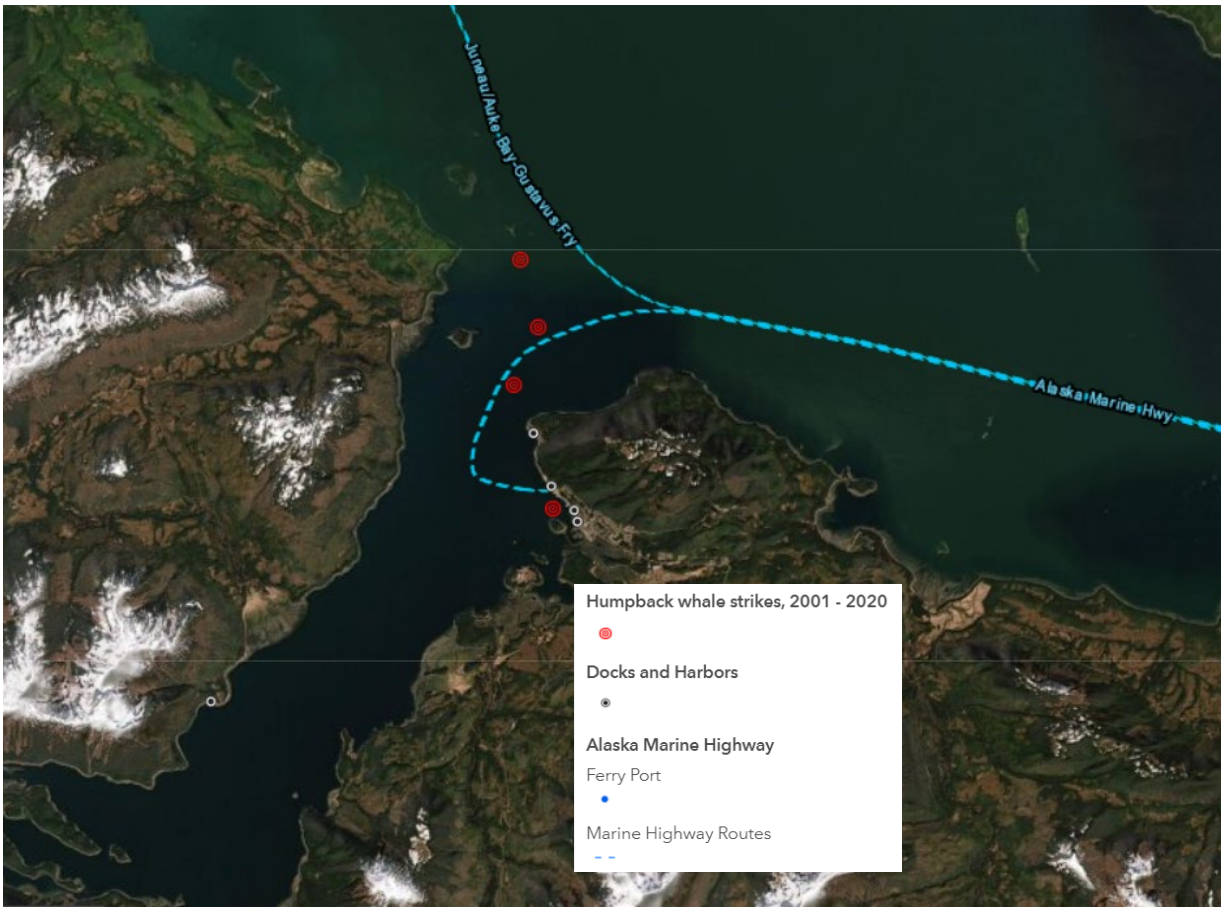

Figure 25. Locations of reported humpback whale strikes in the Action Area (*unpublished data from NMFS Alaska* stranding *program*), docks and harbors, and Alaska Marine Highway vessel routes.

5.2.2.2. Disturbance

The current Icy Strait Point facility has been operating as a port of call for cruise ships since 2004. The facility gets about 72 vessel calls per 90-day season each year. Once at Icy Strait Point, passengers partake in a variety of excursions including whale watching tours to Icy Strait and nearby Point Adolphus. Point Adolphus is a very popular area for whale watching, charter fishing and kayak tours in the summer months. The whale watching tours originating at Icy Strait Point have created a noticeable increase in small and medium vessel traffic at Point Adolphus (C. Gabriele, pers. comm).

Systematic whale counts have been undertaken in the area since 1985 by biologists from Glacier Bay National Park and Preserve. Until 2013, whale counts were increasing along with whale population growth in Southeast Alaska, but in recent years, there has been a sharp decline in the number of whales near Point Adolphus (Neilson et al. 2014, 2015). There are no published findings on the effects of the increase in whale watching vessel traffic at Point Adolphus although reports of whale harassment and collisions with whales have been documented (Neilson et al. 2013, 2014). Despite the decrease in whale numbers, it appears that the same number of

tours still go to Point Adolphus from Icy Strait Point, focusing on a much smaller number of whales, which has the potential to disproportionately affect those individuals via acoustic and behavioral disturbance (C. Gabriele, pers. comm).

5.3. Stressors that affect Steller Sea lions in the Action Area

5.3.1. Illegal shooting

Illegal shooting of sea lions may occur to an unknown extent in the action area. The Steller Sea Lion Recovery Plan (NMFS 2008) ranked illegal shooting as a low threat to the recovery of the western DPS. Illegal shooting of sea lions was thought to be a potentially significant source of mortality prior to the listing of sea lions as threatened under the ESA in 1990.

On June 1, 2015, the NMFS Alaska Marine Mammal Stranding Program received reports of at least five dead Steller sea lions on the Copper River Delta. Two NMFS biologists recorded at least 18 pinniped carcasses, most of which were Steller sea lions, on June 2, 2015. A majority of the carcasses had evidence that they had been intentionally killed by humans. Subsequent surveys located two additional Steller sea lion carcasses, which may also have been intentionally killed.

In April 2018, two men were criminally charged in connection with the 2015 case. They were charged with harassing and killing Steller sea lions with shotguns and then making false statements and obstructing the government's investigation into their criminal activities. In late June 2018, the men plead guilty to criminal charges.

NMFS Alaska Region designed survey plans for the Copper River Delta in 2016-2018 focused on the time period of greatest overlap between the salmon driftnet fishery and marine mammals. The purpose of the surveys was to determine if the intentional killing observed in 2015 continued, and to collect cause of death evidence and samples for health assessments. Intentional killing by humans appears to be continuing and was the leading known cause of death of the pinnipeds assessed on the Copper River Delta from May 10 to August 9, 2016 and from May 18 to August 17, 2017 (Wright and Savage 2017, 2018).. It is unlikely that the presence of the carcasses observed in the 2016 and 2017 surveys would have been reported without these dedicated surveys in this remote area. Without dedicated monitoring in past years it is impossible to know whether intentional killings by humans increased in 2015- 2017 relative to prior years. Numbers of marine mammals found dead with evidence of human interaction dropped considerably between 2015 and 2016, but increased between 2016 and 2017.

5.3.2. Competition for Prey

Competition could exist between Steller sea lions and commercial fishing for prey species. NMFS (2008) noted there are commercial fisheries that target key Steller sea lion prey, including Pacific cod, salmon, and herring in the eastern portion of their range. It was recognized that in some regions fishery management measures appear to have reduced this potential competition (e.g., no trawl zones and gear restrictions on various fisheries in southeast Alaska) and in others the very broad distribution of prey and seasonal fisheries that differs from that of sea lions may minimize competition as well.

5.3.3. Vessel Strikes and Disturbance

5.3.3.1. Vessel Strikes

Although risk of vessel strike has not been identified as a significant concern for Steller sea lions (Loughlin and York 2000), the Recovery Plan for this species states that Steller sea lions may be more susceptible to ship strike mortality or injury in harbors or in areas where animals are concentrated (e.g., near rookeries or haulouts). There are no rookeries or haulouts in Port Frederick. Since 2000, there have been four reported ship strikes of Steller sea lions in the Gulf of Alaska (Table 8), but none in this project's action area.

Table 8. Confirmed vessel strikes of Steller sea lions in Alaska since 2000. Unpublished data from NMFS Alaska stranding program. .

Year	Month	Area	Age	Sex	Length (cm)
2015	June	SE Alaska (Sitka)	unknown	unknown	unknown
2009	Apr	SE Alaska (Sitka)	adult	M	351 cm
2007	May	GOA	adult	F	114 cm
2007	Apr	SE Alaska (Sitka)	unknown	unknown	unknown

5.3.3.2. Disturbance

As discussed above for humpback whales, the current Icy Strait Point facility has been operating as a port of call for cruise ship passengers since 2004. The facility gets about 72 vessel calls per 90-day season each year. Icy Strait Point and Point Adolphus are already heavily used tourism areas in the summer months. There is no published information on the effects of this vessel traffic to marine mammals, however NMFS expects that mild behavioral changes could be occurring when Steller sea lions encounter vessels in the water. There are no Steller sea lion rookeries or haulouts in the action area, although Steller sea lions could congregate around fish cleaning operations if waste isn't properly contained.

5.4. Environmental Baseline Summary

The proposed project is an area of moderately high human use and some existing habitat alteration. Humpback whales have been impacted by entanglement and vessel strike. Steller sea lions experience competition for prey and may be subject to illegal shooting and vessel strike. However, humpback whales and western DPS Steller sea lions in the action area appear to be increasing in population size – or, at least, their population sizes do not appear to be declining – despite their continued exposure to the direct and indirect effects of the activities discussed in the Environmental Baseline. While we do not have trend information for the Mexico DPS of humpback whales, they also do not appear to be declining as a result of the current stress regime.

6. EFFECTS OF THE ACTION

"Effects of the action" are all consequences to listed species or critical habitat that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action. A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action (50 CFR § 402.02).

This biological opinion relies on the best scientific and commercial information available. We try to note areas of uncertainty, or situations where data is not available. In analyzing the effects of the action, NMFS gives the benefit of the doubt to the listed species by minimizing the likelihood of false negative conclusions (concluding that adverse effects are not likely when such effects are, in fact, likely to occur).

We organize our effects analysis using a stressor identification – exposure – response – risk assessment framework for the proposed activities. We conclude our analysis with an integration and synthesis section, where we consider all of the components of our analysis.

NMFS identified and addressed all potential stressors; and considered all consequences of the proposed action, individually and cumulatively, in developing the analysis and conclusions in this opinion regarding the effects of the proposed action on ESA-listed species and designated critical habitat.

6.1. Project Stressors

Stressors are any physical, chemical or biological phenomena that can induce an adverse response. The effects section starts with identification of the stressors produced by the constituent parts of the proposed action.

Based on our review of the data available, the proposed actions may cause these stressors:

1. Sound field produced by impulsive noise sources such as impact pile-driving;
2. Sound fields produced by continuous noise sources such as: vessels, vibratory pile-driving, and drilling operations;
3. Changes to habitat including seafloor disturbance from drilling activities and placement of equipment or anchors, turbidity and sedimentation, and pollution from unauthorized spills; and
4. Vessel strike and disturbance.

Below we analyze the effects of these stressor on Steller sea lions and humpback whales.

6.1.1. Minor Stressors on ESA-Listed Species and Critical Habitat

Based on a review of available information, we identified the following minor stressors associated with the project that could affect Steller sea lions and humpback whales and Steller sea lion critical habitat:

- changes to habitat including seafloor disturbance from drilling activities and placement of equipment or anchors, turbidity and sedimentation, and pollution from unauthorized spills;
- vessel strike; and
- disturbance from vessel noise.

We briefly analyze these minor stressors below.

6.1.1.1. Changes to Habitat

The project may cause changes to listed and prey species habitat, including seafloor disturbance from drilling activities and placement of equipment or anchors. Because of the relatively silt-free nature of sediments in subtidal areas, little material will be suspended in the water column during pile driving. However, turbidity may be increased above background levels within the immediate vicinity of construction activities and could exceed turbidity criteria for state water quality standards (18 AAC 70). Because of local currents and tidal action, any potential water quality exceedances are expected to be temporary and highly localized. The local currents will disperse suspended sediments from pile-driving operations at a moderate to rapid rate, depending on tidal stage. Fish and marine mammals in Port Frederick are routinely exposed to substantial levels of suspended sediment from glacial sources.

Steel piles used during construction will not introduce or leach contaminants into the sediment, and resuspension will be temporary, highly localized, and minor. Pile removal will be conducted with a vibratory hammer, creating minimal resuspension.

Permitted and un-permitted sources have the potential to produce pollutants in the action area. Intentional sources of pollution, including domestic, municipal, and industrial wastewater discharges, are managed and permitted by the Alaska Department of Environmental Conservation (ADEC). Pollution may also occur from unintentional discharges and spills. Marine water quality in the action area may also be affected by discharges from shipyard and other industrial activity, treated sewer system outflows, cruise ships and other vessels operating in marine waters, and sediment runoff from paved surfaces and disturbed areas.

Short-term effects on listed marine mammal species may occur if petroleum or other contaminants accidentally spill into Port Frederick from machinery or vessels during construction activities. Mitigation measures described in Section 2 will be implemented to minimize the risk of fuel spills and other potential sources of contamination. Spill prevention and spill response procedures will be maintained throughout construction activities. No long-term effects on water quality are expected to occur in the action area as the result of the proposed action.

We expect any impacts to listed species habitat from an oil spill or other pollution would be too small to detect or measure because this size of such a spill is likely to be very small and the spilled product would likely dissipate quickly. Spills are also unlikely to occur due to the mitigation measures.

Construction activities, in the form of increased turbidity, have the potential to adversely affect forage fish and juvenile salmonid migratory routes in the project area. Both herring and salmon

form a significant prey base for Steller sea lions and humpback whales. Increased turbidity is expected to occur in the immediate vicinity of construction activities. However, suspended sediments and particulates are expected to dissipate quickly within a single tidal cycle.

Juvenile salmon (which are prey for Steller sea lions and humpback whales) have been shown to avoid areas of unacceptably high turbidities (e.g., Servizi 1988), although they may seek out areas of moderate turbidity (10 to 80 nephelometric turbidity units [NTU]), presumably as cover against predation (Cyrus and Blaber 1987a and 1987b). Chinook salmon exposed to 650 mg/L of suspended volcanic ash are able to find their natal waters (Whitman *et al.* 1982), and thus, very locally elevated turbidities generated by the proposed action present during pile driving activities are highly unlikely to affect marine mammals or their prey.

Based on this information and the proposed mitigation, it is unlikely that the brief, localized, and very temporary increase in turbidity generated by the proposed actions would measurably affect marine mammal prey that may be present in the action area. Therefore, any effects of turbidity on WDPS Steller sea lions and Mexico DPS humpback whales will be too small to detect or measure.

Hollow steel piles will be used for construction of the terminal and will not introduce or leach contaminants into the sediment surrounding the project site. Existing sediment quality in the project area is assumed to be good and relatively free of contaminants, so there will not be any resuspension of contaminants due to pile driving activities. The project is expected to have no measurable effects on habitat or on prey of Steller sea lions and humpback whales.

Proposed construction will alter existing nearshore habitats by increasing overwater coverage. This increase in overwater shading may affect the migration and rearing of juvenile salmon, the adults of which are prey of Steller sea lions. The scientific literature reflects that juvenile salmon migrating along shorelines have consistently shown behavioral responses upon encountering overwater structures. These responses include pausing, school dispersal, and migration directional changes. The significance of these behavioral effects include displacement from optimal habitats or potential increases in predation as fish disperse away from the nearshore. Most of the literature indicates that the change in light intensity between open areas and shading provided by the overwater structure is a primary contributor of behavioral effects. However, there is little empirical evidence to indicate that these behavioral responses result in decreases in fitness or population (Nightingale and Simenstad 2001).

Several salmon-bearing streams and rearing areas are present near the project site, so it is quite likely that juvenile salmon rear and migrate in the vicinity of the site and could be potentially affected by proposed increases in overwater coverage.

The addition of these piles will eliminate a small amount of benthic habitat which juvenile salmon use for feeding and rearing in the nearshore. But the area so affected is on the order of 600 sq ft, or 0.001 acres (0.0004 ha), which comprises an infinitesimal proportion of the range of wDPS Steller sea lions or Mexico DPS humpback whales.

We do not expect that the proposed increase in overwater coverage will affect out-migrating and

juvenile salmon to a degree that could result in any measurable impact on marine mammals that feed on them or on their adult forms.

6.1.1.2. Vessel Strike

As discussed in the Environmental Baseline section, Icy Strait and Port Frederick are busy thoroughfares for commercial and recreational ship traffic, including existing cruise ship traffic to Icy Strait Point and Alaska Marine Highway System ferries and Alaska Marine Lines barges to the COH current facilities. Humpback whales and Steller sea lions in the action area are already exposed to disturbance from vessel noise and are at risk of injury or death from a collision (vessel strike).

Reported vessel strikes of humpback whales in the action area are shown in Figure 25. There have been no reported strikes of Steller sea lions in the action area. Ship strikes can cause major wounds or death to marine mammals. An animal at the surface could be struck directly by a vessel, a surfacing animal could hit the bottom of a vessel, or a vessel's propeller could injure or kill an animal below the water's surface. 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 that most lethal ship strikes on large whales occurred when a vessel was traveling in excess of 24.1 km/h (14.9 mph; 13 kn).

There will be a temporary, localized, and small increase in vessel traffic during construction. Two work barges will be present during the in-water work. The barges will be located near each other where construction is occurring. Once the barges get to the construction site, they will be anchored and will remain present throughout the construction period. Skiffs will transport workers and materials very short distances from shore to the work platform and will keep their speed below 10 knots in the ensonified area (Mitigation Measure 29).

With strict adherence to the mitigation measures, including maintaining a vigilant watch for marine mammals during all vessel operations and speed restrictions, a vessel strike of a listed species from construction vessels is unlikely to occur. The two barges transiting to the construction area will adhere to all vessel transit mitigation measures including the Whale Approach Regulations, making a vessel strike of a listed species from the barges unlikely to occur.

The purpose of constructing the cargo dock at HMIC is to create a safe, year-round berth for barges that already transit to Hoonah and off-load goods using the gravel boat ramp (Figure 3). Currently, using the gravel ramp poses risk to vessel and crew in inclement weather. COH expects that ensuring safe barge delivery year-round will offset the decrease in Alaska Marine Highway System ferry service trips to Hoonah. Thus, the project is not expected to cause a sustained localized increase in vessel traffic.

Because there will be only four additional vessels associated with the action, those vessels are required to follow mitigation measures designed to reduce the risk of vessel strike, and no increased vessel activity is expected as a result of the action, NMFS concludes that vessel strike of humpback whales or Steller sea lions as a result of the activities associated with this action is

extremely unlikely to occur.

6.1.1.3. Vessel Noise

As discussed above, there will be a temporary and localized increase in vessel traffic during construction, and no increase in vessel traffic is expected after the action is concluded. Disturbance to listed species from vessel noise during construction could occur during all vessel activities. Project vessels are likely to generate underwater sound levels exceeding the non-impulsive threshold of 120 dB. NMFS expects that the amount of underwater noise produced by project construction vessels is estimated at between 145–175 dB rms and would drop to 120 dB within 233 meters (or less) of most vessels associated with the proposed action (Richardson et al. 1995; Blackwell and Greene 2003; Ireland and Bisson 2016). Some marine mammals could receive sound levels in exceedance of the acoustic threshold of 120 dB from these vessels or be disturbed by the visual presence of barges and tugs. However such exposures are not expected to significantly disrupt normal behavior patterns for the reasons explained below.

The nature of the exposure (primarily vessel noise) will be low-frequency, with much of the acoustic energy emitted by project vessels at frequencies below the best hearing ranges of listed marine mammals in the action area. In addition, because construction vessels will be transiting small distances between shore and the work platform, the duration of the exposure to vessel noise will be on the order of a few minutes. The project vessels will emit continuous sound while in transit, which will alert marine mammals before the received sound level exceeds 120 dB.

Startle responses are not expected in response to vessel noise. Past experiences of animals exposed to vessel noise with vessels are important in determining the degree and type of response elicited from an animal-vessel encounter. Whale reactions to slow-moving vessels are less dramatic than their reactions to faster and/or erratic vessel movements. Some species have been noted to tolerate slow-moving vessels within several hundred meters, especially when the vessel is not directed toward the animal and when there are no sudden changes in direction or engine speed (Wartzok et al. 1989, Richardson et al. 1995, Heide-Jorgensen et al. 2003). Marine mammals that frequent the project area are very likely habituated to vessel disturbance due to the common presence of ferries, cruise ships, fishing vessels, tenders, barges, tugboats, and other commercial and recreational vessels that use the harbors, docks, and landing ramps at the HMIC and nearby Icy Strait Point cruise ship dock. Approaching vessels will provide abundant notice of their approach. This allows potentially harassed animals abundant time to avoid vessels prior to their being annoyed to such an extent as to significantly disrupt normal behavior patterns in ways that it affects survival or fitness.

If animals do respond, they may exhibit slight deflection from the noise source, engage in low-level avoidance behavior or short-term vigilance behavior, but these behaviors are not likely to result in adverse consequences for the animals. The nature and duration of response is not anticipated to disrupt to a measurable degree important behavioral patterns such as feeding or resting. During the operational period of the action (May through September), there is abundant high-quality habitat for humpback whales adjacent to the ensonified area, and most Steller sea lions will have moved to rookeries outside of the action area. Temporary avoidance of the ensonified area is not likely to adversely affect these species**.**

Disturbances from vessels may motivate seals and sea lions to leave haulout locations and enter the water (Richardson 1998, Kucey 2005). The possible impact of vessel disturbance on Steller sea lions has not been well studied, yet the response by sea lions to disturbance will likely depend on the season and life stage in the reproductive cycle (NMFS 2008a). The action area does not include Steller sea lion critical habitat, and all vessels associated with project construction will avoid the 3,000 ft (914 m) designated aquatic zones surrounding any major rookery or haulout in southeast Alaska as they transit to and from the project site.

Some marine mammals could be exposed to vessel noise as a result of this action. If exposure occurs, it will be temporary and localized, and likely cause responses that are at a low energy cost to individuals. This action's mitigation measures are expected to further reduce the number of times marine mammals react to transiting vessels. NMFS concludes that any disturbance of marine mammals from vessel noise will be temporary and the effects to listed species from vessel noise will be extremely small.

6.1.2. Major Stressors on ESA-Listed Species and Critical Habitat

The following sections analyze major stressors on ESA-listed species and critical habitat: sound fields produced by impulsive noise sources such as impact pile-driving, and sound fields produced by continuous noise sources such as vibratory pile-driving and DTH. First we provide a brief explanation of the sound measurements and acoustic thresholds used in the discussions of acoustic effects in this opinion. As discussed in Section 2, *Description of the Proposed Action*, the COH intends to use three types of pile driving equipment that may result in acoustic effects to listed species (Table 2).

6.1.2.1. Acoustic Thresholds

Since 1997, NMFS has used generic sound exposure thresholds to determine whether an activity produces underwater and in-air sounds that might result in impacts to marine mammals (70 FR 1871, 1872; January 11, 2005). NMFS has developed comprehensive guidance on sound levels likely to cause injury to marine mammals through onset of permanent and temporary thresholds shifts (PTS and TTS) (83 FR 28824; June 21, 2018; 81 FR 51694; August 4, 2016). NMFS is in the process of developing guidance for behavioral disruption (Level B harassment). However, until such guidance is available, NMFS uses the following conservative thresholds of underwater sound pressure levels,[3] expressed in root mean square[4] (rms), from broadband sounds that cause behavioral disturbance, and referred to as Level B harassment under section 3(18)(A)(ii) of the Marine Mammal Protection Act (MMPA) (16 U.S.C § 1362(18)(A)(ii)):

- impulsive sound: 160 dB_{rms} re 1 µPa
- continuous sound: 120 dB_{rms} re 1µPa

[3] Sound pressure is the sound force per unit micropascals (µPa), where 1 pascal (Pa) is the pressure resulting from a force of one newton exerted over an area of one square meter. Sound pressure level is expressed as the ratio of a measured sound pressure and a reference level. The commonly used reference pressure level in acoustics is 1 µPa, and the units for underwater sound pressure levels are decibels (dB) re 1 µPa.

[4] Root mean square (rms) is the square root of the arithmetic average of the squared instantaneous pressure values.

Under the PTS/TTS Technical Guidance, NMFS uses the following thresholds (Table 3) for underwater sounds that cause injury, referred to as Level A harassment under section 3(18)(A)(i) of the MMPA (16 U.S.C § 1362(18)(A)(i)) (NMFS 2018). Different thresholds and auditory weighting functions are provided for different marine mammal hearing groups, which are defined in the Technical Guidance (NMFS 2018). The generalized hearing range for each hearing group is in Table 96.

Table 9. Underwater marine mammal hearing groups (NMFS 2018).

Hearing Group	ESA-listed Marine Mammals In the Project Area	Generalized Hearing Range[1]
Low-frequency (LF) cetaceans *(Baleen whales)*	Bowhead whales	7 Hz to 35 kHz
Mid-frequency (MF) cetaceans *(dolphins, toothed whales, beaked whales)*	None	150 Hz to 160 kHz
High-frequency (HF) cetaceans *(true porpoises)*	None	275 Hz to 160 kHz
Phocid pinnipeds (PW) *(true seals)*	Ringed and bearded seals	50 Hz to 86 kHz
Otariid pinnipeds (OW) *(sea lions and fur seals)*	None	60 Hz to 39 kHz

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

These acoustic thresholds are presented using dual metrics of cumulative sound exposure level (L_E) and peak sound level (PK) for impulsive sounds and L_E for non-impulsive sounds.

Level A harassment radii can be calculated using the optional user spreadsheet[5] associated with NMFS Acoustic Guidance, or through modeling.

[5] The Optional User Spreadsheet can be downloaded from the following website: http://www.nmfs.noaa.gov/pr/acoustics/guidelines.htm

Table 10. PTS Onset Acoustic Thresholds for Level A Harassment (NMFS 2018).

Hearing Group	PTS Onset Acoustic Thresholds* (Received Level)	
	Impulsive	**Non-impulsive**
Low-Frequency (LF) Cetaceans	$L_{pk,flat}$: 219 dB $L_{E,LF,24h}$: 183 dB	$L_{E,LF,24h}$: 199 dB
Mid-Frequency (MF) Cetaceans	$L_{pk,flat}$: 230 dB $L_{E,MF,24h}$: 185 dB	$L_{E,MF,24h}$: 198 dB
High-Frequency (HF) Cetaceans	$L_{pk,flat}$: 202 dB $L_{E,HF,24h}$: 155 dB	$L_{E,HF,24h}$: 173 dB
Phocid Pinnipeds (PW) (Underwater)	$L_{pk,flat}$: 218 dB $L_{E,PW,24h}$: 185 dB	$L_{E,PW,24h}$: 201 dB
Otariid Pinnipeds (OW) (Underwater)	$L_{pk,flat}$: 232 dB $L_{E,OW,24h}$: 203 dB	$L_{E,OW,24h}$: 219 dB

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

Note: Peak sound pressure (L_{pk}) has a reference value of 1 µPa, and cumulative sound exposure level (L_E) has a reference value of 1µPa^{2}s. The subscript "flat" is being included to indicate peak sound pressure should be flat weighted or unweighted within the generalized hearing range. The subscript associated with cumulative sound exposure level thresholds indicates the designated marine mammal auditory weighting function (LF, MF, and HF cetaceans, and PW and OW pinnipeds) and that the recommended accumulation period is 24 hours. The cumulative sound exposure level thresholds could be exceeded in a multitude of ways (i.e., varying exposure levels and durations, duty cycle). When possible, it is valuable for action proponents to indicate the conditions under which these acoustic thresholds will be exceeded.

While the ESA does not define "harass," NMFS issued guidance interpreting the term "harass" under the ESA as to: "create the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering" (Wieting 2016). For purposes of this consultation, any exposure to Level A or Level B disturbance sound thresholds under the MMPA constitutes an incidental "take" under the ESA and must be authorized by the ITS (Section 10 of this opinion).

As described below, we expect that exposures to listed marine mammals from noise associated with the proposed action may result in disturbance. However, no mortalities or permanent impairment to hearing are expected or authorized.

6.2. Exposure Analysis

As discussed in the *Approach to the Assessment* section of this opinion, exposure analyses are designed to identify the listed species that are likely to co-occur with these effects in space and time and the nature of that co-occurrence. In this step of our analysis, we try to identify the number, age (or life stage), and gender of the individuals that are likely to be exposed to an action's effects and the populations or subpopulations those individuals represent.

6.3. Exposure to Noise

6.3.1. Approach to Estimating Exposure to Major Noise Sources

For this analysis we estimated take by considering: 1) acoustic thresholds above which the best available science indicates marine mammals will be behaviorally harassed; 2) the area of water that will be ensonified above these levels in a day; 3) the occurrence of marine mammals within these ensonified areas; and 4) the number of days of activities.

6.3.2. Calculated Distances to Level A and Level B Sound Thresholds

For this project, distances to the Level A and Level B thresholds were calculated based on various source levels, expressed in sound pressure level (SPL)[6] or sound exposure level (SEL)[7] for a given activity and pile type 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.

6.3.3. Sound Source Levels

The intensity of pile driving sounds is greatly influenced by factors such as the type of piles, hammers, and the physical environment in which the activity takes place. There are source level measurements available for certain pile types and sizes from the similar environments recorded from underwater pile driving projects in Alaska (*e.g.*, JASCO Reports - Denes *et al*., 2016 and Austin *et al*., 2016) that were evaluated and used as proxy sound source levels to determine

[6] A sound pressure level (SPL) in dB is described as the ratio between a measured pressure and a reference pressure (for underwater sound, this is 1 microPascal (μPa)), and is a logarithmic unit that accounts for large variations in amplitude; therefore, a relatively small change in dB corresponds to large changes in sound pressure. The source level (SL) represents the SPL referenced at a distance of 1 m from the source (referenced to 1 μPa), while the received level is the SPL at the listener's position (referenced to 1 μPa).

[7] Sound exposure level (SEL; represented as dB re 1 μPa^2-s) represents the total energy in a stated frequency band over a stated time interval or event, and considers both intensity and duration of exposure. The per-pulse SEL is calculated over the time window containing the entire pulse (*i.e.*, 100 percent of the acoustic energy). SEL is a cumulative metric; it can be accumulated over a single pulse, or calculated over periods containing multiple pulses. Cumulative SEL represents the total energy accumulated by a receiver over a defined time window or during an event. Peak sound pressure (also referred to as zero-to-peak sound pressure or 0-pk) is the maximum instantaneous sound pressure measurable in the water at a specified distance from the source, and is represented in the same units as the rms sound pressure.

reasonable sound source levels likely to result from the City's pile driving and removal activities (Table 11). In an effort to be conservative, some source levels used were derived from larger sized piles when proxy values for the same pile size or type were unavailable.

Table 11. Proposed Sound Source Levels

Activity	Sound Source Level at 10 meters	Sound Source
Vibratory Pile Driving/Removal		
20-inch fender pile permanent	161.9 SPL	The 20-in fender and 30-inch-diameter source level for vibratory driving are proxy from median measured source levels from pile driving of 30-inch-diameter piles to construct the Ketchikan Ferry Terminal (Denes *et al*. 2016, Table 72).
30-inch steel pile temporary installation	161.9 SPL	
30-inch steel pile removal	161.9 SPL	
36-inch steel pile permanent	168.2 SPL	The 36-inch-diameter pile source level is proxy from median measured source levels from pile driving of 48-inch diameter piles for the Port of Anchorage test pile project (Austin *et al*. 2016, Table 16).
H-pile installation permanent	168 SPL	The H-pile source level is proxy from median measured source levels from vibratory pile driving of H piles for the Port of Anchorage test pile project (Yurk *et al*. 2015 as cited in Denes *et al*. 2016, Appendix H Table 2).
Sheet pile installation	160 SPL	The sheet source level is proxy from median measured source levels from vibratory pile driving of 24-inch sheets for Berth 30 at the Port of Oakland, CA (Buehler *et al*. 2015; Table I.6-2).
Impact Pile Driving		
36-inch steel pile permanent	186.7 SEL/ 198.6 SPL	The 36-inch diameter pile source level is a proxy from median measured source level from impact hammering of 48-inch piles for the Port of Anchorage test pile project (Austin *et al*., 2016, Tables 9 and 16).
20-inch fender pile installation permeant	161 SEL/ 174.8 SPL	The 20-inch diameter pile source levels are proxy from median measured source levels from vibratory driving of 24-inch piles for the Kodiak Ferry Terminal project (Denes *et al*. 2016)
H-pile installation permanent and Sheet pile installation	163 SEL/ 177 SPL	H-Pile and Sheets Impacting source levels are proxy from median measured source levels from pile driving H-piles and sheets for the Port of Anchorage test pile project (Yurk *et al*. 2015 as cited in Denes *et al*. 2016, Appendix H Table 1).
DTH		
36-inch steel pile permanent	164 SEL/ 166 SPL	The DTH sound source proxy of 164 dB SEL is from 42-in piles, Reyff 2020 and Denes *et al*. 2019; while the 154 dB SEL is based on 24-in piles, Denes *et al*. 2016.
20-inch fender pile installation temporary	154 SEL/ 166 SPL	
H-pile installation permanent (20-inch hole)	154 SEL/ 166 SPL	

6.3.4. Level A Harassment

When the NMFS Technical Guidance (2016) was published, in recognition of the fact that ensonified area/volume could be more technically challenging to predict because of the duration component in the new thresholds, we developed a User Spreadsheet that includes tools to help predict a simple isopleth that can be used in conjunction with marine mammal density or occurrence to help predict takes. We note that because of some of the assumptions included in the methods used for these tools, we expect that isopleths produced are typically going to be overestimates of some degree, which may result in some degree of overestimate of Level A harassment take. However, these tools offer the best way to predict appropriate isopleths when more sophisticated 3D modeling methods are not available, and NMFS continues to develop ways to quantitatively refine these tools, and will qualitatively address the output where appropriate. For stationary sources (such as from impact and vibratory pile driving and DTH), NMFS User Spreadsheet (2020) predicts the closest distance at which, if a marine mammal remained at that distance throughout the duration of the activity, it would not incur PTS. Inputs used in the User Spreadsheet (Tables 6 and 7), and the resulting isopleths are reported below (Table 8).

Table 12. NMFS Technical Guidance (2020) User Spreadsheet Input to Calculate PTS Isopleths for Vibratory Pile Driving.

	30-in piles (temporary install)	**30-in piles (temporary removal)**	**20-in fender piles (permanent)**	**36-in piles (permanent)**	**H-piles (permanent)**	**Sheet piles (permanent)**
Source Level (RMS SPL)	161.9	161.9	161.9	168.2	168	160
Weighting Factor Adjustment (kHz)	2.5	2.5	2.5	2.5	2.5	2.5
Number of piles within 24-hr period	4	4	4	4	4	30
Duration to drive a single pile (min)	15	15	15	15	15	15
Propagation (xLogR)	15	15	15	15	15	15
Distance of source level measurement (meters)$^{+}$	10	10	10	10	11	10

Table 13. NMFS Technical Guidance (2020) User Spreadsheet Input to Calculate PTS Isopleths for Impact Pile Driving.

	36-in piles (permanent)	**36-in pile (DTH)**	**20-in fender piles (permanent)**	**20-in fender pile (DTH)**	**H-pile (permanent)**	**H-pile (DTH)**	**Sheet piles (permanent)**
Source Level (Single Strike/shot SEL)	186.7	164	161	154	163	154	163
Weighting Factor Adjustment (kHz)	2	2	2	2	2	2	2
Number of strikes per pile	100	-	35	-	35	-	35
Strike rate (avg. strikes per second)	-	15		15		15	
Number of piles per day	2	2	2	2	5	2	5
Propagation (xLogR)	15	15	15	15	15	15	15
Distance of source level measurement (meters)$^{+}$	10	10	10	10	15	10	15

Table 14. NMFS Technical Guidance (2020) User Spreadsheet Outputs to Calculate Level A Harassment PTS Isopleths

Activity	Sound Source Level at 10 m	Level A PTS isopleths (meters)	
		Level A harassment	
		Low-Frequency Cetaceans	Otariid
Vibratory Pile Driving/Removal			
20-in steel fender pile installation	161.9 SPL	7.8	0.3
30-in steel pile temporary installation	161.9 SPL	7.8	0.3
30-in steel pile removal	161.9 SPL	7.8	0.3
36-in steel permanent installation	168.2 SPL	20.6	0.9
H-pile installation	168 SPL	22.0	0.9
Sheet pile installation	160 SPL	22.4	1.0
Impact Pile Driving			
36-in steel permanent installation	186.7 SEL/ 198.6 SPL	602.7	23.5
20-in fender pile installation	161 SEL/174.8 SPL	5.8	0.21
H-pile installation	163 SEL/177 SPL	21.8	0.8
Sheet pile installation	163 SEL/177 SPL	21.8	0.8
DTH			
36-in steel permanent installation	164 SEL/166 SPL	1,225.6	47.8
20-in steel fender pile installation	154 SEL/166 SPL	264.1	10.3
H-pile installation	154 SEL/166 SPL	264.1	10.3

No take by Level A harassment is proposed for authorization or expected to occur for humpback whales or Steller sea lions. Operations will shut down when an animal is seen to be approaching the Level A harassment zone. Due to their size and conspicuous nature, humpback whales are expected to be visibly detected approaching the Level A zone, which is a maximum distance of less than 1250 m from the sound source. We expect that the observers will also be able to detect Steller sea lions before they approach the level A zone, which for Steller sea lions, is a maximum distance of less than 50 m from the sound source.

6.3.5. Level B Harassment

Utilizing the practical spreading loss model (NMFS 2018), the City determined underwater noise will fall below the behavioral effects threshold of 120 dB rms for marine mammals at the distances shown in Table 9 for vibratory pile driving/removal, and DTH. With these radial distances, and due to the occurrence of landforms, the largest Level B harassment zone calculated for vibratory pile driving for 36-in steel piles and H-piles were larger than the 15,700

m from the source where land masses block sound transmission. For DTH, the largest radial distance was 11,659 m. For calculating the Level B harassment zone for impact driving, the practical spreading loss model was used with a behavioral threshold of 160 dB rms. The maximum radial distance of the Level B harassment zone for impact piling equaled 3,744 m for 36-in piles m. Table 12 below provides all Level B harassment radial distances (m) during the COH's proposed activities.

Table 15. Shutdown and Harassment Zones

Pile size, type, and method		Shutdown zones (meters*)		
	Received Level at 10 meters	LowFrequency Cetaceans	Otariid	Level B harassment zones (meters)
Vibratory Pile Driving/Removal				
20-in steel fender pile installation	161.9 SPL	10	10	6,215
30-in steel pile temporary installation	161.9 SPL	10	10	6,215
30-in steel pile removal	161.9 SPL	10	10	6,215
36-in steel permanent installation	168.2 SPL	25	10	15,700[a]
H-pile installation	168 SPL	35	10	15,700
Sheet pile installation	160 SPL	25	10	4,645
Impact Pile Driving				
36-in steel permanent installation	186.7 SEL/ 198.6 SPL	625	25	3,745
20-in fender pile installation	161 SEL/ 174.8 SPL	10	10	100
H-pile installation	163 SEL/ 177 SPL	25	10	205
Sheet pile installation	163 SEL/ 177 SPL	25	10	205
DTH				
36-in steel permanent installation	166 SPL	1,230	50	11,660
20-in steel fender pile installation	166 SPL	265	15	11,660
H-pile installation	166 SPL	265	15	11,660

* Numbers rounded up to nearest 5 meters. These specific rounded distances are for monitoring purposes rather than take estimation.

[a] Although the calculated distance to Level B harassment thresholds extends these distances, all Level B harassment zones are truncated at 15,700m from the source where land masses block sound transmission.

Three observers will be positioned in the action area (Figure 6), so that two observers are near the mouth of Port Frederick and would observe animals entering or about to enter the ensonified area. An additional observer on a vehicle completing transects in the southern portion of Port Frederick will monitor that portion of the Level B harassment zone for Steller sea lions and humpback whales and record instances of exposure.

6.3.6. Density Estimates and Take Calculation

Marine mammal species can occur year-round in the action area; however, Steller sea lion and humpback whale use of habitat in and around the action area varies substantially by season. At-sea densities have not been determined for marine mammals in Port Frederick; therefore, all estimates here are determined by using observational data from biologists, peer-reviewed literature, and information obtained from personal communication with researchers, state and Federal biologists, and local charter boat operators. Specific references used include these projects and studies from nearby areas:

- Icy Strait observations from 2015 (BergerABAM 2016)
- Hoonah Duck Point observations in 2019 (SolsticeAK 2020)
- Glacier Bay/Icy Strait NPS Survey data 2014-2018
- Whale Alert opportunistic reported sightings 2016-2019

6.4. Humpback whales

As discussed in the Status of the Species section, humpback whales feed in southeast Alaska into the late Fall, and then most begin their migration back to Mexico or Hawaii. The abundance of humpbacks in Port Frederick changes seasonally with the availability of prey. They are generally present in large numbers from late fall-early winter through mid- to late spring, but are infrequent to uncommon during the mid-summer months when herring are absent. During mid-summer, tour boat operators generally observe four to five whales per day.

During the previous Hoonah Berth I project, humpback whales were observed on 84 of the 135 days of monitoring; most often in September and October (BergerABAM 2016). Additionally, during construction of the Hoonah Berth II project in 2019, humpback whales were observed in the action area on 45 of the 51 days of monitoring; most often in July and September. A maximum of 24 humpback sightings were reported on a single day (July 30, 2019), and a total of 108 observations were recorded in harassment zones during project construction (SolsticeAK 2020). The largest group of humpback whales observed in the previous Hoonah observer reports was 8 individuals.

NMFS estimates that one group of up to 8 humpback whales could occur during each day of the project (110 days) for a total of 880 exposures to Level B harassment. Here we assume that if an animal is present in the ensonified area, it will be exposed to acoustic harassment, acknowledging that not all animals within the action area will be so exposed. Under the MMPA, humpback whales are considered a single stock (Central North Pacific); however, we have divided them here to account for DPSs listed under the ESA. Wade *et al*. 2016 reports that 6.01% of the individual humpback whales in this area are expected to be from the Mexico DPS. Therefore, NMFS expects that 54 individuals from the Mexico DPS of humpback whales may be exposed to Level B harassment.

880 x 0.061 = 53.68 (rounded up to 54) Mexico DPS humpback whales

No take by Level A harassment of humpback whales is proposed for authorization or expected to occur due to their large size and ability to be visibly detected in the project area if an animal should approach the Level A harassment zone.

6.5. Steller sea lion

There are no density estimates of Steller sea lions available in the project area. NMFS expects that Steller sea lion presence in the action area will vary due to prey resources and the spatial distribution of breeding versus non-breeding season. In April and May, Steller sea lions are likely feeding on herring spawn in the action area. Then, most Steller sea lions likely move to the rookeries along the outer coast of Chicagof Island during breeding season, and would be in the action area in greater numbers in August and later months (J. Womble, NPS, pers. comm. to NMFS AK Regional Office, March 2019). However, Steller sea lions are also opportunistic predators and their presence can be hard to predict.

Steller sea lions typically occur in groups of 1-10 animals, but may congregate in larger groups near rookeries and haulouts. There are no rookeries or haulouts in the ensonified area. Two previous construction projects have occurred in or near the ensonifed area of this action. Observers for the Hoonah Berth I project recorded an average of 1.3 sightings of Steller sea lions per day (BergerABAM 2016). During a test pile program performed at the project location by the Hoonah Cruise Ship Dock Company in May 2018, a total of 15 Steller sea lions were seen over the course of 7 hours in one day (SolsticeAK 2018). Most recently, during construction of the Hoonah Berth II project in 2019, an average of 4.6 sightings of Steller sea lions were recorded per day during a period of work similar to this project (SolsticeAK 2020). This estimate of 4.6 (rounded up to 5) sightings per day is the most recent, from a similar season, and seems to represent a middle-point of the other two observations.

NMFS expects that it is likely that up to 5 Steller sea lions may occur in the ensonified area during each day of work period (110 days) for this project, for a total of 550 exposures to Level B harassment. Here we assume that if an animal is present in the ensonified area, it will be exposed to acoustic harassment, acknowledging that not all animals within the action area will be so exposed. NMFS expects that the percentage of Steller sea lions which may be found in the action area from the wDPS is estimated at 1.4% (Hastings *et al.* 2020). Therefore, NMFS expects that 8 individual western DPS Steller sea lions may be exposed to Level B harassment.

550 x 0.014 = 7.7 (rounded up to 8) western DPS Steller sea lions

There is some evidence of Steller sea lions remaining in areas where there is a reliable food source. Should a Steller sea lion go undetected by a Protected Species Observer (PSO) and later be observed within the Level A harassment zone, the COH proposes mitigation measures (including shutdowns), and it would be unlikely that an animal would accumulate enough exposure for PTS to occur. Therefore, no take by Level A harassment is proposed or expected to occur as the largest Level A isopleths calculated were 47.8 m during DTH of 36-in piles and 23.5 m during impact pile driving of 36-in piles. The remaining isopleths were approximately 10 m or less.

Table 16 below summarizes the proposed estimated take for Mexico DPS humpback whales and western DPS Steller sea lions.

Table 16. Estimates of Exposure to Underwater sound in excess of MMPA acoustic harassment thresholds.

Species	Distinct Population Segment	Level A Harassment	Level B Harassment
Humpback Whale	Mexico DPS	0	54
Steller Sea Lion	Western DPS	0	8

In the *Response Analysis* (Section 6.3) we apply the best scientific and commercial data available to describe the species' expected responses to these exposures.

6.5.1. Response Analysis

As discussed in the Approach to the Assessment section of this opinion, response analyses determine how listed species are likely to respond after being exposed to an action's effects on the environment or directly on listed species themselves. Our assessments try to detect the probability of lethal responses, physical damage, physiological responses (particular stress responses), behavioral responses, and social responses that might result in reducing the fitness of listed individuals. Ideally, our response analyses consider and weigh evidence of adverse consequences, beneficial consequences, or the absence of such consequences.

As described in the Exposure Analysis, Mexico DPS humpback whales and western DPS Steller sea lions are anticipated to occur in the action area and to overlap with noise from pile driving activities. Some of the in-water sound source levels from the proposed action will generate noise loud enough to harass western DPS Steller sea lions and Mexico DPS humpback whales at certain distances.

The effects of project-related noise on marine mammals depend on both physical and biological factors. Physical factors include the sound magnitude, duration, and type (e.g., continuous vs. pulse), the size, type, and depth of the animal; the depth of the water column; the substrate of the habitat; the distance between the pile and the animal; and the sound propagation properties of the environment. Biological factors influencing an individual's response include the species receiving the sound, and individual characteristics such as habituation, season, or motivation (Ellison *et al*. 2012).

Marine mammals depend on acoustic cues for vital biological functions (e.g., orientation, communication, finding prey, avoiding predators). In general, the effects of sounds from pile driving activities could result in one or more of the following:

- temporary or permanent hearing impairment;
- non-auditory physical or physiological effects;
- behavioral disturbance, and

- masking (Gordon 2007; Nowacek *et al*. 2007; Richardson *et al*. 1995; Southall *et al*. 2007).

6.5.2. Temporary or Permanent Hearing Impairment

Marine mammals exposed to high intensity sound repeatedly or for prolonged periods can experience hearing threshold shift, the loss of hearing sensitivity at certain frequencies (Finneran *et al*. 2003; Finneran *et al*. 2002; Finneran 2016; Kastak *et al*. 1999; Schlundt *et al*. 2000; NMFS 2018). Threshold shift can be permanent (PTS), in which case the loss of hearing sensitivity is not recovered, or temporary (TTS), in which case the animal's hearing sensitivity recovers over time (Southall *et al*. 2007). TTS may reduce fitness, survival, and reproduction, although this depends on the frequency, duration, and biological context in which it occurs.

TTS of limited duration, occurring in a frequency range that does not coincide with that used for recognition of important acoustic cues, would have little to no effect on an animal's fitness. Repeated sound exposure that causes TTS could result in PTS. As stated in the Exposure analysis, we anticipate no Level A harassment, equivalent in this case to PTS, from the proposed COH project, which includes a combination of impact and vibratory pile driving, and DTH. These activities will not occur at the same time and there will be numerous pauses in activities producing the sounds each day. Given these pauses and the fact that many marine mammals are moving through the ensonified area and not remaining for extended periods of time, the potential for threshold shift declines.

6.5.3. Non-Auditory Physiological Effects

Stress is the primary non-auditory physiological effects that could occur in marine mammals exposed to underwater sound from the COH project. Marine, like terrestrial, mammals may exhibit a generalized stress response (elevated levels of "stress hormones" such as cortisol and corticosterone) to anthropogenic noise in their environment (ONR 2009; Rosen and Kumagai 2008). Prolonged exposure to stress may result in immune system suppression, reproductive failure, accelerated aging, and slowed growth.

Although most research on physiological stress response has focused on terrestrial species (Atkinson *et al*. 2015), stress responses of marine mammals have been reviewed (ONR 2009) and studied (Fair *et al* 2017; Romano *et al*. 2005). Clark *et al.* (2005) documented adrenal exhaustion in chronically stressed marine mammals. Rolland *et al.* (2012) found that noise reduction from lower exposure to ship traffic in the Bay of Fundy was associated with decreased stress in North Atlantic right whales. These and other studies lead to a reasonable expectation that some marine mammals could experience physiological stress responses upon exposure to intense and repeated sounds.

The estimated 110 days of pile driving activities will be staggered over a 4-month period and occur for a limited amount of time on each day (Table 1), thus limiting the potential for chronic stress. Marine mammals that show behavioral avoidance of pile driving, including some odontocetes and some pinnipeds, are especially unlikely to incur auditory impairment or non-auditory physical effects.

6.5.4. Behavioral Disturbance

Behavioral responses of marine mammals to noise can include subtle or more conspicuous changes in activities, and displacement. Marine mammal behavioral responses to sound are highly variable and context-specific, and reactions, if any, depend on species, state of maturity, experience, current activity, reproductive state, auditory sensitivity, time of day, and many other factors (Southall *et al*. 2007). Possible disturbance can range from mild (e.g., startle response) to severe (e.g., abandonment of vital habitat).

Observed responses of wild marine mammals to loud pulsed sound sources (typically seismic guns or acoustic harassment devices, but also including pile driving) have been varied but often consist of avoidance behavior or other behavioral changes suggesting discomfort (Morton and Symonds 2002; Nowacek *et al*. 2007; Thorson and Reyff 2006; Wartzok *et al*. 2003).

It is likely that the onset of both vibratory or impact pile driving could result in short-term changes in an animal's behavior. These behavioral changes may include: changing durations of surfacing and dives, number of blows per surfacing; moving direction and/or speed; reduced/increased vocal activities; changing/cessation of certain behavioral activities (such as socializing or feeding); visible startle response or aggressive behavior (such as tail/fluke slapping or jaw clapping); avoidance of areas where sound sources are located; and/or flight responses (*e.g.*, pinnipeds flushing into water from haulouts or rookeries).

The biological significance of marine mammals' behavioral responses to pile driving is difficult to predict, and in some cases, may not occur at all. For example, marine mammal monitoring for the Kodiak Ferry Dock project (ABR 2016) documented 1,281 Steller sea lions within the Level B harassment zone during pile driving or drilling, but of these, only 45 individuals (3.5%) demonstrated any evidence of behavioral disturbance. Nineteen showed alert behavior, 7 were documented fleeing, and 19 swam away from the project site. Other sea lions were engaged in activities such as milling, feeding, playing or fighting and did not change their behavior. In addition, two sea lions approached within 20 meters of active vibratory pile driving activities.

6.5.5. Masking

Auditory interference, or masking, occurs when a noise is similar in frequency and loudness to (or louder than) the auditory signal received by an animal while it is echolocating 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).

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).

Masking is likely less of a concern for Steller sea lions, which vocalize both in air and water and do not echolocate or communicate with complex underwater "songs."

The COH construction project will occur in an industrialized harbor, where vessel sounds and dock activity occurs frequently. We expect any additional contributions to masking from project activities would be immeasurable and of short duration relative to the existing conditions. The short duration and limited affected area of COH project-related noise will likely result in an insignificant amount of masking. Any masking that could possibly rise to Level B harassment would occur concurrently within the zones of behavioral harassment already estimated for vibratory pile driving, and which have already been taken into account in the *Exposure Analysis*.

6.5.6. Effects on Habitat

Potential impacts to the surrounding habitat from physical disturbance during pile driving and removal are possible. Changes to existing water quality are unlikely, because construction is occurring in an already industrial and commercial shipping area. We conclude that COH proposed activities at the project area would not result in permanent negative impacts to physical habitats used directly by humpback whales or Steller sea lions. However, these activities may have short-term impacts to food sources such as forage fish and invertebrates (see discussion below).

6.5.7. Effects on Potential Prey

As described in the *Status of Listed Species*, in Southeast Alaska, marine mammal distributions and seasonal increases in their abundance are strongly influenced by seasonal pre-spawning and spawning aggregations of forage fish, particularly Pacific herring (*Clupea pallasii*), eulachon (*Thaleichthys pacificus*) and Pacific salmon (*Oncorhynchus* spp.) (Marston *et al*. 2002; Sigler *et al*. 2004; Womble *et al*. 2005).

Herring are a keystone species in Southeast Alaska, serving as a vital link between lower trophic levels, including crustaceans and small fish, and higher trophic levels. In Southeast Alaska, Pacific herring typically spawn from March to May and attract large numbers of predators (Marston *et al*. 2002)The relationship between humpback whales and these ephemeral fish runs is so strong in Southeast Alaska that the seasonal abundance and distribution of marine mammals reflects the distribution of pre-spawning and spawning herring, and overwintering aggregations of adult herring.

Construction activities will produce continuous (vibratory pile driving and drilling) and impulsive (impact driving) sounds. Fish react to intermittent low-frequency sounds that are especially strong. Short duration, sharp sounds can cause overt or subtle changes in fish behavior and local distribution. Hastings and Popper (2005) identified several studies that suggest fish may relocate to avoid certain areas of intensive sound energy. Additional studies have documented effects of pile driving on fish, (Iafrate *et al.* 2019; CALTRANS 2015). Impulsive sounds at received levels of 160 dB may cause subtle changes in fish behavior. SPLs of 180 dB may cause noticeable changes in behavior (Skalski *et al*. 1992). Sounds of sufficient strength have been known to cause injury to fish and fish mortality (Hawkins 2005).

The most likely impact to fish from pile driving and drilling activities in the project area would be temporary avoidance of the area. The duration of fish avoidance after completion of construction activities is unknown, but a rapid return to normal recruitment, distribution and

behavior is expected.

As discussed in the Environmental Baseline section, Port Frederick is a biologically important area for humpback whale feeding from June through November (Figure 17, Figure 18, and Figure 19). Construction will overlap in time and space with this important feeding area, but there is ample suitable habitat in the adjacent water body Icy Strait, which is directly accessible before an animal would enter Port Frederick, without necessarily being disturbed by the construction. Therefore, the planned project is not expected to have adverse effects on the important summer and fall feeding habitat of humpback whales.

Studies on euphausiids and copepods, some of the more abundant and biologically important groups of zooplankton, consumed by baleen whales, have documented the use of hearing receptors to maintain schooling structures (Wiese 1996) and detection of predators (Chu *et al.*1996); however Wiese (1996) concluded that crustaceans (such as zooplankton) are not particularly sensitive to sound produced by even louder impulsive sounds such as seismic operations

Any effects of pile driving activities on zooplankton would be expected to be restricted to the area within a few feet or meters of the project and would likely be sub-lethal. Even if some zooplankton mortality were to occur, no appreciable adverse impact on zooplankton populations is expected, due to large reproductive capacities and naturally high levels of predation and mortality of these populations.

In summary, given the short daily duration of sound associated with individual pile driving activities, the relatively small areas being affected, and lack of expected effects to zooplankton populations, pile driving activities associated with the proposed action are not likely to have a permanent, adverse effect on any populations of fish or invertebrate species or habitat. Thus, any impacts to marine mammal habitat are not expected to cause significant or long-term consequences for individual Mexico DPS humpback whales or western DPS Steller sea lions.

7. CUMULATIVE EFFECTS

"Cumulative effects" are those effects of future state 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.

Some continuing non-Federal activities are reasonably certain to contribute to climate change within the action area. However, it is extremely difficult to distinguish between the action area's future environmental conditions caused by global climate change that are properly part of the environmental baseline *vs.* cumulative effects. Therefore, all relevant future climate-related environmental conditions in the action area are described in the Environmental Baseline.

Reasonably foreseeable future state, tribal, local or private actions include activities that relate to different scenarios of disturbance from vessel traffic - tourism, and transportation, commercial fishing, and community development.

7.1. Tourism and Vessel Traffic

Marine and coastal vessel traffic could contribute to potential cumulative effects through the disturbance of marine mammals associated with tourism. Tourism is a large industry in Southeast Alaska and has grown considerably over the last decade. McDowell Group (2020) shows the volume and trends of visitors coming to Alaska in recent years in Table 14. The summer 2019 visitor volume represent the fifth consecutive summer of growth. Alaska's summer 2019 cruise ship visitor volume was 44% higher than in 2010. Of the 1,331,600 cruise ship passengers to visit Alaska in 2019, 267,200 or 20% of them stopped in Icy Strait Point, in the immediate vicinity of the construction project. The 2020 cruise ship season was all but nonexistent due to the global covid-19 pandemic.

Table 17. Trends in Summer Visitor Volume, By Transportation Market, 2010-2019 (McDowell Group 2020).

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Cruise ship	878,000	883,000	937,000	999,600	967,500	999,600	1,025,900	1,089,700	1,169,000	1,331,600
Air	578,400	604,500	580,500	619,400	623,600	703,400	747,100	750,500	760,100	790,900
Highway/ ferry	76,000	69,300	69,100	74,800	68,500	77,000	84,500	86,100	97,200	90,500
Total	**1,532,400**	**1,556,800**	**1,586,600**	**1,693,800**	**1,659,600**	**1,780,000**	**1,857,500**	**1,926,300**	**2,026,300**	**2,213,000**
% change	**-4.3%**	**+1.6%**	**+1.9%**	**+6.8%**	**-2.0%**	**+7.3%**	**+4.4%**	**+3.7%**	**+5.2%**	**+9.2%**

Other regularly-occurring vessel traffic within the action area in the summer months can be generally characterized as ferries, commercial fishing boats, recreational vessels, or cargo vessels. Nuke (2012) reports that ferries (28%), passenger vessels with overnight accommodations (20%), and cruise ships (19%) comprise the majority of vessel activity in Southeast Alaska even though most of these vessels only operated during the five month period from May through September. Dry freight cargo barges and tank barges account for 19% and 11% of total vessel activity, respectively, while freight ships, both log and ore carriers comprise less than 3% of the total.

With the exception of 2020 due to safety measures in response to the Covid-19 global pandemic, the recent trends in numbers of summer visitors reported above suggest an increasing demand for tourism in this area, including vessel-based activities like whale-watching and sport-fishing. Expected reductions in tour boat demand due to lingering concern over communicable human diseases result in our inability to do more than speculate about the future effects of transportation on listed species; we can better address these changes as trends become clearer.

7.2. Community Development

Community development projects in Southeast Alaska could result in construction noise in coastal areas, and could generate additional amounts of marine traffic to support construction activities. Marine transportation could contribute to potential cumulative effects through the disturbance of marine mammals. No specific major community development projects are expected in the action area or nearby areas during the summer of 2021, however small development projects are ongoing and likely to continue.

8. INTEGRATION AND SYNTHESIS

In this Section, we formulate a "risk analysis," by adding the effects of the action (Section 6) to the environmental baseline (Section 5) and the cumulative effects (Section 7). This informs our biological opinion as to whether the proposed action is likely to: (1) result in appreciable reductions in the likelihood of the survival or recovery of the species in the wild by reducing its numbers, reproduction, or distribution; or (2) result in the adverse modification or destruction of critical habitat as measured through potential reductions in the value of designated critical habitat for the conservation of the species. These assessments are made in full consideration of the status of the species.

As discussed in the *Approach to the Assessment* section of this Opinion, we begin our risk analysis by asking whether the probable physical, physiological, or behavioral responses of endangered or threatened species are likely to reduce the fitness of endangered or threatened individuals or the growth, annual survival or reproductive success, or lifetime reproductive success of those individuals.

As part of our risk analyses, we identified and addressed all potential stressors; and considered all consequences of exposing listed species to all the stressors associated with the proposed action, individually and cumulatively, given that the individuals in the action area for this consultation are also exposed to other stressors in the action area and elsewhere in their geographic range.

8.1 Mexico DPS Humpback Whale Risk Analysis

Based on the results of the exposure analysis, we expect a maximum of 880 humpback whales may be exposed to noise from pile driving, and 6.1% or a maximum of 54 of these are anticipated to be from the Mexico DPS. Exposure to project-related vessel noise and risk of vessel strike may occur, but adverse effects from vessel disturbance and noise are likely to be insignificant due to the small marginal increase in such activities relative to the environmental baseline, the transitory nature of project-related vessel traffic, and the likely habituation of marine mammals that frequent this high vessel traffic area. Adverse effects from vessel strikes are considered extremely unlikely because of the few additional vessels introduced by the action, slow speeds at which these vessels will operate, and existing approach regulations.

Humpback whales' most likely responses to noise from pile driving activities include brief startle reactions or short-term behavioral modification. These reactions are expected to subside quickly when the exposure to pile driving noise ceases. The primary mechanism by which the behavioral changes we have discussed affect the fitness of individual animals is through the animals' energy and time budget. Large whales such as humpbacks have an ability to survive for months on

stored energy during migration and while in their wintering areas, and their feeding patterns allow them to acquire energy at high rates. The individual and cumulative energy costs of the behavioral responses we have discussed are not likely to reduce the energy budgets of humpback whales, and their probable exposure to project-related noise is not likely to reduce their fitness. As discussed in the *Description of the Proposed Action* and *Status of the Species* sections, this action does not overlap in space or time with humpback whale breeding. Mexico DPS humpback whales feed in Southeast Alaska in the summer and fall months, but most migrate to Mexican waters for breeding and calving in the late winter months. As a result, the probable responses to noise associated with pile driving activities are not likely to reduce the current or expected future reproductive success of Mexico DPS humpback whales or reduce the rates at which they grow, mature, or become reproductively active.

The implementation of mitigation measures (including shutdown zones) to reduce exposure to high levels of sound decrease the likelihood of a behavioral response that may affect vital functions, or cause TTS or PTS of humpback whales. When considered in conjunction with the effects of the proposed action, cumulative effects of future state or private activities in the action area are likely to affect humpback whales at a level comparable to present. As a result, this project is not likely to appreciably reduce Mexico DPS humpback whales' likelihood of surviving or recovering in the wild.

8.2 Western DPS Steller Sea Lion Risk Analysis

Based on the results of the exposure analysis, we expect a maximum of 550 Steller sea lions may be exposed to noise from pile driving, and 1.4% or 8 of these are anticipated to be from the Western DPS. It is difficult to estimate the behavioral responses, if any, that western DPS Steller sea lions in the action area may exhibit to underwater sounds generated by project activities. Though the sounds produced during project activities may not greatly exceed levels that Steller sea lions already experience in Port Frederick, the sources proposed for use in this project are not among sounds to which they are commonly exposed. In response to project-related sounds, some Steller sea lions may move out of the area or change from one behavioral state to another, while other Steller sea lions may exhibit no apparent behavioral changes at all.

During monitoring for the Kodiak Ferry Terminal and Dock Improvements Project, only 3.5% of Steller sea lions observed within the Level B exposure area (45 of 1,281) exhibited behaviors associated with disturbance, and five of these observations appeared to be reactions to passing vessels or killer whales rather than construction activity (ABR 2016). If Steller sea lions behave similarly for the COH project, then only 3.5%, or 19, of the 550 sea lions estimated to occur within the Level B zone of the project area during construction activities, might be expected to exhibit detectable signs of disturbance (e.g., alert, fleeing, disorientation, or swimming away from the construction site), and (less than) one of these would be expected to be a western DPS individual. The soft start (ramp-up) procedures described above and in the 4MP (attached) and IHA proposal for this project should further decrease project impacts to Steller sea lions. The largest western DPS Steller sea lion Level A zone for this project is 50 m. An easily observable shutdown zone of 50 m will make it extremely unlikely that western DPS Steller sea lions will be exposed to injury or Level A project-related sounds. Because we do not expect western DPS Steller sea lions to exhibit readily-observable behavioral reactions to project activities, and we do not anticipate physiological stress effects form project noise, we conclude that project activities

will not have a pronounced impact on feeding, breeding, or resting opportunities.

The implementation of mitigation measures (including shutdown zones) to reduce exposure to high levels of sound decrease the likelihood of a behavioral response that may affect vital functions, or cause TTS or PTS of Steller sea lions. When considered in conjunction with the effects of the proposed action, cumulative effects of future state or private activities in the action area are likely to affect Steller sea lions at a level comparable to present. As a result, this project is not likely to appreciably reduce the western PDS of Steller sea lions' likelihood of surviving or recovering in the wild.

9. CONCLUSION

After reviewing the current status of the listed species, the environmental baseline within the action area, the effects of the proposed action, and cumulative effects, it is NMFS's biological opinion that the proposed action is not likely to jeopardize the continued existence of WDPS Steller sea lions or Mexico DPS humpback whales. Additionally, the proposed action is not likely to adversely affect sperm whales or Steller sea lion critical habitat.

10. INCIDENTAL TAKE STATEMENT

Section 9 of the ESA prohibits the take of endangered species unless there is a special exemption. "Take" is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct (16 U.S.C. § 1532(19)). "Incidental take" is defined as take that results from, but is not the purpose of, the carrying out of an otherwise lawful activity (50 CFR § 402.02). Based on NMFS guidance, the term "harass" under the ESA means to: "create the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering" (Wieting 2016). The MMPA defines "harassment" as: any act of pursuit, torment, or annoyance which (i) has the potential to injure a marine mammal or marine mammal stock in the wild [Level A harassment]; or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering [Level B harassment] (16 U.S.C. § 1362(18)(A)(i) and (ii)). For this consultation, the EDA, USACE, and PR1 expect that any take of Steller sea lions or humpback whales will be by Level B harassment only. No Level A takes for these species are authorized.

Federal regulations promulgated pursuant to section 4(d) of the ESA extend the section 9 prohibitions to the take of threatened Mexico DPS humpback whales (81 FR 62259).

Under the terms of Section 7(b)(4) and Section 7(o)(2) of the ESA, taking that is incidental to an otherwise lawful agency action is not considered to be prohibited taking under the ESA, provided that such taking is in compliance with the terms and conditions of an Incidental Take Statement (ITS).

Section 7(b)(4)(C) of the ESA provides that if an endangered or threatened marine mammal is involved, the taking must first be authorized by Section 101(a)(5) of the MMPA. Accordingly, **the terms of this incidental take statement and the exemption from Section 9 of the ESA**

become effective only upon the issuance of MMPA authorization to take the marine mammals identified here. Absent such authorization, this incidental take statement is inoperative.

The terms and conditions described below are nondiscretionary. EDA, USACE, and PR1 have a continuing duty to regulate the activities covered by this Incidental Take Statement (ITS). In order to monitor the impact of incidental take, EDA, USACE, and PR1 must monitor and report on the progress of the action and its impact on the species as specified in the ITS (50 CFR § 402.14(i)(3)). If EDA, USACE, and PR1 (1) fail to require the permit holder to adhere to the terms and conditions of the ITS through enforceable terms that are added to the authorization, and/or (2) fail to retain oversight to ensure compliance with these terms and conditions, the protective coverage of Section 7(o)(2) may lapse.

The taking of any marine mammal in a manner other than that described in this ITS must be reported immediately to NMFS AKR, Protected Resources Division at 907-586-7638.

10.1. Amount or Extent of Take

Section 7 regulations require NMFS to estimate the number of individuals that may be taken by proposed actions (50 CFR § 402.14 (i)(1); see also 80 FR 26832 (May 11, 2015). This ITS authorizes take by harassment only. Based on the best available scientific and commercial information, we do not anticipate that responses of humpback whales and Steller sea lions to impulsive noise at received levels less than 160 dB re 1 µPa rms, or continuous noise at received levels less than 120 dB re 1 µPa rms, would rise to the level of "take" as defined under the ESA. This ITS does not authorize lethal take. Expected take is listed in Table 15.

Based on observational data and groups sizes of humpback whales observed, it is estimated that 1 group of 8 humpback whales may occur within the Level B harassment zone every day of the 110 day construction window during active construction. Based on an estimated 8 animals in a group x 1 group each day × 110 days, we estimate a maximum Level B harassment of 880 humpback whales. As described previously, Of the 880 animals potentially exposed to Level B harassment from construction activities, an estimated 6.1 percent, or 54, are expected to be from the Mexico DPS (Wade *et al*. 2016).Therefore, NMFS is authorizing 54 Level B harassment takes of Mexico DPS humpback whales under the ESA. No Level A take of Mexico DPS humpbacks is anticipated or authorized.

As described in Section 6.4, we estimate that up to 5 Steller sea lions may occur within the Level B harassment zone every day of in-water construction. Accordingly, an estimate of 5 animals x 110 days = 550 Steller sea lions potentially exposed to Level B harassment during project construction. Based on a recent study of Steller sea lion mitochondrial DNA mentioned above (Hastings *et al.* 2020), we assume that 1.4 percent of Steller sea lions observed in the action area may be from the western DPS. We estimate that 550 x 0.014, or 7.7 (rounded to 8) of these may be western DPS individuals. Therefore, NMFS is authorizing 8 Level B harassment takes of western DPS Steller sea lions under the ESA. No Level A take of western DPS Steller sea lions is anticipated or authorized.

If take of western DPS Steller sea lions or Mexico DPS humpback whales approaches the

number of takes authorized in the ITS (listed below in Table 15), PR1, USACE, and EDA will notify NMFS AKR PRD by email, to greg.balogh@noaa.gov to determine whether reinitiation of consultation is appropriate. Because it will be impossible for observers to distinguish western DPS sea lions and Mexico DPS humpback whales from individuals from other DPSs in the harassment zones, NMFS expects the ESA take limits listed in Table 15 will have been reached when the IHA take limits of 880 humpback whales and 550 Steller sea lions have been reached, respectively.

Table 18.Amount of incidental take of ESA-listed species authorized by this ITS.

Species	Proposed Authorized Level A Takes	Take by Harassment	Expected Temporal Extent of Take
Western DPS Steller sea lion (*Eumetopias jubatus*)	0	8[8]	May 1 through September 30
Mexico DPS Humpback whale (*Megaptera novaeangliae*)	0	54[9]	

10.2. Effect of the Take

Studies of marine mammals have shown that humpback whales and Steller sea lions are likely to respond behaviorally to acoustic disturbance. Only takes by acoustic harassment are authorized in this Incidental Take statement. No serious injury or mortalities are anticipated or authorized as part of this proposed action.

In Section 9 of this Opinion, NMFS concluded that the level of incidental take, coupled with other effects of the proposed action, is not likely to jeopardize the continued existence of Mexico DPS humpback whales or western DPS Steller sea lions.

10.3. Reasonable and Prudent Measures

"Reasonable and prudent measures" (RPMs) (50 CFR 402.14) are nondiscretionary measures to minimize the amount or extent of incidental take (50 CFR 402.02).

The RPMs included below, along with their implementing terms and conditions, are designed to minimize the impact of incidental take that might otherwise result from the proposed action. NMFS concludes that the following RPMs are necessary and appropriate to minimize and

[8] The proposed IHA (83 FR 64541) indicated a requested Level B take of 550 Steller sea lions. Of the proposed takes, 0.014% (8 sea lions) are expected to occur to ESA-listed western DPS animals. The basis for this apportionment is described in Section 4.3.2

[9] The proposed IHA (83 FR 64541) indicated a requested Level B take of 880 humpback whales. Humpback whales in southeast Alaska include individuals from two DPSs. Of the proposed takes, 6.1% (54 whales) are expected to occur to ESA-listed Mexico DPS animals. The basis for this apportionment is described in Section 4.3.1.

monitor the incidental take of western DPS Steller sea lions and Mexico DPS humpback whales resulting from the proposed action.

RPM #1: USACE, PR1, and EDA must require COH to conduct operations in a manner that will minimize impacts to western DPS Steller sea lions and Mexico DPS humpback whales that occur within or in the vicinity of the project action area.

RPM #2: USACE, PR1, and EDA must require COH to implement a comprehensive monitoring program to ensure that western DPS Steller sea lions and Mexico DPS humpback whales are not taken in numbers or in a manner not anticipated by this Opinion, and to submit a final report to NMFS AKR evaluating the mitigation measures and the results of the monitoring program.

10.4. Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the ESA, USACE, PR1, and EDA must comply with the following "terms and conditions" (T&Cs), which implement the RPMs described above. These T&Cs are non-discretionary and must be a binding condition of the USACE's, PR1's, and EDA's authorizations for the exemption in section 7(o)(2) to apply. USACE, PR1, and EDA have a continuing duty to monitor for the effects of this action on listed marine mammal species, as specified in this incidental take statement (50 CFR § 402.14).

If USACE, PR1, and EDA (1) fail to require COH to adhere to the T&Cs of the Incidental Take Statement through enforceable terms that are added to their authorizations, and/or (2) fail to retain oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(o)(2) may invalidate the take exemption. Partial compliance with these terms and conditions may result in more take than anticipated, and may also invalidate this take exemption. These terms and conditions constitute no more than a minor change to the proposed action because they are consistent with the proposed action's basic design.

To carry out RPM #1: USACE, PR1, and EDA must require COH to:

A. Implement all mitigation measures, including observation and shut-down zones and other requirements, as described in the final IHA and in the 4MP attached to this Biological Opinion.

B. In the event that the proposed action causes serious injury or mortality of a marine mammal (e.g. ship-strike, stranding, and/or entanglement), COH must immediately cease operations and report the incident to the NMFS Alaska Regional Stranding Coordinator at 907-271-3448 and/or by email to Mandy.Keogh@noaa.gov, and NMFS PR1 at 301-427-8401.

C. Following a prohibited take, USACE, PR1, and EDA will be required to reinitiate consultation under 50 CFR § 402.16, and any subsequent activities causing incidental take will not be exempt from the take prohibitions of ESA section 9. NMFS AKR will work with USACE, PR1, and EDA to determine what is necessary to minimize the likelihood of further prohibited take and ensure ESA compliance.

To carry out RPM #2: USACE, PR1, and EDA must require COH to:

A. Adhere to all monitoring and reporting requirements as detailed in the IHA issued by NMFS under section 101(a)(5) of the MMPA as reflected in the 4MP attached to this Opinion.

B. Submit a project specific report within 90 days of the conclusion of in-water work associated with this project. The report must analyze and summarize marine mammal interactions during this project. Report should be sent to the Protected Resources Division, NMFS by email to Kristin.Mabry@noaa.gov. This report must also contain information described in the mitigation measures of this Biological Opinion.

11. CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the ESA directs Federal agencies to use their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of threatened and endangered species. Specifically, conservation recommendations are suggestions regarding discretionary measures to minimize or avoid adverse effects of a proposed action on listed species or critical habitat or regarding the development of information (50 CFR § 402.02).

1. In project action areas where Steller sea lions have been observed feeding on fish waste at or near fishing vessel docks, PR1, USACE, and the EDA should work with applicants, NMFS Alaska Region, and local organizations to provide training or outreach materials to the consequences of feeding Steller sea lions.
2. Operators of all vessels associated with this project should use real-time passive acoustic monitoring to alert vessels to the presence of whales, primarily to reduce the risk of vessel strikes.
3. All project vessel crews should participate in the WhaleAlert program to report real-time sightings of whales while transiting in the waters of Southeast Alaska. More information is available at https://alaskafisheries.noaa.gov/pr/whale-alert . Access to view reported whale sightings to inform mitigation during construction can be arranged. Contact Kristin.Mabry@noaa.gov
4. NMFS PR1, USACE, and the EDA should work with other relevant stakeholders to develop a method for assessing the cumulative impacts of anthropogenic noise on marine mammals. This analysis includes the cumulative impacts on the distribution, abundance, and the physiological, behavioral, and social ecology of these species.

In order to keep NMFS's Protected Resources Division informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats, EDA, USACE, and PR1 should notify NMFS of any conservation recommendations they implement in their final action.

12. REINITIATION OF CONSULTATION

As provided in 50 CFR § 402.16, reinitiation of consultation is required where discretionary Federal agency involvement or control over the action has been retained or is authorized by law and if: (1) the amount or extent of incidental take is exceeded, (2) new information reveals effects of the agency action on listed species or designated critical habitat in a manner or to an

extent not considered in this opinion, (3) the agency action is subsequently modified in a manner that causes an effect on the listed species or critical habitat not considered in this opinion, or 4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount of incidental take is exceeded, section 7 consultation must be reinitiated immediately (50 CFR § 402.14(i)(4)).

13. DATA QUALITY ACT DOCUMENTATION AND PRE-DISSEMINATION REVIEW

Section 515 of the Treasury and General Government Appropriations Act of 2001 (Public Law 106-554) (Data Quality Act (DQA)) specifies three components contributing to the quality of a document. They are utility, integrity, and objectivity. This section of the opinion addresses these DQA components, documents compliance with the DQA, and certifies that this opinion has undergone pre-dissemination review.

13.1. Utility

This document records the results of an interagency consultation. The information presented in this document is useful to the US Army Corps of Engineers, the Economic Development Administration, the Office of Protected Resources, and the general public. These consultations help to fulfill multiple legal obligations of the named agencies. The information is also useful and of interest to the general public as it describes the manner in which public trust resources are being managed and conserved. The information presented in these documents and used in the underlying consultations represents the best available scientific and commercial information and has been improved through interaction with the consulting agency.

This consultation will be posted on the NMFS Alaska Region website http://alaskafisheries.noaa.gov/pr/biological-opinions/. The format and name adhere to conventional standards for style.

13.2. Integrity

This consultation was completed on a computer system managed by NMFS in accordance with relevant information technology security policies and standards set out in Appendix III, 'Security of Automated Information Resources,' Office of Management and Budget Circular A-130; the Computer Security Act; and the Government Information Security Reform Act.

13.3. Objectivity

Standards: This consultation and supporting documents are clear, concise, complete, and unbiased; and were developed using commonly accepted scientific research methods. They adhere to published standards including the ESA Consultation Handbook, ESA Regulations, 50 CFR 402.01 et seq.

Best Available Information: This consultation and supporting documents use the best available information, as referenced in the literature cited section. The analyses in this opinion contain more background on information sources and quality.

Referencing: All supporting materials, information, data and analyses are properly referenced,

consistent with standard scientific referencing style.

Review Process: This consultation was drafted by NMFS staff with training in ESA implementation, and reviewed in accordance with Alaska Region ESA quality control and assurance processes.

13.4. Commercial Fishing

Salmon and halibut commercial fishing contributes to the local economy and is expected to continue into the future at a level comparable to current efforts since no drastic change to those fish stocks or fishing effort are expected.

13.5. Cumulative Effects Summary

The action area will likely continue to function as a local hub for fishing, tourism (including whale watching), and general water-based transit. To meet the demands of increasing numbers of visitors to Hoonah as described above, NMFS expects that other types of marine vessel traffic (e.g., float planes, charter fishing vessels, whale watching vessels, ferries, etc.) will increase. An overall increase in vessel traffic could affect listed humpback whales or Steller sea lions through increased noise, harassment, vessel strike, displacement, or pollution.

The current and recent increases in population of both Steller sea lions and humpback whales in Southeast Alaska indicate that humans are not currently further endangering these species in this area. We do not expect the cumulative effects of these continued activities to hinder population growth of Mexico DPS humpback whales or Western DPS Steller sea lions. We note, however, that we are unable to say what the population trend for Mexico DPS humpbacks is in this area, just that humpback numbers overall are increasing.

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15. APPENDICES

15.1. Appendix A. Marine Mammal Monitoring and Mitigation Plan

15.2. Appendix B. Marine Mammal Reporting Form