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 Section 7(a)(2) Biological Opinion

Replacement of the Sand Point City Dock and Associated Issuance of an Incidental Harassment Authorization in Sand Point, Alaska

NMFS Consultation Number: AKR-2017-9673

Action Agencies: Federal Highways Administration, Alaska Division
Permits and Conservation Division, Office of Protected Resources, National Marine Fisheries Service, NOAA

Affected Species and Effects Determinations:

		Is the Action Likely To:			
		Adversely Affect:		Jeopardize the Species?	Destroy or Adversely Modify Critical Habitat?
ESA-Listed Species	Status	Species	CH		
Steller Sea Lion, Western DPS (*Eumetopias jubatus*)	Endangered	Yes	No	No	No
Humpback Whale, Western North Pacific DPS (*Megaptera novaeangliae*)	Endangered	Yes	N/A	No	N/A
Humpback Whale, Mexico DPS (*Megaptera novaeangliae*)	Threatened	Yes	N/A	No	N/A
Fin whale *(Balaenoptera physalus)*	Endangered	Yes	N/A	No	N/A

Consultation Conducted by: Alaska Region, National Marine Fisheries Service, NOAA

Issued by: for James W. Balsiger, Ph.D.
Administrator, Alaska Region

Date: 10/10/17

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ACRONYM	FULL NAME
BMPs	Best Management Practices
dB	decibel
DOT&PF	Alaska Department of Transportation and Public Facilities
DPS	distinct population segment
ESA	Endangered Species Act
FHWA	Federal Highways Administration
ft	foot
HTL	High Tide Line
IHA	incidental harassment authorization
ITS	incidental take statement
kg	kilogram
kHz	kilohertz
kts	knots
lb	pound (weight)
MHWM	Mean High Water Mark
MMPA	Marine Mammal Protection Act
nm	nautical mile/s
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
Observer	protected species observer
OCSP	Open Cell Sheet Pile
Opinion	this biological opinion
Permits Division	NMFS Office of Protected Resources, Permits and Conservation Division
PR1	NMFS Office of Protected Resources, Permits and Conservation
PND	PND Engineers, Inc.
p-p	peak-to-peak
PTS	permanent threshold shift
rms	root mean square
TTS	temporary threshold shift
µPa	micropascal
0-p	Zero-to-peak
USCG	U.S. Coast Guard
WQCP	Water Quality Control Plan

1.0 Introduction

Section 7(a)(2) of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. § 1536(a)(2)), requires Federal agencies to ensure that any action they authorize, fund, or carry 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. When a Federal agency's action may affect ESA-listed species or critical habitat, consultation with National Marine Fisheries Service (NMFS) and/or the U.S. Fish and Wildlife Service is required (50 CFR § 402.14(a)).

Section 7(b)(3) of the ESA requires that at the conclusion of consultation, NMFS and/or USFWS provide an opinion stating how the action will affect ESA-listed species and critical habitat under their jurisdiction (16 U.S.C. § 1536(b)(3)). If an incidental take is expected, section 7(b)(4) requires the consulting agency to provide an Incidental Take Statement (ITS) that specifies the impact of any incidental taking and includes reasonable and prudent measures to minimize such impacts and terms and conditions that must be complied with to implement those measures (16 U.S.C. § 1536(b)(4)).

The Alaska Department of Transportation and Public Facilities (DOT&PF), in cooperation with the Federal Highway Administration (FHWA), proposes to replace the existing City Dock in Sand Point, Alaska. The applicants will likely seek a permit for the proposed action under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act from the U.S. Army Corps of Engineers, Alaska District (Corps). The NMFS Office of Protected Resources, Permits and Conservation Division (hereafter referred to as "the Permits Division" or PR1), proposes to issue an incidental harassment authorization (IHA) pursuant to section 101(a)(5)(D) of the Marine Mammal Protection Act of 1972, as amended (MMPA) (16 U.S.C. §§ 1361-1407), to DOT&PF and FHWA for harassment of marine mammals incidental to the Sand Point Dock replacement activities (82 FR 31400; July 6, 2017).

The NMFS Alaska Region (NMFS AK) consulted with the Permits Division and the FHWA/ DOT&PF on the proposed action. This document represents our biological opinion (Opinion) on the proposed action and effects on endangered and threatened species and designated critical habitat for one of those species.

The Opinion and Incidental Take Statement were prepared by NMFS 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 Incidental Take Statement 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 considers the effects to ESA-listed species from the proposed FHWA funding and NMFS PR1 issuance of an IHA associated with replacement of the Sand Point dock. PR1 and FHWA/DOT&PF determined that this project will have no effect on North Pacific right whales (*Eubalaena japonica*). FHWA/ DOT&PF and NMFS Permits Division determined that the project is likely to adversely affect the endangered Western North Pacific Distinct Population Segment (DPS) humpback whale (*Megaptera novaeangliae*), the threatened Mexico DPS humpback whale (*Megaptera novaeangliae*), the endangered fin whale (*Balaenoptera physalus*), and the endangered western DPS Steller sea lion (*Eumetopias jubatus*). These action agencies further determined that the project may affect, but is not likely to adversely affect, designated

critical habitat for Steller sea lions because the effects of the action to critical habitat are insignificant and are not likely to result in a measurable reduction of conservation value. The effects to these species and critical habitat will be analyzed in this consultation.

This Opinion is based on information provided to us in the updated April 2017 IHA application (HDR 2017b); the updated January 2017 Biological Assessment (HDR 2017a); the proposed IHA (82 FR 31400; July 6, 2017); emails and telephone conversations between NMFS Alaska Region and NMFS Permits Division staff, FHWA/DOT&PF staff, and HDR, Inc. staff (on behalf of the City of Sand Point); and other sources of information. A complete record of this consultation is on file at NMFS's field office in Anchorage, Alaska.

1.2 Consultation History

Our communication about this consultation is summarized as follows:

- **July 5, 2016:** Kick off meeting for the proposed action with the applicants, NMFS Permits Division, and NMFS Alaska Region.
- **September 22, 2016**: BA submitted to NMFS by FHWA/DOT&PF with letter requesting imitation of ESA Section 7 formal consultation.
- **November 18, 2016**: NMFS received notice from NMFS Permits Division that the project was updated to include 30-inch-diameter piles.
- **January 25, 2017**: HDR submitted revised IHA application and revised BA to NMFS Permits Division and NMFS Alaska Region. This included recalculated Level A and B harassment zones using the new NMFS guidance.
- **February 10, 2017**: Meeting between applicants and NMFS detailing changes to project design
- **April 11, 2017**: HDR submitted a revised IHA application and 4MP to NMFS Permits Division who then forwards it on to NMFS Alaska Region.
- **June 7, 2017:** letter sent from DOT&PF to NMFS Permits Division objecting to the dismissal by NMFS Permits Division of empirical sound measurements from Alaska SSV studies as being inadequate for the Sand Point IHA application. Multiple discussions ensue on which sound source levels to use and how this will impact take estimates.
- **June 20, 2017**: NMFS Permits Division provided updated take numbers for the IHA.
- **July 7, 2017**: NMFS Permits Division requests the initiation of formal ESA consultation on this action.

2.0. Description of the Action

"Action" means all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by Federal agencies (50 CFR § 402.02). Interrelated actions are those that are part of a larger action and depend on the larger action for their justification (50 CFR § 402.02). Interdependent actions are those that have no independent utility apart from the action under consideration (50 CFR § 402.02).

FHWA/DOT&PF proposes to construct a new dock in Sand Point, Alaska in 2018. The existing dock is 36 years old and is approaching the end of its useful design and operational life and cannot continue to be used for large vessels due to corrosion and wear. Further deterioration is expected and it will eventually need to be removed. Even though the replacement dock is in a

slightly different location to the old dock, the old dock cannot be removed immediately because freight and ferry service would then be disrupted during construction of the replacement dock. The dock receives barge service from Seattle weekly throughout the year. The dock also regularly handles processed seafood. Given the lack of road access to Sand Point, the city dock is an essential component of infrastructure providing critical access between Sand Point and the Pacific Northwest region. Plans to remove the old dock are not solidified and will be contingent upon further funding.

Impact and vibratory driving of piles and vibratory pile removal are expected to take place over a total of approximately 32 working days within a 5-month window from August 1, 2018 through December 31, 2018. However, due to the potential for unexpected delays, up to 40 working days may be required. DOT&PF is asking for the proposed IHA to be valid for a period of one year. Because the exact dates of construction are unknown until a contract can be awarded, we conservatively assumed the action will take place during months with the highest density of whales and sea lions. The new dock would be supported by approximately 52 round, 30-inch-diameter, 100-foot-long permanent steel pipe piles. Fender piles installed at the dock face would be 8 round, 24-inch-diameter, 80-foot-long permanent steel pipe piles. The single mooring dolphin would consist of 3 round, 24-inch-diameter, 120-foot-long permanent battered steel pipe piles. This equates to a total of 63 permanent piles. Up to 90 temporary piles would be installed and removed during construction of the dock and would be either H-piles or pipe piles with a diameter of less than 24 inches.

Federal authorization and funding for the proposed action consists of the following:

- FHWA funding for replacing an existing dock and pilings; and
- NMFS Permits Division's proposed issuance of authorization for non-lethal takes of marine mammals by Level B harassment (as defined by the MMPA) incidental to the dock and piling replacement project (82 FR 31400; July 6, 2017). NMFS Permits Division also proposes to authorize non-lethal takes of non-ESA-listed marine mammals by Level A harassment for this project, but none of the species for which Level A take is authorized (Hawaii DPS of humpback whales, harbor seals, and harbor porpoise) are listed under the ESA. Therefore, this ESA consultation will not discuss and evaluate any Level A harassment.

The IHA would extend from August 1, 2018, to July 31, 2019, and authorize the Level B incidental harassment of 960 Steller sea lions, 6 fin whales, and 4 ESA-listed humpback whales (the Hawaii DPS of humpback whales is also included in the proposed IHA take calculations for both Level A and Level B harassment but since they are not listed under the ESA they are not considered in this consultation), incidental to all components of the replacement and expansion of the Sand Point dock. Section 7.2 of this Opinion contains more information about the methods used to calculate take for Steller sea lions, fin whales, and humpback whales.

The IHA will incorporate the protected species mitigation and monitoring measures and reporting requirements from the applicant's submitted Marine Mammal Monitoring Plan (MMP - See HDR 2017b), which are included as part of the project action.

2.1 Project Location

The Sand Point City Dock is located in the City of Sand Point, Alaska, at 55°20’06.6”N, 160°30’05.9”W, on the northwest side of Popof Island, in the Gulf of Alaska (Figure 1). The Sand Point City Dock is a multi-function dock and active ferry terminal located in Humboldt Harbor, on the southwest side of the City of Sand Point. The existing City Dock is located on the causeway of Sand Point’s “New Harbor” at the end of Boat Harbor Road, and the proposed replacement dock is proposed to be located immediately adjacent (southwest) to the existing City Dock along the causeway, which also serves as the breakwater for the New Harbor (Figure 2 and Figure 3). A small boat harbor is located immediately northeast of the City Dock. There is a seafood processing facility located approximately 410 meters (0.25 mile) north of the proposed dock (Figure 4 and Figure 5).

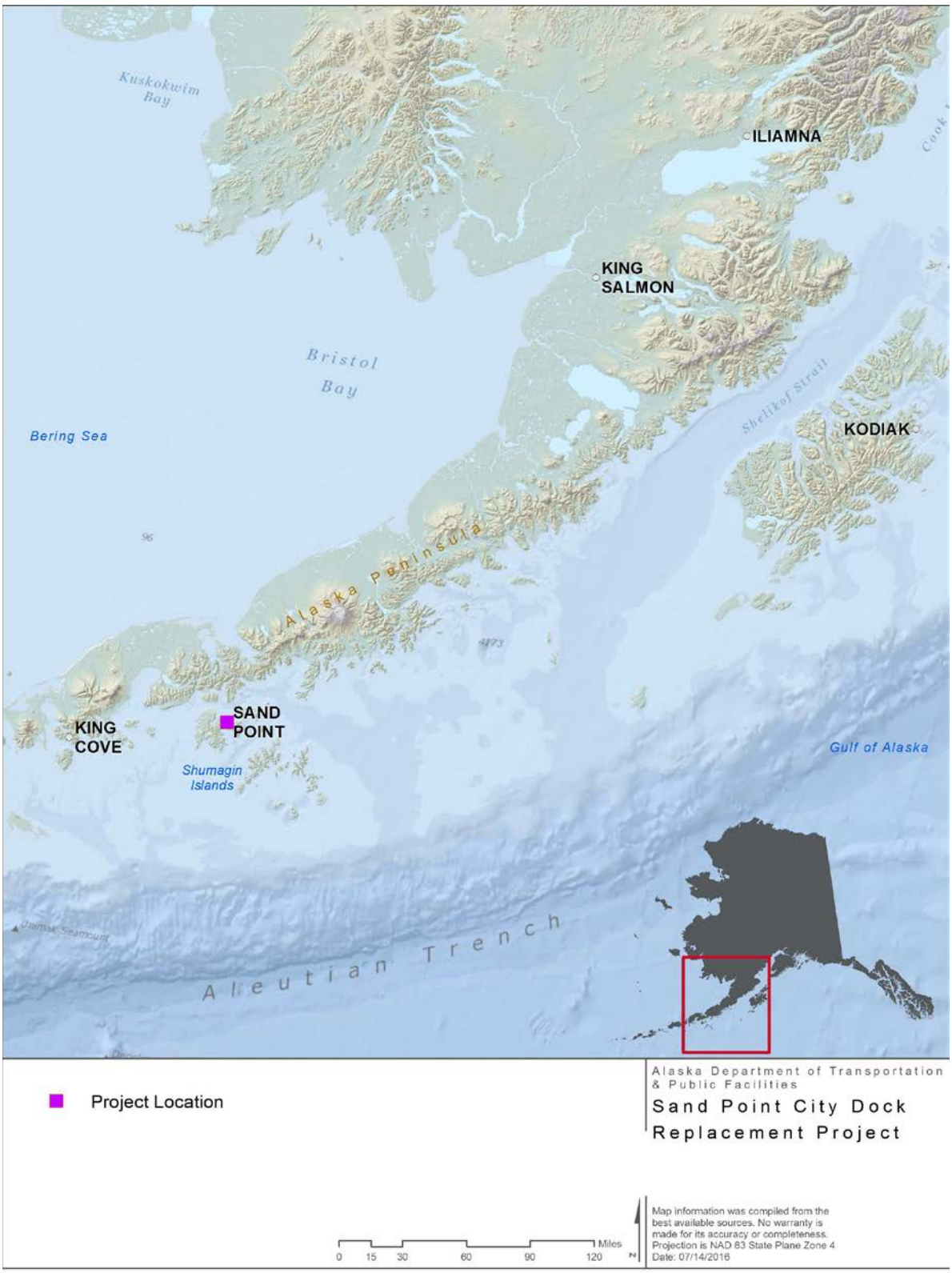

Figure 1. Site location and vicinity.

Figure 2. The area around Sand Point.

Figure 3. Aerial view of the "New Harbor" and existing City Dock. The replacement City Dock would be located at the bottom, center of this image, to the right of the existing City Dock.

Figure 4. Aerial view of the seafood processing facility and the City of Sand Point.

Figure 5. Sand Point City Dock and Humboldt Harbor.

2.2. Details of Construction Activities

The proposed action requires placing fill material adjacent to the existing causeway to create support for the new dock. Dock construction includes the installation of structural support piles, a concrete dock platform, four fenders, a catwalk with dolphin, a generator building, and electrical infrastructure. No dredging is proposed as part of this Project, and the existing dock would not be removed. Minor modifications to the existing dock's dolphin would occur as part of the proposed action (Figure 6).

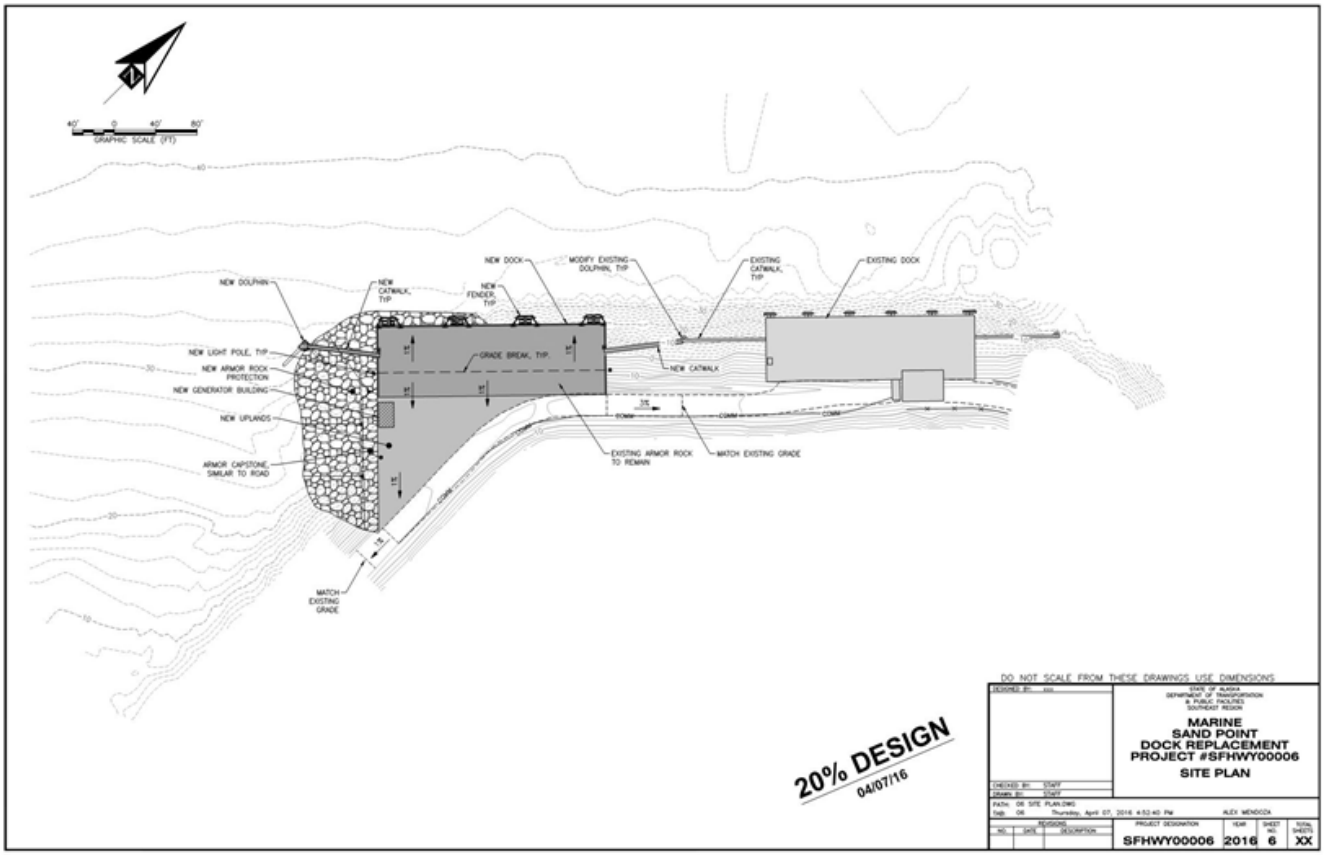

Figure 6. Sand Point City Dock replacement site plan drawing, aerial view (PND 2015).

Construction activities would require both land-based and marine-based staging areas and construction equipment. Land-based equipment would be staged along the causeway and in available storage areas on the inland edge of the New Harbor (Figure 3 and Figure 5). Portions of the existing dock may also be used for staging. While work is conducted in the water, an anchored barge may be used to stage construction equipment.

2.2.1. Dock Fill Placement

The proposed action includes the deposition of shot rock fill adjacent to the existing causeway (See Figure 6). New shot rock fill would be placed on the seaward side of the existing causeway to support dock construction and create an additional upland area for safe passenger staging and maneuvering of equipment. There is no mapped high tide line at Sand Point, and, therefore, engineers will use Mean Higher High Water (MHHW) to determine the placement of fill. This

fill would be placed above and below MHHW to increase the causeway's areal extent and would be stabilized through the use of new and salvaged armor rock protection. Approximately 38,600 square feet of fill and 28,500 square feet of armor rock would be required for breakwater expansion. Shot rock fill deposition activities are not expected to generate underwater sound at levels that would result in Level A or Level B harassment. Therefore, this impact will not result in take of listed species and will not be discussed further. The impacts to animals from silt and other sedimentation are discussed in Section 7.1.1.

2.2.2. Removal and Installation of Piles

Following deposition of fill and prior to placement of armor rock, round steel piles would be installed to support the new city dock foundation and mooring dolphins. Table 1 illustrates the anticipated number of days required for installation and removal of various pile types.

Table 1. Estimated number of days required for pile installation and removal.

Activity	Number of Piles	Days Required
Support pile installation	52	13
Temporary pile installation and removal	90	15
Dolphin pile installation	3	2
Fender pile installation	8	2
Total Days		32
Total Days with 25% contingency		40

Pile driving and removal may occur for up to 4 hours and 40 minutes per day. As noted previously, the proposed project will require installation of 30-inch and 24-inch, permanent steel piles. This equates to a total of 63 permanent piles as shown in Table 2 below. It is anticipated that an ICE 44B or APE 200-6 model vibratory driver or equivalent and a Delmag D62 diesel impact hammer or equivalent would be used to install the piles. Project design engineers anticipate an impact strike rate of approximately 40 strikes per minute, based on substrate density, pile types, and hammer type, which equates to approximately 1,000 strikes for each 30-inch dock support pile, 400 strikes for each dolphin pile, and 120 strikes for each fender pile.

Permanent dock support piles would be installed using both vibratory and impact hammers; both methods of installation typically occur within the same day. Permanent piles are first installed with a vibratory hammer for approximately 45 minutes to insert the pile through the overburden sediment layer and into the bearing layer. The vibratory hammer is then replaced with the impact hammer, which is used to install the pile for the last 15 to 20 feet (approximately 25 minutes). Up to four permanent piles would be installed per day, for a total of 180 minutes of vibratory and 100 minutes of impact installation per day. Installation of permanent piles would require about 13 days of effort (52 permanent piles / 4 permanent piles per day = 13 days).

Installation of the eight fender piles is anticipated to occur over 2 days (after installation of all dock support piles), at a production rate of four fender piles per day (8 fender piles / 4 fender

piles per day = 2 days). Each fender pile would require 30 minutes of vibratory installation and 3 minutes of impact installation, for a total of 120 minutes of vibratory and 12 minutes of impact installation each day. No temporary piles would be required for fender pile installation because they would be installed along the completed dock face.

Installation of three 24-inch permanent battered pipe piles for the dolphin would also require the installation and removal of four temporary piles (either <24 inch diameter or H-piles) to support the template. Installation of the dolphin piles will occur over 2 days, with one or two dolphin piles installed per day for a total of 3 dolphin piles. Thirty minutes of vibratory installation and 10 minutes of impact installation are anticipated per permanent dolphin pile, for a total of no more than 60 minutes of vibratory installation and 20 minutes of impact installation per day. Installation and removal of the temporary piles for the dolphin are included in the calculations for temporary piles above.

Two or more temporary piles would be used to support a template to facilitate installation of two to four permanent dock support piles. Template configuration, including the number of permanent piles that could be installed at once and the number of temporary piles required to support the template, would be determined by the contractor. Four additional temporary piles would support the template for the dolphin. In all, a maximum of 90 temporary piles would be installed and removed during construction of the dock and dolphin. Temporary piles would be either H-piles or pipe piles with a diameter of less than 24 inches.

Temporary piles would be installed and removed during construction of the dock by vibratory methods only. Removal and installation of the temporary piles that support the template typically occur within the same day, with additional time required for installation of the template structure, which would include welding, surveying the location, and other activities. Each temporary pile would be installed in approximately 15 minutes and removed in approximately 15 minutes. Up to six temporary piles would be installed and removed per day, for a total of up to 180 minutes of vibratory installation and removal per day. Installation of temporary piles, including those required to support construction of the dolphin, would require about 15 total days of effort (90 temporary piles / 6 temporary piles per day = 15 days). Total driving time for the proposed action would consist of approximately 22 hours of impact driving and 85 hours of vibratory driving and removal for all pile types.

Table 2. Pile details and estimated effort required for pile installation.

Pile Type	Diameter	Number of piles	Maximum piles per day	Hours per day	Estimated minutes per pile	Anticipated days of effort[1]
Vibratory Installation or Removal						
Permanent support pile	30”	52	4	3	45	13
Permanent dolphin pile	24”	3	2	1	30	2
Permanent fender pile	24”	8	4	2	30	2
Installation, temporary support pile	<24” or H-pile	90	6	1.5	15	15

Pile Type	Diameter	Number of piles	Maximum piles per day	Hours per day	Estimated minutes per pile	Anticipated days of effort[1]
Removal, temporary support pile	<24" or H-pile	90	6	1.5	15	15
Impact Installation						
Permanent support pile	30"	52	4	1.667	25	13
Permanent dolphin pile	24"	3	2	0.33	10	2
Permanent fender pile	24"	8	4	0.20	3	2

[1]Vibratory and impact driving of each permanent pile will occur on the same day. Installation and removal of each temporary pile will occur on the same day.

Following initial pile installation of permanent dock support piles, the mud accumulation on the inside of each pile would be augured out and the piles filled with concrete to provide additional moment capacity and corrosion resistance. An auger with a crane-mounted rotary head would be used for pile clearing. The auguring activities are not anticipated to result in underwater sound levels that would meet Level A or Level B harassment criteria and, therefore, will not be discussed further.

2.3. Mitigation Measures

2.3.1. Non-Acoustic Project Impacts

The following measures (see HDR 2017b) will be incorporated by the applicants to minimize potential non-acoustic impacts from project activities:

- All exposed Project slopes and fills that are susceptible to erosion will be stabilized in accordance with the Project-specific Water Quality Control Plan.
- If contaminated or hazardous materials are encountered during construction, all work in the vicinity of the contaminated site will be stopped until the Alaska Department of Environmental Conservation (ADEC) is contacted and a corrective action plan is approved by ADEC and implemented.
- Fuel hoses, oil drums, oil or fuel transfer valves and fittings, etc., will be checked regularly for drips or leaks, and would be maintained and stored properly to prevent spills.
- The Contractor will provide and maintain a spill clean-up kit on-site at all times, to be implemented as part of the SPCC Plan, as well as the HMCP and WQCP, in the event of a spill or if any oil products are observed in the water.
- Work in waters of the U.S. will be conducted in accordance with the terms and conditions of the USACE permit to be obtained for the Project.
- Fill material would 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 would also be free of invasive marine and terrestrial vegetation species.

2.3.2. Acoustic Impacts of the Action

A series of measures (HDR 2017b, 82 FR 31400) will be incorporated by the applicants to minimize noise impacts associated with pile installation. These include;

- use of a sound attenuation device (i.e., pile caps) during impact driving of piles;
- use standard soft-start, delay, and shut-down procedures;
- Establishing and monitoring Level B harassment zones for impact and vibratory driving as shown in Table 3.
- Implementing shutdown measures if a marine mammal is detected within or approaching the 100 m shutdown zone specified in the IHA;
- Shutting down if ESA-listed cetaceans approach relevant Level A take isopleths as shown in Table 3; and
- For in-water heavy machinery work other than pile driving (e.g., standard barges, tug boats, barge-mounted excavators), if a marine mammal comes within 10 m, operations shall cease and vessels shall reduce speed to the minimum level required to maintain steerage and safe working conditions.

DOT&PF (HDR 2017b) and the NMFS Permits Division (82 FR 31400) have established monitoring and reporting requirements for this project to minimize potential acoustic impacts from project activities. Briefly, qualified observers will be on-site before, during, and after in-water construction activity at land-based sites appropriate for monitoring harassment zones (as shown in Table 3). The plan includes:

- Required qualifications for two protected species observers (observers);
- General methods by which observers will conduct monitoring activities;
- Equipment required by observers;
- Descriptions of the exclusion zones and areas that will be monitored;
- Locations of the observers;
- Monitoring techniques specific to pile-driving and removal; and
- Observers monitor the Level A and B harassment zones for 30 minutes before, during, and for 30 minutes after the proposed activities; and
- Reporting requirements (i.e. final report and reporting injured and dead marine mammals to the Office of Protected Resources and the Alaska Regional Stranding Coordinator using NMFS's phased approach and suspending activities, if appropriate).

Table 3a. Calculated Level A harassment zone.

Level A Harassment Zone (meters)		
Activity	Piles installed per day	Isopleths (m)
		Low frequency cetaceans (i.e. humpback and fin whales)
Impact Installation 30"	4	1,430
	3	1,180
	2	900
	1	570
Impact Installation 24" Dolphin	2	640

Level A Harassment Zone (meters)		
Activity	Piles installed per day	Isopleths (m)
		Low frequency cetaceans (i.e. humpback and fin whales)
	1	400
Impact Installation 24" Fender	4	450
	3	380
	2	290
	1	180

Note: NMFS Alaska Region is not anticipating any Level A take of ESA-listed species; however, shutdowns will occur within the Level A take isopleths if a listed species approaches the zone.

Table 4b. Calculated Level B harassment zone.

Level B Harassment Zone (meters)	
Activity	Cetaceans and Pinnipeds (120 dB)
Vibratory Installation 30"	10,970
Vibratory Installation 24" Dolphin and Fender	5,420
Vibratory Installation and/or removal < 24" piles	5,420
Vibratory Installation H-piles	1,000
Activity	Cetaceans and Pinnipeds (160 dB)
Impact Installation 30"	1,740
Impact Installation 24" Dolphin and Fender	1,590

Observers will collect data including:

- Date and time that monitored activity begins or ends;
- Construction activities occurring during each observation period;
- Detailed information about any implementation of shutdowns, including the distance of animals to the pile and description of specific actions that ensued and resulting behavior of the animal, if any;
- Weather parameters (*e.g.*, percent cover, visibility);
- Water conditions (*e.g.*, sea state, tide state);
- Species, numbers, and, if possible, sex and age class of marine mammals;
- Description of any observable marine mammal behavior patterns, including bearing and direction of travel and distance from pile driving activity;
- Distance from pile driving activities to marine mammals and distance from the marine mammals to the observation point;
- Locations of all marine mammal observations; and
- Other human activity in the area.

Full details about the above mitigation, monitoring and reporting elements that are being analyzed as part of the proposed action are presented in HDR (2017b) and the proposed IHA for this action (82 FR 31400).

2.3.3. Monitoring Zones

Under section 3(18)(A)(ii) of the MMPA, Level B harassment is defined as actions that have 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 but which does not have the potential to injure a marine mammal or marine mammal stock in the wild.

Underwater - NMFS's updated acoustic guidance does not address Level B harassment, or harassment from airborne noise. 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,[1] expressed in root mean square (rms),[2] from broadband sounds that cause behavioral disturbance, and referred to as Level B harassment under section 3(18)(A)(ii) of the MMPA (16 U.S.C. § 1362(18)(A)(ii)):

- impulsive sound: 160 dB re 1 μPa_{rms}
- continuous sound: 120 dB re 1μPa_{rms}

NMFS currently uses a criterion of 100 dB re 20 µPa for in-air Level B harassment of pinnipeds other than harbor seals.[3]

For in-water sound transmission, the radius of the applicable Level B threshold is calculated by the equation:

$$RL = SL - TL\ (Log_{10}\ R)$$

where RL is the rms of received level of sound, SL is the rms source level, TL is the transmission loss coefficient, and R is the radius at which the source level will have attenuated to the desired (160, 120, or 100 dB) received level.

Table 3 presents the distances to the 160 or 120 dB Level B harassment thresholds calculated from the above formula. As noted in Table 3, calculated harassment zones extend out to almost 11 kilometers (for vibratory driving of 76 cm (30-inch) piles). However, sound would likely dissipate relatively rapidly in the shallow waters over soft seafloors in the action area. Additionally, portions of Popof Island and Unga Island would block much of the noise from propagating to its full extent through the marine environment as illustrated in Figure 7.

In-Air – During the installation of piles, the project has the potential to increase airborne noise levels, which could result in disturbance to pinnipeds at the surface of the water or hauled out

[1] 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.

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

[3] http://www.westcoast.fisheries.noaa.gov/protected_species/marine_mammals/threshold_guidance.html. [this font size is 9 pt; above footnotes are 8 pt.]

along the shoreline of Popof or Unga Islands. Most likely, airborne sound would cause behavioral responses. However, these animals are likely to have previously have been "taken" as a result of exposure to underwater sound above the behavioral harassment thresholds, which are in all cases larger than those associated with airborne sound. Thus, our analysis conservatively accounts for the potential of multiple exposures in water and in air, and the behavioral harassment of these animals will be accounted for in the estimates of potential take. Multiple instances of exposure to sound above NMFS's thresholds for behavioral harassment are not believed to result in increased behavioral disturbance, in either nature or intensity of disturbance reaction. Cetaceans are not expected to be exposed to airborne sounds. Therefore, we do not believe that airborne sound will impact ESA-listed species for this proposed action, and airborne sound is not discussed further in this Opinion.

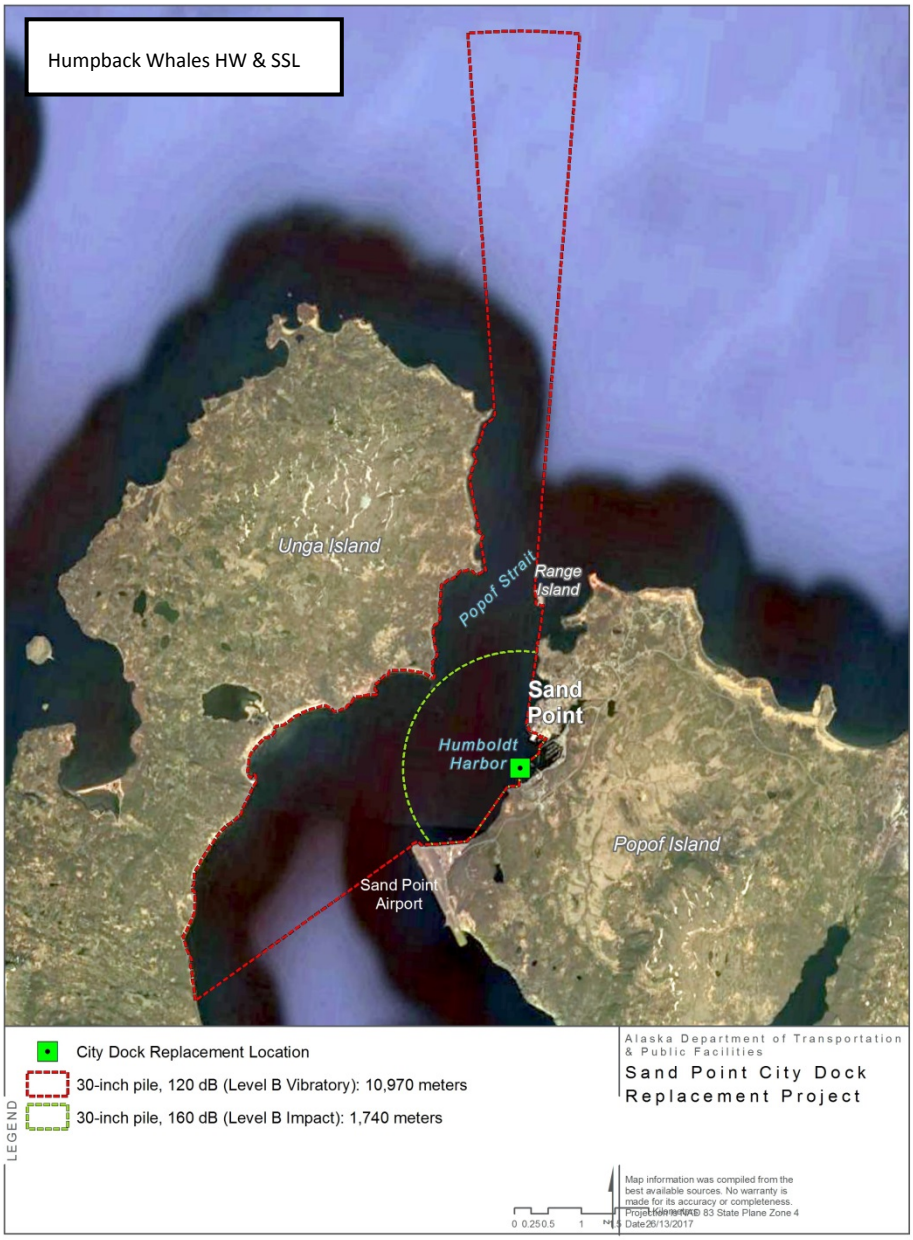

Figure 7. Underwater distances to level B harassment thresholds for all ESA-listed marine mammals in the proposed action during vibratory and impact installation of 30-inch piles (assuming no pile caps).

3.0. Action Area

The proposed action will take place in Sand Point, on Popof Island, Alaska (Figure 1) in the Shumagin Islands. The Sand Point City Dock is a multi-function dock and active ferry terminal located in Humboldt Harbor, on the southwest side of the City of Sand Point. The existing City Dock is located on the causeway of Sand Point's "New Harbor" at the end of Boat Harbor Road, and the proposed replacement dock is proposed to be located immediately adjacent (southwest) to the existing City Dock along the causeway, which also serves as the breakwater for the New Harbor (Figures 2 and 3).

"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 includes the area in which construction activities will take place (located at approximately 55°20'06.6"N x 160°30'05.9"W), and extends up to 11km (Table 10 and Figure 7) which is the maximum distance that pile installation noise associated with the project would be perceptible above ambient underwater conditions.

4.0. 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 designated critical habitat (16 U.S.C. § 1536(a)(2)). 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 for the conservation of a listed species"; such "alterations may include, but are not limited to, those that alter the physical or biological features essential to the conservation of a species or that preclude or significantly delay development of such features" (50 CFR § 402.02).

The designation of critical habitat for Steller sea lions uses the term primary constituent element (PCE) or essential features. The new critical habitat regulations (81 FR 7414 (Feb. 11, 2016)) replace 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 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 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 direct or indirect effects on listed species or critical habitat. As part of this step, we identify the action area – the spatial and temporal extent of these direct and indirect 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 5 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*; anticipated 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 6 of this Opinion.
- Analyze the effects of the proposed actions. 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 features. The effects of the action are described in Section 7 of this Opinion with the exposure analysis described in Section 7.2 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 7.3 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 8 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 7) to the environmental baseline (Section 6) and the cumulative effects (Section 8) 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) reduce the value of designated or proposed 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 5). Integration and synthesis with risk analyses occurs in Section 9 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 10. These conclusions flow from the logic and rationale presented in the Integration and Synthesis Section 9 of this Opinion.
- 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.

5.0. Status of the Species and Critical Habitat

This opinion examines the status of each species that would be adversely affected by the proposed action. The 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.

This section consists of narratives for each of the endangered and threatened species that occur in the action area and that may be adversely affected by the proposed action. In each narrative, we present a summary of information on the population structure and distribution of each 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 or not an action's direct or indirect effects are likely to increase the species' probability of becoming extinct or failing to recover.

Species the action agencies determined likely to be adversely affected by the action include the endangered western North Pacific DPS humpback whale, the endangered fin whale, the threatened Mexico DPS humpback whale, and the endangered western DPS Steller sea lion. The action agencies also determined that the action is not likely to adversely affect designated critical habitat for Steller sea lion.

5.1. Humpback Whale

We used information available in the most recent stock assessment (Muto *et al.* 2016), the most recent status review (Bettridge *et al*. 2015), the most recent global review (Fleming and Jackson 2011), NMFS species information (NMFS 2016a, NMML 2016b), and recent biological opinion (NMFS 2017) to summarize the status of the species, as follows.

5.1.1. Status

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 of humpback whales (Bettridge *et al.* 2015). After analysis and extensive public review, NMFS published a final rule on September 8, 2016 (81 FR 62260), recognizing 14 humpback whale DPSs, designating four of these as endangered and one as threatened, with the remaining nine not warranting ESA listing status. Wade *et al.* (2016) provides information on the basis for DPS designation and the status of each DPS in the North Pacific.

Based on an analysis of migration between winter mating/calving areas and summer feeding areas using photo-identification, Wade *et al.* (2016) concluded that whales feeding in Alaskan waters belong primarily to the Hawaii DPS (recovered), with small numbers of Western North Pacific DPS (endangered) and Mexico DPS (threatened) individuals. In the summer feedings areas (Aleutian Islands, Bering, Chukchi, and Beaufort Seas) that overlap with the action area of the Sand Point dock replacement project, Hawaii DPS individuals are estimated to comprise 86.5

percent of the humpback whales present, Mexico DPS individuals 11.3 percent, and Western North Pacific DPS individuals 4.4 percent (Table 5). Critical habitat has not been designated for the western North Pacific or Mexico DPSs of humpback whales.

Additional information on humpback whale biology and natural history is available at:
http://www.nmfs.noaa.gov/pr/species/mammals/whales/humpback-whale.html
http://alaskafisheries.noaa.gov/pr/humpback
http://www.fisheries.noaa.gov/pr/sars/pdf/stocks/alaska/2014/ak2014_humpback-wnp.pdf

Table 5. Probability of encountering humpback whales from each DPS in the North Pacific Ocean (columns) in various feeding areas (rows). Adapted from Wade et al. (2016) (See also NMFS 2016c).

Summer Feeding Areas	North Pacific Distinct Population Segments in Alaska		
	Western North Pacific DPS (endangered)	Hawaii DPS (not listed)	Mexico DPS (threatened)
Kamchatka	100%	0%	0%
Aleutian Islands, Bering, Chukchi, Beaufort	4.4%	86.5%	11.3%
Gulf of Alaska	0.5%	89.0%	10.5%
Southeast Alaska / Northern BC	0%	93.9%	6.1%
NOTE: For the ESA-listed DPSs, these percentages reflect the upper limit of 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.			

5.1.2. Description and Range

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

Humpbacks filter feed on tiny crustaceans (mostly krill), plankton, and small fish; they can consume up to 3,000 pounds (1,360 kg) of food per day. Several hunting methods involve using air bubbles to herd, corral, or disorient fish.

Humpback whales reach sexual maturity at 4-7 years, and their lifespan is probably around 50 years or more. The gestation period of humpback whales is 11 months, and calves are nursed for 12 months. The average calving interval is two to three years. Birthing occurs in low latitudes during winter months; feeding occurs primarily at high latitudes during summer months. Additional information on humpback whale biology and habitat is available at:

http://www.fisheries.noaa.gov/pr/species/mammals/whales/humpback-whale.html and

http://www.nmfs.noaa.gov/pr/sars/2013/ak2013_humpback-wnp.pdf.

5.1.3. Abundance

The worldwide population of all humpback whales is estimated to be approximately 75,000 individuals. The abundances of the western North Pacific, Hawaii, and Mexico DPSs are estimated to be 1,000, 12,000, and 6,000 - 7,000, respectively. The abundance estimate for humpback whales in the Gulf of Alaska area is estimated to be 2,089 animals, which includes whales from the Hawaii DPS (89%), Mexico DPS (10.5%), and western North Pacific DPS (0.5%) (Wade *et al*. 2016, NMFS 2016c).

Population trends are not available for all humpback whale stocks or populations due to insufficient data, but populations appear to be growing in most areas. The growth rate for the western North Pacific DPS is estimated to be 6.9 percent annually, though humpback whales of this population remain rare in some parts of their former range. The growth rate of the Hawaii DPS is between 5.5 and 6.0 percent annually. The current growth rate of the Mexico DPS is unknown, although the population increased slightly between the 1990s and 2000s (Wade *et al*. 2016).

5.1.4. Distribution

General

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

In the Project Area

Both general and site-specific information indicate that humpback whales are present in the summer in the action area. Results of satellite tracking indicate that humpbacks frequently congregate in shallow, highly productive coastal areas of the North Pacific Ocean and Bering Sea. The waters surrounding the eastern Aleutian Islands and the Shumagin Islands are dominated by strong tidal currents, water-column mixing, and unique bathymetry; these factors are thought to concentrate the small fish and zooplankton that comprise the typical humpback diet in Alaska, creating a reliable and abundant food source for whales (Kennedy et al. 2014).

Specific to the project area, surveys from 2001 to 2004 estimated humpback whale abundance in the Shumagin Islands at between 410 and 593 individuals during the summer feeding season (July–August; Witteveen et al., 2004; Zerbini et al., 2006). Annual vessel-based, photo-identification surveys in the Shumagin Islands from 1999 to 2015 identified 654 unique individual humpback whales between June and September (Witteveen and Wynne 2017). Humpback whale abundance in the Shumagin Islands increased 6 percent per year between 1987 and 2003 (Zerbini et al., 2006). Humpback whales are occasionally observed in Popof Strait between Popof Island and Unga Island (HDR 2017a) and are known to feed in the waters west of

the airport (HDR 2017a). They are unlikely to occur in the shallow waters of Humboldt Harbor proper (HDR 2017a) but may occur in Popof Strait in waters ensonified by pile driving and removal activities. Humpbacks are found in the Shumagin Islands from April or May through October or November, and peak feeding activity occurs between June and early September.

Large aggregations of humpback whales spend the summer and fall in the nearshore areas of the Alaska Peninsula, Gulf of Alaska, and Aleutian Islands. The waters of the western Gulf of Alaska support feeding populations of humpback whales (HDR 2017a). The Shumagin Islands are considered a biologically important area for feeding humpback whales in July and August (Ferguson et al., 2015).

5.1.5. Hearing Ability and Vocalizations

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

Humpback whales produce a variety of vocalizations ranging from 0.02 to 10 kHz (Winn *et al*. 1970, Tyack and Whitehead 1983, Payne and Payne 1985, Silber 1986, Thompson *et al.* 1986, Richardson *et al*. 1995, Au 2000, Frazer and Mercado III 2000, Erbe 2002, Au *et al*. 2006, Vu *et al*. 2012). NMFS categorizes humpback whales in the low-frequency cetacean functional hearing group.

5.1.6 Critical Habitat

There is no critical habitat designated for the humpback whale.

5.2. Fin Whales

We used information available in the recovery plan (NMFS 2010), the five-year review (NMFS 2011), NMFS species information (NMFS 2015e), recent stock assessment reports (Muto *et al.* 2016, Carretta *et al.* 2017, Hayes *et al.* 2017), the status report (COSEWIC 2005), and recent biological opinions (NMFS 2016d,e) to summarize the status of the species, as follows.

5.2.1. Status

The fin whale was listed as endangered under the ESCA on December 2, 1970 (35 FR 18319), and they remain endangered under the ESA. The fin whale is endangered because of past commercial whaling. Whaling does still occur for fin whales, though at a reduced level compared to historical numbers. In the Antarctic Ocean, fin whales were taken (including both landed and struck and lost whales) by Japanese whalers for scientific research under an Antarctic Special Permit. Between 2005/2006 and 2012/2013, 18 fin whales were taken (IWC 2017c). In 2014, the International Court of Justice issued a judgment ordering Japan to suspend their whaling

activities after ruling that their activities could not be considered scientific. Iceland took 292 fin whales from 1986 to 1989 under a special permit (IWC 2017c).

The moratorium on whaling by IWC Member Nations in the Northern Hemisphere has ended legal commercial whaling for fin whales; however, fin whales are still killed commercially by countries that filed objections to the moratorium (i.e., Iceland and Norway). Iceland returned to commercial whaling of fin whales in 2006 and has taken 706 fin whales since that time (IWC 2017b). Norway has not returned to commercial whaling of fin whales.

Whaling for subsistence purposes still occurs for fin whales. Denmark has taken 368 fin whales in Greenland since 1985 for subsistence purposes (IWC 2017a).

In summary, since the moratorium on commercial whaling in 1985, 1,384 fin whales have been taken (i.e., landed or struck and lost).

Additional threats to the species include ship strikes, fisheries interactions (including entanglement), and noise, and are discussed in Section 6 of this opinion.

5.2.2. Description and Range

Fin whales are large baleen whales distinguished by a sleek, streamlined body and distinctive coloration pattern of black or dark brownish-gray back and sides with a white underside. The lifespan of fin whales is estimated to be 80 to 90 years. Sexual maturity is reached at six to 10 years of age. Their gestation period is less than one year, and calves are nursed for six to seven months. The average calving interval is two to three years. Birthing and mating occur in lower latitudes during the winter months.

Fin whales eat pelagic crustaceans (primarily krill) and schooling fish such as herring, walleye pollock, and capelin. Intense foraging occurs at high latitudes during the summer. Most foraging occurs in deeper off-shore waters, though fin whales may feed in water as shallow as 10 m if prey is present at the surface.

While the fin whale is listed as a single endangered species under the ESA, two subspecies of fin whale are recognized:

- *B. p. physalus*: occurs in the North Atlantic
- *B. p. quoyi* (commonly called the Antarctic fin whale): occurs in the Southern Hemisphere

Though not formally recognized as a subspecies, a third population of fin whale in the North Pacific is generally considered a separate, unnamed subspecies and a fourth subspecies, *B. p. patachonica* (as described by Dr. H. Burmeister [Gray 1865]), may exist in the mid-latitudes of the Southern Hemisphere (Clarke 2004).

Globally, fin whales are sub-divided into three major groups:

- Atlantic
- Pacific
- Southern Hemisphere

The two subspecies described above appear to be organized into separate populations within these groups, though there is a lack of consensus in the published literature as to population

structure. Within the Atlantic and Pacific groups, the International Whaling Commission (IWC) and NMFS recognize different stocks and populations of fin whales. Within the Antarctic group, both organizations consider fin whales to belong to the subspecies *B. p. quoyi*.

In the North Pacific, the IWC considers all fin whales to belong to one stock; however, under the MMPA, NMFS recognizes three stocks in U.S. Pacific waters:

- Northeast Pacific
- California/Oregon/Washington
- Hawaii

5.2.3. Abundance

Abundance data for stocks and populations in the Southern Hemisphere are limited and there are no reliable estimates available. The IWC (1979) estimated the Southern Hemisphere population to be 85,200 whales in 1978/1979; however NMFS considers this a poor estimate because of the calculation methods used.

Fin whales in the action area are members of the northeast Pacific stock. Abundance estimates are not available for all populations or stocks worldwide, though abundance estimates are available for stocks, or portions of stocks, within U.S. waters:

- Western North Atlantic: minimum population estimate is 1,234 whales
- Northeast Pacific: provisional minimum population estimate of abundance west of the Kenai peninsula is 1,368
- California/Oregon/Washington: minimum population estimate is 2,598
- Hawaii: minimum population estimate is 27 whales

Abundance appears to be increasing in Alaska (4.8 percent annually) and in the California/Oregon/Washington stock (3.5 percent annually). Trends are not available for other stocks due to insufficient data.

Though worldwide data are lacking, fin whales in the action area belong to a stock (Northeast Pacific) with a positive growth trend in Alaska, indicating this stock is resilient to current threats.

5.2.4. Distribution

General

Fin whales are distributed widely in every ocean except the Arctic Ocean (though occasional sightings have been reported in recent years). In the North Pacific Ocean, fin whales occur in summer foraging areas in the Chukchi Sea, the Sea of Okhotsk, around the Aleutian Islands, and the Gulf of Alaska; in the eastern Pacific, they occur south to California; in the western Pacific, they occur south to Japan. Fin whales in the eastern Pacific winter from California south; in the western Pacific, they winter in the Sea of Japan, the East China and Yellow Seas, and the Philippine Sea.

In the Project Area

Vessel-based line-transect surveys of coastal waters between Resurrection Bay and the central Aleutian Islands were completed in July and August from 2001 to 2003. Large concentrations of fin whales were found in the Semidi Islands, located midway between the Shumagin Islands and Kodiak Island just south of the Alaska Peninsula. The abundance of fin whales in the Shumagin

Islands ranged from a low estimate of 604 in 2003 to a high estimate of 1,113 in 2002. The estimated density of fin whales in the western Gulf of Alaska was 0.007 whales per km^2 (Zerbini et al. 2006). Fin whale density in the Shumagin Islands outside of the July and August survey period is unknown and they have not been observed in Humboldt Harbor. Fin whales have been observed on very rare occasions in the waters southwest of Sand Point between Unga and Popof islands, just west of the Sand Point airport (HDR 2017a).

Additional information on fin whales can be found at: http://www.fisheries.noaa.gov/pr/species/mammals/whales/fin-whale.html.

5.2.5. Hearing Ability and Vocalizations

Fin whales produce a variety of low-frequency sounds in the 0.01 to 0.2 kHz range (Watkins 1981, Watkins *et al*. 1987, Edds 1988, Thompson *et al*. 1992). NMFS categorizes fin whales in the low-frequency cetacean (i.e., baleen whale) functional hearing group. As a group, it is estimated that baleen whales can hear frequencies between 0.007 and 25 kHz (NOAA 2016b).

5.2.6 Critical Habitat

There is no critical habitat designated for the fin whale.

5.3. Steller Sea Lion (Western DPS)

We used information available in the most recent stock assessment (Muto *et al.* 2016), the recovery plan (NMFS 2008), NMFS species information (NMFS 2015c, NMML 2015), and recent biological opinions (NMFS 2015a, b; 2017) to summarize the status of the species, as follows.

5.3.1. Status

The Steller sea lion was listed as a threatened species under the ESA on November 26, 1990 (55 FR 49204). In 1997, NMFS reclassified Steller sea lions as two DPSs based on genetic studies and other information (62 FR 24345); 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 66139). Information on Steller sea lion biology, threats, and habitat (including critical habitat) is available online at: http://alaskafisheries.noaa.gov/protectedresources/stellers/default.htm and in the revised Steller Sea Lion Recovery Plan (NMFS 2008), which can be accessed at: https://alaskafisheries.noaa.gov/pr/ssl-recovery-plan.

5.3.2. Description and Range

Steller sea lions are distributed throughout the northern Pacific Ocean, including coastal and inland waters in Russia (Kuril Islands and the Sea of Okhotsk), east to Alaska, and south to central California (Año Nuevo Island) (Figure 8).

Steller sea lions are the largest of the eared seals (Otariidae), though there is significant difference in size between males and females: males reach lengths of 3.3 m (10.8 ft) and can weigh up to 1,120 kg (2469 lb), and females reach lengths of 2.9 m (9.5 ft) and can weigh up to 350 kg (772 lb). Their fur is light buff to reddish brown and slightly darker on the chest and abdomen; their skin is black. Sexual maturity is reached and first breeding occurs between 3 and 8 years of age. Pupping occurs on rookeries in May and June, and females breed 11 days after

giving birth. Implantation of the fertilized egg is delayed for about 3.5 months, and gestation occurs until the following May or June.

Most adult Steller sea lions occupy rookeries during pupping and breeding season. During the breeding season, most juvenile and non-breeding adults are at haulouts, though some may be present at or near rookeries. During the non-breeding season many Steller sea lions disperse from rookeries and increase their use of haulouts. Steller sea lions are not known to migrate, but individuals may disperse widely outside the breeding season (late May to early July). At sea, Steller sea lions commonly occur near the 200-m (656-ft) depth contour, but have been seen from near shore to well beyond the continental shelf (Kajimura and Loughlin 1988).

Steller sea lions are generalist predators. They eat a variety of fishes and cephalopods, and occasionally consume marine mammals and birds.

5.3.3. Abundance

The western DPS population declined approximately 75 percent from 1976 to 1990 (the year of ESA-listing). The western DPS population decreased another 40 percent between 1991 and 2000. The most recent comprehensive (pup and non-pup) abundance estimate for the western DPS is 82,516 sea lions. The minimum comprehensive population estimate of western DPS Steller sea lions in Alaska is 48,676 individuals. From 2000 to 2012, the western DPS population increased at an average rate of 1.7 percent annually for non-pups and 1.5 percent annually for pups, though considerable regional variation exists among populations; populations east of Samalga Pass are increasing at an average rate of 2.9 percent annually and populations west of Samalga Pass are decreasing at a rate of -1.5 percent annually (NMFS 2008). The action area for this project is located east of Samalga Pass.

5.3.4. Distribution

General

Steller sea lions are distributed throughout the northern Pacific Ocean, including coastal and inland waters in Russia (Kuril Islands and the Sea of Okhotsk), east to Alaska, and south to central California (Año Nuevo Island) (Figure 8). Animals from the eastern DPS occur primarily east of Cape Suckling, Alaska (144° W) and animals from the endangered western DPS occur primarily west of Cape Suckling. The western DPS includes Steller sea lions that reside primarily in the central and western Gulf of Alaska, Aleutian Islands, and those that inhabit and breed in the coastal waters of Asia (e.g., Japan and Russia). The eastern DPS includes sea lions living primarily in southeast Alaska, British Columbia, California, and Oregon. The action area considered in this Opinion occurs in the range of the western DPS Steller sea lion.

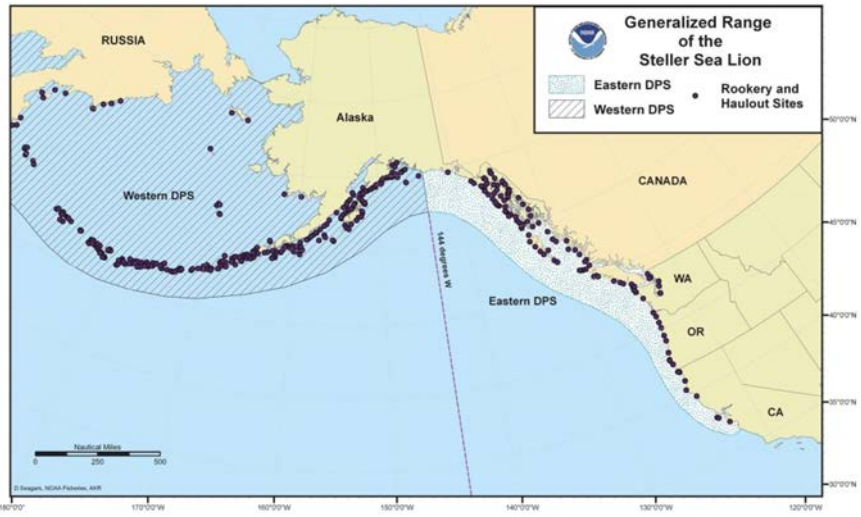

Figure 8. Generalized range of Steller sea lion, including rookery and haulout locations.

In the Project Area

Steller sea lions are the most obvious and abundant marine mammal in the portion of the action area near the Sand Point City Dock, and their abundance is highly correlated with seasonal fishing activity. Sea lions tend to congregate at the seafood processing facility during the pollock fishing seasons (HDR 2017a; Figure 9). There are four pollock fishing seasons: the "A" season starts on January 20, the "B" season starts on March 10, the "C" season starts on August 25, and the "D" season starts on October 1 (HDR 2017a). The end dates of these seasons are variable. Outside of the pollock seasons, there are few sea lions in the harbor. It is suspected that sea lions are feeding on salmon during the summer salmon runs, and are not present in high numbers around Sand Point (HDR 2017a).

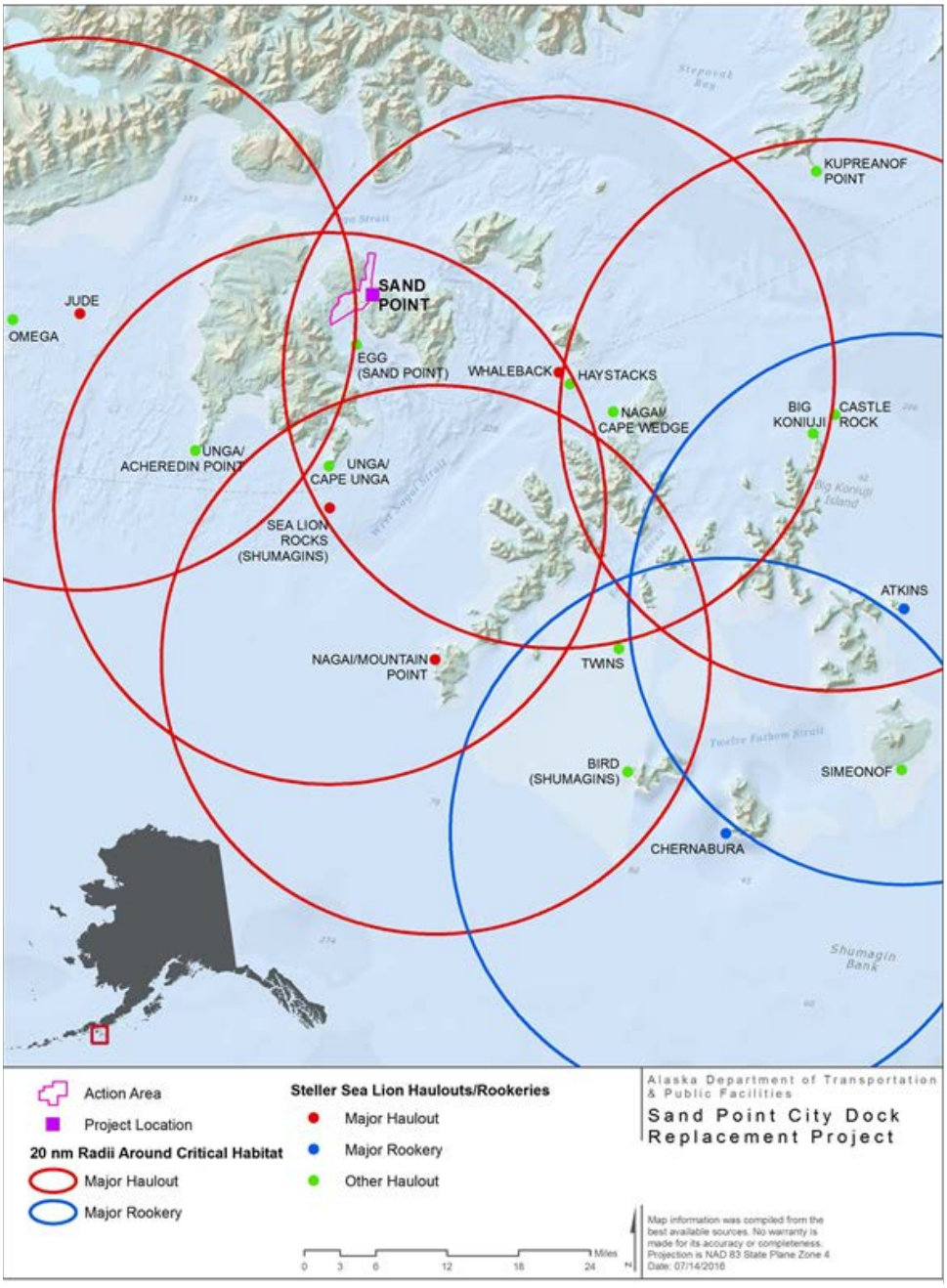

Figure 9. Steller sea lion haulouts, and designated major haulouts and major rookeries near Sand Point, Alaska, and the Project action area

The closest Steller sea lion haulout to the action area is located on Egg Island which is approximately 6 kilometers (3.7 nautical miles) from the action area. Recent counts have not recorded any Steller sea lions at this haulout (Fritz *et al.* 2016a, b; HDR 2017a), however, local anecdotal reports suggest that the haulout does experience some use (HDR 2017a). Researchers have noted as many as 10 sea lions at this haulout in May, although these observations are not part of systematic counts (HDR 2017a). There are six other haulouts within 20 nautical miles (37 kilometers) of Sand Point. Annual counts from the last 5 years of surveys at the nearby haulouts indicate that at least 300 to 500 sea lions are hauled out each year (Table 5). The closest pup-production site (which is designated as a haulout under the critical habitat rule) is located on

Jude Island, approximately 38.9 kilometers (21 nautical miles) west of Sand Point, which had average annual counts of 214 sea lion pups from 2009-2014 (Fritz *et al.* 2016a).

Table 6. Steller sea lion non-pup counts at seven haulouts within 20 nautical miles of Sand Point, Alaska, in 2008, 2009, 2011, 2013, and 2014.

Location	Distance from Project; nm (km)	Year				
		2008	2009	2011	2013	2014
Egg (Sand Point)	3.7 (6)	0	NA	NA	NA	0
Unga/Acheredin Pt.	16.4 (30.4)	202*	NA	103*	9	107*
Unga/Cape Unga	12.2 (22.6)	0	NA	NA	NA	0
Sea Lion Rocks[a] (Shumagins)	15.1 (28)	54*	NA	169*	46*	97*
The Whaleback[a]	14.8 (27.4)	102*	103	123*	186*	190*
The Haystacks	15.8 (29.3)	9	NA	NA	72*	137*
Nagai/Rock West of Cape Wedge	19.5 (36.1)	0	NA	NA	NA	0

[a] Denotes a major haulout as designated by NMFS (58 FR 45269)
Source: Fritz *et al.* 2016b
Notes: NA = no counts completed; * = average of two counts completed in that year

Abundant and predictable sources of food for sea lions in the Sand Point area include fishing gear, fishing boats and tenders, and seafood processing facilities that accept transfers of fish from offloading vessels. Sea lions have become accustomed to depredating fishing gear and raiding fishing vessels during fishing and offloading, and they follow potential sources of food in and around the harbor, waiting for opportunities to feed. The number of sea lions in the waters near Sand Point varies depending on the season and presence of commercial fishing vessels unloading their catch at the seafood processing facility. The Sand Point harbormaster and seafood processing plant foreman are the best available sources for information on sea lion abundance at Sand Point. Reports from these individuals suggest that sea lions are present in highest numbers during the pollock fishing seasons. Average counts at the seafood processing facility range from 4 to 12, but can occasionally reach as many as 20 sea lions. There are no notable differences in abundance between the four pollock seasons. Outside of the pollock seasons, sea lions may be present, but in small numbers, such as one or two. Sea lions also regularly visit other parts of Humboldt Harbor in search of opportunistic food sources, including the small boat harbor, the New Harbor, and City Dock (HDR 2017a).

Steller sea lions do not generally eat every day, but tend to forage every 1-2 days and return to haulouts to rest between foraging trips (Merrick and Loughlin 1997; Rehburg *et al.* 2009). The foraging habits of sea lions using the haulouts near Sand Point and throughout the Shumagin Islands are not well known, but it is reasonable to assume that given the abundance of readily available food, not every sea lion in the area visits the adjacent seafood processing plant every day. Based on numbers at the seafood processing facility it is conservatively estimated that about 12 unique individual sea lions likely occur in Humboldt Harbor each day during the pollock fishing seasons (HDR 2017a).

5.3.5. Hearing Ability and Vocalizations

The ability to detect sound and communicate underwater and in-air is important for a variety of Steller sea lion life functions, including reproduction and predator avoidance. NMFS categorizes Steller sea lions in the otariid pinniped functional hearing group. As a group, it is estimated that otariid pinnipeds can hear frequencies between 0.1 and 48 kHz in water (NMFS 2016b).

5.3.6. Critical Habitat

NMFS designated critical habitat for Steller sea lions on August 27, 1993 (58 FR 45269; Figure 10). The following essential features were identified at the time of listing:

- Alaska rookeries, haulouts, and associated areas identified at 50 CFR § 226.202(a), including:
  - Terrestrial zones that extend 914 m (3,000 ft) landward;
  - Air zones that extend 914 m (3,000 ft) above the terrestrial zone;
  - Aquatic zones that extend 914 m (3,000 ft) seaward from each major rookery and major haulout east of 144° W. longitude; and
  - Aquatic zones that extend 37 km (23 mi) seaward from each major rookery
  - and major haulout west of 144° W. longitude; and
- Three special aquatic foraging areas identified at 50 CFR § 226.202(c):
  - Shelikof Strait
  - Bogoslof
  - Seguam Pass

NMFS defines Steller sea lion critical habitat by a 20-nautical mile (nm) radius (straight-line distance) encircling a major haul-out or rookery.

The action area overlaps with the aquatic zones (i.e., designated critical habitat) for three designated major haulouts: Sea Lion Rocks (Shumagins), The Whaleback, and Jude. The dock site is outside the aquatic zone of the Jude Island haulout, but within the aquatic zones for the other two major haulouts (Figure 9). The major haulout at Sea Lion Rocks (Shumagins) is located approximately 28 kilometers (15.1 nautical miles) south of Sand Point. The major haulout at The Whaleback is located approximately 27.4 kilometers (14.8 nautical miles) east of Sand Point. The major haulout at Jude Island is located 39.6 kilometers (21.4 nautical miles) west of Sand Point. The action area does not overlap with the aquatic zone of any major rookery designated as critical habitat, nor does it overlap with the three designated offshore foraging areas. The closest major rookery designated as critical habitat is on the east side of Atkins Island, which is approximately 83.3 kilometers (45 nautical miles) southeast of Sand Point. Another major rookery is located about 85.2 kilometers (46 nautical miles) south of Sand Point on the southwest point of Chernabura Island (Figure 9).

At the time of designation, the following human activities (and their generalized area of occurrence) were identified as having the potential to "disrupt the essential life functions" that occur in critical habitat (58 FR 45269; Aug. 27, 1993):

- Wildlife viewing (primarily south-central and southeastern Alaska and California)
- Boat and airplane traffic (throughout the range of the Steller sea lion)
- Research activities (on permitted sites and during specified times throughout the year)
- Commercial, recreational, and subsistence fisheries for groundfish, herring, salmon, and invertebrates, e.g., crab, shrimp, sea urchins/cucumbers (throughout the range of the Stellar sea lion)
- Timber harvest (primarily southeastern and south-central Alaska)
- Hard mineral extraction (primarily southeastern Alaska)
- Oil and gas exploration (primarily Bering Sea and Gulf of Alaska)

- Coastal development, including pollutant discharges (specific sites throughout range)
- Subsistence harvest (Alaska)

Threats to critical habitat in the action area are discussed further in Section 6 of this Opinion.

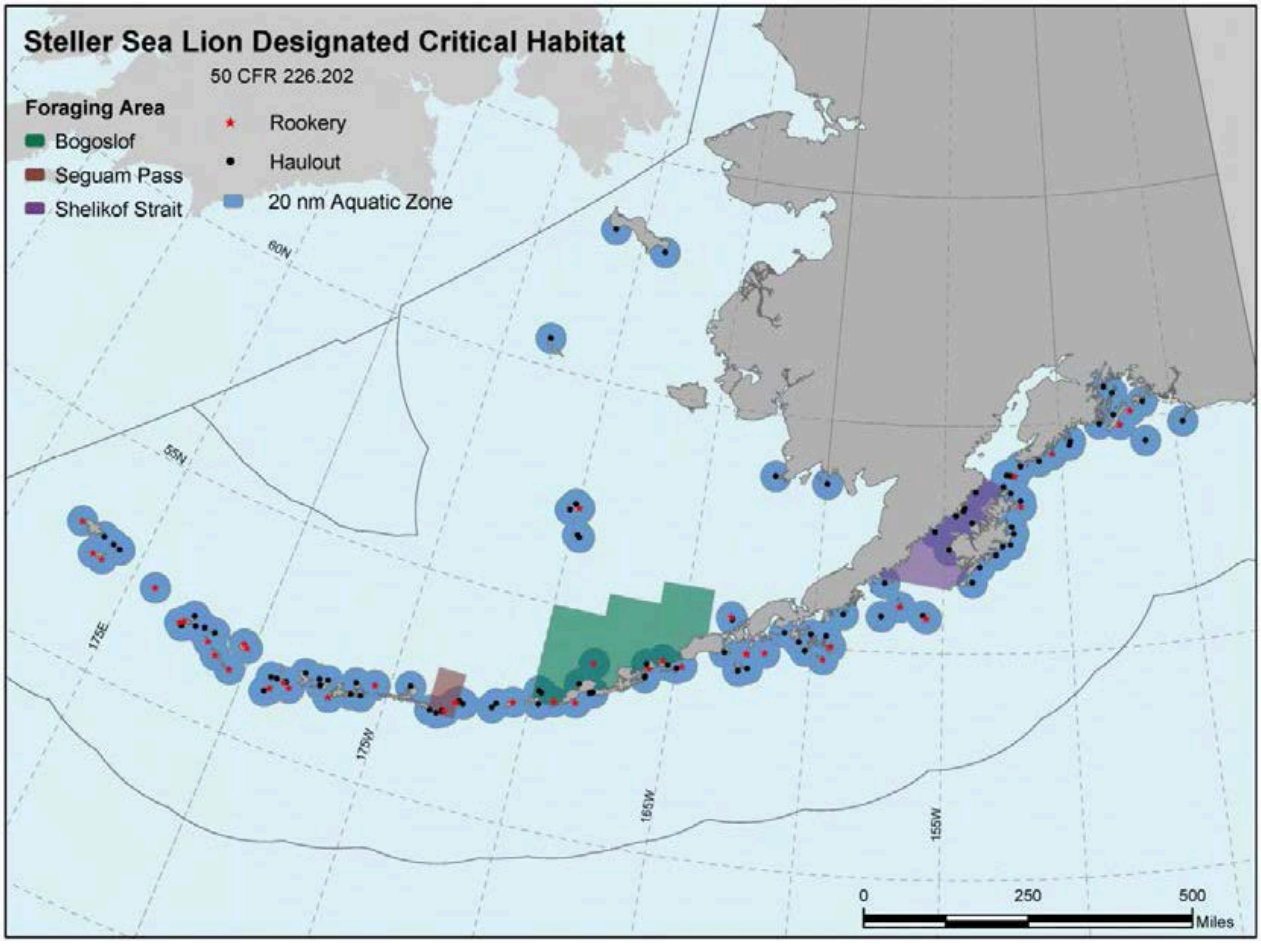

Figure 10. Designated critical habitat for western DPS Steller sea lions.

6.0. Environmental Baseline

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 anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of state or private actions which are contemporaneous with the consultation in process (50 CFR § 402.02).

A number of human activities have contributed to the current status of populations of ESA-listed fin and humpback whales, and Steller sea lions in the action area. Many of these factors apply to all of the species in this Opinion. 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 this Opinion, please refer to the following documents:

- "Alaska Marine Mammal Stock Assessments, 2016" (Muto *et al*. 2016). Available online at http://www.nmfs.noaa.gov/pr/sars/pdf/ak_2016_final_sars_june.pdf.

- "Status Review of the Humpback Whale (*Megaptera novaeangliae*) under the Endangered Species Act" (Bettridge *et al*. 2015). Available online at http://www.nmfs.noaa.gov/pr/species/Status%20Reviews/humpback_whale_sr_2015.pdf.
- "Status Review of the Fin Whale (*Balaenoptera physalus*) under the Endangered Species Act" (NMFS 2011). Available online at http://www.nmfs.noaa.gov/pr/pdfs/species/finwhale_5yearreview.pdf
- "Recovery plan for the Steller sea lion (*Eumetopias jubatus*). Revision." (NMFS 2008). Available online at https://alaskafisheries.noaa.gov/sites/default/files/sslrpfinalrev030408.pdf.

6.1. Humpback Whale

In the "Status Review of the Humpback Whale (*Megaptera novaeangliae*) under the Endangered Species Act," Bettridge *et al*. (2015) identified and described major threats to each DPS of ESA-listed humpback whales.

The main human activities known to have affected the status of the ESA-listed western North Pacific DPS and Mexico DPS humpback whales in the vicinity of the action area include whaling, climate change, entanglement (principally in commercial fishing gear), shipping, coastal development such as port expansion, oil and gas development, and harmful algal blooms (HABs) (Bettridge *et al*. 2015). These activities may also have impacts to Steller sea lions and fin whales (with the exception of whaling for Steller sea lions) and will be discussed further in Section 6.4 of this Opinion.

Historically, commercial whaling represented the greatest threat to every population of humpback whales and ultimately led to listing humpback whales as an endangered species. From 1900 to 1965, nearly 30,000 whales were taken in whaling operations of the Pacific Ocean. Prior to that, an unknown number of humpback whales were taken (Perry et al. 1999). In 1965, the International Whaling Commission banned commercial hunting of humpback whales in the Pacific Ocean.

There are no reported takes of humpback whales from the western North Pacific or Mexico DPS by subsistence hunters in Alaska or Russia for the 2008-2012 period (Muto et al. 2016). However, on approximately May 12, 2016, a humpback whale was harvested, in violation of the Whaling Convention Act (WCA), near the Village of Toksook Bay, Alaska, which is about 400 miles north of Sand Point. The whale was reported to have been in the bay and became a target of opportunity by Alaska Natives who may have been unaware of the WCA.

6.2 Fin Whale

In the "Status Review of the Fin Whale (*Balaenoptera physalus*) under the Endangered Species Act" NMFS (2011) identified and described major threats to fin whales.

The main human activities known to have affected the status of the endangered fin whale in the vicinity of the action area include competition with fisheries for resources, climate change, effects of anthropogenic noise, whaling, and ship collisions (NMFS 2011). These activities may also have impacts to Steller sea lions and humpback whales (with the exception of whaling for Steller's sea lions) and will be discussed further in Section 6.4 of this Opinion.

Between 1911 and 1985, 49,936 fin whales were reported taken in commercial whaling operations throughout the North Pacific (Mizroch *et al.* 2009), although newly revealed information about illegal Soviet catches indicates that the Soviets over-reported catches of about 1,200 fin whales, presumably to hide catches of other protected species (Doroshenko 2000). Subsistence hunters in Alaska and Russia have not been reported to take fin whales.

6.3. Steller Sea Lion

In the revised Steller sea lion recovery plan (NMFS 2008), the recovery team identified and described 11 factors that may be threats to the recovery of the species (NMFS 2008). Table 6 shows the age class and sex most vulnerable to, and the frequency of occurrence of, each threat; the amount of uncertainty about each threat's influence on Steller sea lion population dynamics; and the relative impact of each threat to the recovery of the species.

Table 7. Summary of threats to Steller sea lion recovery, including the ages and sexes most vulnerable, frequency of threat occurrence, uncertainty of threat impact to recovery, feasibility of threat mitigation, and relative impact of threat to recovery.

Threat	Age Class Most Vulnerable	Sex Most Vulnerable	Frequency of Occurrence of Threat	Uncertainty of Threat Impact to Recovery	Feasibility of Mitigation	Relative Impact to Recovery
Alaska Native subsistence harvest	Adult Juvenile	M	Medium	Low	High	Low
Competition with fisheries	Adult	F	High	High	High	Potentially high
	Juvenile	M, F				
Disease and parasites	Adult	F	High	Medium	Low	Low
	Pup	M, F				
Disturbance due to research activities	Pup	M, F	Medium	Low	High	Low
Disturbance from vessel traffic and tourism	Pup	M, F	Medium	Medium	High	Low
Entanglement in marine debris	Juvenile	M, F	Medium	Medium	Medium	Low
Environmental variability	Adult	F	High	High	Low	Potentially high
	Juvenile	M, F				
Illegal shooting	Juvenile Adult	M, F	Low	Medium	Medium	Low
Incidental take due to active fishing gear interactions	Juvenile	M, F	Medium	Medium	Medium	Low
Predation by killer whales	Juvenile Pup	M, F	High	High	Low	Potentially high
Toxic substances	Adult	F	High	High	Medium	Medium
	Pup	M, F				
Table adapted from NMFS (2008).						

In addition to the threats shown in Table 6, it is likely that Steller sea lions in the action area have become conditioned to associate fishing vessels with easy access to food. The factors that have likely had the greatest impact on western DPS Steller sea lions in the action area are discussed in the sections below. For more information on the threats and factors listed above, but

not discussed in the sections below, please see the "Recovery Plan for the Steller Sea Lion" (NMFS 2008), available online at https://alaskafisheries.noaa.gov/pr/ssl-recovery-plan.

6.3.1. Fisheries – Competition

The potential impact of competition with fisheries, through localized reduction in the amount and quality of Steller sea lion prey species, has caused considerable debate among the scientific community. The primary issue of contention is whether fisheries reduce Steller sea lion prey biomass and quality at local and/or regional spatial scales that may lead to a reduction in Steller sea lion survival and reproduction, and if sustained, their recovery. The effect of fisheries on the distribution, abundance, and age structure of the Steller sea lion prey field, at the spatial scale of foraging sea lions and over short and long temporal scales, is largely unknown (NMFS 2008).

6.3.2 Fisheries – Conditioning and Habituation

Steller sea lions are likely drawn to the action area by the abundant and predictable sources of food provided by commercial fishing vessels and fish processing facilities. Sea lions are sighted more often when fishing boats are docked at facilities and are often observed foraging near fishing boats that are docked (NMFS 2016), suggesting sea lions in the Sand Point area are habituated to the presence of fishing vessels and are likely conditioned to associating fishing boats with easy access to food (80 FR 79822; Dec. 23, 2015).

6.4 Factors Affecting Steller Sea Lions, Fin and Humpback Whales.

6.4.1. Climate Change

Climate change is a factor potentially affecting the range-wide status of all species (including humans) and is of particular relevance for sub-Arctic and Arctic species. The general discussion in this section applies to all species addressed in this Opinion.

Since the 1950s the atmosphere and oceans have warmed, snow and sea ice have diminished in both areal extent and volume, sea level has risen, and concentrations of greenhouse gases have increased. The time period 1983-2012 was likely the warmest 30-year period in the northern hemisphere in the last 1400 years (IPCC 2013). There has been strong scientific consensus over the past two decades that atmospheric temperatures are increasing, affecting many of the earth's climate-related processes (IPCC 1990; Houghton *et al*. 2001; Oreskes 2004; Frame and Stone 2013; NASA 2016). The overwhelming majority of climate scientists agree that human activities, especially the burning of fossil fuels (coal, oil, and gas), are responsible for most of the climate change currently being observed (NRC 2012).

Effects to marine ecosystems from increased atmospheric CO_2 and climate change include ocean acidification, expanded oligotrophic gyres, and shifts in temperature, circulation, stratification, and nutrient input (Doney *et al*. 2012). Altered oceanic circulation and warming cause reduced subsurface oxygen concentrations (Keeling *et al*. 2010). These large-scale shifts have the potential to disrupt existing trophic pathways as change cascades from primary producers to top level predators (Doney *et al*. 2012, Salinger *et al*. 2013). Effects to marine mammals could result from changes in the distribution of temperatures suitable for rearing young, the distribution and abundance of prey, and the distribution and abundance of competitors or predators.

The potential impacts of climate and oceanographic change on whales and sea lions will likely affect habitat availability and food availability. Site selection for feeding, breeding, and whale

migration may be influenced by factors such as ocean currents and water temperature. For example, there is some evidence from Pacific equatorial waters that sperm whale feeding success and, in turn, calf production rates are negatively affected by increases in sea surface temperature (Smith and Whitehead 1993, Whitehead 1997). Any changes in these factors could render currently used habitat areas unsuitable. Changes to climate and oceanographic processes may also lead to decreased prey productivity and different patterns of prey distribution and availability. Such changes could affect whales and sea lions that are dependent on those affected prey. Variations in sea-surface temperatures and the extent of sea-ice cover during the winter months have been linked to variations in the recruitment of krill (*Euphausia superba*) and the reproductive success of krill predators. Different species of whales will likely react to these changes differently. For example, range size, location, and whether or not specific range areas are used for different life history activities (e.g., feeding, breeding) are likely to affect how each species responds to climate change (Learmonth *et al*. 2006).

Climate change will affect pinnipeds on land where they rest and give birth to young, and at sea where they forage. On land, sea level rise and larger, more frequent storms may reduce or eliminate resting and birthing areas. (Learmonth *et al*. 2006; NPS 2016). Changes in ocean currents, ocean acidification, and other alterations in climate cycles such as changes in the frequency of El Nino events are likely to alter ocean food webs and affect the abundance and diversity of prey items. These changes may also affect susceptibility to diseases. Some changes may be positive. For example, new suitable habitats may become available for some species (Learmonth *et al*. 2006, NPS 2016).

The most pronounced warming is expected in the north, exceeding the estimate for mean global warming by a factor of 3, due in part to the “ice-albedo feedback loop.” As the reflective areas of Arctic ice and snow retreat, the northern latitudes absorb more heat, exacerbating the warming (NRC 2012). Climate change is projected to have substantial direct and indirect effects on individuals, populations, species, and the structure and function of marine, coastal, and terrestrial ecosystems in the foreseeable future (NRC 2012).

In summary, none of the future climactic changes discussed are expected to materially alter the environmental baseline of the action area over the temporal scope (one year) of the proposed action.

6.4.2. Fisheries - Incidental Take and Entanglement

Sand Point City Dock is an active public dock and ferry terminal. The adjacent property to the east of the City Dock is a small boat harbor, which was expanded in 2014 to accommodate 172 vessels and is home to the largest commercial fishing fleet in the Aleutian region (City of Sand Point 2017). Just north of the small boat harbor is a cold storage, fish meal, and fish-processing plant owned and operated by Trident Seafoods and Peter Pan Seafoods (see Figures 4 and 5). During open fishing seasons, the plant receives numerous commercial fishing vessels daily for offloading and processing of catch. Almost half the inhabitants of Sand Point support themselves by fishing and fish processing (City of Sand Point 2017).

Humpback Whales

Humpback whales are killed or injured during interactions with commercial fishing gear and other entanglements, although the available evidence suggests that these interactions do not have

population-level consequences for the listed humpback whale DPSs in the action area (Bettridge *et al*. 2015).

Along the Pacific coast of Canada, 40 humpback whales have been reported as entangled since 1980, four of which are known to have died (Ford *et al*. 2009, COSEWIC 2011). A photography study of humpback whales in southeastern Alaska in 2003 and 2004 found at least 53% of individuals showed some kind of scarring from entanglement (Neilson *et al*. 2005). However, very few stranding reports are received from areas west of Kodiak where this proposed action is occurring. Between 2008 and 2012, there were two mortalities of humpback whales near Dutch Harbor in the Bering Sea/Aleutian Islands pollock trawl fishery, and one mortality in the Bering Sea/Aleutian Islands flatfish trawl (Muto *et al.* 2016). The mean annual human-caused mortality and serious injury rate for 2008-2012 based on fishery and gear entanglements reported in the NMFS Alaska Regional Office stranding database is 0.3 (Muto et al. 2016). These events have not been attributed to a specific fishery (76 FR 73912; Nov. 29, 2011). No observers have been assigned to several fisheries that are known to interact with these listed humpback stocks, making the estimated mortality rate unreliable.

Fin Whales

One incidental mortality of a fin whale due to entanglement in the ground tackle of a commercial mechanical jig fishing vessel was reported to the NMFS Alaska Region in 2012 (Helker *et al*. 2016). Since observer data are not available for this fishery, this mortality results in a mean annual mortality and serious injury rate of 0.2 fin whales in 2010-2014 (Muto *et al.* 2016).

Steller Sea Lions

Commercial fisheries operate in and around Sand Point. Due to the presence of these fisheries that land at docks to off-load their catch, Steller sea lions frequently forage in this area. These conditions have contributed to habituation of Steller sea lions, and likely other marine species, to human presence, industrial/commercial uses, and associated noise-generating activities. The most recent minimum total annual incidental take of western DPS Steller sea lions associated with commercial fisheries is 30 individuals (Table 7).

Table 8. Summary of most recent data available for western DPS Steller sea lion incidental mortalities associated with commercial fisheries in Alaska.

Fishery Name	Year(s)	Mean Annual Mortality
Bering Sea/Aleutian Islands		
Atka mackerel trawl	2010 – 2014	0.2
Flatfish trawl	2010 – 2014	5.8
Pacific cod trawl	2010 – 2014	0.8
Pacific cod longline	2010 – 2014	0.3
Pollock trawl	2010 – 2014	6.3
Gulf of Alaska		
Pacific cod longline	2010 – 2014	0.2
Pacific cod trawl	2010 – 2014	0.2
Sablefish longline	2010 – 2014	1.1
Prince William Sound		
Salmon drift gillnet	1990 – 1991	15
Salmon set gillnet	1990	0

Fishery Name	Year(s)	Mean Annual Mortality
Alaska Peninsula/Aleutian Islands		
Salmon drift gillnet	1990	0
Cook Inlet		
Salmon set gillnet	1999 – 2000	0
Salmon drift gillnet	1999 – 2000	0
Kodiak Island		
Salmon set gillnet	2002	0
MINIMUM TOTAL ANNUAL MORTALITY		**29.9**
Table adapted from Muto *et al.* (2016).		

Take (in the form of serious injury or mortality) resulting from entanglement or hooking by fishing gear in the Bering Sea/Aleutian Islands groundfish fisheries, authorized from 2014 to 2016, was limited to a total of 42 Steller sea lions during that three-year period (NMFS 2014).

The most recent minimum total annual mortality of western DPS Steller sea lions reported to the NMFS stranding network is 4.2 individuals (Table 8). This estimate is considered a minimum because not all entangled animals strand and not all stranded animals are found or reported. Steller sea lions reported to the stranding network as having been shot are not included in this estimate, as they may result from animals struck and lost in the Alaska Native subsistence harvest.

Table 9. Summary of Western U.S. Steller sea lion mortality and serious injury, by year and type, reported to the NMFS Alaska Region marine mammal stranding network and Alaska Department of Fish and Game in 2010-2014 (Helker et al. 2016).

Cause of injury	2010	2011	2012	2013	2014	Mean annual mortality
Hooked by Gulf of Alaska longline gear*	1	0	0	0	0	0.2
Hooked by Southcentral Alaska salmon troll gear*	0	1	0	0	1	0.4
Hooked by Alaska Peninsula troll gear*	0	0	0	1	0	0.2
Hooked by troll gear*	0	0	2	0	0	0.4
Entangled in unidentified fishing gear*	0	0	1	0	1	0.4
Entangled in marine debris	5	1	2	0	3	2.2
Struck by arrow	0	0	0	1	0	0.2
Entangled in commercial Kodiak salmon hatchery net	0	0	0	1	0	0.2
*Total in unknown (commercial, recreational, or subsistence) fisheries Total in marine debris Total due to other causes (arrow strike, entangled in hatchery net)						1.6 2.2 0.4

6.4.3. Vessel Collision

Sand Point is a busy port that is home to the largest commercial fishing fleet in the Aleutian Islands chain (City of Sand Point 2017). There is also some tug and barge traffic but no container ships visit (Nuka Research Planning Group, LLC and Cape International, Inc. 2006). During the summer and into the fall, the Alaska Marine Highway operates the M/V *Tustumena* ferry stopping in Sand Point four times per month.

The City of Sand Point maintains two marinas, the Robert E. Galovin small boat harbor, expanded in 2014 to accommodate 172 vessels, and the "New Harbor" (Figure 5). The City of Sand Point and the Aleutians East Borough are currently seeking funds to install a complete float system and full electricity in the harbor. As previously described, there is a seafood processing facility on the north side of Humboldt Harbor (Figure 5). During open fishing seasons, the plant receives numerous commercial fishing vessels daily for offloading and processing of catch.

Vessel collisions with fin and humpback whales remain a management concern, given the increasing abundance of humpback whales foraging in Alaska, as well as the growing presence of marine traffic in Alaska's coastal waters and in the Sand Point area with its increased marine infrastructure. Based on these factors, injury and mortality of humpback whales as a result of vessel strike may likely continue, or possibly increase, in the future (NMFS 2006b).

The mean annual human-caused mortality and serious injury rate for 2010-2014 due to vessel collisions reported in Alaska is 3.1 humpbacks, an increase from the last reporting period (2008-2012). Most vessel collisions with humpbacks are reported from Southeast Alaska, and it is not known whether the difference in ship strike rates between Southeast Alaska and other portions of the humpback whale range in Alaska is due to differences in reporting, amount of vessel traffic, densities of animals, and/or other factors (Muto *et al*. 2016).

Fin whale mortality due to ship strikes in Alaska waters (one each in 2010 and 2014) has also been reported to the NMFS Alaska Region stranding network (Helker *et al.* 2016), resulting in a mean annual mortality and serious injury rate of 0.4 fin whales due to ship strikes in 2010-2014 (Muto *et al.* 2016).

Although risk of ship 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; NMFS 2008). Additionally, sea lions are sighted more often when fishing boats are docked at facilities and are often observed foraging near fishing boats that are docked (NMFS 2016), suggesting sea lions in the Sand Point area are habituated to the presence of fishing vessels and are likely conditioned to associating fishing boats with easy access to food. Such habituation could potentially lead to greater risk of inadvertent contact with vessel hulls or propellers.

6.4.4. Oil and Gas Development

There have been proposals to open oil exploration and drilling near the action area in the southeastern Bering Sea, notably in the North Aleutian Basin. While in 2010 this region was removed from consideration for oil and gas lease sales, if such activity were authorized in the future, the potential for spills and resulting direct contamination and effects to feeding areas would represent additional threats to all marine mammals in the area.

6.4.5. Harmful Algal Blooms (HABs)

Naturally occurring biotoxins from dinoflagellates and other toxins are known to exist within the range of these listed species and close to the action area (Figure 11). It is also possible that biotoxins played a role in the Unusual Mortality Event observed in the western Gulf of Alaska in 2015 (Desroches 2015; NOAA 2016). In 2015, increased mortality of large whales (including 11 fin whales, 14 humpback whales, 1 gray whale, and 4 unidentified cetaceans from May to mid-

August 2015) was observed along the western Gulf of Alaska, including the areas around Kodiak Island, Afognak Island, Chirikof Island, the Semidi Islands, and the southern shoreline of the Alaska Peninsula (http://www.nmfs.noaa.gov/pr/health/mmume/faqs_2015_large_whale.html, accessed December 2016). On 20 August 2015, NMFS declared an Unusual Mortality Event for large whales in the western Gulf of Alaska; however, to date, no specific cause for the increased mortality has been identified. Although fin and humpback whale and Steller sea lion mortality as a direct result of exposure to biotoxins has not been documented to date in the action area, marine mammal mortality from HABs have been documented close by in Cold Bay, the Semidi Islands, and the Eastern Aleutians (Lefebvre *et al.* 2016) and it is reasonable to expect algal blooms could occur within the action area.

The occurrence of HABs in Alaska is expected to increase with the growth of various types of human-related activities, and with increasing water temperatures (Lefebvre *et al*. 2016). Increasing ocean temperatures are expected to exacerbate blooms of the Pseudo-nitzschia diatoms in Alaska waters. This marine phytoplankton produces the paralytic shellfish poisoning neurotoxin domoic acid (DA) which has been implicated in causing mortality of marine mammals. Lefebvre *et al*. (2016) found that, among 10 species of marine mammals, humpback whales accounted for half of the individuals that tested positive for saxitoxin (STX), another paralytic shellfish poisoning neurotoxin. Lefebvre *et al*. (2016) also found that 38% of humpbacks tested positive for DA, which was a lower rate than harbor seals, walrus, and harbor porpoise but higher than 8 other marine mammal species. The highest DA and STX concentrations were found in a humpback that died from a ship strike, which may not be a coincidence because STX and DA intoxication have been suggested to be a factor in the loss of ability to avoid ships and to be a cause of stranding. The humpbacks that tested positive for HABs were all sampled in Southeast Alaska; no humpbacks were sampled near the action area. However, Steller sea lions, as well as other marine mammals from the Aleutians, did test positive for HABs. The number of species and the extensive geographic range in which DA and STX were detected in the Lefebvre *et al*. (2016) study demonstrates that HABs are present throughout the Alaskan marine environment; thus the potential for health effects due to exposure is a possible threat for humpback whales and Steller sea lions. A DA outbreak is the suspected agent in the current mortality event of sea lions and other pinnipeds in California (Ritchie 2017).

Figure 11. Algal toxins detected in 13 species of marine mammals from southeast Alaska to the Arctic from 2004 to 2013 (Lefebvre *et al*. 2016).

6.4.6. Anthropogenic Noise

Steller sea lions, fin and humpback whales in the action area are exposed to numerous sources of natural and anthropogenic noise. Natural sources of underwater noise include sea ice, wind, waves, precipitation, and biological noise from marine mammals, fishes, and crustaceans. Anthropogenic sources of noise include noise generated by vessels (used for fishing, construction, and transportation), aircraft, and marine and coastal construction. Commercial ships that frequent nearby shipping lanes can emit underwater sounds of over 120 dB re 1 μPa_{rms} at distances of 3 km (1.86 mi) (McKenna *et al*. 2012). The area around the City Dock and Humboldt Harbor are frequented by fishing vessels and tenders; the M/V *Tustumena*, barges, tugboats; and other commercial and recreational vessels that use the small-boat harbor, City Dock, seafood processing plant, and which produce varying noise levels and frequency ranges (Table 9).

Table 10. Representative noise levels of anthropogenic sources of noise commonly encountered in the proposed action area.

Noise Source	Frequency Range (Hz)	Underwater Noise Level (dB rms re 1 µPa @ 1m)
Small vessels	250–1,000	151–159
Tug pulling barge	1,000–5,000	145–170

Because responses to anthropogenic noise vary among species and individuals within species, it is difficult to determine long-term effects. Habituation can occur when an animal's response to a stimulus wanes with repeated exposure, usually in the absence of unpleasant associated events (Wartzok *et al*. 2003). Habitat abandonment due to anthropogenic noise exposure has been found

in terrestrial species (Francis and Barber 2013). Clark *et al*. (2009) identified increasing levels of anthropogenic noise as a habitat concern for whales because of its potential effect on their ability to communicate (i.e., masking). Some research (Parks 2003, McDonald *et al*. 2006, Parks 2009) suggests marine mammals compensate for masking by changing the frequency, source level, redundancy, and timing of their calls. However, the long-term implications of these adjustments, if any, are currently unknown.

Steller sea lions are sighted more often when fishing boats are docked and are often observed foraging near fishing boats that are docked at the Sand Point facilities, suggesting sea lions in the Sand Point area are habituated to the presence of fishing vessels and, presumably, to the presence of shipping vessels and noises associated with activities in and around Sand Point.

Coastal development, which may include projects such as port expansion or waterfront development, is ongoing in the action area. The City of Sand Point and the Aleutians East Borough are currently seeking funds to install a complete float system and full electricity in the new harbor. The design and construction of these features are part of the City of Sand Point Capital Improvement Plan priorities (HDR 2017a). Given continued human population growth in the region (Zador 2016), the threat can be expected to increase. Many of these developments generate noise at levels above NMFS harassment thresholds.

6.5 Factors Affecting Steller Sea Lion Critical Habitat within the Action Area

The action area overlaps with the aquatic zones (i.e., designated critical habitat) for three designated major haulouts: Sea Lion Rocks, The Whaleback, and Jude (see Section 5.3.5 of this Opinion and Figure 9). The closest is The Whaleback at 27.4 kilometers (14.8 nautical miles) east of Sand Point and the proposed dock. The dock site itself is outside the aquatic zone of the Jude Island haulout. The action area does not overlap with the aquatic zone of any major rookery designated as critical habitat, nor does it overlap with the three designated offshore foraging areas. We expect the factors affecting the species as discussed in Section 6 of this Opinion (climate change, fisheries, vessel collisions, oil and gas development, HABs, and anthropogenic noise) have also affected critical habitat in the action area. The action is occurring in a busy port with constant disturbance to the critical habitat located within it. Boat and airplane traffic, fisheries for groundfish, herring, salmon, and invertebrates, and coastal development, including pollutant discharges are the factors in the action area most likely to have disrupted the essential life functions that occur in critical habitat. These factors have reduced the importance of the action area to the overall conservation value of critical habitat.

7.0. Effects of the Action

"Effects of the action" means the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action that will be added to the environmental baseline. Indirect effects are those that are caused by the proposed action and are later in time, but still are reasonably certain to occur (50 CFR § 402.02).

This 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 an Integration and Synthesis of Effects (section 9) that integrates information presented in the Status of the Species (section 5) and Environmental Baseline (section 6) of this Opinion with the results of our exposure and response analyses to estimate the probable risks the proposed action poses to endangered and threatened species.

The proposed activities of primary concern to ESA-listed humpback whales, fin whales, and Steller sea lions include exposure to sounds underwater from pile driving and removal. Associated factors such as exposure to airborne sounds from pile driving and removal, increased potential for vessel strike, pollution, and sedimentation during project construction are considered to have minimal effects, due to species life history and behavior, construction practices and mitigation measures incorporated into the project design. If any of these mitigation measures change then reinitiation of formal consultation is required (see Section 13.0 of this Opinion).

In analyzing effects to species, we consider the action's timing, duration, nature of effect, and the frequency, intensity, and severity of disturbance. The timing of the activity likely will have no effect on breeding of Steller sea lions or fin or humpback whales, since they do not breed in the vicinity—humpbacks in the area breed primarily in Hawaiian waters in the winter, fin whales in the area primarily breed in Mexico in the winter, and the nearest major Steller sea lion rookery designated as critical habitat (east side of Atkins Island) is about 83.3 kilometers (45 nautical miles) southeast of Sand Point. There is some pup production on some of the haulouts, the closest being Jude Island, approximately 38.9 kilometers (21 nautical miles) west of Sand Point, which had average annual counts of 214 sea lion pups from 2009-2014 (Fritz et al. 2016a). The action area represents a small portion of the geographic range of the species. Further, the project duration is one year. The new dock is intended to replace the primary function of the existing dock (Alaska Marine Highway System ferry and freight) and no added capacity is anticipated (pers. comm DOT&PF; 27 Sept. 2017). No increased vessel traffic is expected from this project; however, vessels previously anchoring in the harbor may be able to dock at either the new or existing dock (until it is removed) when space is available. Therefore, any impacts in the project area likely will not have long-term adverse impact on species' distribution. Accordingly, we focus our analysis on the intensity and severity of effects to the species.

The proposed action is expected to result in non-lethal, non-injurious harassment of Steller sea lions, fin and humpback whales. The ESA does not define harassment, and NMFS has not defined this term through regulation pursuant to the ESA. NMFS recently developed interim guidance interpreting "harass" under the ESA to mean: "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" (Weiting 2016). For the purposes of this consultation, any action that amounts to incidental harassment under the MMPA (16 U.S.C. § 1362(18)(A)) constitutes an incidental "take" under the ESA and must be authorized by the ITS (Section 11).

7.1. Stressors

During the course of this consultation, we identified the following potential stressors from the proposed activities:

- Underwater sounds from:
  - Vibratory pile-driving and removal
  - Impact pile-driving
- Direct contact with:
  - Piles, during placement
  - Sound attenuation devices (pile caps), during placement and removal
- Vessel strike
- Disturbance of sediment
- Modification of critical habitat

Below we discuss each stressor's potential to affect ESA-listed species.

7.1.1. Stressors Not Likely to Adversely Affect ESA-Listed Species and Critical Habitat

Based on a review of available information, we determined which of the possible stressors may occur, but are discountable or insignificant even when considered in combination with other stressors and, therefore, need not be evaluated further in this Opinion.

Direct Contact

Though it is possible that western DPS Steller sea lions, fin and humpback whales could come in direct contact with, and suffer injury from, piles and sound attenuation devices during their placement, the Level A shutdown zones (Table 3) implemented during construction (100m) will make these activities extremely unlikely to impact Steller sea lions or fin and humpback whales; therefore, we conclude the effects from this stressor are discountable.

Vessel Strike

Vessels will transit year-round and fin and humpback whales, and Steller sea lions are known to occur in the action area year-round. However, available information (see Section 6.4.3) does not indicate that vessel strikes of these species in the region have occurred and there is no indication that strikes will become a major source of injury or mortality in the action area. There have been 108 reports of whale-vessel collisions in Alaska waters between 1978 and 2011. Of these, 3 involved fin whale and 93 were humpback whales but none were in or close to the action area (Neilson *et al*. 2012). Most vessel collisions with humpbacks are reported from Southeast Alaska and all but two of the 108 reported strikes was east of 160^{o}W (Neilson et al. 2012). Even if vessel-related deaths of fin and humpback whales in the waters outside of the action area, where strikes have been known to occur, were several times greater than observed levels, it would still be a small fraction of the total fin and humpback whale population. The risk of ship strike has not been identified as a significant concern for Steller sea lions (Loughlin and York 2000) and there are no reported vessel collisions or prop strikes of Steller sea lions in or near the action area. Therefore, we conclude the effects from this stressor for all three species are discountable.

Disturbance of Sediment

A small amount of sediment will be disturbed and may temporarily impact water quality during pile-driving and removal and fill placement in the upland area. This will occur in the area immediately surrounding these activities. Suspended sediments are not expected to persist in the

area for more than a few hours because tidal action will sufficiently disperse them to a point where their concentration in the water column is not detectably different from surrounding waters. In addition, actions specified in a WQCP and associated BMPs (see Section 2.3.1 of this Opinion and HDR 2017a) would limit sedimentation. For these reasons, we do not expect this project will affect water quality to any measurable degree during construction, nor is it likely to cause future impacts that are measurably different from the existing environmental baseline. Therefore, we conclude the effects from this stressor are insignificant and discountable.

Modification of Critical Habitat

Replacement of the Sand Point City Dock would approximately double the footprint of municipal docks on the New Harbor causeway and additional upland area would be created through the expansion of the existing causeway. As such, a small amount of designated critical habitat for Steller sea lions would be modified from the existing condition due the addition of fill and armor rock, disturbance of the seafloor, and additional shading beneath the expanded dock. Changes are expected to be minor given the previously disturbed condition of the area and the minor amount of critical habitat affected within the action area.

There is no other permanent loss of critical habitat associated with the proposed project. While the action area overlaps with designated critical habitat (aquatic zones of three major haulouts; Sea Lion Rocks, The Whaleback, and Jude Island [see Figure 9]) the proposed dock is on the edge of critical habitat; the Sand Point dock is 27.4 km (14.8 nmi) from the nearest haulout (The Whaleback). The action area does not overlap with the aquatic zone of any major rookery designated as critical habitat, nor does it overlap with the three designated offshore foraging areas. The closest designated major rookery is on the east side of Atkins Island, which is approximately 83.3 kilometers (45 nautical miles) southeast of Sand Point (Figure 9).

Furthermore, the project is located within a well-developed port which does not currently function as high quality Steller sea lion habitat or foraging area. Although the action area meets the distance criteria used to define Steller sea lion critical habitat, it provides few if any of the physical and biological features required by the species.

It is extremely unlikely that the small modification of ecologically compromised critical habitat in an already highly developed area will diminish the role of that habitat for the survival and recovery of Steller sea lions, nor will that modification diminish the value of the entire area designated as critical habitat for Steller sea lions to any measurable degree; therefore, we conclude such effects from the modification of critical habitat to be insignificant in terms of the conservation value of Steller sea lion critical habitat.

Summary of Stressors Not Likely to Adversely Affect ESA-Listed Species

In conclusion, based on review of available information, we have determined that effects to western DPS Steller sea lions, fin whales, and western North Pacific and Mexico DPS humpback whales from direct contact, physical injury from pile-driving and removal, and vessel strike are extremely unlikely to occur. We consider the effects to western DPS Steller sea lions, fin and humpback whales from these stressors to be discountable.

We determined project-related disturbance of sediment will have insignificant effects on western DPS Steller sea lions, fin and humpback whales and the modification of Steller sea lion critical habitat related to this project will have insignificant effects on designated critical habitat.

7.1.2. Stressors Likely to Adversely Affect ESA-Listed Species

The following sections analyze the stressors likely to adversely affect ESA-listed species: underwater sounds from vibratory pile-driving and removal, and impact pile-driving.

The frequencies emitted by vibratory and impact pile-driving are estimated to range from 0.01 to 1.5 kHz, mostly within the expected hearing range of Steller sea lions and fin and humpback whales (Table 10). For the purposes of this consultation we assume that all sounds produced by pile driving are within their expected hearing range as estimated by several studies (Southall *et al*. 2007, Ciminello *et al*. 2012).

Table 11. Functional Marine Mammal Hearing Groups, Auditory Bandwidth1.

Functional Hearing Group: ESA-Listed Species that May Occur in the Action Area	Estimated Auditory Bandwidth	
	Southall *et al*. (2007)	Ciminello *et al*. (2012)
Low-frequency (LF) cetaceans: humpback and fin whales	7 Hz to 22 kHz	5 Hz to 30 kHz
Otariid Pinnipeds (in air): Steller sea lion	75 Hz to 30 kHz	100 Hz to 30 kHz
Otariid Pinnipeds (in water): Steller sea lion	75 Hz to 75 kHz	100 Hz to 40 kHz

[1] Estimated Lower to Upper Frequency Hearing Cut-off

Injury (Level A Harassment)

NMFS recently developed comprehensive guidance on sound levels likely to cause injury to marine mammals through onset of permanent and temporary thresholds shifts (PTS and TTS; Level A harassment) (81 FR 51693). Under the 2016 Technical Guidance (NMFS 2016b), NMFS divides marine mammals into five groups and presents thresholds for underwater sounds that cause PTS in each group (Table 11). NMFS presents these acoustic thresholds 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. Based on these criteria the action agencies anticipate no injury (Level A harassment) to ESA-listed western DPS Steller sea lions, fin whales, or western North Pacific or Mexico DPS humpback whales associated with this activity.

Table 11. PTS Onset thresholds for cetaceans and pinnipeds (from NMFS 2016b)

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

Behavioral Disturbance (Level B Harassment)

The modeled radii for vibratory pile-driving and removal, and impact pile-driving are presented in Table 3, in Section 2.3.2, of this Opinion and in the proposed IHA (82 FR 31400; July 6, 2017). As indicated in Table 3, the calculated radius of the 160 dB isopleth for impact pile driving is 1,740m for 30-inch piles and 1,590m for 24-inch piles. Calculated radii to the 120 dB isopleth for vibratory driving and removal is 10,970m for 30-inch pile, 5,420m for 18 and 24-inch pile, and 1,000m for H-piles.

7.2. Exposure

Our exposure analyses are designed to identify the ESA-listed resources that are likely to co-occur with the action's effects in space and time, as well as the nature of that co-occurrence. In this step of our analysis, we try to identify the number, age (or life stage), and sex of the individuals that are likely to be exposed to the action's effects and the population(s) or subpopulation(s) those individuals represent.

7.2.1. Underwater Sounds

The number of marine mammals expected to be taken by behavioral harassment is usually calculated by multiplying the expected densities of marine mammals in the survey area by the area ensonified in excess of 120 and 160 dB re 1 μPa_{rms}, though the method to calculate take may vary, depending on the information available. All of the marine mammal distribution data used to evaluate take in the action area (see Section 5 of this Opinion and 82 FR 31400; July 6, 2017) represent the best available scientific information. The Permits Division calculated exposures of marine mammals for use in the proposed IHA (82 FR 31400; July 6, 2017) and we have adopted them for our exposure analysis here.

Take estimates for Steller sea lions, fin and humpback whales are summarized in Table 11. Take estimates for all marine mammals in the action area were calculated using the following:

$$Observation\ Rate\ (OR) = \frac{No.of\ animals\ observed}{Hours\ of\ observation}$$

$$Exposure\ Rate\ (XR) = \mu_{OR} + CI_{95}$$

where: $\mu_{OR} = Average\ of\ Monthly\ Observation\ Rates$

$CI_{95} = 95\%\ Confidence\ Interval\ (Normal\ Distribution)$

$$CI_{95} = 1.96 \cdot \left(\frac{standard\ deviation}{sample\ size}\right)$$

$$Estimated\ Exposures = XR \times Duration\ (hours)$$

Table 12. Summary of Estimated Takes for Replacement of the Sand Point City Dock

Species	Estimated Level B Take	Estimated Level A take
Western DPS Steller sea lions	960	0
Fin whales	6	0
All humpbacks	30	2

Species	Estimated Level B Take	Estimated Level A take
Western North Pacific DPS Humpback Whale	1	0
Mexico DPS Humpback Whale	3	0

Due to the project location, it is virtually certain that all estimated 960 endangered Steller sea lions potentially exposed to Level B harassment will be individuals of the endangered western DPS. Of the estimated six endangered fin whales potentially exposed to Level B harassment we expect all individuals will be from the Northeast Pacific stock. Humpback whales found in the Shumagin Islands are predominantly members of the Hawaii DPS, which are not listed under the ESA. However, based on a comprehensive photo-identification study, members of both the Western North Pacific DPS (ESA-listed as endangered) and Mexico DPS (ESA-listed as threatened) are known to occur in the Gulf of Alaska. Members of different DPSs are known to intermix on feeding grounds; therefore, all waters off the coast of Alaska should be considered to have ESA-listed humpback whales. According to Wade *et al*., (2016), the probability of encountering a humpback whale from the Western North Pacific DPS in the Gulf of Alaska is 0.5 percent (CV [coefficient of variation] = 0.001). The probability of encountering a humpback whale from the Mexico DPS is 10.5 percent (CV = 0.16). The remaining 89 percent (CV = 0.01) of individuals in the Gulf of Alaska are likely members of the Hawaii DPS (Wade *et al.*, 2016). Therefore, of the 30 humpback whales potentially exposed to Level B harassment, it is estimated that 26 would be from the non-listed Hawaii DPS, three humpback whales would be from the threatened Mexico DPS, and one humpback whale would be from the endangered Western North Pacific DPS.

No Level A takes are expected or authorized for ESA-listed humpbacks. This is a reasonable assumption because, though our modeling suggests construction could cause two Level A takes of humpback whales, only 11% of humpbacks in the action area—or 0.2 of the potential Level A takes—are assumed to be from an ESA-listed population. Thus, if construction activities cause any Level A takes, it is far more likely such takes would impact individuals from the unlisted Hawaii DPS. In addition, the two Level A takes authorized in the IHA represent a conservative estimate of possible exposures to Level A harassment. Mitigation measures will markedly reduce the likelihood of any Level A takes because work will shut down if cetaceans are observed approaching the relevant Level A harassment isopleths (as shown in Table 3). Therefore, we conclude there is likely to be zero Level A takes of ESA-listed humpback whales. Further, even if we authorized one Level A take by harassment of an ESA-listed humpback in the ITS, that would not change our conclusion regarding the likelihood of the action to jeopardize the continued existence of any ESA-listed humpback DPS.

These are considered reasonable estimates of the number of ESA-listed marine mammal exposures to sound above the Level B harassment threshold that are likely to occur over the course of the project. However, they do not necessarily reflect the number of different animals exposed. For instance, because Steller sea lions likely associate fishing boats in Sand Point with reliable sources of food, there will almost certainly be some overlap in individuals present (and exposed) day-to-day. However each instance of exposure for these individuals will be recorded as a separate take. Moreover, because we anticipate that marine mammal observers will typically be unable to determine from field observations whether the same or different individuals are

being exposed over the course of a workday, each observation of a marine mammal will be recorded as a new take, although an individual theoretically would only be considered as taken once in a given day.

Unlike Steller sea lions, fin and humpback whales are less likely to frequent the action area. Therefore, no assumptions can be made about the number of individual fin and humpback whales represented in the exposure estimates for fin whales and western North Pacific or Mexico DPS humpback whales.

We expect exposures to all marine mammals will be limited to Level B harassment. Mitigation measures (HDR 2017b and 82 FR 31400; July 6, 2017) will be employed so that any Steller sea lion, fin whale or humpback whale observed within the Level B zones (Table 3) will be monitored to ensure pile-driving operations will be shut down if they appear likely to enter the Level A harassment zones (Table 3). In addition, a shutdown zone will be established for all in-water work; 10m for in-water heavy machinery work and 100m for pile driving so that if a marine mammal enters, or is about to enter, this zone all work will cease. Furthermore, if a marine mammal is observed within the shutdown zone or Level A zone (if take is not authorized), a soft-start can only proceed if the animal is observed leaving the zone or has not been observed for 30 minutes (for fin and humpback whales) and 15 minutes (for sea lions).

7.3. Response

Loud underwater sounds can result in physical effects on the marine environment that can affect marine organisms. Possible responses by western DPS Steller sea lions, fin whales, western North Pacific DPS humpback whales, and Mexico DPS humpback whales to the impulsive sound produced by impact pile-driving and continuous sound produced by vibratory pile-driving and removal considered in this analysis are:

- Threshold shifts
- Auditory interference (masking)
- Behavioral responses
- Non-auditory physical or physiological effects

This analysis also considers information on the potential effects on prey of western DPS Steller sea lions, fin whales, and western North Pacific DPS and Mexico DPS humpback whales.

7.3.1. Threshold Shifts

Exposure of marine mammals to very strong sounds can result in physical effects, such as changes to sensory hairs in the auditory system, which may temporarily or permanently impair hearing. Temporary threshold shift (TTS) is a temporary hearing change and its severity is dependent upon the duration, frequency, sound pressure, and rise time of a sound (Finneran and Schlundt 2013). TTSs can last minutes to days. Full recovery is expected, and this condition is not considered a physical injury. At higher received levels, or in frequency ranges where animals are more sensitive, permanent threshold shift (PTS) can occur. When PTS occurs, auditory sensitivity is unrecoverable (i.e., permanent hearing loss). Both TTS and PTS can result from a single pulse or from accumulated effects of multiple pulses from an impulsive sound source (i.e., impact pile-driving) or from accumulated effects of non-pulsed sound from a continuous sound source (i.e., vibratory pile-driving and removal). In the case of exposure to multiple pulses, each

pulse need not be as loud as a single pulse to have the same accumulated effect. TTS and PTS occur only in the sound frequencies to which an animal is exposed.

Data are lacking on effects to pinnipeds exposed to impulsive sounds (Southall *et al*. 2007, NMFS 2016b), and the energy levels required to induce TTS or PTS in pinnipeds are not known. Finneran *et al*. (2003) exposed two California sea lions to single underwater pulses up to 183 dB re 1 μPa_{p-p}[4] and found no measurable TTS following exposure. Southall *et al.* (2007) estimated TTS will occur in pinnipeds exposed to a single pulse of sound at 212 dB re 1 μPa_{0-p}[5] and PTS will occur at 218 dB re 1 μPa_{0-p}. Kastak *et al*. (2005) indicated pinnipeds exposed to continuous sounds in water experienced the onset of TTS from 152 to 174 dB re 1 μPa_{rms}.[6] Southall *et al*. (2007) estimated PTS will occur in pinnipeds exposed to continuous sound pressure levels and single pulses of 218 dB re: 1 μPa_{0-p}.

The sound exposures that elicit TTS in low-frequency cetaceans, like the fin and humpback whales, have not been measured (Southall *et al.* 2007). Since no published data exist on auditory effects of noise in either low- or high frequency cetaceans, data from mid-frequency cetaceans (i.e., beluga whales and bottlenose dolphins) are used as surrogates (Southall *et al.* 2007). Low-frequency cetaceans (mysticetes), based on their auditory anatomy (Wartzok and Ketten 1999) and ambient noise levels in the frequency ranges they use (Clark and Ellison 2004), almost certainly have poorer absolute sensitivity (i.e., higher thresholds) across much of their hearing range than do the mid-frequency species. Mid-frequency cetaceans experience TTS-onset at relatively high levels compared with their absolute hearing sensitivity at similar frequencies (i.e., high sensation levels), although it is not known whether this is similarly characteristic of low-frequency cetaceans. Using this surrogacy, Southall *et al.* (2007) estimated TTS will occur in low-frequency cetaceans exposed to single, multiple, and non-pulse sounds at sound pressure levels of 230 dB re: 1 µPa0-p.

It is possible that western DPS Steller sea lions and fin and humpback whales that remain in the Level B harassment zones (i.e., the areas ensonified to at least 160, but less than 190, dB re 1 μPa_{rms} during impact pile-driving and at least 120, but less than 180, dB re 1 μPa_{rms} during vibratory pile-driving) may experience TTS during project activities. However, it is highly unlikely that western DPS Steller sea lions or any fin or humpback whales will experience PTS during project activities because of the incorporation of shutdown measures if these species are seen entering or appear likely to enter the Level A harassment zones (i.e., the areas ensonified to at least 190 dB re 1 μPa_{rms} during impact pile-driving and at least 180 dB re 1 μPa_{rms} during vibratory pile-driving).

7.3.2. Auditory Interference (Masking)

Auditory interference, or masking, occurs when an interfering noise is similar in frequency and intensity, or is louder than, the auditory signal received by an animal while it is processing echolocation signals or listening for acoustic information from other animals (Francis and Barber 2013). Masking can interfere with an animal's ability to gather acoustic information about its

[4] Peak-to-peak.

[5] Zero-to-peak.

[6] Values originally reported as sound exposure level of 183 to 206 dB re 1 μPa^2-s.

environment, such as predators, prey, conspecifics, and other environmental cues (Francis and Barber 2013).

There are overlaps in frequencies between vibratory and impact pile-driving sounds and the expected hearing range of Steller sea lions, fin and humpback whales. The proposed activities could mask vocalizations or other important acoustic information. This could affect communication among individuals or affect their ability to receive information from their environment. However, the project activities will occur in a busy fishing port, an environment where masking from vessel sounds and dock activity likely occurs frequently. We expect any additional impacts that project activities may have to masking in the environment would be very small relative to the existing conditions.

7.3.3. Behavioral Responses

Steller sea lions, fin and humpback whales may exhibit a variety of behavioral changes in response to underwater sound, which can be generally summarized as:

- Modifying or stopping vocalizations
- Changing from one behavioral state to another
- Movement out of feeding or breeding areas

In cases where response is brief (i.e., changing from one behavior to another, relocating a short distance, or ceasing vocalization), effects are very unlikely to be significant at the population level, but could rise to the level of take by harassment of individual sea lions, fin or humpback whales.

Marine mammal responses to anthropogenic sound vary by species, state of maturity, prior exposure, current activity, reproductive state, time of day, and other factors (Ellison *et al*. 2012). This is reflected in a variety of aquatic, aerial, and terrestrial animal responses to anthropogenic noise that may ultimately have fitness consequences (Francis and Barber 2013).

The most likely response of humpback and fin whales to noise disturbance would be to avoid the area where pile installation and extraction noise is occurring (Malme *et al*. 1988; Richardson *et al*. 1995). A whale passing through the area might be momentarily disturbed and could exhibit a short-term change in movement or feeding behavior; however, any such response is expected to be temporary. We do not expect that fin whales or western North Pacific or Mexico DPS humpback whale response to construction sounds from this project will result in any long-term impacts to feeding, vocalization, or reproductive behavior.

Information on behavioral reactions of pinnipeds to in-water “impulsive” sound sources (multiple pulses) is known from exposures to small explosives used in fisheries interactions, impact pile driving, and seismic surveys. In general, exposure of pinnipeds in water to multiple pulses of sound pressure levels ranging from approximately 150 to 180 dB re 1μPa_{rms} has limited potential to induce avoidance behavior (Southall *et al*. 2007).

Less information is available on behavioral reactions of pinnipeds in water to continuous sounds. Using data from pinniped exposures to acoustic harassment devices, a research tomography source, and underwater data communication sources, Southall *et al*. (2007) suggested that exposure to continuous sound sources with sound pressure levels between approximately 90 to 140 dB re 1 µPa have limited potential to induce strong behavioral responses in pinnipeds.

It is difficult to estimate the behavioral responses, if any, that western DPS Steller sea lions, fin or humpback whales in the action area may exhibit in response to project activities. As we discussed in Sections 5 and 6 of this Opinion, it appears that western DPS Steller sea lions in Sand Point have become habituated to the presence of vessels in the busy harbor. Though the sounds that will be produced during project activities may not greatly exceed levels that Steller sea lions, fin or humpback whales already experience in the area, the sources proposed for use in this project (pile-drivers) are not among sound sources to which they are commonly exposed. Some Steller sea lions, and fin or humpback whales may find sounds produced by the project activities to be of greater annoyance than others and move out of the area or change from one behavioral state to another, while others may exhibit no apparent behavioral changes at all. Due to the level of existing anthropogenic activity in the area and the relatively short project duration, we do not expect project activities will significantly impact feeding, breeding, or resting opportunities for these species.

As noted above, Southall *et al.* (2007) report that sound levels up to 180 dB for impulsive sounds or 140 dB for continuous sounds had limited potential to induce avoidance behavior in pinnipeds. If used, these higher disturbance thresholds would result in disturbance isopleths greatly reduced from those provided in Table 3 and a resulting lower take estimates. However, for the purposes of this Opinion, we will consider 'take' for the purposes of the ESA as equivalent to Level B harassment as defined by the MMPA, for Steller sea lions, fin and humpback whales.

7.3.4. Physical and Physiological Effects

Individuals exposed to noise can experience stress and distress, where stress is an adaptive response that does not normally place an animal at risk, and distress is a stress response resulting in a biological consequence to the individual. Both stress and distress can affect survival and productivity (Curry and Edwards 1998, Cowan and Curry 2002, Herráez *et al*. 2007, Cowan and Curry 2008). Mammalian stress levels can vary by age, sex, season, and health status (St. Aubin *et al*. 1996, Gardiner and Hall 1997, Hunt *et al*. 2006, Keay *et al*. 2006, Romero *et al*. 2008).

Loud noises generally increase stress indicators in mammals (Kight and Swaddle 2011). During the time following September 11, 2001, shipping traffic and associated ocean noise decreased along the northeastern U.S. This decrease in ocean noise was associated with a significant decline in fecal stress hormones in North Atlantic right whales, suggesting that chronic exposure to increased noise levels, although not acutely injurious, can produce stress (Rolland *et al*. 2012). These levels returned to their previous level within 24 hours after the resumption of shipping traffic. Exposure to loud noise can also adversely affect reproductive and metabolic physiology (Kight and Swaddle 2011). In a variety of factors, including behavioral and physiological responses, females appear to be more sensitive or respond more strongly than males (Kight and Swaddle 2011).

Steller sea lions, fin and humpback whales use hearing as a primary way to gather information about their environment and for communication; therefore, we assume that limiting these abilities is stressful. Stress responses may also occur at levels lower than those required for TTS (NMFS 2006a); therefore, exposure to levels sufficient to trigger onset of PTS or TTS are expected to be accompanied by physiological stress responses (National Research Council 2003, NMFS 2006a).

As discussed in the previous sections, we expect that Steller sea lion, fin and humpback whale individuals are not likely to experience PTS, but may experience TTS or masking, and may exhibit behavioral responses. They may also experience physiological changes in stress hormone levels from project activities. We expect that any project-related stress response will dissipate shortly after pile-driving activity ceases. We do not expect that potential occurrence of TTS or changes to stress hormone levels will result in harm to individuals.

7.3.5. Marine Mammal Prey

Anthropogenic noises may also have indirect, adverse effects on prey availability through lethal or sub-lethal damage, stress responses, or alterations in their behavior or distribution. Species-specific information about prey of Steller sea lions, fin and humpback whales in the action area is not available; however, we expect their prey will react to anthropogenic noise in manners similar to the fish and invertebrates described below.

Effects from exposure to high-intensity sound sources have been documented in fish and invertebrates, including stress (Santulli *et al*. 1999), injury (McCauley *et al*. 2003), TTS (Popper *et al*. 2005), and changes in balance (Dalen and Knutsen 1986). In general, we expect fish will be capable of moving away from project activities if they experience discomfort. We expect the area in which stress, injury, TTS, or changes in balance, of prey species could occur will be limited to a few meters directly around the pile-drivers. Prey species may startle and disperse when exposed to sounds from project activities, but we expect any disruptions will be temporary. Further, while Steller sea lions, fin and humpback whales are known to occur in Popof Strait, the area is not known to provide an unusually high level of marine prey species, and it represents a relatively small portion of both species' range. We do not expect effects to prey species from the Sand Point Dock project will be sufficient to affect western DPS Steller sea lions, fin whales or western North Pacific DPS or Mexico DPS humpback whales.

7.3.6. Response Summary

Though project activities may cause TTS, brief interruptions in communications (masking), avoidance of the action area, and stress associated with these disruptions, we expect all effects to western DPS Steller sea lions, fin whales, and the western North Pacific and Mexico DPSs of humpback whales will be temporary. Prey species may experience stress, injury, TTS, changes in balance, or impacts from sedimentation in a small radius directly around the pile-drivers and drill or startle and disperse when exposed to sounds from project activities, but we do not expect these effects to prey species will be sufficient to affect western DPS Steller sea lions, fin whales, or western North Pacific DPS or Mexico DPS humpback whales.

8.0. 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, per section 7 of the ESA.

We searched for information on non-Federal actions reasonably certain to occur in the action area. Any future dock or harbor projects would require permits from the U.S. Army Corps of Engineers, and possibly Incidental Harassment Authorizations from NMFS as well. We did not find any information about non-Federal actions other than what has already been described in the

Environmental Baseline (Section 6 of this Opinion). We expect climate change, noise, fisheries, and toxic substances will continue to be the primary factors impacting western DPS Steller sea lions, fin whales, and the western North Pacific and Mexico DPSs of humpback whales in the action area.

9.0. Integration and Synthesis of Effects

The narrative that follows integrates and synthesizes the information contained in the Status of the Species (Section 5), the Environmental Baseline (Section 6), and the Effects of the Action (Section 7) sections of this Opinion to assess the risk that the proposed activities pose to western DPS Steller sea lions, fin whales, and to the Mexico and western North Pacific DPSs of humpback whales.

The survival and recovery of western DPS Steller sea lions, fin whales, and the western North Pacific DPS humpback whales, and Mexico DPS humpback whales within the action area may be affected by:

- Climate change
  - Prey distribution
- Anthropogenic noise
- Fisheries interactions
  - Incidental take and entanglement
  - Conditioning and habituation to presence of commercial fishing vessels and processors

Despite these pressures, available trend information indicates western DPS Steller sea lions populations east of Samalga Pass are increasing, and populations of fin whales, western North Pacific, and Mexico DPS humpback whales appear to be stable or increasing.

We concluded in the Effects of the Action (Section 7 of this Opinion) that western DPS Steller sea lions, fin whales, and the western North Pacific and Mexico DPSs of humpback whales may be harassed by the proposed activities. We expect a maximum of 960 instances in which Steller sea lions will be exposed to sounds of at least 160 dB re 1 μPa_{rms} from impact pile-driving, and sounds of at least 120 dB re 1 μPa_{rms} from vibratory pile-driving and removal (i.e., will be exposed to Level B harassment). We also expect a maximum of 6 instances in which fin whales, 1 instance in which western North Pacific DPS humpback whales, and 3 instances in which Mexico DPS humpback whales may be exposed to these sound levels.

We note this number does not reflect the maximum number of individuals that will be exposed. Instead, we expect some smaller number of individual Steller sea lions will be exposed to harassment multiple times over the duration of the project. The same may hold true for any fin or humpback whales that remain in the action area during project construction.

We expect these exposures may cause TTS, interruptions in communication (i.e., masking), and avoidance of the action area. We expect low-level stress responses will accompany behavioral responses. As indicated in Section 7 of this Opinion, we do not expect western DPS Steller sea lions, fin whales or humpback whales from the Mexico or western North Pacific DPSs exposed to these sounds will experience a reduction in numbers, reproduction, or distribution.

Prey species may experience stress, injury, TTS, or changes in equilibrium and ability to remain upright in a radius of several meters directly around the pile-drivers, or they may startle and disperse when exposed to sounds from project activities. We do not expect these effects will limit prey available to western DPS Steller sea lions, fin whales, or western North Pacific DPS or Mexico DPS humpback whales.

We concluded in "Stressors Not Likely to Adversely Affect ESA-listed Species and Critical Habitat" (Section 7.1.1 of this Opinion) that the modification of a small amount of Steller sea lion critical habitat due to this project is likely to have insignificant effects on the function of critical habitat for Steller sea lions.

In summary, we do not expect exposure to any of the stressors related to the proposed project to reduce fitness in any individual western DPS Steller sea lion, fin whales, or ESA-listed humpback whales. Therefore, we do not expect consequences to the survival or recovery of western DPS Steller sea lions, fin whales, or ESA-listed humpback whales at the population or species level.

10.0. Conclusion

After reviewing the current status of western DPS Steller sea lions, fin whales, western North Pacific DPS humpback whales, and Mexico DPS humpback whales, the environmental baseline for the action area, the anticipated effects of the proposed activities, and the possible cumulative effects, it is NMFS's biological opinion that FHWA's funding of the city dock improvements in Sand Point, Alaska and the Permits Division's issuance of an IHA to FHWA/DOT&PF to replace the city dock in Sand Point, Alaska are not likely to jeopardize the continued existence of western DPS Steller sea lions, fin whales, western North Pacific DPS humpback whales, or Mexico DPS humpback whales, or destroy or adversely modify designated Steller sea lion critical habitat.

11.0. Incidental Take Statement

Section 9 of the ESA prohibits the take of endangered species without 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). "Incidental take" is defined as "take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity" (50 CFR § 402.02). Under the terms of ESA sections 7(b)(4) and 7(o)(2), taking that is incidental and not intended as part of the 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 this Incidental Take Statement.

Section 7(b)(4)(C) of the ESA specifies that in order to provide an Incidental Take Statement for an endangered or threatened species of marine mammal, the taking must be authorized under 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, and must be undertaken by the FHWA/DOT&PF and Permits Division so that they become binding conditions for the exemption in section 7(o)(2) to apply. Section 7(b)(4) of the ESA requires that when a proposed

agency action is found to be consistent with section 7(a)(2) of the ESA and the proposed action may incidentally take individuals of ESA-listed species, NMFS will issue a statement that specifies the impact of any incidental taking of endangered or threatened species.

11.1. Amount or Extent of Take

NMFS anticipates the proposed dock replacement project in Sand Point, Alaska, may result in the incidental take of ESA-listed species by behavioral disturbance (MMPA Level B harassment). There are no anticipated Level A takes of any ESA listed species or stock for this proposed action. As discussed in Section 2.0 and 7.2.1 of this Opinion, the proposed action is expected to take, by Level B harassment, **960 western DPS Steller sea lions, 6 endangered fin whales, 1 endangered western North Pacific DPS humpback whale, and 3 threatened Mexico DPS humpback whales.**

These numbers do not represent the take of individuals; rather they represent the number of instances of take, possibly with repeated take of some individuals in a given day or over multiple days during the project.

If unauthorized take occurs, (i.e., authorized Level B take exceeded or Level B take of any ESA-listed species other than western DPS Steller sea lions, fin whales, and western North Pacific DPS humpback whales, or Mexico DPS humpback whales, or Level A take of any ESA-listed species), it must be reported to NMFS Alaska Region within one business day to the contact listed in Item 3, below, and the FHWA/DOT&PF and Permits Division must immediately request reinitiation of section 7 consultation.

Level B harassment will occur by exposure to impulsive sound sources (i.e., impact pile-driving) with received sound levels of least 160 dB re 1 μPa_{rms} and exposure to continuous sound sources (i.e., vibratory pile-driving and removal) with received sound levels of at least 120 dB re 1 μPa_{rms}. The take estimate is based on the best available information of western DPS Steller sea lion, fin and humpback whale occurrence in Sand Point, not density; therefore, we do not provide separate estimates for take from impulsive and continuous sound sources. Incidental take will result from exposure to acoustic energy from pile-driving and will be in the form of harassment. Death or injury is not expected for any individual western DPS Steller sea lions or fin or humpback whales exposed to these sounds.

Harassment of these listed marine mammals is not expected when they are exposed to received sound level less than 160 dB re 1 μPa_{rms} during impact pile-driving or received sound levels less than 120 dB re 1 μPa_{rms} during vibratory pile-driving and removal; however, if overt reactions (e.g., strong startle responses or rapid departures from the area) by individuals occur at these received sound pressure levels, this may constitute take that is not covered in this Incidental Take Statement. As specified below, in the event of such reactions by listed species, the FHWA/DOT&PF and/or the Permits Division must contact NMFS Alaska Region to determine whether reinitiation of consultation is required.

Listed marine mammals observed within the Level B harassment zones identified in Table 3 during pile driving will be considered to be taken, regardless of subsequent shut-downs, or lack of observed behavioral reactions.

Any incidental take authorized in this consultation is restricted to the action as proposed. If the actual incidental take exceeds the predicted level or type, the FHWA/DOT&PF and NMFS Permits Division must reinitiate consultation. Likewise, if the action deviates from what is

described in section 2 of this Opinion, the FHWA/DOT&PF and NMFS Permits Division must reinitiate consultation. All anticipated takes will be by harassment, as described previously, involving temporary changes in behavior. Take causing injury or death is not anticipated or authorized.

11.2. Effect of the Take

In this Opinion, NMFS has determined that the level of incidental take is not likely to jeopardize the continued existence of any ESA-listed species, and we do not expect exposure to any of the stressors related to the proposed project to reduce fitness in any individual western DPS Steller sea lions, fin whales, or ESA-listed humpback whales.

11.3. Reasonable and Prudent Measures

"Reasonable and prudent measures" are nondiscretionary measures to minimize the amount or extent of incidental take (50 CFR § 402.02). NMFS concludes the reasonable and prudent measures described below, along with its implementing terms and conditions, is necessary and appropriate to minimize and/or to monitor the amount of incidental take of western DPS Steller sea lions, fin whales, Mexico DPS humpback whales, and western North Pacific DPS humpback whales resulting from the proposed actions.

1) The FHWA/DOT&PF and Permits Division must require all project-associated personnel adhere to the project description and to the minimization and mitigation measures as they are presented in the IHA application, the final Biological Assessment, the Marine Mammal Monitoring and Mitigation Plan (see http://www.nmfs.noaa.gov/pr/permits/incidental/construction.htm#SandPoint_2017), and this Biological Opinion.
2) The FHWA/DOT&PF and Permits Division must require that marine mammal observations of, interactions with, and reactions to project activities are reported to NMFS AKR.

11.4. Terms and Conditions

"Terms and conditions" implement the reasonable and prudent measures (50 CFR § 402.14(i)(1)(iv) and (i)(2)). These must be carried out for the exemption in section 7(o)(2) to apply.

To be exempt from the prohibitions of section 9 of the ESA, the FHWA/DOT&PF and Permits Division must require all contractors to comply with the following terms and conditions, which implement the reasonable and prudent measure described above and the mitigation measures set forth in this Opinion (see HDR 2017b and 82 FR 31400; July 6, 2017). These terms and conditions are non-discretionary. The FHWA/DOT&PF and NMFS Permits Division have a continuing duty to monitor the impacts of incidental take and must report the progress of the action and its impact on the species as specified in this incidental take statement (50 CFR § 402.14(3)). If the FHWA/DOT&PF or Permits Division: (1) fail to require the authorization holder to adhere to the terms and conditions of the Incidental Take Statement 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.

1. To implement Reasonable and Prudent Measure #1, the FHWA/DOT&PF and Permits Division must ensure that the following are accurate and that adherence is required of project-associated personnel:

   1.1. all portions of the description of the action (Section 2 of this Opinion);

   1.2. all portions of the Sand Point City Dock Replacement Project Marine Mammal Monitoring and Mitigation Plan (HDR 2017b);

   1.3. all mitigation measures, requirements and conditions described in the final Incidental Harassment Authorization.[7] See http://www.nmfs.noaa.gov/pr/permits/incidental/construction.htm#SandPoint_2017

2. To implement Reasonable and Prudent Measure #2, the FHWA/DOT&PF and Permits Division must ensure that:

   2.1. Observations of dead or impaired marine mammals are reported to NMFS AKR at the points of contact listed at 2.13 below. Such reports must include the following:

      2.1.1. the species or description of the animal(s),
      2.1.2. condition of the animal or carcass,
      2.1.3. location (lat/long), date and time of first discovery,
      2.1.4. observed behaviors (if alive), and
      2.1.5. photo or video (if available).

   2.2. If an ESA-listed marine mammal's condition is a direct result of the project, NMFS must be notified, and work must stop until NMFS AKR is able to review the circumstances of the prohibited take.

   2.3. If the lead observer determines that the injury or death of an ESA-listed marine mammal is not associated with or related to the activities authorized in the IHA (e.g., previously wounded animal, carcass with moderate to advanced decomposition, scavenger damage), the applicants must report the incident within 24 hours of the discovery.

   2.4. Construction activities may continue while NMFS AKR reviews the circumstances of the incident and makes a final determination on the cause of the reported injury or death.

   2.5. If cause of death is unclear, the applicants must immediately report the incident to NMFS AKR. Construction activities may continue while NMFS AKR reviews the circumstances of the incident and makes a final determination as to the cause of the reported injury or death. NMFS AKR will work with the applicants to determine whether additional mitigation measures or modifications to the activities are appropriate.

   2.6. Care must be taken in handling dead specimens to preserve biological materials in the best possible state for later analysis of cause of death.

   2.7. In preservation of biological materials from a dead animal, the finder (i.e. marine mammal observer) has the responsibility to ensure that evidence associated with the specimen is not unnecessarily disturbed.

[7] Some of these terms and conditions are in addition to reporting requirements required by the Permits Division.

2.8. Reports of dead or impaired marine mammals will be made to the NMFS AKR Protected Resources Division: Anchorage: (907) 271-5006 or Juneau: (907) 586-7235 during business hours (M-F 8:00-4:00) or to the 24 Hour Marine Mammal Stranding Hotline: (877) 925-7773 or (877) 9-AKR-PRD.

2.9. Monthly and Final Reports - Monthly observer reports, a final technical report, completed listed marine mammal observation record forms (developed by HDR), and an electronic copy of an Excel spreadsheet with all marine mammal observations must be provided.

2.9.1. Electronic spreadsheet observation records for ESA-listed marine mammals must include all reporting information specified below and must clearly summarize:

2.9.1.1. Number of listed animals taken;
2.9.1.2. Date, time, and location (lat/long) of each take;
2.9.1.3. Cause of the take (e.g., Steller sea lion, fin or humpback whale observed within Level B zone during vibratory and impact pile driving);
2.9.1.4. Time the animal(s) entered the zone, and, if known, the time it exited the zone;
2.9.1.5. Mitigation measures implemented prior to and after the animal entered the zone.

2.10. Monthly reports must be provided by the 5th day of the subsequent month. The reporting period for each monthly observer report will be the entire calendar month. Completed observation record forms for listed marine mammal, in electronic format, will be provided to NMFS AKR at the points of contact listed at item 2.13 below.

2.11. Observer report data will be submitted in electronic spreadsheet format and will include the following for each listed marine mammal observation (or "sighting event" if repeated sightings are made of the same animal[s]):

2.11.1. Species, date, location (lat/long), and time for each sighting event

2.11.1.1. Number of animals per sighting event and number of adults/juveniles/calves/pups per sighting event

2.11.2. Primary, and, if observed, secondary behaviors of the listed marine mammals in each sighting event, focusing on behavioral reactions just prior to, or during, soft-start and shutdown procedures

2.11.3. Geographic coordinates for the observed animals, with the position recorded by using the most precise geographic coordinates practicable (coordinates must be recorded in decimal degrees, or similar defined coordinate convention)

2.11.4. Time of most recent pile-driving or other project activity prior to listed marine mammal observation

2.11.5. Any shut-downs that occurred due to listed species presence,

2.11.6. Environmental conditions as they existed during each sighting event, including, but not limited to:

2.11.6.1. Beaufort Sea State
2.11.6.2. Weather conditions
2.11.6.3. Visibility (km/mi)
2.11.6.4. Lighting conditions

2.11.6.5. Percentage of ice cover

2.12. A final technical report must be submitted to NMFS Alaska Region within 90 days after the final pile has been driven, removed, or drilled for the project. The report must summarize all pile-driving and other project activities and results of listed marine mammal monitoring conducted during project activities. The report must include an electronic spreadsheet with all of the data as outlined in Items 2.12.1-2.12.7. The final technical report must include all elements from Items 2.1-2.11 above, as well as:

2.12.1. Summaries that include monitoring effort (e.g., total hours, total distances, and listed marine mammal distribution through the study period)
2.12.2. Analyses of the effects from various factors that influences detectability of marine mammals (e.g., sea state, number of observers, fog, glare, etc.)
2.12.3. Species composition, occurrence, and distribution of listed marine mammal sightings, including date, water depth, numbers, age/size/sex categories (if determinable), group sizes, and ice cover
2.12.4. Species composition, occurrence, and distribution of listed marine mammal takes, including date, water depth, numbers, age/size/sex categories (if determinable), group sizes, and ice cover
2.12.5. Analyses of effects of project activities on listed marine mammals
2.12.6. Number of Steller sea lions, fin and humpback whales observed (and taken) during periods with and without project activities
2.12.7. Other variables that could affect detectability, such as:

2.12.7.1. Initial sighting distances versus project activity at time of sighting
2.12.7.2. Observed behaviors and movement types versus project activity at time of sighting
2.12.7.3. Numbers of sightings/individuals seen versus project activity at time of sighting
2.12.7.4. Listed marine mammal distribution around the action area versus project activity at time of sighting

2.13. NMFS Contacts:

Monthly and final reports and reports of unauthorized take must be submitted to:
NMFS Alaska Region, Protected Resources Division
Verena Gill
verena.gill@noaa.gov
907-271-1937 or 907-271-5006

12.0. 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 endangered and threatened species (16 U.S.C. § 1536(a)(1)). Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on ESA-listed species or critical habitat, help implement recovery plans, or develop information (50 CFR § 402.02).

We offer the following conservation recommendation, which will provide information for future consultations involving the issuance of permits that may affect western DPS Steller sea lions, fin whales, Mexico DPS humpback whales, or western North Pacific DPS humpback whales:

- Behavioral responses of listed marine mammals: We recommend that the Permits Division summarize findings from past IHA holders about behavioral responses of ESA-listed species to sounds from pile-driving and other sounds related to dock construction activities. Better understanding of how ESA-listed species have responded to sounds from past projects will inform our exposure and response analyses in the future.

In order for the NMFS Alaska Region to be kept informed of actions minimizing or avoiding adverse effects on, or benefiting, ESA-listed species or their habitats, the Permits Division should notify the NMFS Alaska Region of any conservation recommendations it implements.

13.0. Reinitiation Notice

This concludes formal consultation on the FHWA's funding of the Sand Point City Dock replacement and the NMFS Permits Division's proposed issuance of an IHA for the Sand Point City Dock replacement project in Sand Point, Alaska. As provided in 50 CFR § 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if:

- The amount or extent of proposed take is exceeded.
- New information reveals effects of the agency action that may affect ESA-listed species or critical habitat in a manner, or to an extent, not considered in this opinion.
- The agency action is subsequently modified in a manner that causes an effect to the ESA-listed species or critical habitat not considered in this opinion.
- A new species is ESA-listed or critical habitat designated that may be affected by the action.

If the amount or extent of authorized take and/or effects to critical habitat is exceeded, the FHWA/DOT&PF and Permits Division must immediately request reinitiation of section 7 consultation.

14.0 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.

14.1. Utility

This document records the results of an interagency consultation. The information presented in this document is useful to NMFS, the FHWA/DOT&PF, 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.

14.2. 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.

14.3. 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 Part 402.

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.

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