

APPENDIX N

Part I: Corps Letter to NMFS Re-initiating Section 7 Consultation

Part II: ASAP Biological Assessment

Part III: Biological Opinion

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DEPARTMENT OF THE ARMY
ALASKA DISTRICT, U.S. ARMY CORPS OF ENGINEERS
REGULATORY DIVISION
P.O. BOX 6898
JBER, AK 99506-0898

September 6, 2017

Regulatory Division
POA-2009-651

SUBJECT: Reinitiation of Section 7 Consultation // Alaska Stand Alone Pipeline
Supplemental Environmental Impact Statement

Mr. Jon Kurland, Director
NOAA Fisheries' National Marine Fisheries Service
Post Office Box 21668
Juneau, AK 99802

Dear Mr. Kurland:

In accordance with Section 7(a)2 of the Endangered Species Act of 1973, as amended (ESA), the U.S. Army Corps of Engineers, Alaska District, Regulatory Division (Corps), and pursuant to the Letter of Concurrence, dated January 11, 2012, issued for the Alaska Stand Alone Pipeline project by National Marine Fisheries Service (NMFS), the Corps, requests reinitiation of consultation regarding a Department of the Army (DA) permit application submitted by Alaska Gas Development Corporation (AGDC), file number POA-2009-651, Multiple Waterways, which should be referred to in all correspondence with us. The National Marine Fisheries' Service issued a Letter of Concurrence for the Alaska Stand Alone Gas Pipeline project on January 11, 2012. Reinitiation is requested due to new project information that may affect listed species or critical habitat in a manner or extent not previously considered. Please see Attachment A for project modifications and additions, since the 2012 FEIS. The following information is provided in accordance with 50 CFR §402.14(c):

1. **Project Location and Proposed Construction:** The applicant requests authorization to construct, operate and maintain a 733-mile, buried, 26-in-diameter intrastate natural gas transmission pipeline; originating from Prudhoe Bay and extending south, terminating at the ENSTAR distribution system (Milepost 39 of the Beluga Natural Gas Pipeline, southwest of Big Lake). Additional pipeline construction includes a 30-mile 12-inch lateral for servicing Fairbanks which will diverge from the mainline, approximately 2.5 miles south of the mainline Chatanika River crossing at MP 440, and terminate at the Fairbanks natural gas distribution system. The proposed pipeline would be primarily buried with portions elevated at fault crossings, pigging facilities, and off-take valve locations. For your convenience, an overview map has been provided in Attachment B (AGDC's Biological Assessment). A gas conditioning facility

(GCF) is proposed for construction at Prudhoe Bay and will provide a gas flow rate input of 500 MMscfd at peak capacity. Due to the size of the project and multiple components proposed for construction, the Applicant has provided an interactive webviewer which may be more beneficial for viewing other project components on a smaller scale: <http://agdc.maps.arcgis.com/apps/webappviewer/index.html?id=be66ef54f7434486bf4c845123f90fb7+>

The basis of the information used for the analysis is based primarily upon information received from the Applicant (ASAP Biological Assessment, dated February 8, 2017; ASAP West Dock Dredge and Disposal Plan & ASAP Marine Transit Plan, dated July 12, 2016), as well as, literature values based upon studies with similar equipment, climate and installation conditions, when available. Site-specific noise propagation studies have not been conducted by the Applicant. West Dock Upgrades: ASAP proposes winter dredging to create a 50-foot wide by 5,400-foot long access channel, dredge to a depth of -9ft below mean lower low water (MLLW)) leading up to Dockhead 3 in order to achieve navigable depth to accommodate the maximum barge draft of 7.6ft and allow an additional 1.4ft of clearance space. Ice will be Screeding of the navigational channel to level the seabed to a precise depth will be necessary in early summer prior to barge arrival. The mechanically-dredged material is proposed to be placed into a truck and transferred over ice roads to a 100-acre disposal location consisting of shorefast ice within Prudhoe Bay. Pile Driving and West Dock Upgrades: According to the Biological Assessment, "Vibratory hammering will be used in winter to install mooring dolphins on bottomfast / shorefast ice, and potentially other pilings for bridge abutment infrastructure. Specific activity and durations of work will be defined by the contractor, but vibratory work can be expected to occur intermittently within a 90-day period. AGDC proposes to maintain a 500m radii observation zone around the proposed vibratory pile driving. If any marine mammal (polar bear or seal) is observed in the zone, work will stop immediately. Work is expected to be conducted in groundfast ice, without exposure to open water." Proposed Dredging and Disposal Operations: The Applicant proposes to scour through ice and excavate a 500-foot wide by 5,400-foot deep channel in order to obtain a navigable depth of -9.0 feet for a planned barge approach at Dockhead 3, of West Dock facility within Prudhoe Bay. Both ice pads and ice roads would be utilized to access the proposed dredge and disposal locations on Prudhoe Bay. Proposed dredge disposal requires excavated ice and sediments to be loaded into a truck and mobilized to the aforementioned 100-acre disposal location (see AGDC's Dredge and Disposal Plan for site vicinity maps and equipment list). Barge Traffic: Modules will be transported using 22 barges from Chukchi Sea into Prudhoe Bay: Barges will arrive at the ASAP Project area when they reach the open water marshalling area, a deep water location approximately 3 to 5 miles offshore from West Dock. Barges will vary in dimensions, deadweight capacity, and draft. Barge specifications are listed in Table 1. (p. 10) of the enclosed Marine Transit Plan. The proposed activity will require a single-season sealift involving 23 barges that will transport 53 prefabricated modules to Prudhoe Bay. Barges are reported as using existing shipping routes from production to delivery within Prudhoe Bay. There is no additional infrastructure support that is required for the module delivery beyond what has been describe for the West Dock Expansion.

2. **Action Area:** The 2012 FEIS action area included three ESA polygons by location: Port of Seward, Port of Anchorage and Prudhoe Bay. The NEPA review for the ASAP Rev6.1 SEIS includes ESA action area polygons within Prudhoe Bay and Port of Seward. Both polygon areas are located within Section 10 Rivers and Harbors Act and Section 404 Clean Water Act jurisdictions of the Corps. The Port of Anchorage is not considered a primary use port by the Applicant and has been excluded from the current consultation effort and Biological Assessment. The action area is the area in which direct and indirect effects of the action to listed species and designated critical habitat may occur. The area directly affected by the proposed project is the total footprint of the GCF, dredging and screeding areas for creation and maintenance of a navigation channel to Dockhead 3 (West Dock) and the proposed 100-acre disposal site within Prudhoe Bay, as well as, the main and lateral pipeline infrastructure, access roads (proposed ice roads), and associated permanent and construction support facilities up to 50 miles inland from the Beaufort Sea coast. The area indirectly affected by the proposed project is delineated by a zone of influence surrounding new infrastructure within which listed species may be affected by disturbance resulting from construction activities and project operations. This zone of influence is assumed to be 1.6 kilometer (km) (1 mile) either side of the centerline to as far south as 50 miles from the Beaufort Sea Coast for the endangered bowhead whale (*Balaena mysticetus*), the threatened Arctic subspecies of ringed seal (*Phoca hispida hispida*), and threatened Beringia DPS of bearded seal (*Erignathus barbatus*). Transit routes for the those barges arriving into Prudhoe Bay, via the Chukchi Sea, barging operations and the location of the marine marshalling area have been provided in the West Dock Marine Transit Plan (Attachment C).

3. **Species:** Three ESA-listed species are known to occur in waters around Prudhoe Bay, Alaska: the endangered bowhead whale (*Balaena mysticetus*), threatened Arctic subspecies of ringed seal (*Phoca hispida hispida*), and threatened Beringia DPS of bearded seal (*Erignathus barbatus barbatus*). At present, there is no critical habitat designated for these species. All marine mammals are protected under the Marine Mammal Protection Act. In addition to the threatened and endangered marine mammals previously mentioned, non-listed marine mammals in the Prudhoe Bay area include the gray whale, killer whale, beluga whale, narwhal and spotted seal. The Applicant is consulting with NMFS- Office of Protected Services regarding Incidental Take Authorization.

Analysis: Barge Traffic: Modules will be transported using 22 barges from Chukchi Sea into Prudhoe Bay: Barges will arrive at the ASAP Project area when they reach the open water marshalling area, a deep water location approximately 3 to 5 miles offshore from West Dock. Barges will vary in dimensions, deadweight capacity, and draft. Barge specifications are listed in Table 1. (p. 10) of the enclosed Marine Transit Plan. The proposed activity will require a single-season sealift involving 23 barges that will transport 53 prefabricated modules to Prudhoe Bay. Barges are reported as using existing shipping routes from production to delivery within Prudhoe Bay. Vessel noise and collision can result in adverse effects to the bowhead whale. The Applicant has proposed the delivery timeframe and main shipping routes that will be outside known migration routes. Current mitigation measures proposed for use by the Applicant include

use of a trained whale spotter during operations and work under reduced vessel speeds when in areas potentially utilized by bowhead whales.

West Dock Upgrades: According to the Biological Assessment, “Vibratory hammering will be used in winter to install mooring dolphins on bottomfast / shorefast ice, and potentially other pilings for bridge abutment infrastructure. Specific activity and durations of work will be defined by the contractor, but vibratory work can be expected to occur intermittently within a 90-day period. AGDC proposes to maintain a 500m radii observation zone around the proposed vibratory pile driving. If any marine mammal (polar bear or seal) is observed in the zone, work will stop immediately. Work is expected to be conducted in groundfast ice, without exposure to open water. While NMFS’s new acoustic criteria (NMFS 2012a) does not specifically cover polar bear, a 500m setback zone is expected to be sufficient for areas of bottomfast and shorefast ice. When a specific pile driving contractor is selected, specific observation radii will be calculated to ensure that an appropriate observation distance is established.”

Ice seals (and polar bears) can be affected by Industry activities in numerous ways. These include (1) noise disturbance, (2) physical obstructions, (3) human encounters, and (4) effects on habitat and prey. The Applicant has recently indicated a change in the project description indicating that vibratory and impact hammering will be used during the summer months (the biological assessment previously indicated winter construction only) to install mooring dolphins and other pilings for bridge abutment infrastructure. The Applicant indicated that vibratory work can be expected to occur intermittently over a 90-day period. Both dredging, dredge disposal and vibratory pile driving operations could adversely affect ice seals by exposing them to elevated noise levels in the vicinity of the proposed Project Area. Disturbance, including from increased noise or presence of vessels or vehicles, and, location, construction and mobilization over ice pads and ice roads may affect ice seals differently depending on their reproductive status (*e.g.*, denning versus non-denning seals). Dredge disposal over large acreages can result in mortality through compression impacts during occupation beneath shallow ice formations or suffocation through elimination of shallow breathing holes within the ice.

The Applicant has further indicated that the specific activity and duration of work will be defined by the contractor, however, the Corps has requested this information be provided so that a thorough determination regarding potential impacts to the species can be made. Site-specific noise modeling has not been conducted by the Applicant for equipment proposed for use, therefore, the Corps has reviewed a range of literature documenting noise values derived from construction equipment usage in various environments (air, water and ice). The Corps has requested an updated biological assessment be provided that provides the current scope of work and seasonal application of all proposed work upgrades for West Dock. Until such time, a proficient review of potential impacts to both the bowhead whale and ice seal populations cannot be completed. Additionally, the Corps has requested that AGDC consult with NMFS in order to determine whether an IHA/LOA would be required pursuant to the Marine Mammal Protection Act.

5. Other species considerations and mitigation measures proposed by the Applicant are included in Attachment B. of this correspondence (Biological Assessment), Appendix B, Table B-1.

The USACE has made a preliminary determination that the proposed action ***may affect, not likely to adversely affect*** the endangered bowhead whale (*Balaena mysticetus*) and ***may adversely affect*** Arctic subspecies of ringed seal (*Phoca hispida hispida*), and threatened Beringia DPS of bearded seal (*Erignathus barbatus barbatus*). As a curiosity, the Applicant's Biological Assessment has been included as an attachment to this correspondence.

Should you require additional information, please contact me via email at Sandy.P.Gibson@usace.army.mil, by mail at the address above, by phone at (907) 753-2877, or toll free from within Alaska at (800) 478-2712, if you have questions. For additional information about our Regulatory Program, visit our web site at <http://www.poa.usace.army.mil/Missions/Regulatory.aspx>.

Sincerely,

Sandy P. Gibson
Project Manager

Enclosures:

Attachment A. Key Project Changes to ASAP Rev.6.1
Attachment B. AGDC Biological Assessment, dated 2017.

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Appendix K

Biological Assessment

A Biological Assessment is prepared to conform with the requirements of Section 7(a)2 of the Endangered Species Act of 1973, as amended. This Biological Assessment was submitted to U.S. Fish and Wildlife Service and National Marine Fisheries Service as part of a reinitiation of consultation. The Biological Assessment identifies potential effects to threatened and endangered species as a result of development/production of the Alaska Stand Alone Pipeline. This Biological Assessment was published in the Draft Supplemental Environmental Impact Statement. It has been updated to reflect changes in project design and mitigation measures since its publication in June, 2017.

Abbreviations and Acronyms

°C	degrees Celsius
°F	degrees Fahrenheit
μ Pa rms	MicroPascal root mean square
ACP	Arctic Coastal Plain
ADF&G	Alaska Department of Fish and Game
AGDC	Alaska Gasline Development Corporation
ASAP	Alaska Stand Alone Gas Pipeline
BA	Biological Assessment
BACT	Best Available Control Technology
BLM	U.S. Department of Interior, Bureau of Land Management
BiOp	Biological Opinion
BOEM	Bureau of Ocean Energy Management
BPXA	British Petroleum (Alaska), Inc.
CO ₂	carbon dioxide
CO ₂ eq	CO ₂ equivalent
cu. yd.	cubic yard
CV	coefficient of variation
Delta	Yukon-Kuskokwim Delta
DH	dockhead
DPS	distinct population segment
EDPS	Eastern distinct population segment
EIS	environmental impact statement
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FEIS	Final Environmental Impact Statement
FR	Federal Register
ft.	foot / feet
GCF	gas conditioning facility
GHG	greenhouse gas

GIS	Geographic Information System
Hz	hertz
IHA	Incidental harassment authorization
IPCC	Intergovernmental Panel on Climate Change
ITR	incidental take regulations
IWC	International Whaling Commission
JAFP	Joint Application for Permit
km	kilometer
lbs	pounds
L _{pk}	peak sound pressure level
LOA	Letter of Authorization
LOC	Letter of Concurrence
MLLW	Mean Lower Low Water
MMBtu	million British thermal units
MMPA	Marine Mammal Protection Act
MMS	Minerals Management Service
MP	milepost
NMFS	National Marine Fisheries Service
N _{min}	current minimum population estimate
NMML	National Marine Mammal Laboratory
NOAA	National Oceanic and Atmospheric Administration
NSB	North Slope Borough
NWT	Northwest Territory
O&M	operation and maintenance
OCs	organochlorine compounds
OCS	Outer Continental Shelf
PBU	Prudhoe Bay Unit
POPs	Persistent organic pollutants
PSO	protected species observer
PTS	permanent threshold shifts
ROW	right-of-way

SB	Southern Beaufort Sea population
SEIS	Supplemental Environmental Impact Statement
SEL _{24h}	24-hour cumulative sound exposure level
SPL	sounds pressure level
SPLASH	Structure of Populations, Levels of Abundance and Status of Humpbacks
TAPS	Trans-Alaska Pipeline System
TTS	Temporary threshold shifts
USACE	U.S. Army Corps of Engineers
USDOC	U.S. Department of Commerce
USDOT	U.S. Department of Transportation
USFWS	U.S. Fish and Wildlife Service
WDPS	Western distinct population segment
WDSP	West Dock Staging Pad

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Summary

On January 13, 2016, the Alaska Gasline Development Corporation (AGDC) submitted a revised Application for Department of the Army Permit (DA application) for the Alaska Stand Alone Pipeline (ASAP) Project designed to provide gas for Alaskans. AGDC proposed the construction and operation of (i) a Gas Conditioning Facility (GCF) on the North Slope capable of conditioning a volume of 500 million standard cubic feet per day of natural gas, (ii) a 733-mile (1,180 kilometer (km)), 36-inch-diameter (1 meter (m)) buried natural gas pipeline extending from Prudhoe Bay on the North Slope of Alaska to a tie-in with the ENSTAR system in southcentral Alaska at milepost (MP) 39 of the existing Beluga Pipeline near Big Lake, (iii) a 30-mile (48 km), 12-inch-diameter (0.3 m) lateral pipeline from MP 440 of the Mainline to Fairbanks, and (iv) associated off-ROW facilities.

On June 7, 2011, the U.S. Army Corps of Engineers (Corps) provided a Biological Assessment (BA) in conjunction with the ASAP Environmental Impact Statement (EIS) to the Services (AGDC 2011). On July 10, 2012, the USFWS responded with a Biological Opinion (BiOp). The NMFS provided a Letter of Concurrence (LOC), dated January 11, 2012, concurring with the USACE's determination of 'Not Likely to Adversely Affect' and did not require formal consultation. A Final Environmental Impact Statement (FEIS) was published in October 2012 (USACE 2012).

Since the publication of the FEIS, revisions have occurred to the ASAP Project design, necessitating a Supplemental EIS (SEIS) for evaluation of environmental impacts not previously evaluated under the FEIS. Project revisions that necessitated a change to the BA are concentrated in the action area at Prudhoe Bay and on the North Slope.

New construction activities within the action area include delivery of GCF modules and construction materials to West Dock at Prudhoe Bay (AGDC 2015; AGDC 2016a). The construction of the GCF would require a single-year sealift involving 23 barges that would transport 53 pre-fabricated modules to Prudhoe Bay. Improvements to West Dock would be required to facilitate module offloading, including winter dredging of a navigational channel leading up to Dockhead 3 (DH3), disposal of dredged material over bottomfast ice in a nearshore area of Prudhoe Bay, construction of a temporary bridge using ballasted barges and bulkheads, and other infrastructure modifications to the dock and causeway. Barges would be ballasted by filling internal barge compartments with seawater using portable pumps and hoses inserted into utility holes on the barge decks. Barges would be un-ballasted by pumping the water out of the barge.

Table 1 provides a list of the species addressed in this BA, their ESA status, and the action agency's effects determination.

TABLE 1. Endangered Species Act Protected, Candidate, and Proposed Species Potentially Occurring In or Near the Action Area

Agency	Common Name	Scientific Name	Federal Status	Determination of Effect
USFWS	Steller's Eider	<i>Polysticta stelleri</i>	Threatened	May affect, but not likely to adversely affect
	Spectacled Eider	<i>Somateria fischeri</i>	Threatened	May affect, likely to adversely affect
	Polar Bear*	<i>Ursus maritimus</i>	Threatened	May affect, likely to adversely affect
	Pacific Walrus ²	<i>Odobenus rosmarus divergens</i>	Not Listed / Candidate	May affect, but not likely to adversely affect
NMFS	Bowhead Whale	<i>Balaena mysticetus</i>	Endangered	May affect, but not likely to adversely affect
	Ringed Seal ^{3,*} (Arctic Subspecies – Alaska Stock)	<i>Phoca hispida</i>	Threatened	May affect, but not likely to adversely affect
	Bearded Seal ⁴ (Beringia DPS)	<i>Erignathus barbatus</i>	Threatened	May affect, but not likely to adversely affect

DPS – Distinct Population Segment

*** = denotes that critical habitat is designated or has been proposed for this species**

Notes:

1. The Eskimo Curlew (*Numenius borealis*) is a federally-listed species, but is considered to be extinct and is not known to occur in the Project area. For these reasons, the USFWS has concurred with the decision to remove it from this table, although its status is noted through this footnote (B. Henszey, Branch Chief, Fairbanks, personal communication, July 2016). However, the Project acknowledges its formal listing

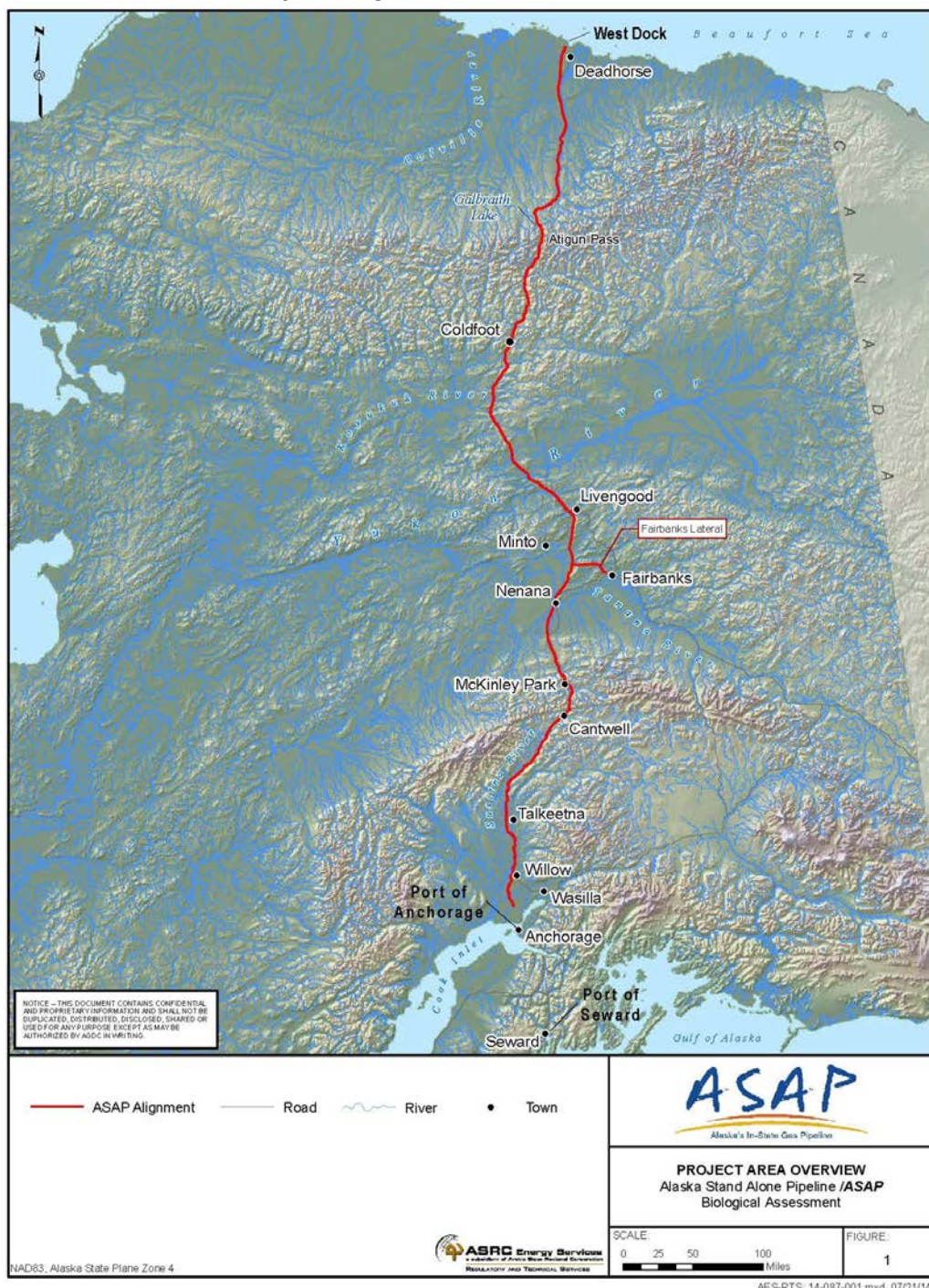
despite its probable extinction and no known historic occurrence near the Project area. Additionally, since the Project's use of the Port of Anchorage is negligible, a prior action area around that port has been removed and there are no impacts associated with the Port of Anchorage for this Project. Subsequently, Cook Inlet Beluga Whale and Critical Habitat for Cook Inlet Beluga Whale have been removed from this evaluation, as the Project will not impact the area. The Project will also not impact the area used by Northern Sea Otter (Southwest DPS), which was previously evaluated.

2. On October 5th, 2017, the USFWS noticed its 12-month findings for a petition to list Pacific walrus as an ESA species. The Service determined that a listing was not warranted (50 CFR Part 17 / 82 FR 46618 / Docket ID FWS-R7-ES-2017-0069). The determination to not list walrus means that this BA does not require the inclusion of walrus. However, because the USFWS' determination to not list walrus is likely to receive legal challenge in the near future, the evaluation of impacts to the species has been left in this document voluntarily despite it not being listed as an ESA species.
3. The 9th Circuit Court of Appeals upheld the listing of the Arctic ringed seal as threatened under the ESA, on February 12, 2018. Critical habitat is also proposed for ringed seal; it is not designated at this time however, this could change with a reversal of the U.S. District Court decision by an appellate court.
4. Beringia bearded seals occur in U.S. waters off Alaska's coast. On December 28, 2012, NMFS published a final rule listing the Beringia DPS as threatened (77 FR 76740). On July 25, 2014, the U.S. District Court for the District of Alaska issued a decision vacating NMFS' listing of the Beringia DPS of bearded seals. However, on October 24, 2016, the Ninth Circuit Court of Appeals reversed the decision of the District Court to vacate the listing of bearded seals, allowing the original NMFS listing of the bearded seal as 'threatened' to stand. On January 22, 2018, the Supreme Court declined to review the Ninth Circuit Court decision, therefore the Beringia bearded seal remains listed as threatened.

1.0 Project Description:

The proposed ASAP Project consists of a natural gas pipeline, a GCF, and supporting facilities. The pipeline comprises a 733-mile long (1,180 km), 36-inch-diameter (1 m) natural gas transmission mainline extending from the GCF at Prudhoe Bay within the North Slope Borough (NSB), south to a connection with the ENSTAR pipeline system near Big Lake (Figure 1).

FIGURE 1. Entire Project Alignment



A 30-mile-long (48 km), 12-inch-diameter (0.3 m) lateral pipeline would be used to transport gas from the Mainline to Fairbanks. The proposed pipeline would be primarily buried, with portions elevated only at bridged stream crossings, certain fault crossings, pigging facilities, and off-take valve locations. ASAP is designed to transport accessible natural gas composed primarily of methane to markets in south central Alaska, Fairbanks, and other Alaskan communities.

Ancillary facilities would include a 90.6-acre gravel pad for the GCF and associated workspace; a separate 20.2-acre gravel pad for the GCF camp; mainline block valves at a maximum of every 20 miles (32 km); five pigging facilities, which could be collocated on pads with other aboveground facilities; Operations and Maintenance (O&M) response bases located in Prudhoe Bay, Fairbanks, and Big Lake; material sites (sand and gravel pits) distributed along the route; existing material sites would be used whenever possible; water sources used for construction needs would be collected from permitted surface water sources; project offices and response bases; logistics support sites; personnel housing and support (camps); port facilities; temporary barge bridge; staging locations; access roads; construction work pads (gravel, ice or snow, and grade); laydown yards and storage facilities; airports and airstrips.

GCF-related materials would be barged into Prudhoe Bay, while most pipeline-related materials would be barged into the Port of Seward. In both cases, barges will be transported along defined shipping routes following standard maritime practices and procedures. In Prudhoe Bay, barges would stage at the marshalling area and transit to West Dock to unload. Dredging and dock infrastructure improvements would be required to receive and offload the GCF modules. No infrastructure improvements are expected at the Port of Seward, although a pipeline marshalling yard would be developed on uplands adjacent to the existing dock and railroad tracks.

The GCF will comprise 53 modular components transported on a total of 23 barges. Improvements at DH3 (Figure 2) to accommodate the offload of the modules would include winter dredging and disposal of dredged material over bottomfast ice to accommodate barges the next summer (Figure 3 and Figure 4); removing existing damaged timber barge mats and replacing them with new; removing and replacing existing damaged upper and lower fenders; and construction of ramps behind the face of the existing DH3. No pile driving is anticipated for the removal and replacement of the fenders. Along the causeway to DH3 (Figure 5), improvements would include the installation of mooring dolphins and gravel to support a temporary bridge composed of two ballasted barges; and infrastructure improvements to the West Dock road and causeway (see AGDC 2016a for more details).

An online interactive map viewer is available to show all specific project footprint details at: <http://asapgas.agdc.us/interactivemap.html>. A detailed description of the proposed project is provided at www.asapeis.com.

FIGURE 2. DH3 and Temporary Bridge at West Dock, Prudhoe Bay, Alaska

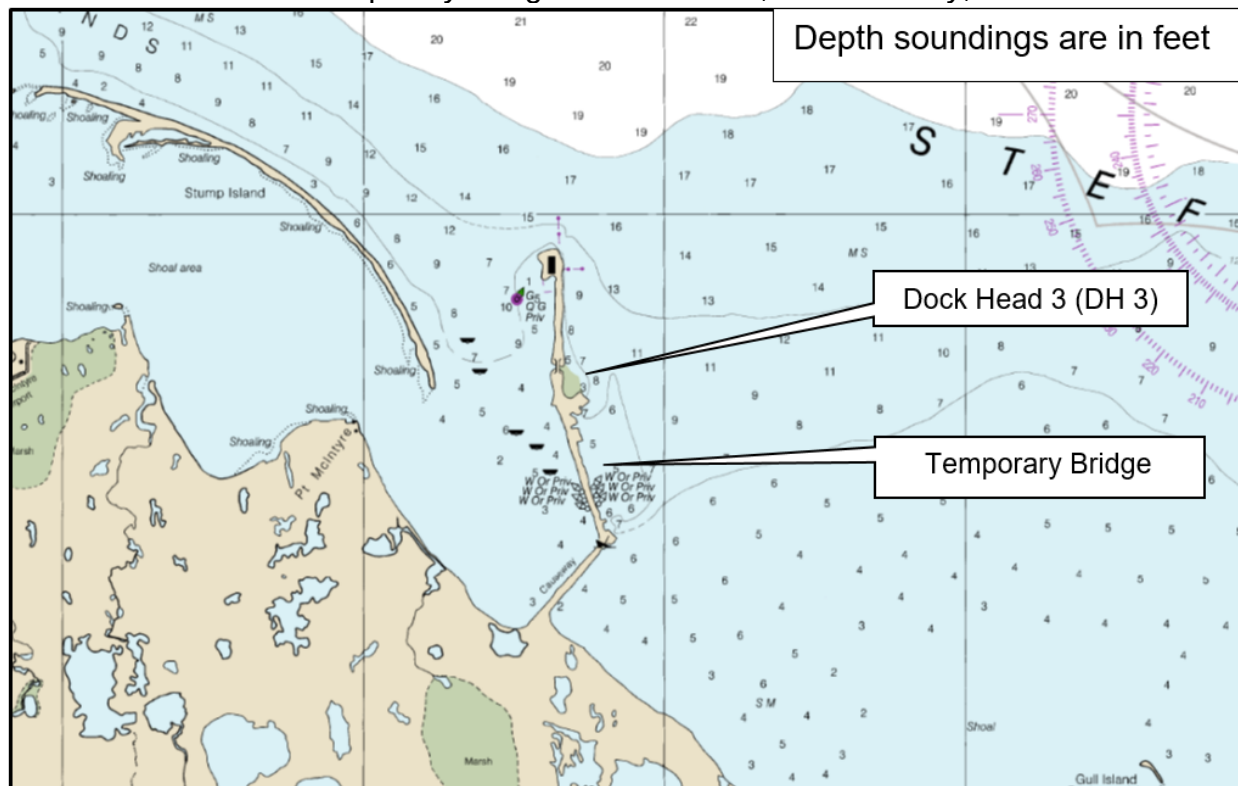


FIGURE 3. Construction Activities in Marine Waters

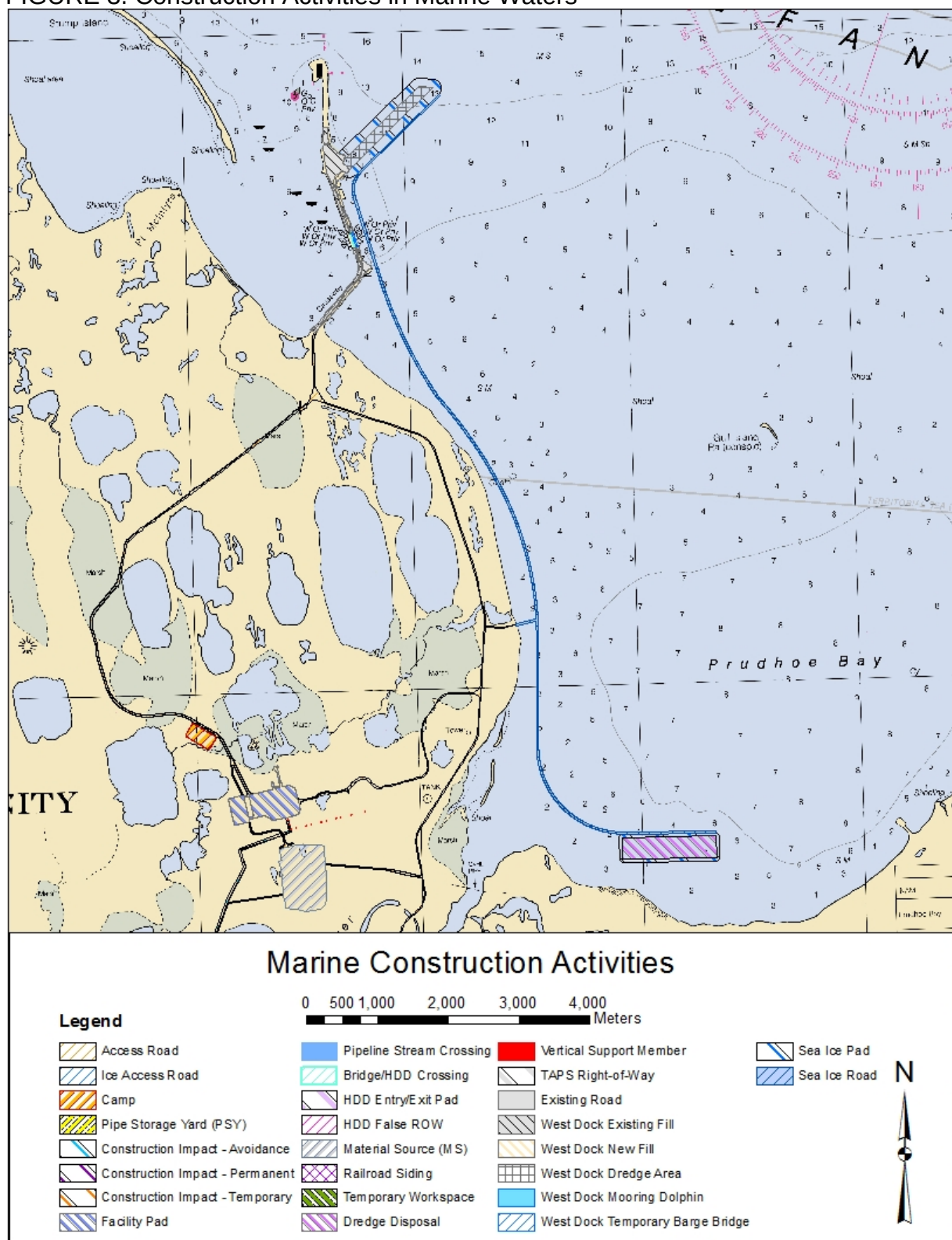


Figure 4. Detail of the Navigation Channel and Ice Pad/Road at DH3

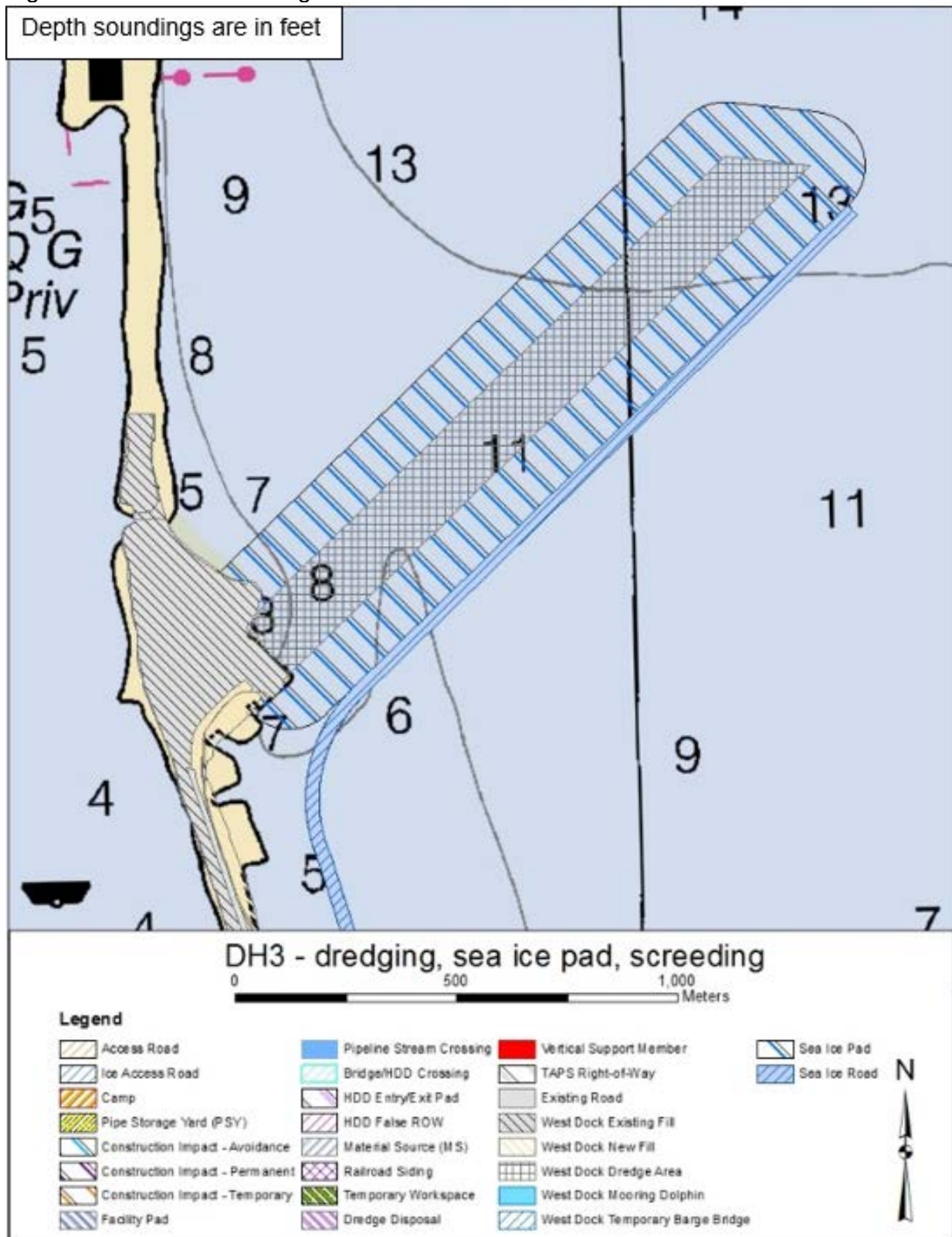
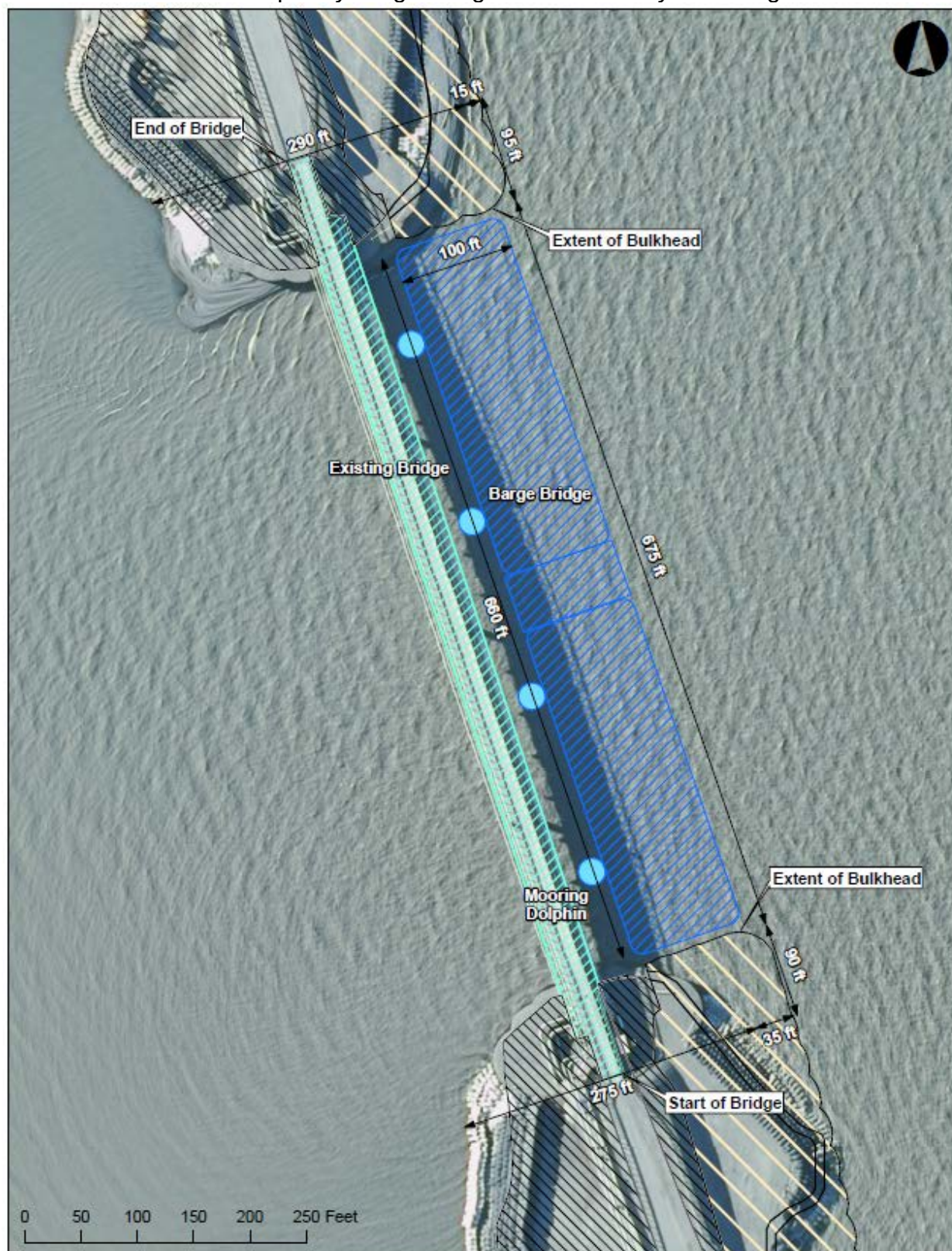


FIGURE 5. Detail of Temporary Barge Bridge and Causeway Widening



Federal Action

The Federal action for this project includes evaluation of an application for authorization to discharge dredged or fill material into waters of the U.S. under Section 404 of the Clean Water Act, and the request for authorization to work or construct structures in, under, and above the mean high water mark of navigable waters of the U.S. under Section 10 of the Rivers and Harbors Act. Proposed activities which require authorization under Section 404 of the Clean Water Act include:

- The discharge of 25,000 cubic yards (19,114 cubic meters) of gravel into 1.5 acres below the high tide line adjacent to the existing causeway to create a stable surface upon which to scuttle two barges to create a temporary bridge (Figure 5),
- The discharge of material into 11.4 acres below the high tide line to widen the existing causeway from 290 feet (ft.) (88 m) wide to a maximum of 305 ft. (92 m) wide (Figure 3),
- The discharge of 250,000 cubic yards (191,139 cubic meters) of dredged material into 100 acres below the high tide line (Figure 3),
- Screeding activities within 1.5 acres below the high tide line at the proposed temporary bridge and within up to 59 acres below the high tide at the at DH 3 (Figure 4 and Figure 5),
- The discharge of fill into approximately 9,704 acres of wetlands for the purpose of constructing the GCF, the 733-mile (1,180 km) long pipeline and support features, including access roads and associated permanent or construction support facilities (Figure 1).

Activities which require authorization under Section 10 of the Rivers and Harbors Act include:

- Installation and removal of four (4) 48-inch (122 centimeter (cm)) diameter, 110-ft-long, steel pilings below the mean high water mark to stabilize two barges for a temporary bridge. Installation would require the use of an impact hammer. After the bridge is no longer needed, the piles would be cut off below the sediment surface, and the remainder would be abandoned in place;
- Removal of 60 linear ft. (18 m) of existing sheet pile, using a vibratory hammer, currently installed below the mean high water mark, in order to construct the approaches to the temporary bridge. A minimum opening of 10 ft. (3 m) (5 ft. (1.5 m) on each side) is required at each point of interference between the new piling and the old piling. There are 6 points of interference;
- Installation of 2,973 linear ft. (906 m) of new sheetpile below the mean high water mark using a vibratory hammer to construct the approaches to the temporary bridge;
- Installation and removal of the temporary bridge composed of two ballasted barges (each 400 ft. (122 m) x 105 ft. (32 m) x 20 ft. (6 m)) over and below the mean high water mark in an area 1.5 acres in size. The total size of the bridge would be 675 ft. (206 m) x 100 ft. (30 m);
- Dredging of up to 250,000 cubic yards (191,139 cubic meters) of material from a 59-acre area, below the mean high water mark, to a depth of -9 ft. (3 m) below the mean lower low water mark; and

- Creation and maintenance of an 108 acre ice pad (400 ft. wide x 11,680 ft. long (122 m wide x 3.6 km long)) around the dredge area, 104 acres of ice roads (8.61 miles long x 60 ft. wide (13.9 km long x 18 m wide)), 38.5 acres of transportation corridor around the dredge disposal area (11,183 ft. long x 150 ft. wide (3.4 km long x 46 m wide)) which would be used during dredging activities, and a 1.5-acre ice pad coincident with the gravel fill area and the temporary barge bridge footprint.

2.0 Action Area:

The action area is defined as the areas to be affected directly or indirectly by the Federal Action¹. The action area includes:

- The footprint of the pipeline and ancillary features, and the footprint of the GCF including the footprint of all discharges of dredged or fill material in waters of the U.S.;
- In Prudhoe Bay, the action area is expanded to include areas that would be directly and indirectly affected by noise and construction activities. The action area for this part of the project is shown in Figure 6 and includes 185 square miles (479 km²) surrounding the West Dock Causeway, the navigational channel, the temporary barge bridge, a barge marshalling area, and the dredge disposal site summarized in the ASAP West Dock Dredge and Disposal Plan (AGDC 2015; AGDC 2016a), as well road improvements and gravel pads to be constructed in support of the transportation and construction of the GCF;
- In addition, the action area includes a 1-mile (1.6 km) buffer along the pipeline Right of Way south from the GCF near the Beaufort Sea (Figure 7). This includes areas within which listed species may be affected by disturbance resulting from construction activities and project operations. This zone extends as far south as 50 miles (80.4 km) from the Beaufort Sea Coast for both species of eiders, and as far south as 25 miles (40 km) from the Beaufort Sea Coast for polar bear. There would be a total of 627.3 acres of permanent impacts within the action area resulting from the discharge of fill into waters of the U.S., as well as the conversion of wetlands from one wetland type to another (Table 2).

In order to focus efforts of this BA on the aspects of the proposed action that may affect ESA species within the action area, the geographic areas evaluated focus on designated critical habitat or other portions of the action area where there is a likelihood of finding ESA-listed or ESA-proposed species. This is limited to the portion of the action area that begins 50 miles (80 km) south of the Beaufort Sea and extends north.

In the 2012 LOC, NMFS stated that fin whales, humpback whales, and Steller's sea lions may be present in or adjacent to the action area around the Port of Seward. The activities the Port of Seward have not changed since the FEIS evaluation. The Corps removed the Port of Seward from the action area as there are no activities proposed at that location which require federal authorization.

¹ 50 CFR 402.02

FIGURE 6. Northern Portion of Action Area, West Dock

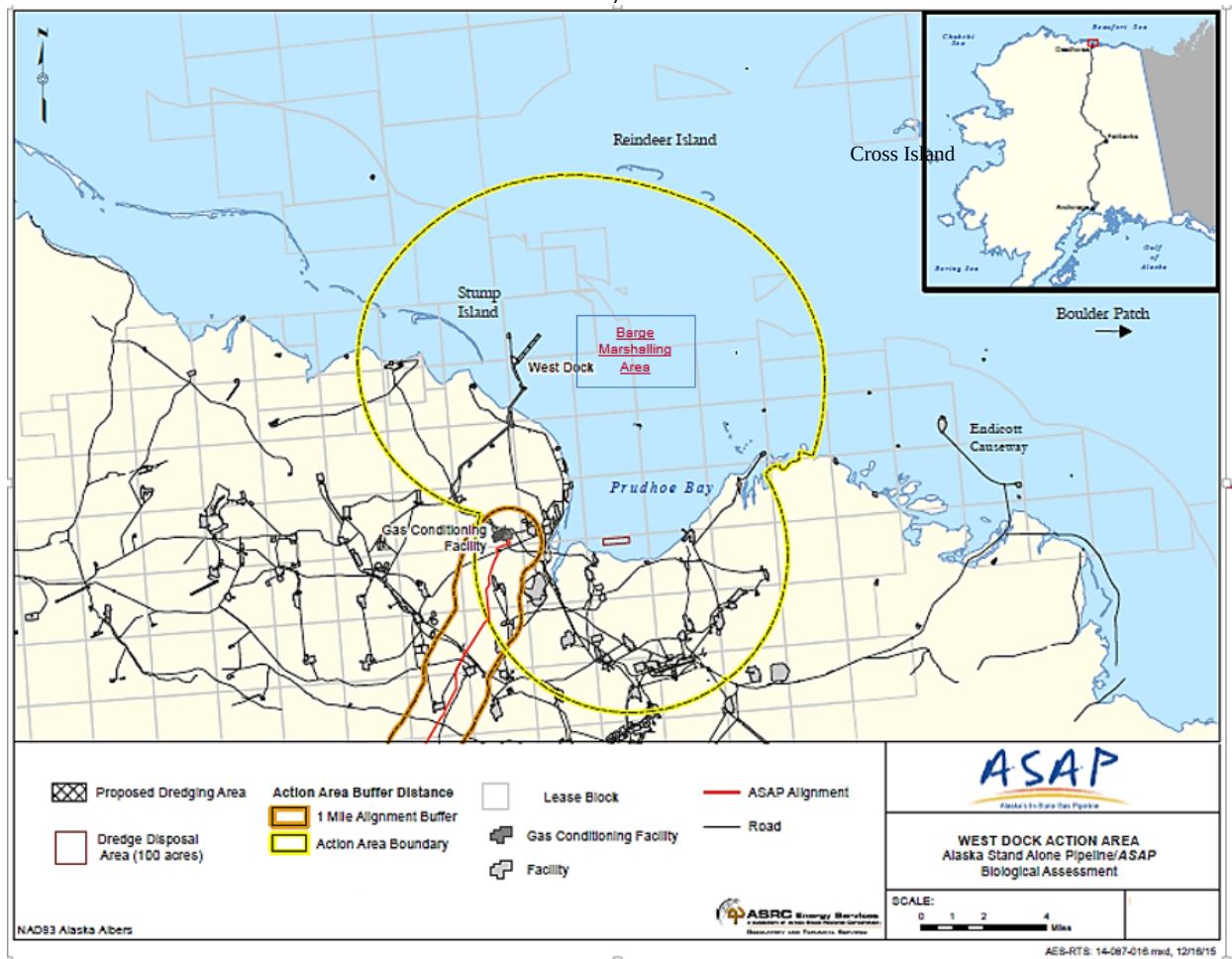


FIGURE 7. Northern Portion of the Action Area, 1- mile buffer around alignment

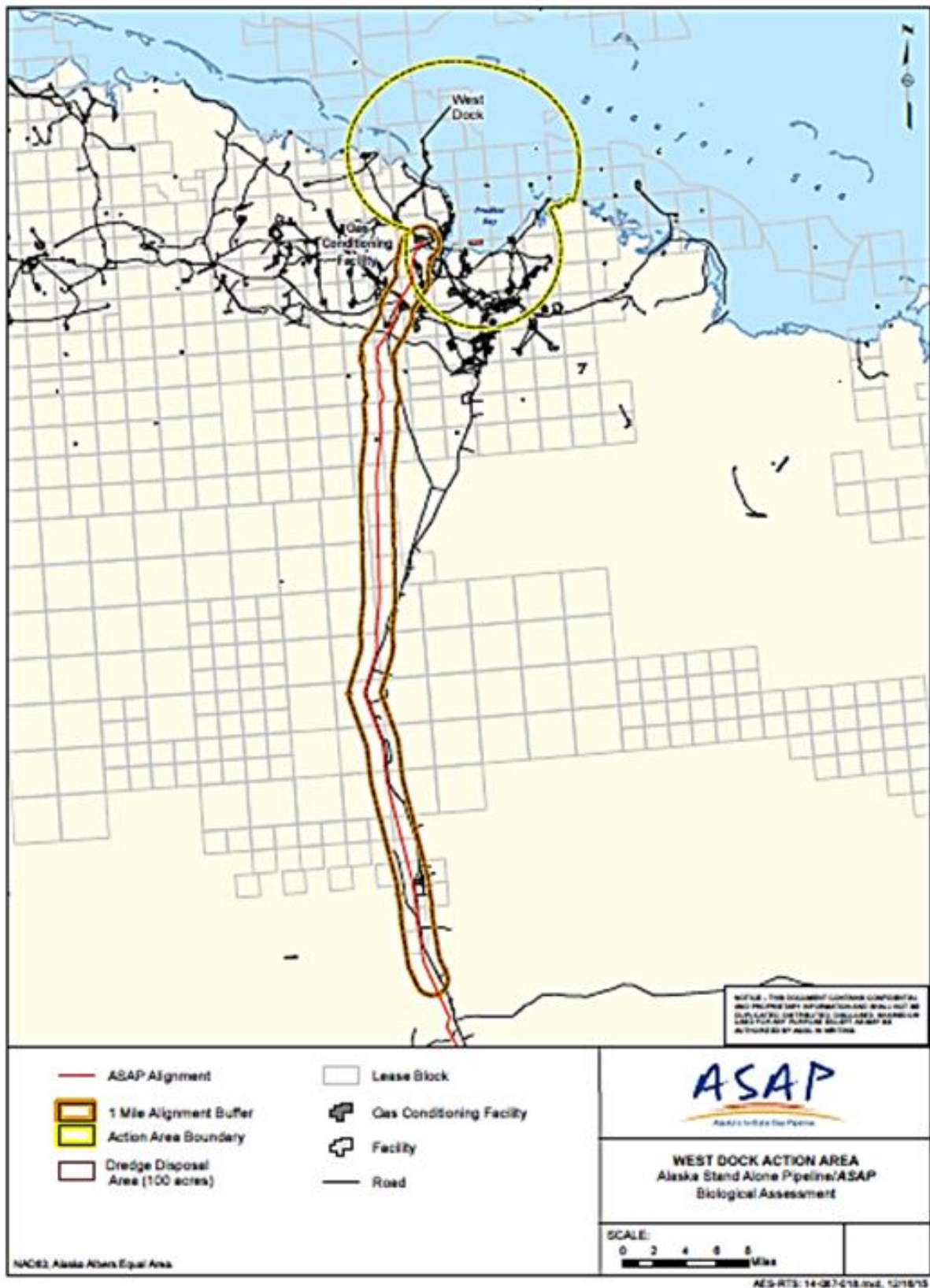


TABLE 2. Project Components within the Action Area and 1- Mile Buffer to MP 50

Project Phase	Facilities	Land Development/ Habitat Disturbance ^a
Construction	Pipe Storage Yards (2)	20.7 acres
	Camp - 800 Person	35.2 acres (existing)
	Fuel Storage	existing
	Airport	existing
	West Dock	existing
	Pipeline Construction ROW ^b	ROW: 727.27 acres (50 miles x 120 ft) Ground Disturbance: 42.42 acres permanent wetlands disturbance (50 miles x 7 ft)
	Gas Conditioning Facility ^c	110.8 acres
	Access Road for Gas Conditioning Facility to CGF and PBU ^d	163.2 acres
	New Material Source Sites ^e	136.9 acres
	Access Roads for Pipe Storage Yards, Material source sites ^f	53.4 acres
Operation^g	Pipeline Operational ROW	324.24 acres (50 miles x 53.5 ft)
	Gas Conditioning Facility and Associated Facilities ^c	110.8 acres
	Access Road for Gas Conditioning Facility to CGF and PBU	163.2 acres
	New Material Source Sites ^d	136.9 acres
	Access Roads for Pipe Storage Yards, Material source sites ^e	20.7 acres
Notes: Data revision date: November 2017 a. The acreage for project components from the shoreline of Prudhoe Bay south to MP 50 of the ASAP Pipeline. b. Total ROW acreage from the edge of the GCF to MP 50. Permanent wetland impact disturbance within the ROW will be confined to a corridor of 50 miles x approximately 7ft wide. c. Gas Conditioning Facility, Operations and Construction Camp Complex, Warehousing, Maintenance Facilities, and Offices (Preliminary). d. Access road acreage includes existing road surface and new road surface, but no ice roads or existing West Dock road. e. Does not include existing material sites. f. Three new gravel roads (preliminary), does not include existing road surfaces. g. Acreages are considered to all be disturbed lands during construction, but may continue to be used during operation. CGF - existing Central Gas Facility PBU - existing Prudhoe Bay Unit		

All ESA-protected species that may be affected by the ASAP Project are found exclusively in the marine environment or in nearshore areas. With the exception of the two bird species, all species are marine mammals (i.e., whales, walrus, seals, and polar bear). Within the ASAP action area, the range for three species – spectacled eider, Steller's eider, and polar bear – includes both Beaufort Sea marine areas and terrestrial nearshore areas of the Arctic Coastal Plain (ACP).

Portions of polar bear critical habitat are located within the ASAP Project's northern action area. Portions of proposed ringed seal (*Phoca hispida hispida*) critical habitat are also located within the Project's northern action area. Other species assessed in this BA (spectacled eiders and Steller's eiders) do have portions of their home range along Pacific and Arctic coasts or oceans designated as critical habitat, but these areas are not in or near the ASAP Project action area.

3.0 Proposed Action

3.1 West Dock Modifications

Modifications of the existing West Dock facilities would be necessary to facilitate offloading and transport of modules off the causeway within a short ice-free work window. The modification of West Dock infrastructure would involve impact pile driving of four mooring dolphins (48-inch (122 cm) pipe), vibratory pile driving of sheet piles, widening of the West Dock causeway, and use of a temporary barge bridge to span the 650-ft gap paralleling the existing weight-limited bridge currently spanning the causeway (Figure 5). Collectively, all West Dock modifications would occur over a period of less than two years. The noise generated by the construction activities, as well as the proposed structures, vessel traffic associated with the proposed construction, the discharge of the gravel at the temporary bridge, and the impact from the proposed discharge of dredged material would be temporary and localized. The impacts from the proposed discharge of fill material to widen the causeway would be permanent, but the construction related impacts from this proposed discharge would be temporary and localized.

The water depth around West Dock is dependent on wind conditions but typically, it is less than 15 ft. (4.5 m) near the end of the causeway at the Seawater Treatment Plant (STP) and approximately 7 ft. (2.1 m) near DH3 (NOAA 2016), as shown in Figure 4 above. Any work in winter would be in or around shallow water covered by several feet of bottomfast or shorefast sea ice, where small head space would not support aquatic activity by marine mammals under the ice. Additional information regarding sound propagation, impacts and mitigation measures specific to marine mammals and threatened or endangered species are discussed in greater detail in Section 5.0, below.

3.2 Dredging, and Disposal of Dredged Material

Dredging of a navigational channel (Figure 4) to 9 ft. (3 m) below Mean Lower Low Water (MLLW) is necessary for barge offloading to occur at West Dock DH3 (AGDC 2015; AGDC 2016a).

Up to 250,000 cubic yards (191,139 cubic meters) of material would be dredged through the ice in winter and trucked over ice roads to a 100-acre disposal area in southwestern Prudhoe Bay where it would be disposed of in the nearshore environment over bottomfast ice, landward of the Territorial Sea boundary. A dredged navigational channel depth to 9 ft. (3 m) below MLLW is proposed in order to accommodate the maximum barge draft of 7.6 ft. (2 m) and allow an additional 1-2 ft. (0.3-0.6 m) of clearance space. Dredging would occur in March and April. Over-dredging would mitigate against trench infilling during spring break-up and would eliminate any need for summer dredging.

Winter was selected over summer for dredging to avoid negatively impacting marine species and to promote project safety. Conventional winter excavation, using extended reach excavators, is the preferred method of dredging and has been used during the construction of several North Slope pipelines. Three (3) tracked excavators would be used over one winter construction season to provide enough time for ice cutting, winter storms, dredge disposal at the approved location, and other unforeseen delays.

After the ice roads and pads are constructed, a ditchwitch would be used to cut the ice in the dredge area and the ice would be removed with tracked excavators. The excavators would then excavate the 500 ft.-wide (152 m-wide) channel to approximately -9 ft. (3 m) and place the dredged material into trucks. Concurrent with the excavation, trucks would transport the dredge spoils to the designated disposal site.

As noted in a screening-level analysis in the West Dock Dredge and Disposal Plan (AGDC 2016a), winter dredging was selected for the following reasons:

- Excavation accuracy is increased on a more stable surface, reducing the chance of unintentional over-dredging;
- Migrating whales are not in the area during winter, reducing the potential for conflicts with whaling activities;
- Ice mitigates the potential of an excavation turbidity plume;
- Ice eliminates wave action;
- The winter season aids in completing the excavation;
- Work fronts can be increased simultaneously by adding excavators and extra trucks;
- Minimal channel maintenance is required during the winter because ice helps keep channel side slopes from sloughing; and
- Fish are not in the area during the winter, thereby reducing the impact on fish migration.

Winter disposal would coincide with winter dredging activity. Winter dredge and disposal activities would reduce potential conflicts with migratory animals (birds and marine mammals), subsistence activities, and migratory fish routes. The following factors were considered in determining the best location and most appropriate methods for dredge disposal:

- Physical and chemical composition of dredged material;
- Matching of dredged material to disposal area sediments;
- Timing of disposal;
- Technical feasibility;
- Environmental considerations; and
- Cost-benefit.

The preferred disposal location for dredge material from the West Dock navigation channel would be landward of the Territorial Sea boundary in the nearshore environment over bottomfast ice within Prudhoe Bay (AGDC 2015). The majority of the coastal

Beaufort Sea does not have a rocky substrate, but one characterized by silt and sand. Where cobbles and boulders do occur, a diverse assemblage of organisms can be found in association. Benthic algal communities occur throughout the Beaufort, but they are especially dense at the Boulder Patch east of Prudhoe Bay in Stefansson Sound (Bushosh et al., 1985). The nearshore environment is disturbed by seasonal bottomfast ice movements that scour the seabed, as well as by intermittent storms in the ice-free season. These nearshore areas generally would be too perturbed an environment to allow significant aquatic marine plant or algae communities to thrive. The continual formation and retreat of ice throughout the season would move sediments away from the nearshore environment over time. AGDC proposes to avoid biologically important areas, such as polar bear and ice seal denning, the “boulder patch” – a unique area of boulders that provides habitat for multiple species in an otherwise habitat-poor environment, migratory fish routes, and benthic communities (e.g., clam habitat). The nearshore disposal site was also chosen to avoid interference with subsistence use areas or subsistence activities (as per the NSB Department of Wildlife Management). In summary, nearshore disposal on bottomfast ice is the preferred option for the following reasons:

- Area is of adequate distance from West Dock, so there is no sediment repositioning in the navigation channel or the West Dock breach;
- Area is accessible from both land and water;
- Dredged sediment is presumably of similar physiochemical composition to disposal site;
- Area is poor benthic habitat because of ice gouging on the seafloor;
- Area has naturally high turbidity, therefore, sediment plumes should not alter the water quality to an unacceptable level; and
- No navigation interference.

A one-time nearshore dispersal of dredge material onto bottomfast ice in an area that becomes ice-scoured and turbid each spring is not likely to have adverse effects on the surrounding environment (e.g., habitat, migratory routes, or navigational routes). Specific engineering information pertaining to dredge and disposal activities is provided below. Table 3 shows the estimated duration of ice cutting in the dredge area, Table 4 shows the estimated duration of equipment operation for dredge and disposal, and Table 5 shows the estimated trucking effort for dredge disposal.

TABLE 3. Estimated Duration of Ice Cutting in Dredge Area

Linear Ft. of Ice per Day	Total Number of Ditchwitches per Day	Total Hrs per Ditchwitch per Day	Total Ditchwitch Hours per day	Estimated Days of Operation	Total Ditchwitch Hours
18,000 (5,486 m)	3	16.67	50	39	1,950

TABLE 4. Estimated Duration of Equipment Operation for Dredge Disposal

Description	Qty	Days	Hours	Total Hrs	Operation
CAT 345 amphibious	2	39	936	1,872	Excavating & Loading Trucks
CAT 730 Articulated Trucks	32	39	936	29,952	Hauling to Disposal
CAT 320 or equivalent	1	39	936	936	Cleaning Truck Beds
D-8 Dozer	1	39	936	936	Clean up at Disposal Site
Ditchwitch	4	39	936	3,744	Cutting Ice
CAT 320 Long Stick	2	39	936	1,872	Removing Ice
966 Loader	1	39	936	936	Pushing Ice from Work Area
CAT 16 Grader	2	39	936	1,872	Ice Road Maintenance
966 with Snow Blower	1	39	936	936	Ice Road Maintenance
Water Truck	2	39	936	1,872	Ice Road Maintenance

TABLE 5. Estimated Trucking Effort for Dredge Disposal

Loads per Hour per Truck	Hours per Day	Loads per Truck per Day	Total Days	Total Trucks Running per Day	Total Number of Round Trips
1.2	20.0	23.5	25.0	32.0	18,779

3.3 Ice Roads, and Ice Pads

Ice would be thickened to support excavators by drilling through the ice and pumping seawater onto the ice surface. Construction of the ice pad and road would begin prior to March 1. This technique would then allow a safe platform for excavation and hauling equipment, as well as efficient dredge operation. A 108-acre ice pad (400 ft. (122 m) wide x 11,680 ft. (3.6 km) long) would be created around the dredge area, 104 acres of ice roads (8.61 miles (13.9 km) long x 60 ft. (18 m) wide) would be created between the dredge and the disposal area, and 38.5 acres of transportation corridor would be created around the dredge disposal area (11,183 ft. (3.4 km) long x 150 ft. (46 m) wide).

There would be also be thickening of the ice at the barge bridge to provide a safe work platform. The footprint of this ice pad would be 1.5 acres and match the footprint of the

temporary bridge. Most of this area is ground fast ice. Ice thickening would begin in January and continue into February. No new areas would be thickened after March 1.

3.4 Impact Pile Driving

Impact pile driving would be required at West Dock to install four mooring dolphins, preferably during the ice-free season (summer). The four mooring dolphins would protect the current bridge from the barges and hold the ballasted barges in place (Figure 5). The mooring dolphins are 4-ft.-diameter (48 in.)(1.2 m), 110-ft.-long (34 m-long) piles that would be driven a minimum of 65 ft. (19.8 m) into the seabed. At the end of construction, piles would be cutoff below the sediment surface and removed.

Impact pile driving is scheduled for five days during the first half of August. The contingency time period for dolphin installation is March thru April, working off of ice the following year, if the originally scheduled summer time period becomes infeasible due to unexpected logistical or other constraints (see West Dock modification schedule, Table 7). It has not yet been determined what specific hammer would be utilized for this project. Assuming a 20-hour work day, actual pile driving would average 25% of a 20-hour period, or approximately 5 hours per day. Although the specific model of hammer is not yet known, an average strike per minute rate is 26, resulting in approximately 1,560 strikes per hour. Specific details of sound sources and propagation of sound are discussed in greater detail below.

While NMFS's acoustic criteria (NMFS 2016b) does not specifically cover polar bear, AGDC would implement a shutdown for polar bears within 500 m of the pile driving. AGDC's construction activities would be conducted in accordance with the current Incidental Take Regulations (ITRs) for polar bear, as noted in 50 CFR 18 Subpart J for August 5, 2016-2021 (81 FR 52276). AGDC intends to apply for the necessary Letters of Authorization (LOAs).

3.5 Vibratory Sheetpile Driving

The sheetpiles required to build out the new bulkhead interfacing the temporary bridge with the causeway would be installed using a vibratory pile driver (Figure 5). It has not yet been determined what specific hammer would be utilized for this project. Vibratory work would be scheduled from early June through August 24 (year 1); however, if work is not completed during this time due to logistical or other constraints, vibratory hammering would be completed during the contingency period(s) of September 16 – October 31 of year 1 and / or May 1 thru June 30 of year two (See West Dock Modification schedule, below, in Section 2.3). No pile driving would occur during the Nuiqsut whaling period of August 25 - September 15.

Vibratory hammering would occur over a period of approximately 60 days, assuming crews work consecutive 12-hour shifts each day with hammering occurring 40% of the time. This would result in approximately 576 hours of vibratory operation during the 60-day period. A summary of sheet piles to be installed is provided in Table 6.

The proposed bulkhead face would be constructed from a series of Arcs that are tied together with Wye piling and further supported by Tail Walls. The Endwalls are sheet pile Arcs at the end of each individual Wall (2 each for the North Wall and 2 each for the South Wall). The Endwalls and sheetpile Arcs are both generally on the sea-ward face of the bulkheads. The Tailwalls form the tie-backs that provide additional support for the sea-ward sheet piling and are connected to the Arcs at the Wye piling. The Tailwalls would typically be driven into fill and would be landward of the bulkhead face. It is usual industry practice to install the face piling and Tailwall piling at the same time; however, the Tailwall piling would generally be installed into fill and would not be driven in the water. The fill material, more so than the face piling, would attenuate the propagation of the sound of the Tailwall sheet pile driving.

The existing bulkhead would interfere with the installation of the Tailwalls and tying in the new bulkhead to the old bulkhead, so removal of 60 ft. (18 m) of existing sheetpile would be necessary. This work would be performed concurrently with the installation of the new bulkhead and would be limited to removing only those piles that are in conflict with the new bulkhead and Tailwalls. The anticipated gap would be 5 ft. (1.5 m) at each point of interference, and the sloughing of the existing fill should be minimal since the majority of the fill behind the existing bulkhead would be frozen. This work would occur in late April in Prudhoe. Preliminary designs indicate that there are up to 6 points of interference between the existing bulkhead and the proposed new bulkhead and Tailwalls. Assuming that the existing sheet pilings are not damaged, it should take less than 1 hour per point of interference to extract the piling, for a total of 6 hours of hammer operation.

TABLE 6. Location, Type, Quantity and Length of Sheetpile to be Installed

Description	Total Quantity	Linear Ft of Installation (Horizontal Ft)
South Barge Bridge Abutment		
Sheetpile Arc - PS27.5 Type x 55' Long x 21 each	21	34
Sheetpile Arc - PS27.5 Type x 55' Long x 19 each	266	436
Sheetpile - PS27.5 Type x 55' Long Tailwall x 8 each	144	236
Sheetpile - PS27.5 Type x 45' Long Tailwall x 13 each	234	384
Sheetpile - PS27.5 Type x 40' Long Tailwall x 8 each	144	236
Sheetpile Arc Endwall - PS27.5 Type x 55' Long - End Wall 15	93	153
Sheetpile Arc Endwall - PS27.5 Type x 55' Long - End Wall 3	49	80
Anchor Pile HP 14 x 89 x 40' Long	18	21
1/2 Section Sheetpile at Anchor Pile x 40' Long	18	15
North Barge Bridge Abutment		
Sheetpile Arc - PS27.5 Type x 55' Long x 19 each	247	405
Sheetpile - PS27.5 Type x 55' Long Tailwall x 8 each	120	197
Sheetpile - PS27.5 Type x 45' Long Tailwall x 13 each	195	320
Sheetpile - PS27.5 Type x 40' Long Tailwall x 8 each	120	197
Sheetpile Arc Endwall - PS27.5 Type x 55' Long - End Wall 15	93	153
Sheetpile Arc Endwall - PS27.5 Type x 55' Long - End Wall 3	49	80
Anchor Pile HP 14 x 89 x 40' Long	13	15
1/2 Section Sheetpile at Anchor Pile x 40' Long	13	11
TOTALS (Installed)	1,837	2,973 ft. (906 m)

3.6 Screeding, and Gravel Placement

Screeding consists of a shallow-draft vessel slowly towing a beam across the ocean floor to level the area. Screeding would occur in the dredge area and at the 1.5 acre area of the temporary barge bridge. The temporary barge bridge area would be screeded twice, first in winter when the area is cut or ground free of ice and before the gravel fill is placed, and second, just prior to placing the barges in summer. The areas would be leveled and any high spots would be smoothed, to create an area for the barges to be safely ballasted.

Screeding at DH3 would take 7 days or less. Screeding at the barge bridge would take 14 days or less, for each instance.

Up to 25,000 cubic yards (19,114 cubic meters) of gravel would be placed in up to 1.5 acres of tidal waters, matching the footprint of the barge bridge, to create a level pad for the barge bridge. This would occur in the spring, using equipment working from an ice pad. The gravel would be imported from a North Slope material source, such as Put-23.

3.7 Barge Bridge

The first two barges to offload modules would be used to span the 650-ft. (198 m) causeway breach. These barges would be used to form the temporary bridge, paralleling the existing weight-limited bridge spanning the breach. The barge bridge would be able to withstand the weight of modules being transported to the GCF construction location.

One at a time, barges would be positioned in the proper place using shallow-draft tugs. The first barge would be positioned flush against two of the mooring dolphins and secured to those dolphins. Barges would take on seawater into ballasting tanks within the hull and would come to rest on the gravel at the seafloor. The second barge would then move into place and follow the same procedures. The barges, already secured to dolphins, would be secured to each other and to the bulkheads with reinforced ramps and tie-offs. Once offload of all modules is completed, ramps would be removed and de-ballasting would occur by pumping water out of ballast tanks. Barges would again float, would be detached from mooring dolphins and would be towed away.

The two ballasted barges would be placed bow-to-bow when resting on the seafloor. The barge rakes would angle upward and touch at their adjoining point, leaving a 52.5 ft. (16 m) gap at the sea-floor between the barges. The stern of each barge would angle sharply upward at each end of the bridge, leaving an additional 10 ft. (3 m) gap at the seafloor at each end. The height of the deck would be at 14 ft. (4 m) elevation when ballasted to the sea floor. The barges would have a 20 ft. (6 m) side shell, and when ballasted to -6 ft. (1.8 m), the deck would be at 14 ft. (4 m) above MLLW. When empty, barges are assumed to draw 2 ft. (0.6 m) depth of water.

Construction of the temporary barge bridge is expected to take 3 days. The temporary bridge would be in place for as little as 21 days and as many as 39 days, depending on weather conditions and logistics.

3.8 Vessel Transit

There would be vessel transit and noise in the action area, from the marshalling area to West Dock. The 23 barges would stage at the marshalling yard, and three barges at a time would rotate in to offload at DH3. The barge marshalling area is located 3 to 5 miles (4.8 to 8 km) offshore of West Dock (Figure 3). Offloading is scheduled to occur between August 1 and September 15. In order to offload, the barges would be ballasted so that they settle on the substrate to create a stable platform for offloading. Once unloaded, the barges would make their way out of the action area, using established shipping lanes. Further information on the Marine Transit Plan is located in Appendix F, of the SEIS.

3.9 Timing

A schedule of West Dock construction activities is shown in Table 7. The activities described include equipment mobilization, ice road and pad construction and maintenance, bulkhead construction (pile driving, back filling, erosion protection, etc.), mooring dolphin installation, ice cutting, gravel placement and screeding, dredging, hauling, and disposal of dredge material.

TABLE 7. Schedule of West Dock Construction Activities

Year	Year 1												Year 2											
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Barge Bridge Bulkheads																								
Order Long Lead Materials; by July 1 – previous year																								
NTP/Permits in Place; by January 1	x																							
Contractor Mobilized		x																						
Ice Roads & Pads																								
Initial Ice Roads & Pad Construction	x	x	x	x									x	x	x	x								
Maintain Ice Roads				x	x	x	x	x							x	x	x	x	x					
Barge Bridge Bulkheads																								
Haul 30,000 cy to South Side - 2 weeks duration					x																			
Haul 30,000 cy to South Side - 2 weeks duration						x																		
Thaw & Remove Existing sheet pile							x																	
Prepare Initial Site for Pile Driving								x																
Thermally Modify Existing Ground (if needed)								x	x	x	x													
Drive South Side Face and Tailwall Sheet Pile (vibratory)								x	x															
Move to North Side																								
Drive North Side Face and Tailwall Sheet Pile (vibratory)																								
Complete Backfill of Sheet Pile - 2 weeks duration																								
Install Erosion Protection																								
Mooring Dolphins																								
Mobilize Construction Barge by August 1																								
Install Mooring Dolphins (impact); August 1 – August 15																								
Breach Sea Bottom Leveling																								
Thicken Ice																								
Cut Ice & Remove																								
Excavate to smooth the Sea Bottom																								
Haul, & Place 25,000 cy of Gravel to Fill low Areas																								
Screeding of Breach Area																								
Navigation Channel																								
Ice Roads & Pads																								
Initial Ice Roads & Pad Construction																								
Maintain Ice Roads																								
Cut Ice & Remove																								
Dredge Load, and Haul 250,000 cy to Disposal																								
Start Up = 7 days																								
Crew 1; Excavate at 250 cy/hr & 20 Hr per day = 25 days																								
Crew 2; Excavate at 250 cy/hr & 20 Hr per day = 25 days																								
Additional Work to Complete = 7 Days																								
Screed DHS in Channel																								

4.0 Species Description and Habitats:

The species and critical habitats discussed in this BA are those identified as a result of a USACE-initiated consultation with USFWS and NMFS on the ASAP FEIS (USACE 2012) and in re-initiation consultations during the SEIS process (2014 to present). On August 1, 2014, the USACE forwarded letters from AGDC (the designated non-federal representative) to USFWS and NMFS that described the ASAP Project, including the revised action area not analyzed in the 2012 FEIS, and requested a list of threatened and endangered species and critical habitat that may be present. The species list indicate that the following species are present or within range of proposed project area and support components: the Alaska-breeding Steller's eiders (*Polysticta stelleri*), spectacled eiders (*Somateria fischeri*), polar bears (*Ursus maritimus*) and polar bear critical habitat.

In 2011, the USFWS found that the Pacific walrus (*Odobenus rosmarus divergens*) was warranted for listing but precluded by higher priority actions, and added it to the candidate species list. On October 4, 2017, the USFWS determined that the Pacific walrus does not warrant listing as threatened or endangered under ESA. The species continues to be protected under the Marine Mammal Protection Act (MMPA). Due to considerations of MMPA and the potential for the species to occur within the project area, though infrequently, it has been included for limited discussion and analysis in this BA.

In the 2012 LOC, NMFS stated that fin whales, humpback whales, and Steller's sea lions may be present in or adjacent to the action area around the Port of Seward. The activities the Port of Seward have not changed since the FEIS evaluation, however the Corps has removed the Port of Seward from the action area as there are no activities proposed at that location which require federal authorization. The information that was presented in the version of the BA (AGDC 2011) attached to the 2012 FEIS (USACE 2012) has been moved to the section on activities outside of the Corps Federal authority. Updates have been made, where relevant, to ensure status and critical habitat information is current.

Due to ongoing changes and additions to project features and construction techniques, the application was withdrawn in 2014. AGDC submitted a revised application to the Corps in January, 2016. Requests to reinstate consultation were provided by the Corps to USFWS on February 16, 2017 and to NMFS on September 6, 2017.

Descriptions of these species and critical habitats are provided, below, organized by agency, then ESA status.

4.1 NMFS Managed ESA Species in the Action Area

4.1.1 Bowhead Whale (Endangered)

Biological Populations and Listing Status

Four stocks of bowhead whales are recognized worldwide (International Whaling Commission (IWC) 2010): the Western Arctic, Sea of Okhotsk, Spitsbergen, and the recently combined western Greenland/eastern Canada stocks or populations. The Western Arctic stock of bowhead whales is the only stock found within U.S. waters. The bowhead whale is federally designated as endangered. The species was listed as an endangered species on 2 June 1970 (FR35:8495). It is also an Alaska Species of Special Concern. The stock is classified as a strategic stock because the bowhead whale is listed as "endangered" under the ESA and is therefore also designated as "depleted" under the MMPA (Muto et al. 2016).

Populations Status, Trends, and Abundance

Small stocks occur in the Sea of Okhotsk and the offshore waters of Spitsbergen. These are composed of only tens to hundreds of individuals (Shelden and Rugh 1995; Zeh et al. 1993). Until recently, available evidence indicated that only a few hundred bowheads were in the Hudson Bay and Davis Strait stocks, but it now appears these should be considered one stock based on genetics (Postma et al. 2006), aerial surveys (Cosens et

al. 2006), and tagging data (Dueck et al. 2006; Heide-Jørgensen et al. 2006), and the abundance may be over a thousand (Heide-Jørgensen et al. 2007).

In the late 19th and early 20th century, the Western Arctic stock of bowhead whales was overwhelmed by highly successful commercial whaling. The number of bowhead whales plummeted from an estimated population, in 1848, of 10,400–23,000 whales to a rough count of 1,000–3,000 individuals in the mid-20th century (Woodby and Botkin 1993). Commercial whaling of bowheads was outlawed in 1996 by a moratorium from the IWC, although specific exemptions for certain countries exist and limited modern subsistence whaling continues with oversight and quotas regulated by the IWC.

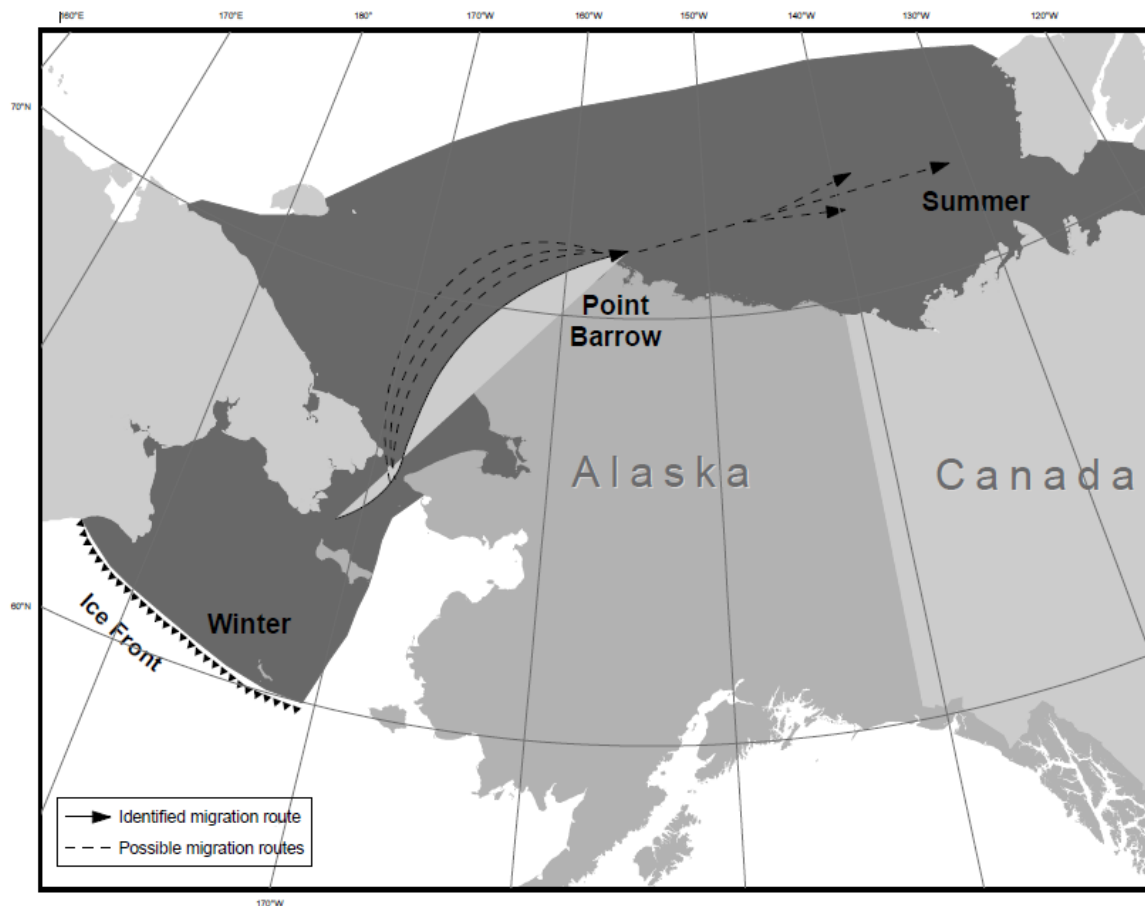
The 1993 population of Western Arctic stock of bowheads was estimated at 8,200 (Zeh et al. 1995). Calf counts in 2001 were the highest on record, 121 individuals, confirming a growing population (George et al. 2004). Studies and surveys indicated the bowhead whale population slowly increased at an annual rate of 3.4 percent between 1978 and 2001 (George et al. 2004). Some prior reports have suggested Western Arctic stock bowhead whales were approaching the carrying capacity of their habitat (Brandon and Wade 2004).

Givens et al. (2013) reported that the Western Arctic stock bowhead whales increased at a rate of 3.7 percent (95 percent CI = 2.8-4.7%) from 1978 to 2011, during which time abundance tripled from approximately 5,000 to approximately 16,000 whales (Givens et al. 2013). The current minimum population estimate (NMIN) for the Western Arctic stock of bowhead whales is 16,091 (Muto et al. 2016). Prior accounts estimated 10,545 Western Arctic stock bowhead (USACE 2012; Angliss and Outlaw 2008).

Range

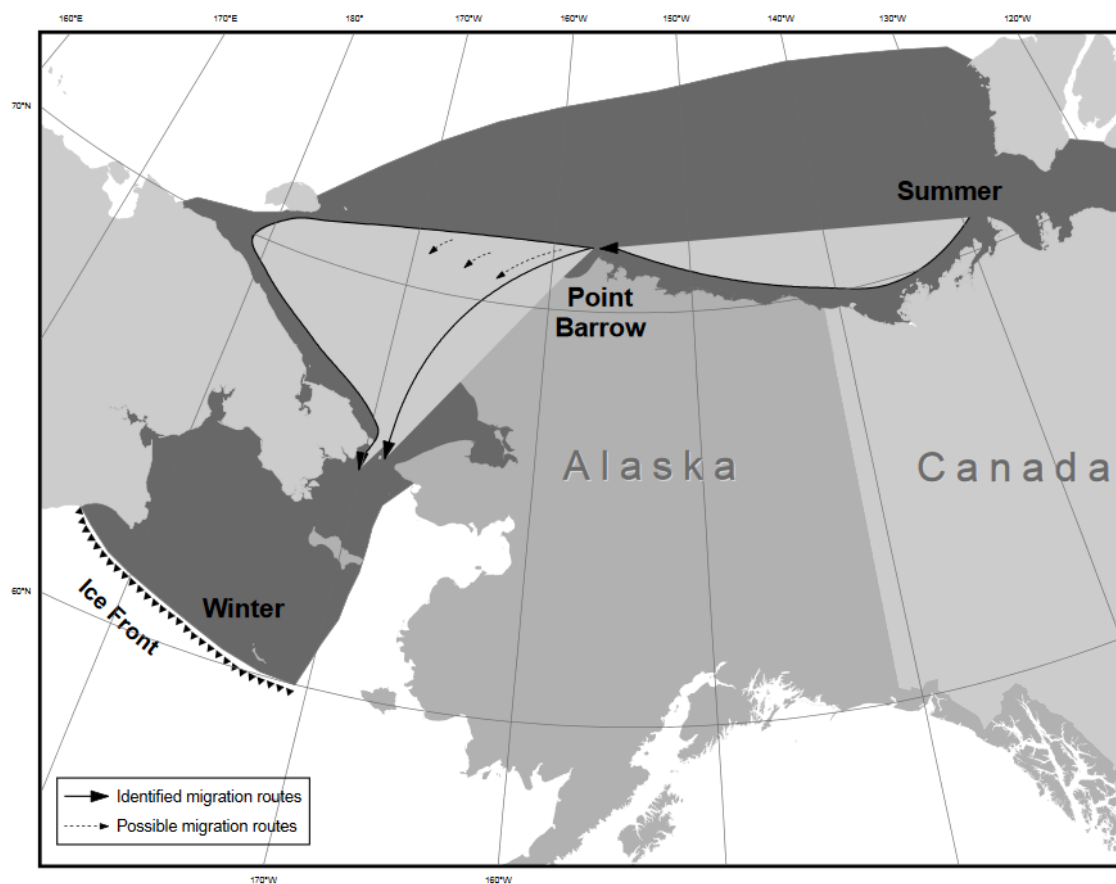
Bowhead whales are distributed seasonally in ice-covered waters of the Arctic and near-Arctic, generally between 60 degrees and 75 degrees North latitude in the Western Arctic Basin (Moore and Reeves 1993, Muto et al. 2016). As depicted in Figures 8 and 9, the majority of bowhead whales overwinter in the central and northwestern Bering Sea (November to March), migrate through the Chukchi Sea in the spring (March through June) following offshore ice leads around the coast of Alaska in continental shelf waters, and spend summers in the Canadian Beaufort Sea (mid-May through September) (Braham et al. 1980; Moore and Reeves 1993; Muto et al., 2016; Figures 8 and 9).

FIGURE 8. Spring Migration of Western Arctic Stock of Bowhead Whales



Source: NOAA NMFS Alaska Marine Mammal Stock Assessments (Muto et al. 2016). Dark areas depict the approximate distribution of the western Arctic stock of bowhead whales. The spring migration represented here by lines and arrows follows a route from the Bering Sea wintering area to the Beaufort Sea summering area, mostly along a coastal tangent that constricts somewhat as it goes east, past Point Barrow shelf waters, and spend summers in the Canadian Beaufort Sea (mid-May through September) (Braham et. al. 1980; Moore and Reeves, 1993; Muto et.al., 2016).

FIGURE 9. Fall Migration of Western Arctic Stock of Bowhead Whales



Source: NOAA NMFS Alaska Marine Mammal Stock Assessments (Muto et al. 2016). Dark areas depict the approximate distribution of the western Arctic stock of bowhead whales. The fall migration is represented here by lines and arrows showing generalized routes used to travel from the Beaufort Sea (summering area) to the Bering Sea (wintering area) (Braham et. al. 1980; Moore and Reeves, 1993; Muto et.al., 2016).

Life History and Habitat Use

Most bowheads of the Western Arctic population overwinter in the central and western Bering Sea, where they are associated with polynyas and the marginal ice zone. The amount of feeding that takes place in the Bering Sea is unknown (Richardson and Thomson 2002), however most mating is thought to occur there (MMS and NMFS 2008). The whales congregate in polynyas before migrating in the spring (Moore and Reeves 1993), passing through the Bering Strait and into the Chukchi Sea from late March to mid-June. Migration through the eastern Chukchi Sea takes place largely in open leads, some or most calving occurs at this time in the Chukchi Sea. Spring whaling takes place at this time by residents of Point Hope, Point Lay, Wainwright, and Barrow. Bowheads have been observed to pass Barrow, entering into the Beaufort Sea from early April to late May (IWC 2004). Migration through the Beaufort Sea occurs through lead systems offshore of the barrier islands. The whales arrive on their summering grounds near Banks Island in Canada from Mid-May through June (IWC 2005). Bowheads move back out of the

Canadian Beaufort and into the Alaska Beaufort Sea in August and September, with migration in the Central Beaufort and Prudhoe Bay area continuing from late August through late October (Moore and Reeves 1993).

Bowheads frequently interrupt their migration to feed (Ljungblad et al. 1986; Lowry 1993; Lowry et al. 2004) and their stops vary in duration from a few hours to a few weeks (MMS 2002). A commonly used feeding area is in and near Smith Bay, east of Barrow. Less consistently used feeding areas are in coastal and shelf waters near and east of Kaktovik. In 2007 and 2008, bowhead whales also used areas near Camden Bay to feed during their migration (Ireland et al. 2008, Funk et al. 2008). More research is being funded by the former MMS (now the Bureau of Ocean Energy Management (BOEM)) including the Bowhead Whale Feeding Ecology Study to determine the extent to which bowheads might feed in the western Beaufort Sea.

During the fall migration (September – November) bowhead whales typically travel in continental shelf waters that are less than 164 ft. (50 m) deep on their way back to the Bering Sea. Ice cover influences the timing, duration, and path that the whales follow (Treacy 2002). In heavy ice conditions, bowhead whales divert north and migrate in deeper water further off-shore (Moore et al. 2000).

Fall whaling for Kaktovik and Nuiqsut residents occurs from late August to mid-September. Traditional Knowledge gathered from local Iñupiat residents suggests that migration pods are segregated by sex and age (Braham et al. 1980). Bowhead whales typically reach the Barrow area in mid-September to late October during their westward migration from the feeding grounds in the Canadian Beaufort. Fall bowhead whaling near Barrow normally begins in mid-September, but may begin as early as August if whales are present and ice conditions are favorable (BLM 2005). Whaling near Barrow may continue into October, depending on the quota and conditions.

Fall surveys of bowhead whales in the Beaufort Sea have been conducted annually by MMS since 1979 (Ljungblad et al. 1986, 1987; Moore et al. 1989; Treacy 2002; Clarke et al. 2014, Clarke et al. 2017). Results of those surveys show that bowhead whales tend to migrate to deeper water (farther offshore) in the fall during years with higher-than-average ice coverage (Moore et al. 2000). Most bowhead whales migrate west in water ranging from 50 to 650 ft. (15 to 198 m) deep (Miller and Davis 2002), though some individuals enter shallower water, particularly in light ice years. Ice cover influences the timing, duration, and path that the whales follow (Treacy 2002).

Bowhead whales feed primarily on copepods and euphausiids (Lowry 1993; Lowry and Sheffield 2002). To satisfy energy requirements, bowheads may need to find areas with above-average concentrations of zooplankton (Lowry 1993).

Bowhead whales are long-lived, slow-growing, late-maturing, and reproduce infrequently (Koski et al. 1993). Females and males become sexually mature around 25 years of age (George et al. 2007). Bowhead whales mate and calve during spring migration (Nerini et al. 1984), and calving occurs every three to four years (Koski et al. 1993). Gestation lasts

between 12 and 16 months (Nerini et al. 1984). The majority of bowhead whale mating occurs in March and April (IWC 2004).

Critical Habitat

No critical habitat has been designated for the bowhead whale. The NMFS was petitioned by the Center for Biological Diversity and Marine Biodiversity Protection Center on February 22, 2000, to designate critical habitat for the Western Arctic bowhead stock. Petitioners asserted that the nearshore areas from the U.S.–Canada border to Barrow, Alaska should be considered critical habitat. Upon review, NMFS found the petition to have merit (FR 66:28141), but subsequently on August 30, 2002 (FR 67:55767), they announced the decision to not designate critical habitat for this population. In this decision, NMFS reported that they believed designation of critical habitat was not necessary because the population is known to be approaching its pre-commercial whaling population size, the population is increasing, there are no known habitat issues which are slowing the growth of the population, and activities that occur in the petitioned area are already managed to minimize impacts to the population.

Bowhead Whales in the Action Area

Most of the bowhead whale population migrates through the Beaufort Sea offshore of West Dock during spring and fall (late August through late October) migrations to and from the summer feeding grounds. The migrations have been monitored by BOEM and NMFS since 1982 (Treacy et al. 2006; Clarke et al. 2014, Clarke et. al. 2017) and industry (Blackwell et al. 2007; Ireland et al. 2009; Reiser et al. 2011; Bisson et al. 2013) over a number of years. A small number of bowhead whales have been seen or heard offshore near Prudhoe Bay in late August. (LGL and Greenridge 1996; Greene et al. 1999; Blackwell et al. 2008; Goeta et al. 2008). Figures 10 and 11 show bowhead whale sightings by the former MMS and the Marine Mammal Laboratory (Clarke et. al. 2014; Clarke et al, 2017) in the Beaufort Sea. However, these survey data indicate that the fall migration off northern Alaska occurs primarily over the continental shelf, mainly in waters 66–197 ft. (20-60 m) deep (Moore et al. 1989; Moore and Reeves 1993; Treacy 2002), e.g., generally 12–37 miles (19-60 km) offshore (Treacy 2002; Monnett and Treacy 2005; Treacy et al. 2006).

Monitoring surveys have been conducted annually at the Northstar offshore oil and gas facility since 2001; the survey area is just offshore of West Dock. Over 95 percent of the bowheads observed during these fall surveys occurred more than 13.9 miles (22 km) offshore in 2001, 14.2 miles (23 km) in 2002, 8.4 miles (13.5 km) in 2003, and 10.1 miles in 2004 (16 km) (Blackwell et al. 2007). West Dock extends out from the shoreline a total distance of 2.7 miles (4.3 km).

FIGURE 10. ASAMM bowhead whale sightings on transect, September-October, in years with light sea ice cover: 1982, 1986-87, 1989-90, 1993-2015, and 2016.

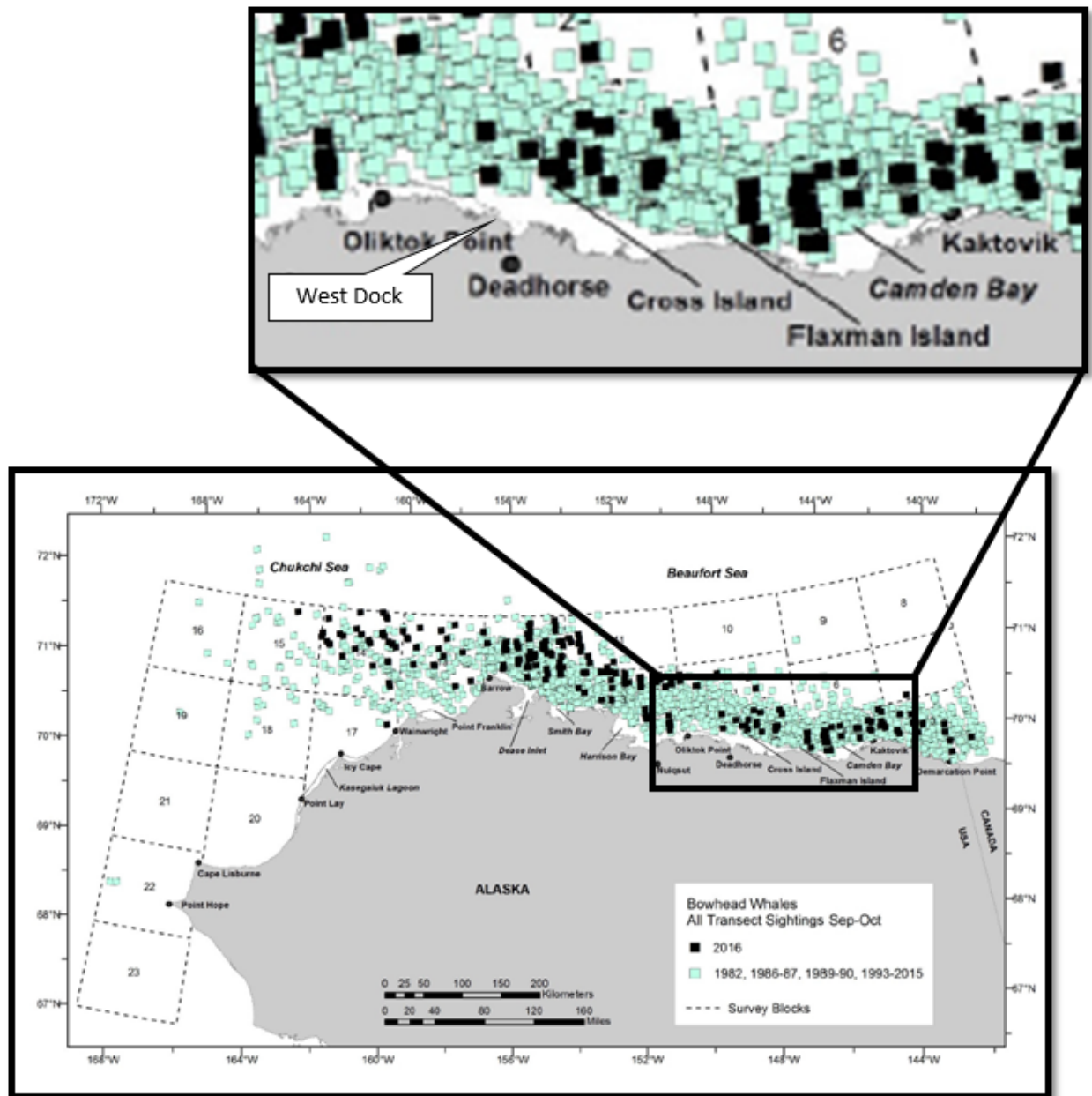


FIGURE 11. Bowhead Whale Sightings in the Beaufort Sea 1979-2012



AES-RTS: 14-087-004.mxd, 07/22/14

Threats

Known actions that have previously or are currently having an effect on bowhead whales within the action area include historic commercial whaling, subsistence hunting, oil and gas-related activity, non-oil and gas industrial development, research activities, marine vessel traffic and commercial fishing, pollution and contaminants baseline, and climate change. Other than historic commercial whaling, no data is available to signify that any previous or current human activity has had population-level negative effects on bowhead whales or the recovery of the species (MMS and NMFS 2008).

The following documents have more detailed information regarding threats to bowhead whales and are incorporated here by reference:

- Biological Opinion on Issuance of Annual Quotas Authorizing the Harvest of Bowhead Whales to the Alaska Eskimo Whaling Commission for the Period 2013 through 2018 (NMFS 2013a).
- Final Environmental Assessment for Issuing Subsistence Quotas to the Alaska Eskimo Whaling Commission for a Subsistence Hunt on Bowhead Whales for the Years 2008 through 2012 (NMFS, 2008a).
- Biological Opinion on Oil and Gas Leasing and Exploration Activities in the U.S. Beaufort and Chukchi Seas, Alaska, and Authorization of Small Takes under the MMPA (NMFS 2008).

Historical Commercial Whaling

Current information suggests that bowhead whales in the Chukchi and Beaufort Sea planning areas are resilient at least to the level of human-caused mortality and disturbance that has existed after the cessation of commercial whaling (MMS and NMFS 2008). Historic commercial whaling has had the greatest negative impact on bowhead whales of all past and present human industrial activities (NMFS 2008). Prior to the onset of commercial whaling activity in the late 1800s, it is estimated that the bowhead whale population was between 10,400 and 23,000 whales (Woodby and Botkin 1993). Near the end of commercial whaling, it is estimated that between 1,000 and 3,000 animals remained (Woodby and Botkin 1993). The Western Arctic population has increased in abundance significantly since the end of commercial whaling.

Subsistence Hunting

Alaska Native communities have harvested bowhead whales for subsistence and cultural purposes for over 2,000 years (Stoker and Krupnik 1993). Currently, 10 Alaskan villages participate in the bowhead whale hunt. There is no evidence that subsistence harvesting caused a significant negative impact on the Western Arctic population of bowhead whales prior to commercial whaling (MMS and NMFS 2008). However, as technological advances have been made, bowhead whales have become more accessible and easier to harvest, creating a possibility of over-harvest if unregulated (MMS and NMFS 2008). Since 1977, the IWC has implemented a quota system to regulate the harvest of this population. There is currently a co-management agreement between the Alaska Eskimo

Whaling Commission, and the NOAA. The IWC establishes strike limits for Russian and Alaskan communities. Over a period of five years 280 landings are currently allowed. Because the quota is dependent upon the population size of bowhead whales, it is unlikely that subsistence activities would cause a significant impact on the recovery of the Western Arctic population in the future.

Oil and Gas Activity

Offshore oil and gas activity, including seismic surveys, has occurred in the Chukchi and Beaufort Seas since the late 1960s (MMS and NMFS 2008). Two- and three-dimensional seismic programs have been conducted in both program areas. Twenty-three Geological and Geophysical permits were issued in the Beaufort Sea by the MMS in 1982 and 24 in 1983. There has been more seismic survey activity in the Beaufort Sea than in the Chukchi Sea. Between 1981 and 2002, 30 exploratory wells were drilled in the Beaufort Sea. Offshore oil and gas operations often require support operations that can also cause impacts to bowhead whales, such as ice-breaking, aircraft traffic, and vessel traffic. More information on the history of oil and gas activity between 1979 and 1999 in the Beaufort Sea can be found in MMS Study 2002-071, GIS Geospatial Data Base of Oil-Industry and Other Human Activity (1979-1999) in the Alaskan Beaufort Sea (MMS 2002). There is no indication that oil and gas activity in the Beaufort and Chukchi Seas have had any detectable long-term negative impacts on the health, status, or recovery of bowhead whale populations (MMS and NMFS 2008). The Western Arctic population has continued to increase over the period of time that oil and gas activities have been conducted offshore in the Alaskan Arctic.

The NMFS previously consulted with the MMS on the potential impacts of oil and gas leasing and exploration in the Beaufort and Chukchi Seas. NMFS issued seven Biological Opinions related to OCS lease sales. The Arctic Regional Biological Opinion was issued in 1988 on the potential effects of leasing and exploration activities in the Arctic Region and reinitiated in 1999. By 1999, oil and gas emphasis was placed on the Beaufort Sea. Therefore, the Biological Opinion issued in 1999 focused on the Beaufort Sea and presented newly available information on the potential effects of oil and gas-related noise on the bowhead whale. The Biological Opinion was revised in 2001 and concluded that oil and gas leasing and exploration in the Beaufort Sea was not likely to jeopardize the continued existence of bowhead whales.

With renewed industry interest in oil and gas exploration in the Chukchi Sea, the MMS reinitiated consultation with the NMFS in 2006 to include the Beaufort and Chukchi Seas. A revised opinion was issued in March 2006. After new information about the presence of humpback and fin whales in the Chukchi and Beaufort Seas, NMFS published a Biological Opinion of the potential impacts of oil and gas activities on those species along with the bowhead whale. They concluded that oil and gas activities in the Alaskan Beaufort and Chukchi seas may affect but are not likely to jeopardize the continued existence of Western Arctic bowhead whales (MMS and NMFS 2008).

Vessel and Aircraft Traffic

Vessel traffic, in general, can impact bowhead whales due to disturbances by noise and vessel strikes. There are few documented records of vessel strikes of bowhead whales. There is speculation that vessel strikes could become more common in the future as vessel traffic is projected to increase due to receding ice levels (MMS and NMFS 2008). Noise disturbances could result in temporary changes in behavior, such as deflection or avoidance, of individual whales from a highly localized area (MMS and NMFS 2008). Noises from vessels that could affect bowhead whales are generally associated with motors, seismic air-guns, sonar, and ice-breaking (MMS and NMFS 2008). All disturbance effects on bowhead whales from marine vessels are expected to be short duration. Low-flying aircraft could also produce noise that could temporarily disturb individual bowhead whales in a highly-localized area (MMS and NMFS 2008). Aircraft are generally flown at heights that do not cause harassment. Fuel spills from either vessels or aircraft would introduce contaminants into the environment which could potentially impact bowhead whales if ingested, inhaled, or if physical contact occurred.

Commercial Fishing

Commercial fishing activities could impact whales via incidental take, entanglement in fishing gear, behavioral changes due to disturbances by associated activities, and vessel strikes. The association of bowhead whales with habitat associated with sea ice limits its exposure to commercial fishing activities (MMS and NMFS 2008). If commercial activity increases in the arctic and subarctic environments due to a reduction in sea ice, disturbances of bowhead whales by commercial fishing activities would increase. There have been no reports by marine mammal observers on commercial fishing vessels of bowhead whale mortalities due to commercial fish operations (Angliss and Lodge 2002). There have been few documented incidents of bowhead whales interacting with commercial crab pot gear, but, according to preliminary results of the examination of harvest records, there are slightly more incidents associated with ropes (Angliss and Outlaw 2008). The minimum average annual mortality and serious injury rate in U.S. commercial fisheries in 2009-2013 is 0.2 whales; however, the actual rate is currently unknown (Muto et al. 2016).

Climate Change

The current trend of warming in the arctic environment is attributed to the changes in sea ice extent, thickness, distribution, age, and melt duration (MMS and NMFS 2008). Sea ice extent is becoming less in both the summer and winter, although the reduction is more pronounced in the summer (Intergovernmental Panel on Climate Change (IPCC) 2001). Ice thickness is also decreasing, while the melt duration is increasing. It is uncertain whether non-ice-obligate arctic species, such as baleen whales, would be adversely influenced by diminishing sea ice (MMS and NMFS 2008). Moreover, the reduction in sea ice extent could beneficially increase the availability of prey for the Bering-Chukchi-Beaufort Sea Stock of bowhead whales (Moore and Laidre 2006). The reduction of sea ice over the past 20 years could be related to the recovery trend of bowhead whales

(Walsh 2008), and the trend is expected to continue as the ice extent retreats further (Sheldon et al. 2003). Bowhead whales may alter routes used for migration and change feeding areas as the ice extent changes due to climate change (Moore and Huntington 2008).

4.1.2 Ringed Seal (Threatened)

Biological Populations and Listing Status

The range of the ringed seal is circumpolar with five subspecies being recognized: the Arctic ringed seal (*Phoca hispida hispida*), the Baltic ringed seal (*Phoca hispida botnica*), the Okhotsk ringed seal (*Phoca hispida ochotensis*), the Ladoga ringed seal (*Phoca hispida ladogensis*), and the Saimaa ringed seal (*Phoca hispida saimensis*). On 10 December 2010, NMFS published a proposed rule to list the Arctic, Okhotsk, Baltic, and Ladoga subspecies as threatened and the Saimaa subspecies as endangered under the ESA (75 FR 77476). A final listing of threatened under the ESA for the four subspecies of ringed seals was issued 28 December 2012 (77 FR 76705). The 9th Circuit Court of Appeals upheld the listing of the Arctic ringed seal as threatened under the ESA, on February 12, 2018. The only subspecies occurring in the action area, and addressed in this BA, is the Arctic subspecies. A detailed comprehensive description of the distribution, life history, and abundance of ringed seals is included in the status review of the ringed seal recently published by NMFS (NMFS 2010).

Populations Status, Trends, and Abundance

The most recent stock assessment reports indicate that reliable abundance estimates of the Arctic ringed seal population in Alaska are not available (Muto et al, 2016), but NMFS suggested that the population numbers are in the millions (FR 75:77492). Bengston et al. (2005) conducted ringed seal surveys in the Chukchi Sea in 1999 and 2000 and found densities higher at nearshore locations. They estimated the Chukchi population at 252,488 animals in 1999 and 208,857 in 2000. Frost et al. (2002) conducted surveys in the Beaufort Sea and estimated the density of ringed seals was 2.65 seals per square mile. For the purposes of ESA listing, NMFS used previous surveys (Bengston et al. 2005; Frost et al. 2004) Kelly et al. (2010) estimated that there are at least 300,000 Arctic ringed seals in the Chukchi and Beaufort Seas (Muto et al, 2016). Kelly et al (2010) considered this number to be a very conservative estimate the surveys were only conducted within 40 km of shore in the Beaufort Sea. Considering that these surveys were restricted to U.S. and Canadian waters, and did not include large areas of pack ice, Kelly et al. (2010) provided a reasonable estimate for the total population of Arctic ringed seals in the Chukchi and Beaufort Seas of 1,000,000 seals.

Reliable data on population abundance trends for the Arctic stock of ringed seals do not presently exist. Frost et al. (2002) reported that trend analyses based on comparisons of observed seal densities in the central Beaufort Sea suggested a marginally significant but substantial decline of 31 percent from 1980–1987 to 1996–1999; however, Muto et al. (2016) concluded that the apparent decline between the 1980s and the 1990s may have been due to a difference in the timing of surveys rather than an actual decline.

Range

In Alaska, the range of the ringed seal encompasses the Beaufort, Chukchi, and Bering seas and can reach as far south as Bristol Bay in Alaska in years with extensive ice coverage. Throughout their range, ringed seals exhibit an affinity for ice-covered waters.

Life History and Habitat Use

Ringed seals excavate subnivean lairs in the snow above some of the holes, in which they have their pups between March and April. The lair protects the pup against hypothermia and predation by Arctic foxes and polar bears (Smith et al. 1991). Once the pup is born, it is nursed there for five to eight weeks during which time the pup stays in the lair. There is a positive relationship between lack of maternal experience and increased predation by polar bear, which could account for poor reproductive success of less experienced females (Eley 1994). The primary food sources for ringed seals are arctic cod, saffron cod, shrimp, amphipods, and euphausiids (Reeves et al. 1992).

Ringed seals tend to prefer large ice floes (i.e., greater than 147 ft. (45 m) in diameter) and are often found in the interior ice pack where the sea ice coverage is greater than 90 percent (Simpkins et al. 2003). They remain in contact with ice most of the year and pup on the ice in late winter to early spring. During late April through June, ringed seals are distributed throughout their range from the southern ice edge northward (Burns and Harbo 1972; Burns et al. 1981; Braham et al. 1984). Ringed seals overwinter on pack and shorefast ice (Bengston et al. 2005). They create breathing holes in the newly formed ice and maintain them throughout the year by scraping the sides using the nails on their foreflippers (Smith and Hamill 1981).

The density of ringed seals is dependent upon the availability of food, ice conditions, and water depth. Frost et al. (2004) conducted aerial surveys over the Beaufort Sea coast between Barrow and Kaktovik to assess what variables such as water depth, distance from fast ice, and ice quality have on distribution. They determined that ringed seal density was greatest in intermediate water depths of 16 - 115 ft. (5-35 m) and in areas of smooth ice nearest to the edge of fast ice. Ringed seal densities were estimated from similar surveys flown in 1996–1999 in the Alaska Beaufort Sea from Barrow to Kaktovik. Observed seal densities in that region ranged from 0.81 to 1.17 per square kilometer (km^2) (Frost et al. 2002, 2004). Results of surveys conducted by Frost and Lowry (1999) indicate that, in the Alaskan Beaufort Sea, the density of ringed seals in May-June is higher to the east than to the west of Flaxman Island. These surveys are conducted in the spring when seals are visible on ice, less is known of their distribution during summer months.

Ringed Seals in the Action Area

BPXA conducted spring seal surveys near the Northstar Unit located approximately 6 miles (9.7 km) from West Dock offshore of Prudhoe Bay to determine baseline conditions prior to the construction of the Satellite Drilling Island. Ringed seal densities close to the Northstar site ranged from 0.39 to 0.63 seals per km^2 (Moulton et al. 2002.) These numbers did not indicate a decline in densities during 1997 to 1999 (Moulton et al. 2003).

Ringed seals are associated with sea ice and typically remain with the ice throughout the year (Angliss and Allen 2009; Bengston et al. 2005), although in the summer, ringed seals are commonly seen alone or in small groups in open water (Harwood and Stirling 1992). Large concentrations of ringed seals are not expected near West Dock during activities associated with the proposed Project; only minimal occurrence of ringed seals has occurred in or near the action area historically (Figure 12) due to the normal industrial activity present at West Dock and the fact that they do not travel in large groups. They are, however, the most frequently-encountered seal species in the Prudhoe Bay region (Simpkins et al. 2003).

Threats

Pollution and Contaminants

Contaminants accumulate in the Arctic and can adversely affect marine mammals. Contaminant loads have been studied in ringed seals, because they are the main prey for polar bears and they are an important subsistence species for Alaskan Natives (Dietz et al. 1995; Zhu et al. 1995; Kovacs et al. 1996; Muir et al. 1999; Fisk et al. 2001; Fisk et al. 2005; Dietz 2008). Contaminant loads of pollutants such as organochlorine compounds and heavy metals in ringed seals that live in the Alaskan Arctic are lower than those found in ringed seals in Europe (Borga et al. 2005). High levels of mercury have been found in the liver and muscles of ringed seals in the Canadian Arctic, although no toxic effect of the metal was observed (Smith and Armstrong 1978). Mercury concentration becomes higher as seals age (Dehn et al. 2005). Persistent organic pollutants (POP) levels measured in ringed seals taken from Barrow were similar to those found in the Canadian Arctic and lower than those in Svalbard and the Kara Sea in the Russian Arctic (Nakata et al. 1998; Kucklick et al. 2002). Levels of perfluorononanoic acid and perfluorooctane sulfonate were higher in ringed seals from the Bering and Chukchi Seas than in Canada and Greenland (Quakenbush and Citta 2008). Section 4.2.5.1 in The Status Review of the Ringed Seal (*Phoca hispida*) contains more detailed information on contaminants in ringed seals and is incorporated in this document by reference (NMFS 2010).

Subsistence Hunting

Ringed seals are an important subsistence resource for Native Alaskans living in communities along the Beaufort Sea coast. Harvest levels decreased during the 1970s from 7,000-15,000 to 2,000-3,000 by 1979 (Frost 1985). In 2000, ADF&G estimated that 9,500 ringed seals were being harvested per year, but there is no current estimate of the number of seals being harvested (Allen and Angliss 2011).

Oil and Gas Activities

Offshore oil and gas exploration, development, and production activities, have occurred in the Chukchi and Beaufort Seas since the late 1960s (MMS and NMFS 2008). Oil and gas activities may include artificial island construction, drilling operations, pipeline construction and operation, seismic surveys, and vessel and aircraft support operations. Among these activities, the effects of noise, physical disturbance and potential oil spills

have the greatest potential to affect ringed seals. (75 FR 77487). However, long term research and monitoring results on ice seals, including ringed seals, in the Alaskan Arctic have shown no evidence of more than limited and transitory effects, resulting in no detectable injury to individual seals and seal lairs, and no more than a negligible impact on the affected Arctic subpopulation. As a result, NMFS has determined that oil and gas activities are not a foreseeable threat, individually or cumulatively, to the conservation status of the Arctic ringed seal. (75 FR 77489).

Climate Change

The proposed listing of ringed seals as a threatened species is primarily premised upon the potential adverse effects of modification of their sea ice habitat resulting from a warming climate projected out through the end of the century (NMFS 2010). Although the Arctic ringed seal remains abundant and there have been no detected effects of climate change on ringed seals to date, NMFS has inferred that future ice and snow conditions threaten this subspecies with becoming endangered by 2100. The effects of climate change may be ameliorated if the Arctic ringed seal retracts northward with sea ice habitats; however, NMFS has projected that snow depths would be insufficient for lair formation and maintenance throughout most of the subspecies' range by the end of the century (75 FR 77490). The timing for the onset of potential impacts from climate change on the Arctic ringed seal is uncertain.

4.1.3 Bearded Seal (Threatened)

Biological Populations and Listing Status

The bearded seal is a circumpolar, ice-associated seal. There are two widely recognized subspecies of bearded seals, one (*Erignathus barbatus barbatus*) inhabiting the Atlantic sector of the species range, and the other (*Erignathus barbatus nauticus*) occupying the Pacific sector (Rice 1998). There is not a discrete geographical gap between the distributions of the two subspecies, but the general determination is that the Pacific sector subspecies is found to the west of longitude 112 degrees in the Canadian archipelago (NMFS 2010), and the only subspecies found in Alaska.

NMFS conducted a status review of the bearded seal, in which the Biological Review Team further delineated the subspecies found in the Pacific sector into an Okhotsk DPS and a Beringia DPS. The Okhotsk DPS is found in the Sea of Okhotsk. The Beringia DPS is found in the Bering, Chukchi, and Beaufort Seas, and is therefore, the DPS described below. NMFS subsequently promulgated a proposed rule to list the Beringia DPS and the Okhotsk DPS of bearded seals as threatened throughout their ranges under the ESA on 10 December 2010 (75 FR 77496). Listing of the Beringia DPS or the Okhotsk DPS of bearded seals was issued on 12 December 2012 (77 FR 76739). NMFS has not proposed to designate critical habitat for either the Beringia DPS or the Okhotsk DPS of bearded seals, because it is not currently determinable. A detailed comprehensive description of the distribution, life history, and abundance of bearded seals is included in the status review of the bearded seal recently published by NMFS (2010).

FIGURE 12. Ringed and Bearded Seal Sightings in the Beaufort Sea 1979-2012



Populations Status, Trends, and Abundance

While no accurate estimates of the entire stock of bearded seals exist, various authors have suggested populations of 500,000 to 1,000,000 (Bychkov 1971; Burns et al. 1981; Stirling and Archibald 1979; NMFS 2010); perhaps 450,000 of these are *Erignathus barbatus nauticus* in the Pacific sector. Early estimates of the Beringia DPS in Alaska range from 250,000 to 300,000 (Popov, 1976; Burns J. 1981). There are no reliable estimates of the bearded seal population in the Beaufort and Chukchi Seas (Muto et al, 2016). At the time that the Beringia DPS of the bearded seal was listed as threatened, NMFS estimated that the stock numbered 150,000 individuals (77 FR 76740). Estimates based on a sampling of data from a survey in the U.S. portion of the Bering Sea indicated that 273,676 bearded seals occur in that area (Muto et al, 2016).

Range

Bearded seals, the largest of the ice seals, are associated with sea ice (Burns et al. 1981; Smith 1981; Kelly 1988; NMFS 2010; Angliss and Allen 2009). In Alaska, their range extends from the Bering Sea north and east through the Chukchi and Beaufort Seas. Bearded seals are found in the Beaufort Sea year-round but in fewer numbers during the winter when habitat is limited to areas of open leads and active ice pack. Seasonal movements of bearded seals are related to the advance and retreat of sea ice (Kelly 1988). Ice platforms are needed for resting, reproduction, and molting (Fay 1974; Burns 1981; Nelson et al. 1984; NMFS 2010.) They migrate throughout the year following the pack ice edge south into the Bering Sea in the winter and north into the Chukchi and Beaufort Seas in areas with high ice coverage in the summer (Burns et al. 1981; Simpkins et al. 2003; Bengston et al. 2000).

Life History and Habitat Use

Bearded seals primarily feed on benthic organisms on or in the sediments on the seafloor, including crabs, shrimp, and clams (Kelly 1988; Reeves et al. 1992; Antonelis et al. 1994; NMFS 2010). They are therefore typically distributed in areas with sea ice cover over water less than 656 ft. (200 m) where they can effectively reach the seafloor to forage (Kovacs 2002; NMFS 2010), although they are also seen swimming in open water (Burns et al. 1981). Surveys in the Beaufort Sea indicated that bearded seals prefer areas with relatively open ice cover over water depths of less than 246 ft. (75 m) (Stirling 1977; Stirling et al. 1982). Preferred bearded seal habitat in the summer months in the Beaufort Sea is in water with fragmented multi-year ice over the continental shelf seaward of the scour zone (LGL 2007).

Bearded seals are the largest of the northern seals, weighing up to 750 pounds. They give birth to a single pup. Pupping occurs on drifting ice flows from late March through May (Kovacs et al. 1996). Pups are typically weaned when they are around 24 days old (Kovacs et al. 1996).

Bearded Seals in the Action Area

Aerial surveys indicated that bearded seals of the Beringia DPS are commonly found in Beaufort Sea waters offshore and, therefore, could potentially approach the action area at West Dock; however no sightings have been detected in the action area (Figure 12). They would not be expected to occur there commonly due to industrial activity. Bearded seals in the Beaufort Sea have been found to prefer areas close to the pack ice over water between 82 and 246 ft. deep (25 and 75 m) (Stirling 1977; Sterling et al. 1982). However, when the pack ice recedes north to areas over water depths greater than 656 ft. (200 m), bearded seals tend to move further inshore to areas where they have access to the seafloor where they forage.

In the summer, the preferred habitat is in the central and northern Chukchi Sea. Habitat in the Beaufort Sea is more limited, because the edge of the pack ice is often over waters depths that are too deep for foraging (greater than 656 ft. (200 m)) (LGL 2007). During spring seal surveys conducted in Prudhoe Bay, nine bearded seals were seen hauled-out on ice, only two of which were seen south of the barrier islands (Moulton et al. 2002). Several bearded seals were recorded during surveys in Prudhoe Bay between 1999 and 2001, but none were seen during surveys between 1997 and 1998 (Moulton et al. 2002). Although bearded, ringed, and spotted seals were observed during a marine mammal survey for an ocean bottom cable survey west of the Liberty Satellite Drilling Island site and approximately 14 miles (22.5 km) west of West Dock, only 7 percent of those seals were bearded seals. LGL estimated an average summer density of .557 seals per square mile for bearded seals near Liberty (Richardson and Williams 2002). Few bearded seals are expected to be near West Dock during vessel related activities associated with the proposed project.

Threats

Pollution and Contaminants

There is little information available regarding contaminants in bearded seals. Contaminant loads of organochlorine compounds in bearded seals are lower in the U.S. and Canadian Arctic than in the European Arctic (Borga et al. 2005). High levels of mercury have been found in the liver and muscles of bearded seals, although no toxic effect of the metal was observed (Smith and Armstrong 1978). The rate of accumulation of heavy metals in bearded seals, appear to be higher than that seen in ringed seals (Smith and Armstrong 1978). Mercury concentration becomes higher as seals age (Dehn et al. 2005).

Oil and Gas Activities

Offshore oil and gas exploration, development, and production activities, have occurred in the Chukchi and Beaufort Seas since the late 1960s (MMS and NMFS 2008). Oil and gas activities may include artificial island construction, drilling operations, pipeline construction and operation, seismic surveys, and vessel and aircraft support operations. Among these activities, the effects of noise, physical disturbance and potential oil spills have the greatest potential to effect ringed seals (75 FR 77509). However, long-term research and monitoring results on ice seals, including ringed seals, in the Alaskan Arctic

have shown no evidence of more than limited and transitory effects, resulting in no detectable injury to individual seals and seal lairs, and no more than a negligible impact on the affected subpopulation. As a result, NMFS has determined that oil and gas activities are not a foreseeable threat, individually or cumulatively, to the conservation status of the bearded seal (75 FR 77510). Offshore oil and gas operations often require support operations, such as ice-breaking, air-craft traffic, and vessel traffic, which can also cause impacts to bearded seals. More information on the history of oil and gas activity from 1979 to 1999 in the Beaufort Sea can be found in the MMS Study 2002-071 Geographic Information System (GIS) Geospatial Data Base of Oil-Industry and Other Human Activity (1979-1999) in the Alaskan Beaufort Sea (MMS 2002).

Climate Change

The proposed listing of bearded seals as a threatened species is primarily premised upon the potential adverse effects of modification of their sea ice habitat resulting from a warming climate projected out through the end of the century (NMFS 2010). Although the bearded ringed seal remains abundant and there have been no detected effects of climate change on bearded seals to date, NMFS has inferred that future ice and snow conditions threaten this subspecies with becoming endangered by 2100. The effects of climate change may be ameliorated if the bearded seal retracts northward with sea ice habitats; however, NMFS has projected that snow depths would be insufficient for lair formation and maintenance throughout most of the subspecies' range by the end of the century. The timing for the on-set of potential impacts from climate change on the bearded seal is uncertain.

4.2 USFWS Managed ESA Species in the Action Area

4.2.1 Steller's Eider (Threatened)

Biological Populations and Listing Status

The Steller's eider is a small sea duck with a Holarctic distribution in Russia and Alaska. Three distinct breeding populations are recognized: the Alaska breeding population, the Russian-Atlantic breeding population, and the Russian-Pacific breeding population. These breeding populations mix in wintering areas such as the Bering Sea.

USFWS was petitioned in December 1990 to list the Steller's eider as endangered under the ESA. After a status review USFWS concluded that listing the Steller's eider was warranted but precluded by higher listing priorities. Upon subsequent reconsideration, USFWS concluded in August 1993 that available information did not support listing the species range-wide, but did support listing the Alaska-breeding population. Listing the species across its entire range was considered to be unwarranted because counts in 1992 indicated that at least 138,000 Steller's eiders wintered in southwest Alaska, and because indications of decline were based upon imprecise population size estimates. Although population size estimates for the Alaska-breeding population were also imprecise, it was clear that Steller's eiders had essentially disappeared as a breeding species from the Yukon-Kuskokwim Delta (Delta), where they had historically occurred,

possibly in significant numbers. On June 11, 1997, the Alaska-breeding population of the Steller's eider was listed as threatened based on the observed contraction in the breeding range in Alaska and the resulting increased vulnerability of the remaining breeding population to extirpation (FR 62:31748-31757). Causes for the decline were not identified when the listing occurred; potential causes referenced included hunting, ingestion of lead shot, predation, and changes in the marine environment that may have affected eider food resources. Causes of the decline are still poorly understood (USFWS 2002a). The Alaska-breeding population is the only population listed under the ESA.

Population Status, Trends, and Abundance

The current world population of Steller's eiders is estimated to be about 110,000 to 125,000 birds, but is thought to have declined by as much as 50 percent in the 1960s, 1970s, and 1980s (ADF&G 2014; BirdLife International 2013). Currently, most of the world's Steller's eiders nest in Russia, with the Alaskan breeding population being much smaller than the Russia population, numbering approximately 500 individuals (USFWS 2011a) to 680 individuals (Stehn et al. 2013). The species has undergone near extirpation in western Alaska. It still breeds on the ACP (Dau et al. 2000), but populations may number as low as 1,000 birds. Stehn et al. (2013), reported the results of 27 consecutive years of aerial surveys and estimated population size at 680 eiders. Based on these aerial surveys, Stehn et al. (2013) reported an average growth rate of 0.946 percent for the North Slope subpopulation of Steller's eiders from 1989-2012. Although the growth rate is declining, Stehn et al (2013) reported that the data analyzed were imprecise and population trend could not be conclusively supported.

Range

Range of the Steller's eider in the Pacific is depicted in Figure 13. The nesting distribution for the Alaska breeding population of Steller's eider includes much of the ACP in Alaska (Figure 14). A very small population also nests in the Delta. The majority of sightings of nesting Steller's eiders have been observed during annual aerial surveys of breeding pairs of waterfowl (Mallek et al. 2007; Stehn et al. 2013) since 1986, and eider breeding population surveys (Larned et al. 2006) conducted across the ACP annually since 1992. These surveys have occurred east of Point Lay and west of Prudhoe Bay, and within about 50 miles (80 km) of the coast (USFWS 2002a). The largest concentrations of breeding Steller's eiders in Alaska are found between Barrow and the Colville River Delta, which is considered to be the core of the nesting area (USFWS 2002a, 2005). Steller's eiders winter in coastal waters along the Aleutian Islands, Kodiak Island, and lower Cook Inlet.

Life History and Habitat Use

Breeding pairs are formed on wintering grounds. The birds congregate in large numbers in estuaries along the north and south sides of the Alaska Peninsula in the spring, and then migrate north and east to the breeding grounds using coastal waters and offshore leads (Roseneau and Herter 1984; USFWS 2002a). Steller's eiders begin migrating into

the ACP in late May or early June, when ponds and tundra begin to thaw. Steller's eiders that have arrived on the North Slope but have not begun to nest are often associated with deep to shallow *Arctophila* sp. and *Carex* sp. ponds (Rojek 2006, 2007, 2008).

FIGURE 13. Range of the Steller's eider in the Pacific



Source: USFWS 2011a

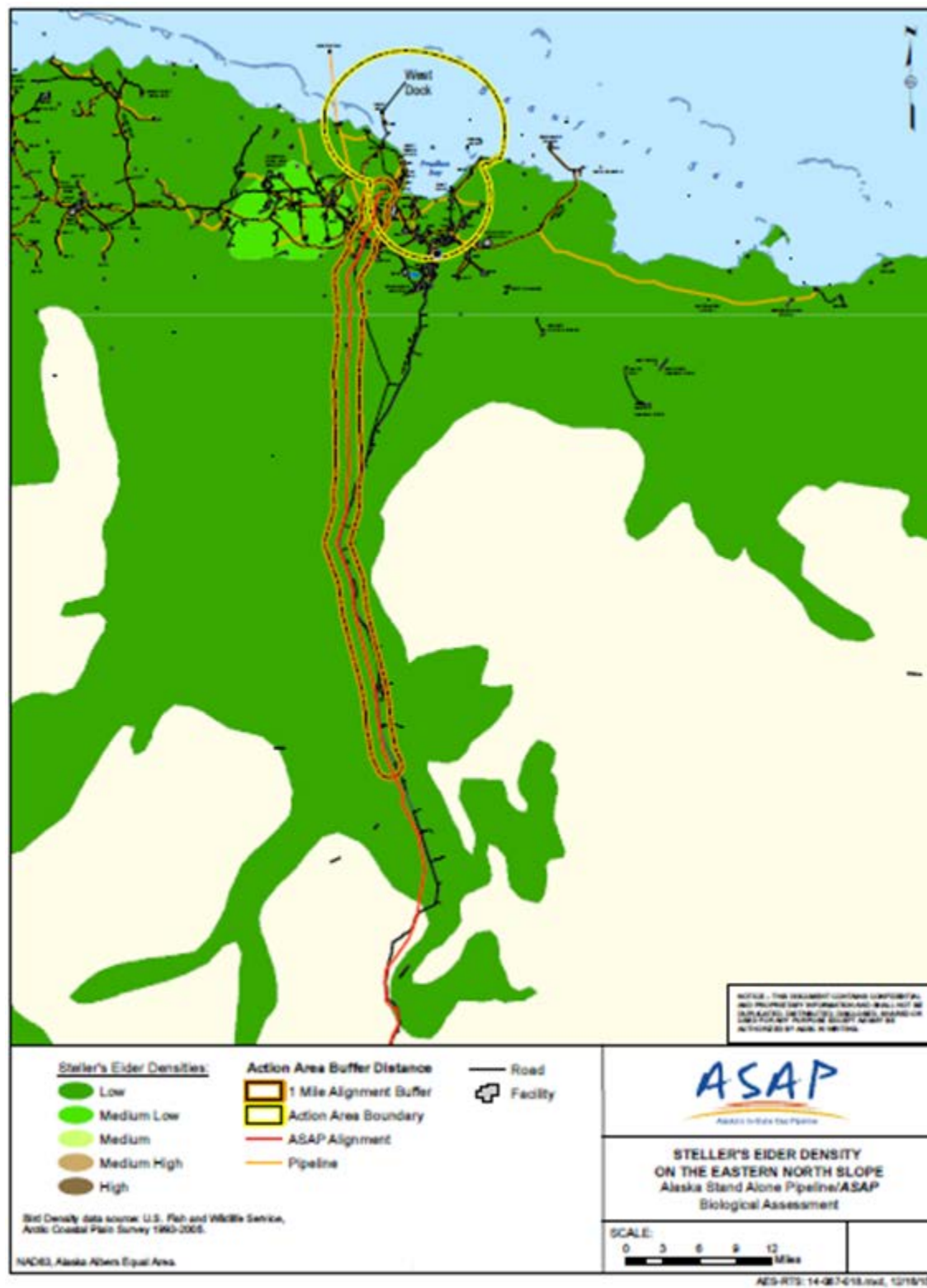
Nesting in the Barrow area began June 10 to July 1 in 2005, 2006, and 2007 (Rojek 2006, 2007, 2008). Nest sites are chosen in open tundra or within shrub communities near ponds (Deygtyarev et al. 1999), often on slightly elevated areas near ponds (Murie 1924; Brandt 1943; Cramp et al. 1977). USFWS reported that most observed nests in the Barrow area have been found on the rims of low-centered polygons within partially-drained lake basins that contain a mosaic of shallow ponds with emergent sedges, and most are within 330 ft. (100 m) of permanent water (unpublished data summarized in FR 65:13262–13283).

The female and brood move from the nest site to brood habitat in nearby ponds and wetlands, where they feed on aquatic insects and plants until they are capable of flight (Solovieva 1997). In the Barrow area, hatching was determined to occur July 12 to August 2 in 2005, 2006, and 2007. The distance traveled from the nest to the brooding area was found to range from 328 ft. (100 m) to 2 miles (3 km) (Rojek 2006, 2007, 2008). Steller's eiders and their broods forage on insect larvae and beetle species in emergent vegetation in shallow ponds.

Females and their broods move to coastal marine waters as the broods fledge. Rojek (2006, 2007, and 2008) reported that broods are fledged in the Barrow area anywhere from the second half of August to early September. Males and unsuccessful hens leave the tundra earlier, being found at small ponds on the tundra nesting ground until the middle or end of July, at which time they move to coastal waters (Rojek 2006, 2007, 2008). Unsuccessful females may congregate near incubating females until departure (Solovieva 1997). In unsuccessful years, all birds generally depart the breeding grounds sometime in July (Fredrickson 2001) or even mid-June (Rojek 2008). In successful years, males move to nearshore waters prior to molting body feathers and forage prior to fall migration.

The birds move to molting areas in Western Alaska, such as the Alaska Peninsula, Izembek Lagoon, Nelson Lagoon, Port Heiden, and the Seal Islands (Petersen 1981). As sea ice forms in the Arctic Ocean, flocks move south through open leads and eventually arrive at ice-free lagoons along the north and south side of the Alaska Peninsula, Cook Inlet, and the eastern Aleutian Islands (USFWS 2005). Winter habitat consists of waters typically less than 30 ft. (9 m) deep, so most birds are found within about 1,312 ft. (400 m) of the shore, except where shallows extend further (USFWS 2002a). In these areas they dive for mollusks, crustaceans, small fish, and other invertebrates (Petersen 1981). These prey items are often associated with eelgrass meadows, which provide a substrate for invertebrates (Metzner 1993).

FIGURE 14. Steller's eider Density on the Eastern North Slope



Critical Habitat

Approximately 2,830 square miles (7,330 km²) of land and coastal waters in five units were designated as critical habitat for the Alaskan breeding population of Steller's eiders in 2001 (FR 66:8849). These areas include the historic breeding range on the Delta (Unit 1), and molting or wintering grounds at the Kuskokwim Shoals (Unit 2), Seal Islands (Unit 3), Nelson Lagoon (Unit 4), and Izembek Lagoon (Unit 5). All designated critical habitat for Steller's eiders is located more than 100 miles (161 km) from the action area.

Steller's eiders in the Action Area

From late May through early September, Steller's eiders may be found within or near portions of the action area located on the ACP, and in coastal waters near West Dock in the Beaufort Sea (see Figures 12 and 13). All other portions of the action area, including other terrestrial portions of the action area are not within the range of the species according to published maps, and the eiders would not be expected to occur in these areas.

The USFWS conducted annual aerial population surveys for breeding pairs of waterfowl on the entire ACP, including the Prudhoe Bay area, from 1986-2006 (Mallek et al. 2007), and conducted separate aerial surveys in the same area specifically for eiders from 1992 to 2006 (Larned et al. 2006). Since 2007, the two survey programs have been combined (Larned et al. 2012; Stehn et al. 2013). The action area lies within areas documented by these survey programs as having low densities of nesting or breeding eiders. Since 1986 these surveys have resulted in observations of low numbers of pairs of Steller's eiders in the Prudhoe Bay area.

Site-specific surveys for Steller's eider's have not been conducted in the action area for the ASAP. However, Troy and Johnson (1987) reported the results of intensive avian surveys conducted for shorebirds and waterfowl in the lagoon waters on either side of West Dock and on the adjacent tundra in July-September 1981 that were part of a monitoring study for the Prudhoe Bay waterflood project. No Steller's eiders were observed along transects in the lagoon waters, but one Steller's eider was observed on the tundra. It was also reported in FR 62:31750 that a few pairs of Steller's eiders were observed on the tundra in the Prudhoe Bay oil fields each year from 1992 to 1994.

Extensive aerial surveys of the bird use of nearshore and offshore waters extended from Barrow to the Canadian border and from the shoreline offshore for distances of up to 62 miles (100 km) in 1991, 2000, and 2001 (Fischer and Larned 2004). During those surveys, only three Steller's eiders were observed, representing about 0.01 percent of all observed birds. The observed Steller's eiders were in Smith Bay more than 100 miles (161 km) to the west of the action area.

Threats

Toxic Contamination of Habitat

Lead poisoning from the deposition of lead shot in nearshore habitats has been described as a threat to spectacled and Steller's eiders. Lead poisoning of eiders has been documented on the North Slope of Alaska. Use of lead shot for hunting all birds on the North Slope is prohibited. Hunter out-reach programs are being conducted to educate hunters and prevent the use of lead shot on the North Slope. Development of the proposed Project would not increase hunting of spectacled or Steller's eiders or the use of lead shot in the action area.

Increased Predator Populations

Predator and scavenger populations may be increasing on the North Slope near industrial development and human infrastructure. Increased fox, gull, and raven populations (due to anthropogenic food sources and increased denning and nest sites) may have affected eider populations, although this has not been proven (USFWS 2009a).

Harvest

Hunting for Steller's eiders was closed in 1991; however, harvest data indicates that listed eiders continue to be hunted on the North Slope. Efforts are being conducted by BLM, NSB, and USFWS to curtail this activity. Much of this activity has taken place near Barrow and other villages, not in the Project action area. Intra-service consultations for the Migratory Bird Subsistence Hunting Regulations are conducted annually and the harvest of listed eiders is being monitored.

Impacts from Development

Alteration of North Slope nesting habitat of listed eiders has not been extensive to date. Some areas of breeding habitat have been altered by wetland fill and human infrastructure that may disturb individual birds, increase nesting or denning predators, or present collision obstacles. However, human activities on the ACP are not thought to have played a significant role in population declines of listed eiders, and, accordingly, Steller's eiders were not listed as a result of the impacts of development. Development and other activities that may adversely affect listed eiders undergo a Section 7 consultation, and the amount of impact is estimated in order to issue an Incidental Take Statement and a non-jeopardy conclusion (USFWS 2009a).

The North Slope of Alaska is especially sensitive to climate fluctuations and effects on individual organisms, species, or communities are complex. Lakes and ponds used by eiders for forage and nesting may be affected by warmer temperatures and longer growing seasons. Changes in precipitation patterns, air and soil temperature, and water chemistry may also affect tundra communities (Hinzman et al. 2005). The comprehensive effects of climate change that could impact both the habitats of Steller's eiders are not fully known at this time (USFWS 2009a).

Climate Change

The North Slope of Alaska is especially sensitive to climate fluctuations and effects on individual organisms, species, or communities are complex. Lakes and ponds used by eiders for forage and nesting may be affected by warmer temperatures and longer growing seasons. Changes in precipitation patterns, air and soil temperature, and water chemistry may also affect tundra communities (Hinzman et al. 2005). The comprehensive effects of climate change that could impact the habitat of eiders are not fully known at this time (USFWS 2009a).

4.2.2 Spectacled eider (Threatened)

Biological Populations and Listing Status

The spectacled eider is a sea duck that inhabits the northern extent of the Pacific Ocean in the Chukchi and Bering Seas. Three primary breeding populations have been identified; the Russian arctic population, the ACP of Alaska population, and the Delta population in western Alaska. The spectacled eider was listed as threatened throughout its range under the ESA in 1993 (FR 58:27474). It is believed that large declines in the populations were due to exposure to lead shot, increased predation, and changes in forage quality in wintering areas of the Bering Sea (USFWS 2002a).

Populations Status, Trends, and Abundance

The world-wide population of spectacled eiders was estimated by Larned and Tiplady (1999) to be about 330,000–390,000 birds. This estimate was based on survey counts of birds wintering in the Bering Sea, and therefore presumably includes many non-breeding birds. It has been estimated that about 4,000 pairs nest annually in the Delta, another 3,000–4,000 pairs nest on the ACP, and perhaps 40,000 or more pairs nest in arctic Russia (USFWS 2009a). In the Delta area, populations declined drastically in the 1970s, 1980s, and 1990s (USFWS 2011b). Due to the scarcity of historical data, it is unknown whether such declines ever occurred in Russia or on the ACP. Current survey data suggest that the spectacled eider population on the ACP is generally stable (Stehn et al. 2013).

Range

The range of the spectacled eider in the Pacific is indicated in Figure 15. Nesting occurs on the ACP from about the Utukok River just south of Icy Cape, north and west to the Shaviovik River, and within this area most of the nesting takes place between Cape Simpson and the Sagavanirktok River (USFWS 2000), and primarily north of latitude of 70 degrees (USFWS 2000) or within about 50 miles (80 km) of the coast (Larned and Balogh 1997).

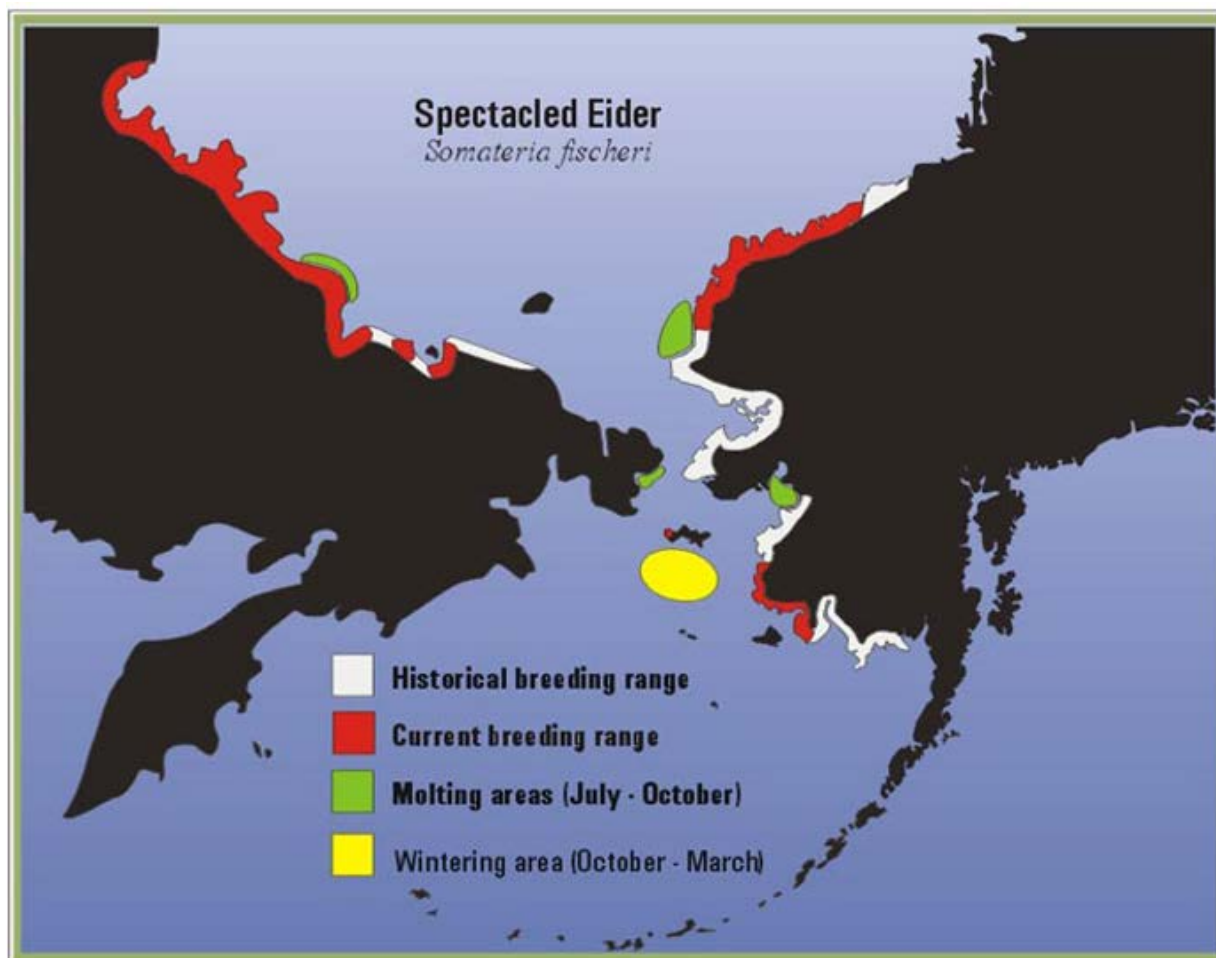
Four principal molting areas have been identified: Ledyard Bay along the northeastern Chukchi Sea, Norton Sound in the northeastern Bering Sea, and Mechigmentskiy Bay and the Indigirka-Kolyma Delta in Russia. Most females from the North Slope molt in Ledyard Bay and Mechigmentskiy Bay, while the males molt in all three areas with about equal

numbers molting at Ledyard Bay, Mechigmenskiy Bay, and the Indigirka-Kolyma Delta (Peterson et al. 1999). The only known wintering area used by spectacled eiders is located in the Bering Sea south of Saint Lawrence Island, in water depths of 165-200 ft. (50-61 m). Thousands of spectacled eiders are known to congregate in open areas in the pack ice in this area.

Life History and Habitat Use

Spectacled eiders spend most of their life in the marine environment where they dive to feed on bottom-dwelling prey such as mollusks, bivalves, and crustaceans (Petersen et al. 1998). These prey items are part of a benthic community that is highly variable, being influenced by seasonal and decadal weather systems in the North Pacific (Peterson and Douglas 2004; Grebmeier and Dunton 2000). This variability, coupled with the extreme energetic requirements of their habitats, may explain as much as 50 percent of winter mortality of female spectacled eiders (Flint et al. 2000).

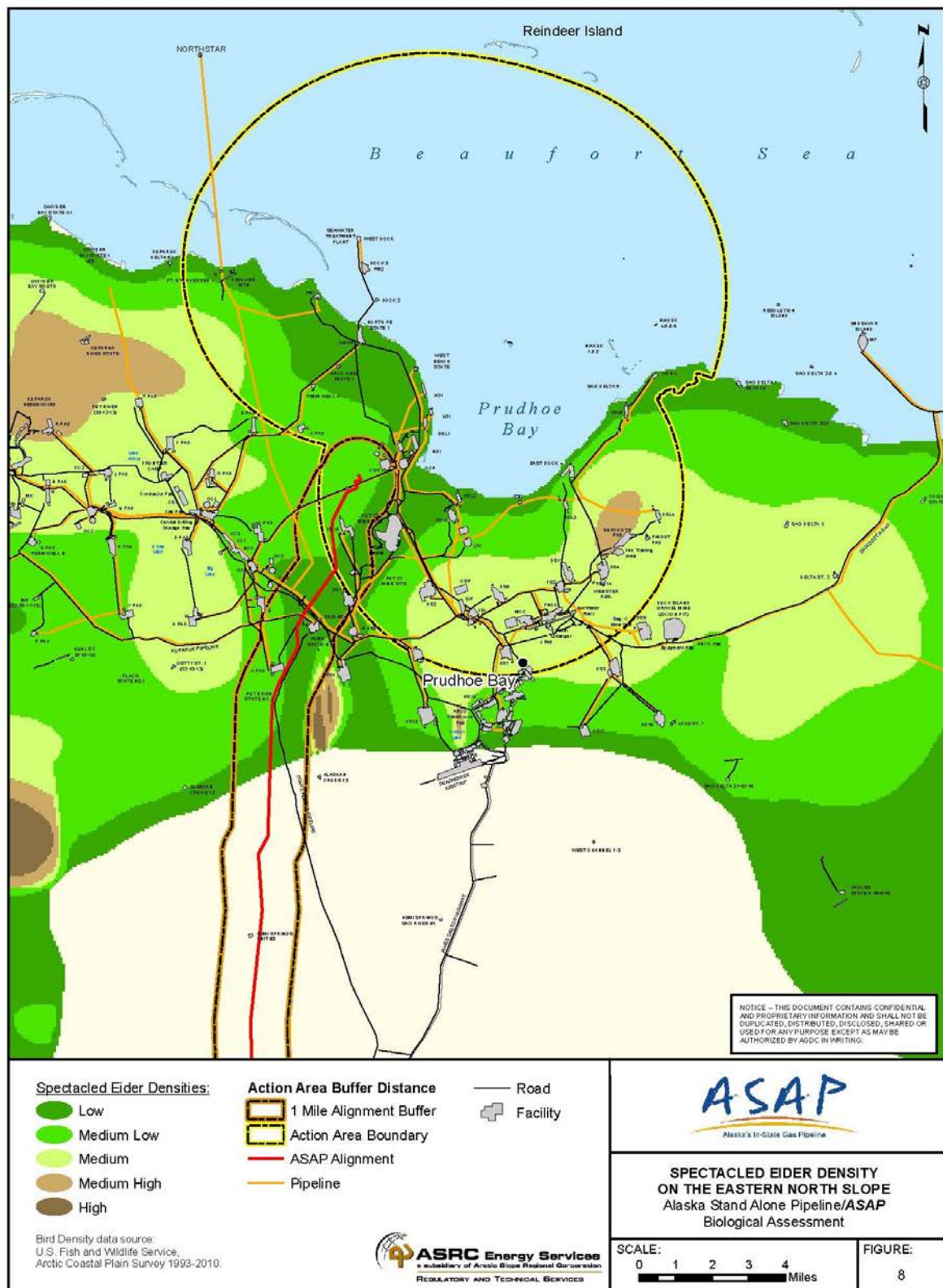
FIGURE 15. Range of the Spectacled Eider in the Pacific



Source: USFWS 2011b

Source: USFWS 2011b

FIGURE 16. Spectacled Eider Density on the Eastern North Slope



NAD83, Alaska Albers Equal Area.

AES-RTS: 14-087-012.mxd, 07/22/14

Spectacled eiders return from wintering areas in the Bering Sea in late May or early June and nest in coastal wetlands near relatively shallow lakes and ponded areas dominated by emergent vegetation. Densities of spectacled eiders vary across the ACP, with larger densities west of the proposed action area (Figure 16). Surveys conducted since 1992 by the USFWS have recorded higher densities in recent years near Teshekpuk Lake. In the action area, the breeding population density of spectacled eiders is between 0.05 and 0.4 eiders per square mile (Larned et al. 2006).

Males depart the nesting grounds once females begin to incubate their clutch of eggs from mid- to late June. Depending upon breeding success, females would leave nesting areas between late June and early September (USFWS 2009a; Larned et al. 2012). As the annual sea ice forms, open water, or leads, provide molting and foraging habitat for spectacled eiders in northeast Russia and Ledyard Bay in the Chukchi Sea prior to winter migration (USFWS 2002a). All three breeding populations congregate in a 3,000-square mile (7,770 km²) area south of St. Lawrence Island (Peterson and Douglas 2004; FR 66:9146).

Critical Habitat

Critical habitat for spectacled eiders was designated by the USFWS in 2001 (FR 66:9146) and comprises nesting habitat in the Delta, molting areas in Norton Sound and Ledyard Bay, and wintering habitat south of St. Lawrence Island. All designated critical habitat is located more than 400 miles (644 km) from the action area.

Spectacled eiders in the Action Area

Spectacled eiders may be present in or near the action area near the northern coast of Alaska and West Dock but are not expected along the pipeline corridor further than approximately 50 miles (80 km) from the northern coast (Figure 16).

Surveys were conducted in offshore waters of the Beaufort Sea in order to determine the composition and distribution of birds in June, July, and August 1999-2001 (Fischer and Larned 2004). In 1999 and 2000 the area near West Dock at Prudhoe Bay was surveyed. Spectacled eider density was low throughout the entire survey area. In 2001, 15 spectacled eiders were seen between Prudhoe Bay and Barrow, and the density in the area encompassing West Dock was 0.0 (Fischer and Larned 2004).

Threats

Toxic Contamination of Habitat

Lead poisoning from the deposition of lead shot in nearshore habitats is a threat to spectacled eiders. Lead poisoning of spectacled eiders has been documented on the North Slope of Alaska. Use of lead shot for hunting all birds on the North Slope is prohibited. Hunter outreach programs are being conducted to educate hunters and prevent the use of lead shot on the North Slope. Development of the proposed Project would not increase hunting of spectacled eider or the use of lead shot in the action area.

Increased Predator Populations

Predator and scavenger populations may be increasing on the North Slope near industrial development and human infrastructure. Increased fox, gull, and raven populations (due to anthropogenic food sources and increased denning and nest sites) may have affected eider populations, although this has not been proven (USFWS 2009a).

Harvest

Hunting for spectacled eiders was closed in 1991, however harvest data indicates that listed eiders continue to be hunted on the North Slope. Efforts are being conducted by BLM, NSB, and USFWS to curtail this activity. Much of this activity has taken place near Barrow and other villages, not in the Project action area. Intraservice consultations for the Migratory Bird Subsistence Hunting Regulations are conducted annually and the harvest of listed eiders is being monitored.

Impacts from Development

Alteration of North Slope nesting habitat of listed eiders has not been extensive to date. Some areas of breeding habitat have been altered by wetland fill and human infrastructure that may disturb individual birds, increase nesting or denning predators, or present collision obstacles. However, human activities on the ACP are not thought to have played a significant role in population declines of listed eiders, and, accordingly, spectacled eiders were not listed as a result of the impacts of development. Development and other activities that may adversely affect listed eiders undergo a Section 7 consultation, and the amount of impact is estimated in order to issue an Incidental Take Statement and a non-jeopardy conclusion (USFWS 2009a).

Climate Change

The North Slope of Alaska is especially sensitive to climate fluctuations and effects on individual organisms, species, or communities are complex. Lakes and ponds used by eiders for forage and nesting may be affected by warmer temperatures and longer growing seasons. Changes in precipitation patterns, air and soil temperature, and water chemistry may also affect tundra communities (Hinzman et al. 2005). The comprehensive effects of climate change that could impact the habitat of eiders are not fully known at this time (USFWS 2009a).

4.2.3 Polar Bear (Threatened)

Biological Populations and Listing Status

Evidence from telemetry surveys, tagging studies, and traditional knowledge has resulted in the recognition of 19 partially-discrete polar bear populations (Schliebe et al. 2008). Two recognized polar bear populations occur in Alaska: the Southern Beaufort Sea stock and the Chukchi/Bering Seas stock. Only the Southern Beaufort Sea Stock is found in or near the action area.

Because the principal habitat of polar bears is sea ice, it is considered a marine mammal, and included in the species protected under the Marine Mammal Protection Act (MMPA). On May 15, 2008, the polar bear was listed as a threatened species range-wide under the ESA (FR 73:28212). This listing was based on the best available science showing that a loss of sea ice would threaten polar bear habitat. The polar bear was listed as a threatened species which is defined as a species likely to become endangered in the foreseeable future.

The Southern Beaufort Sea (SB) population occurs between Icy Cape, Alaska on the western boundary and Pearce Point, Northwest Territory (NWT), Canada (Amstrup et al. 1986; Amstrup and DeMaster 1988; Stirling 1988). While accurate population estimates for Alaskan polar bear populations have historically been difficult to obtain, the most current estimate for SB polar bears is 1,526 (Regehr et al. 2006). The value is derived from capture-recapture data collected during 2001 to 2006 (with a 95 percent confidence interval equal to 1,211 – 1,841) (Regehr et al. 2006). The size of the SB population was estimated to be approximately 1,800 animals in 1986 (Amstrup et al. 1986). Because the precision of the earlier estimate was low, the two estimates cannot be statistically differentiated. The harvest of polar bears in the SB region is shared between Canada and the United States and since 1988 has been managed under the “Polar Bear Management Agreement for the Southern Beaufort Sea” by the Inuvialuit Game Council of Canada, and the NSB of Alaska. The harvest quota for the SB is 80 animals (40 for Alaska and 40 for NWT) (USFWS 2009a). In 2004/2005 the joint harvest was 46 bears (Schliebe et al. 2006; Branigan et al. 2006). The status of the SB population is designated as reduced (FR 73:28212, 15 May 2008; page 28217) and the predicted trend is declining (Aars et al. 2006).

Critical Habitat

In February 2016, the U.S. Court of Appeals for the Ninth Circuit upheld a USFWS designation of critical habitat in Alaska for polar bear. Oil and gas exploration, development, and production, and other associated human disturbance (vessel traffic) are potential sources of harm to polar bears and/or their critical habitat (Lentfer and Hesel 1980). Changes in the abundance or timing of sea ice are concerns for overwintering or foraging polar bears. Critical habitat for polar bear exists in a 187,000 square mile (484, 328 km²) swatch of land and sea covering sea ice (Unit 1 – entire Arctic coast and some subarctic coast of Alaska), terrestrial denning habitat (Unit 2 – ranging in 8 to 32km between the Canadian border and Barrow), and the barrier islands (Unit 3 – located arctic and subarctic barrier islands) (USFWS 2010c).

Populations Status, Trends, and Abundance

The global population of polar bears is estimated to be about 26,000 bears (USFWS, 2017). Bromaghin et al. (2015) estimated the Southern Beaufort Sea (SBS) population to be about 900 bears, which was a marked decline from the Regehr et al. (2006) estimate

of 1,526. The SBS population of polar bears is thought to be low and declining due to the decline of sea ice (USFWS, 2017)).

In 2006, results from an intensive five-year mark-recapture study indicated that the SB subpopulation included 1,526 polar bears (Regehr et al. 2006) suggesting a decline between the late 1990s and 2006, although low precision in the previous estimate of 1,800 precluded a statistical determination. Subsequent analyses of the 2001-2006 data indicates that the survival and breeding of polar bears during this period were affected by sea ice conditions. The population is currently considered to be declining.

Range

Polar bears are the apical predators of the Arctic marine ecosystem (Amstrup 2003) and are distributed throughout regions of arctic and subarctic waters where the sea is ice-covered for large portions of the year. The SB population is found from Icy Cape, Alaska east to Pearce Point, NWT, Canada (Amstrup et al. 1986, Amstrup and DeMaster 1988, Stirling 1988).

Life History and Habitat Use

Polar bears are common in the Beaufort Sea and are known to occur in small, widely-distributed numbers in the proposed project area. Over most of their range, polar bears remain on the sea ice year round, as the sea ice is where their prey (mostly ringed seals) is accessible. Polar bears generally remain on sea ice and visit land only for short periods when sea ice is prevalent. However, polar bear use of coastal areas during the fall open-water period has increased in recent years and is projected to continue to increase (Hunter et al. 2010; Kochnev et al. 2003; Schliebe et al. 2005). Polar bears derive energy from marine mammal prey obtained on sea ice habitat. The high fat intake from specializing on marine mammal prey allows polar bears to thrive in the harsh arctic environment (Stirling and Derocher 1990; Amstrup 2003; USFWS 2009a). Over much of their range, polar bears are dependent on ringed seals (Smith 1980) and where common, bearded seals (Derocher et al. 2002).

Maternal dens typically are located in snow drifts in coastal areas, stable parts of the offshore pack ice, or on landfast ice (Amstrup and Gardner, 1994). The highest density of land dens in Alaska occur along the coastal barrier islands of the eastern Beaufort Sea and within the Arctic National Wildlife Refuge (USFWS 2009a). Only pregnant female polar bears den; other members of the population (males, solitary females, females with older cubs) remain active throughout winter. Amstrup and Garner (1994) studied fidelity to denning locations and found that bears that denned once on pack ice were more likely to den on pack ice than on land in subsequent years. Bears were also found to be faithful to general areas. They are more likely to return to the eastern coastal area to den (if that is where they previously denned), earlier than to the western half of the Alaska coast. Annual variations in weather, ice conditions, prey availability, and the long-distance movements of polar bears (Amstrup et al. 1986; Garner et al. 1990) make recurrence of

exact denning locations unlikely to occur. Polar bears typically create dens in a snow bank on land, although dens can occur on sea ice. Maternity dens are usually inhabited by early January, with emergence following in March or April. In the northern Alaska coastal areas, pregnant females enter maternity dens by late November and generally emerge by early April.

Fischbach et al. (2007) evaluated a broad range of Northern Alaska polar bear maternal den distributions between 137°W and 167°W over a 20 year period and found that the proportion of dens on pack ice declined from 62% in 1985-1994 to 37% in 1998-2004 ($p = 0.044$); among pack ice dens, fewer occurred in the western Beaufort Sea after 1998 (Fischbach et al. 2007). Durner et al. (2006) found approximately 50 percent of pregnant females in the Beaufort Sea came ashore to construct maternity dens, while Amstrup and Gardner (1994) found 42 percent of females observed in the Alaskan Chukchi and Beaufort seas and Canadian Beaufort Sea from 1983-1991 denned on land. Pregnant females come ashore to den in late October/early November depending upon ice movements and timing of freeze up (Lentfer and Hensel 1980). In Alaska, dens are sparsely distributed along a narrow coastal strip with sightings reported up to 30 miles (48 km) inland (Lentfer and Hensel 1980) and 38 miles (61 km) inland (Amstrup and Gardner 1994). Denning habitat includes areas such as coastal and river banks and bluffs where snow accumulates early.

Polar Bears in the Action Area

Polar bear habitat exists in the action area (Figure 17). As described, above, they spend the majority of their time on sea ice, coming on land only occasionally. Polar bears may den on sea ice or on land. Some pregnant females from the SB stock come on land to enter dens in late fall. Maternal polar bear denning habitat exists in the action area; however, recent surveys have not documented dens within the area's boundary (Figure 18). AGDC plans to seek and adhere to appropriate mitigation measures directed by USFWS to avoid impacts to polar bear maternity dens, particularly due to noise or visual disturbance during construction. As winter activities have the potential to disturb denning polar bears or ice seals, AGDC will consult with the Services to mitigate impacts appropriately and will obtain the needed permits and authorizations.

Threats

Historical and present potential threats affecting polar bears in the Beaufort Sea area include subsistence and sport hunting, environmental contaminants, climate change and development.

Hunting

Since passage of the MMPA, the sport hunting of polar bears in the United States has ceased. Alaska Natives that live on the North Slope of Alaska still harvest polar bears for subsistence purposes. There is a Native-to-Native agreement between the Iñupiat people of Alaska and the Inuvialuit people of Canada, developed in 1988, that establishes quotas

and recommendations concerning hunting practices (USFWS 2009a). The current harvest levels, which have averaged 36 bears per year since 1980, are thought not to impact the rate of recovery of the species (USFWS 2006). Subsistence hunting for polar bears occurs near the villages of Barrow, Kaktovik, and Nuiqsut, the closest to the Project being Nuiqsut, located 59 miles (95 km) from West Dock.

Environmental Contaminants

The types of contaminants with the greatest potential to be a threat to polar bears in the Arctic are petroleum hydrocarbons, persistent organic pollutants (POPs), and heavy metals. The Arctic ecosystem is particularly sensitive to environmental contamination due to the slower rate of breakdown of POPs, including organochlorine compounds (OCS) (Fisk et al. 2001; Lie et al. 2003). The highest concentrations of OCS have been found in species at the top of the marine food chains such as polar bears, which feed primarily on seals (Braune et al. 2005). The SB polar bear populations may also have concentrations of mercury close to the reported toxicological threshold levels of 60 micrograms per gram wet weight for marine mammals (Arctic Monitoring and Assessment Program 2011). Polar bear ranges overlap with many active oil and gas operations within 25 miles (40 km) of the coast or offshore (Schliebe et al. 2006). Exposure of polar bears to petroleum hydrocarbons could potentially come from direct contact with oil spill products. To date, no major oil spills have occurred in the Alaska marine environment within the range of polar bears. Industrial development in polar bear habitat may also expose individuals to other hazardous substances through improper storage or spills. The USFWS determined that contaminants are not a past, present, or future foreseeable threat to the survival and recovery of polar bears throughout all or a portion of their range (FR 73:28,288).

Climate Change

The listing of polar bears as a threatened species under ESA is based largely on findings that continuing declines in arctic sea ice, linked to climate change, are likely to threaten the polar bear species within the foreseeable future (FR 73:28212, May 15, 2008). USFWS has determined that ongoing and projected loss of sea ice habitat is likely to result in nutritional stress and reduced productivity as already evidenced in the Western Hudson Bay and Southern Beaufort Sea populations (FR 73:28292). Eventually, at rates and magnitudes that would vary among populations, all polar bear populations are projected to suffer adverse effects, with some populations at risk of becoming extirpated if sea ice declines continue as projected through the end of the century.

Declining sea ice in the arctic marine environment may also lead to changes in polar bear use of their terrestrial environment. Sea ice must be stable for ice denning to be successful. Therefore, if the quality of sea ice decreases, more females may den on land (Durner et al. 2006). In addition, if large areas of open water persist until late winter females may be unable to access land to den (Stirling and Andriashek 1992). Climate change may also affect the quality of denning habitat on coastal or island bluffs due to

rapid erosion and slope failure due to melting permafrost (Durner et al. 2006). Changes
 FIGURE 17. Polar Bear Sightings in the Beaufort Sea

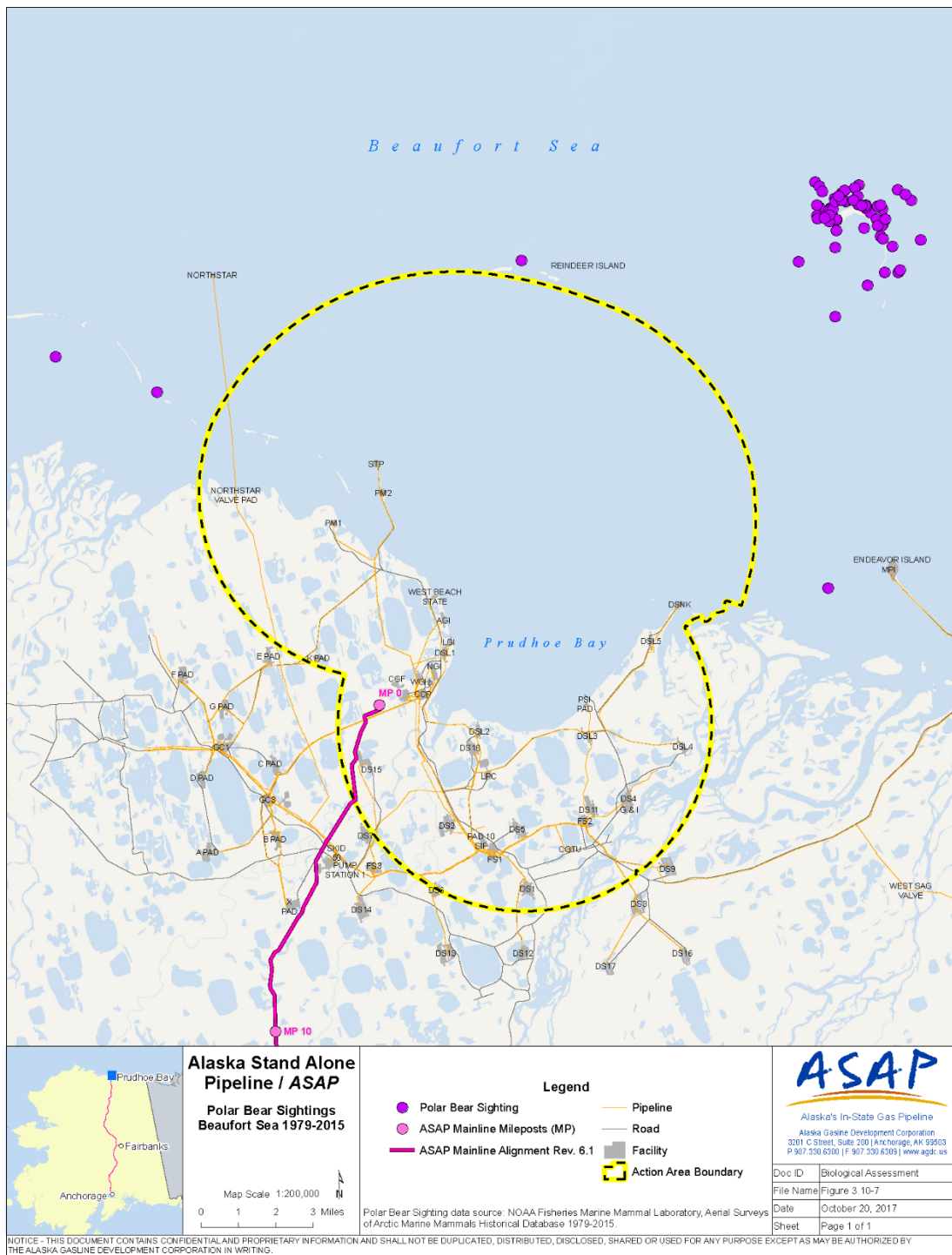


FIGURE 18. Maternal Polar Bear Den Locations / Habitat in the Beaufort Sea



in autumn and winter precipitation or wind patterns could significantly alter the availability and quality of denning habitat (Durner et al. 2003). Polar bears' use of coastal habitats in the fall, during open water and freeze-up conditions, has increased since 1992 (USFWS 2006). Since the late 1990s, the timing of ice formation in the fall has occurred later in the year (November or early December, as opposed to early or mid-October in the 1980s) resulting in an increased amount of time that the area was not accessible to polar bears. Consequently, bears spent a greater amount of time on land and not feeding. A decrease in sea ice has also led to more female polar bears coming ashore to den and give birth to young (Fischbach et al. 2007).

Recent formation of nearshore ice increases the probability of bear-human interactions occurring in coastal villages (Schliebe et al. 2006). U.S. Geological Survey created a website containing a compilation of new polar bear findings (http://alaska.usgs.gov/science/biology/polar_bears/).

Human Development

The primary form of human development near the polar bear range that overlaps the action area has been oil and gas exploration and production-related facilities. Minimal effects have occurred to polar bears from the oil and gas industry in Alaska during the past 30 years. Since 1968 there have been only two known incidents of lethal takes of polar bears by industry in Alaska. Formal Section 7 Consultations have been conducted for the Chukchi Sea and Beaufort Sea ITRs Beaufort Sea Incidental Take Regulations (ITRs), which authorize the incidental taking of a small number of polar bears in these seas and the adjacent ACP during oil and gas activities in the Alaskan Arctic. No lethal take associated with the oil and gas industry has occurred during the period covered by ITRs (1991 until present) in either the Chukchi or Beaufort seas (USFWS 2009a).

Females and cubs denning on land can be vulnerable to disturbance from oil and gas activities; however, most females have been found to be relatively tolerant of human disturbance (Amstrup 1993). If disturbed, females appear more likely to abandon their dens in the fall before cubs are born and relocate, than in the spring when young cubs are less likely to survive if they leave the maternal den early (Lentfer and Hensel 1980; Amstrup 1993; Durner et al. 2006). Polar bears occur at or near most coastal and offshore facilities, and can occur in the Project action area. The proposed Project and associated activities would be subject to regulations under the MMPA, ITRs, and associated authorizations, therefore minimizing human-bear incidents and interactions.

4.2.4 Pacific Walrus (Not Listed / Candidate)

Biological Populations and Listing Status

On September 10, 2009, the USFWS announced a finding on a petition to list the Pacific walrus as threatened or endangered under the ESA and to designate critical habitat. The USFWS found that the petition presented scientific information indicating that listing a subspecies may be warranted. On February 10, 2011, the USFWS designated the Pacific walrus as a candidate for ESA protection. The 12-month finding indicated that, while the

Pacific walrus warrants protection under the ESA, there were higher priority species that need to be addressed prior to the walrus. The walrus' status would be reviewed annually and a proposed rule to protect the species under the ESA would be developed in the future. On October 5th, 2017, the USFWS noticed its 12-month findings for a petition to list Pacific walrus as an ESA species. The Service determined that a listing is not warranted at this time (50 CFR Part 17 / 82 FR 46618 / Docket ID FWS-R7-ES-2017-0069). The determination to not list walrus means that this Biological Assessment doesn't require an assessment of walrus at this time. However, because the determination to not list walrus is likely to receive legal challenge in the coming months, the evaluation of impacts to the species has been left in this document despite it not being listed.

Populations Status, Trends, and Abundance

Aerial surveys of Pacific walrus conducted jointly by the U.S. and Russia between 1975 and 1990 produced population estimates ranging from 201,039 to 234,020 animals (USFWS 2014c). However, those estimates were considered minimum values and were not suitable for detecting trends in population size (Gilbert et al. 1992). In 2006, the methodology for walrus surveys changed to use more advanced technologies. The estimates derived from 2006 joint United States – Russian Federation surveys using the newer methodology estimated walrus population to be 129,000 with 95 percent confidence limits of 55,000 to 507,000 individuals in 2006 (Speckman et al. 2011; USFWS 2014c). This estimate did not account for areas that were not surveyed, some of which are known to have had walruses present. Therefore the estimate was negatively biased to an unknown degree (Speckman et al. 2011; USFWS 2014c) which provides assurance that walrus population size was greater than the estimate (NMFS 2005). The historic walrus population size estimates from 1975 are not directly comparable to present day estimates (Fay et al. 1997) because of differences in survey methods, timing of surveys, and segments of the population surveyed (USFWS 2014c).

Range

The Pacific walrus is distributed in Russian and Alaskan waters over the continental shelves of the Chukchi and Bering seas, and ranges in the north from the eastern East Siberian Sea to the western Beaufort Sea. Migrations are directly related to the seasonal advance and retreat of the sea ice (Fay 1982). Walruses are found in waters less than 656 ft. (200 m) deep along the pack ice margin where ice concentrations are less than 80 percent (Fay 1982). This ice-covered, shallow continental shelf is important for walruses, as they use this for rest and for calves incapable of deep or long-term diving (Minerals Management Service (MMS) 2007). Walruses use floating sea ice for birthing, nursing, resting, isolation from predators and for passive transport to new feeding areas (USFWS 2009b). Reduced summer sea ice over the continental shelf in the Chukchi Sea in the past decade has resulted in increased use of land haulouts by adult females and young during ice-free periods (Jay and Fischbach 2008).

Life History and Habitat Use

Walrus feed on benthic macroinvertebrates and prefer to forage in areas less than 262-ft.-deep (80 m deep) (Fay 1982). Walrus feed on a wide variety of organisms including worms, snails, clams, marine birds, and seals; but most frequently on clams, snails, and polychaete worms (Fay 1982; Sheffield and Grebmeier 2009).

Walrus in the Action Area

The Pacific walrus is found in low numbers in the Beaufort Sea (USFWS 2010b) (see Figure 19). Some walrus have hauled-out onshore near Kaktovik in the past, but this is not a frequent event. The Beaufort Sea does not provide the optimal habitat for walrus. The probability of walrus occurring in or near the proposed action area offshore of Prudhoe Bay is very low, as is the probability of walrus hauled-out on the coast in the action area (Fischbach, personal comm. 2010).

Threats

Subsistence Hunting

Walrus have an intrinsically low rate of reproduction and are therefore limited in their capacity to respond to exploitation (Fay 1982). In the late 19th century, American whalers intensively harvested walrus in the northern Bering and southern Chukchi seas. The population was substantially depleted by the end of the century (Fay et al. 1989). Since 1930, the combined U.S. and Russia walrus harvests have ranged from 2,300 to 9,500 animals per year. These harvest levels were thought to be of sufficient scale to result in subsequent population declines (Fay et al. 1989; Fay et al. 1997). Since 1992, harvest levels have been limited; through the 1990s harvests ranged from approximately 2,400 to 4,700 animals per year. Current assessment of sustainable harvest rate is unknown (Garlich-Miller et al. 2006).

Climate Change

Pacific walrus is an ice-dependent species. Individuals use ice for many aspects of their life history throughout the year. Because of the projected loss of sea ice over the 21st century, USFWS has identified the loss of sea ice and associated effects to be a threat to the Pacific walrus population. Although USFWS anticipates that sufficient ice would remain, so that breeding behavior and calving would still occur in association with sea ice, the locations of these activities are expected to change in response to changing ice patterns. The greatest change in sea ice, walrus distribution, and behavioral responses is expected to occur in the summer (June to August) and fall (October to November), when sea ice loss is projected to be the greatest. USFWS has concluded that loss of sea ice, with its concomitant changes to walrus distribution and life-history patterns, would lead to a population decline, and is a threat to Pacific walrus in the foreseeable future because, over time, walrus would be forced to rely on terrestrial haul-outs to an increasingly greater extent.

Final SEIS/ASAP 70 Biological Assessment



Although USFWS determined that threats resulting from climate change warrant listing Pacific walrus under the ESA, the agency also determined that such a listing is precluded by limited resources and higher priority species. USFWS has assigned the Pacific walrus a priority listing of 9, on a scale of 1 to 12, with 1 representing the highest priority species for ESA listing and protection. USFWS assigned Pacific walrus a lower priority ranking because of its relatively high present abundance and its ability to rely on terrestrial haul-outs as sea ice diminishes.

Commercial Fishing and Marine Vessel Traffic

As walruses are normally closely associated with sea ice, their interaction with commercial fishing and marine vessel traffic in the Arctic is very limited.

Offshore Oil- and Gas-related activities

Oil- and gas-related activities have been conducted in the Chukchi and Beaufort seas since the late 1960s. Much of this activity has occurred in the Beaufort Sea Outer Continental Shelf (OCS) rather than the Chukchi Sea OCS. Pacific walruses do not normally range into the Beaufort Sea (USFWS 2002b), though individuals and small groups are occasionally observed. During the history of the ITRs in the Beaufort Sea interactions with walruses have been minimal. From 1994 to 2004, a total of nine sightings, involving 10 walruses were recorded by Industry during the open water seasons. A recent aerial survey reported 28 sightings of approximately 900 individuals in the Beaufort Sea between Barrow and 153°W (Clarke et al. 2013).

4.3 Critical Habitat

4.3.1 Ringed Seal Proposed Critical Habitat

Critical habitat for the ringed seal was proposed on 9 December 2014. The proposed critical habitat includes ice habitat used by ringed seals for subnivean birth lairs and molting. The proposed boundaries for ringed seal critical habitat include U.S. waters out to 200 nautical miles (370 km) and covering the US Exclusive Economic Zone (NMFS 2014, Figure 20). The proposed boundaries are defined by the Bering Sea, south of St. Mathew Island, and Nunivak Island at the south to the Chukchi and Beaufort Seas in the North, and extending east to the Canada border (79 FR 236). The public comment period for the proposed rules expired 9 March 2015. As the critical habitat area only pertains to ice habitat, the planned open-water vessel activities from August through September would not impact this critical habitat if officially designated during the project's duration since they are planned for ice-free waters. Winter construction and dredging activities would occur when sea ice is present, but only on bottomfast / shorefast ice, far away from the ice shelf where ice seals would be expected to be present in mid-winter. Summer work at West Dock would be done with PSOs present in accordance with Sections 1.0 and 2.0 of Appendix B.

In Alaska, the range of the ringed seal encompasses the Beaufort, Chukchi, and Bering seas and can reach as far south as Bristol Bay in Alaska in years with extensive ice

coverage. Throughout their range, ringed seals exhibit an affinity for ice-covered waters. Ringed seals excavate subnivean lairs in the snow above some of the holes, in which they have their pups between March and April. Ringed seals tend to prefer large ice floes (i.e., greater than 147 ft. (45 m) in diameter) and are often found in the interior ice pack where the sea ice coverage is greater than 90 percent (Simpkins et al. 2003). They remain in contact with ice most of the year and pup on the ice in late winter to early spring. During late April through June, ringed seals are distributed throughout their range from the southern ice edge northward (Burns and Harbo 1972; Burns et al. 1981; Braham et al. 1984). Ringed seals overwinter on pack and shorefast ice (Bengston et al. 2005).

FIGURE 20. Proposed Ringed Seal Critical Habitat



Source: NMFS 2014

4.3.2 Polar Bear Critical Habitat

Designation of Critical Habitat

Impacts to polar bear and its critical habitat were described in detail in the 2012 FEIS (USACE 2012). The final USFWS listing rule for polar bear critical habitat was published in the Federal Register on May 15, 2008 (73 FR 28212). The proposed rule to designate critical habitat was published in the Federal Register on October 29, 2009 (74 FR 56058), and the document was published on May 5, 2010 (75 FR 24545). In total, approximately 187,157 square miles (484,734 square km²) fall within the boundaries of the critical habitat designation. Figure 21 provides the location and boundaries of the 3 units of designated polar bear critical habitat (USFWS 2010d).

In January 2013, an order issued by the U.S. District Court remanded the 2010 ruling for critical habitat. However, in February 2016, the U.S. Court of Appeals for the Ninth Circuit upheld the USFWS designation of critical habitat in Alaska for polar bear. It is likely that further litigation regarding polar bear critical habitat would occur after the publication of this document.

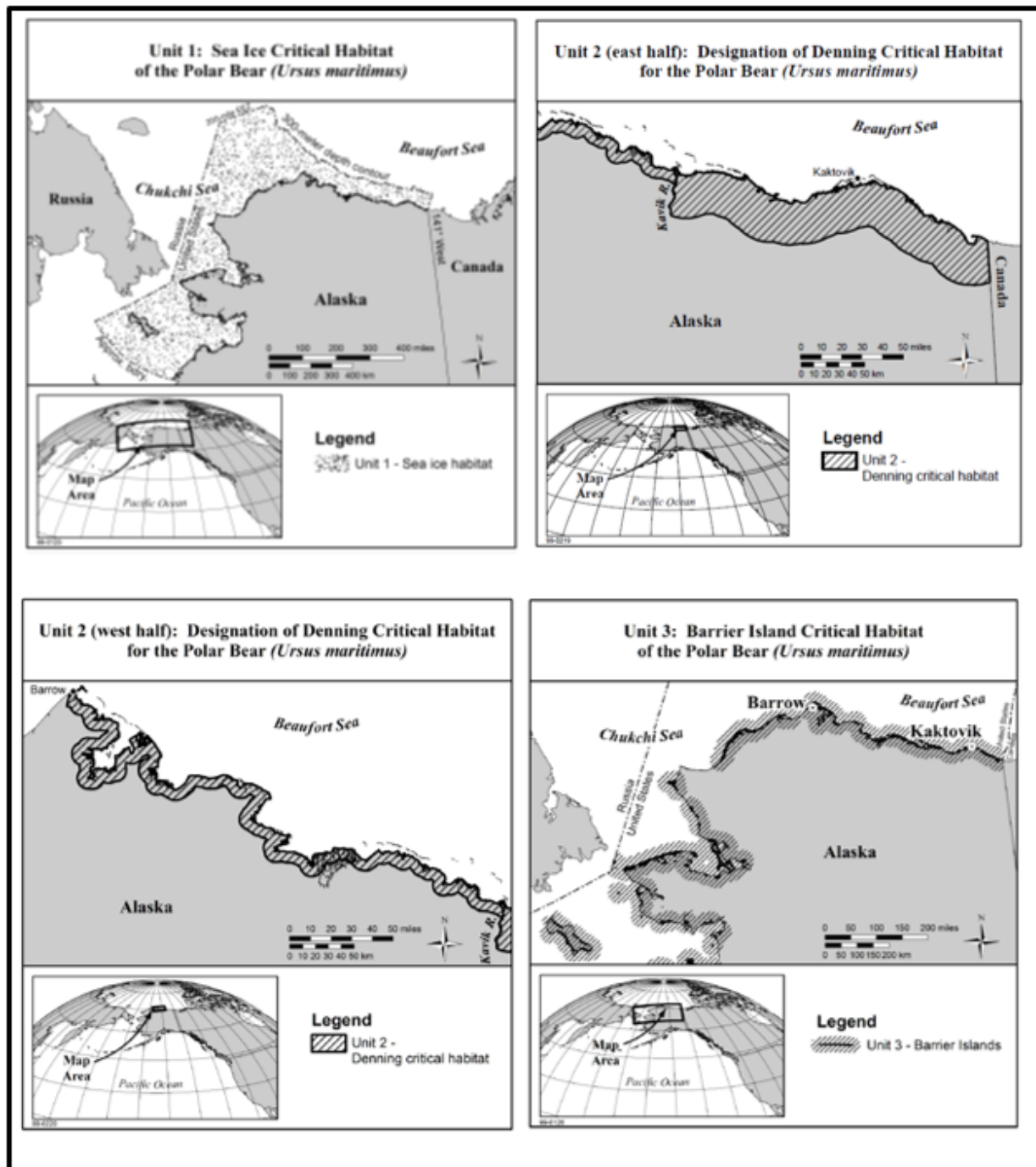
An estimated 1,500 polar bears occur in the Southern Beaufort Sea polar bear population (73 FR 95:28212). This population is considered to be declining and is predicted to continue to decline because of declining sea ice habitat (73 FR 95:28212).

In Alaska, polar bears remain on sea ice year-round over most of their range, although their distribution varies seasonally with the seasonal extent of sea ice cover and availability of prey (primarily ringed seals and bearded seals). In the fall, when the annual sea ice begins to form in the shallower water over the continental shelf, polar bears that had retreated north of the continental shelf during the summer return to the shallower shelf waters where seal densities are higher (Durner et al. 2009). Polar bears in the southern Beaufort Sea reach their peak weights during the fall and early winter period (Durner and Amstrup 1996). Consequently, the availability and accessibility of prey during this time may be critical for survival through the winter. Polar bears are active all winter moving to adjust to changing sea ice and seal distributions. During the winter period, when energetic demands are the greatest, nearshore lead systems and ephemeral (may close during the winter) or recurrent (open throughout the winter) polynyas (areas of open sea surrounded by sea ice) are important for seals, and are thus important foraging habitat for polar bears (Lentfer and Hesel 1980). Nearshore lead systems and the shore-fast ice zone are important hunting and foraging habitat for polar bears in the spring (Stirling and Derocher 1993).

In Alaska, most land use is by maternal females in dens during the winter. Female bears use dens to give birth. They typically excavate dens in snow in November, give birth in late December, and emerge from their dens in March or April (Ramsay and Stirling 1988). Young bears stay with their mothers until they are weaned at about two years of age, and female bears may reproduce at 3-year intervals. Polar bears may also occur on shore when there is open water during summer and early fall. In recent years, the prolonged open water season has resulted in increased use of terrestrial coastal areas by polar bears for longer durations during the summer and early fall (Schliebe et al. 2006).

In northern Alaska, denning habitat is more diffuse than in other areas such as Wrangel Island (located between the Chukchi Sea and East Siberian Sea) where high-density denning by polar bears has been identified (Amstrup 2003). Polar bears in the Beaufort Sea exhibit fidelity to denning areas but not to specific den sites (Amstrup and Gardner 1994). Barrier islands, river bank drainages, and coastal bluffs that occur at the interface of mainland and marine habitat that are able to accumulate snow in fall and early winter appear to be the preferred topographic features for denning polar bears in Alaska (Durner et al. 2010).

FIGURE 21. Polar Bear Critical Habitat



Source: USFWS 2010d

Suitable macrohabitat characteristics of these topographic features were identified in the final critical habitat designation for polar bears (Lentfer and Hesel 1980) and include:

- Steep, stable slopes (mean = 40, SD = 13.5), with heights ranging from 4.3 to 111.6 ft. (1.3 to 34 m) (mean = 17.7ft.(5.4 m), SD = 24.3ft.(7.4 m)), and with water or relatively level ground below the slope and relatively flat terrain above the slope;
- Unobstructed, undisturbed access between den sites and the coast; and
- The absence of disturbance from humans and human activities that might attract other polar bears.

Polar bears on land would be most likely to be affected by the proposed Project (i.e., maternal females in dens during the winter or polar bears on shore during open water in the summer and early fall). Typically, polar bears avoid humans. This is demonstrated by the areas where they choose to rest, their den site locations, and their avoidance of snow machines (Anderson and Aars 2008). Polar bears tend to avoid denning in areas where active oil and gas exploration, development, and production activities are occurring (Lentfer and Hesel 1980). However, if predictions of the continued loss of Arctic sea ice due to climate change occur, it is expected that the number of polar bears denning on land in northern Alaska east of Barrow would continue to increase (Schliebe et al. 2006). This is supported by the recent increase in the number of bears using the coastal areas during the summer and early fall in northern Alaska (Schliebe et al. 2006). Polar bears face increasing potential for conflicts with humans in a warming Arctic, as industrial activity expands (Arctic Climate Impact Assessment 2005), longer ice-free periods force polar bears to spend more time on land (Schliebe et al. 2006) and nutritional stress encourages polar bears to seek anthropogenic food sources (Regehr et al. 2007). Increased use of terrestrial environments by polar bears would likely increase bear/human interactions in the future.

4.3.3 Steller's Eider Critical Habitat – Outside Action Area

Critical Habitat for Steller's eider exists over 100 miles (161 km) from the Project area. It would not be impacted by the Project.

4.3.4 Spectacled Eider Critical Habitat– Outside Action Area

Critical Habitat for spectacled eider exists over 400 miles (644 km) from the Project area. It would not be impacted by the Project.

5.0 Effects of the Action:

The following sections provide an analysis of the potential effects of the proposed action on the threatened and endangered species, critical habitat, and candidate / proposed species within the Action Area. The analyzed effects include direct, indirect, and cumulative effects.

Direct and Indirect Effects

Direct effects are the immediate effects of the proposed Project in the action area. Disturbance stemming from noise and habitat loss associated with construction, operation, and maintenance are considered direct effects. Indirect effects are reasonably foreseeable results from activities associated with the Project that occur at a later time or at a distance removed from the immediate project area, such as effects on a prey species or changes in a pattern of land use.

5.1 Threatened and Endangered Species Managed by NMFS

The removal and replacement of existing damaged timber barge mats, removal and replacement of existing damaged upper and lower fenders, and construction of ramps behind the face of the existing DH3 would all occur in uplands. These activities would not generate noise at levels which would harm or harass marine mammal species nor would these actions result in any substrate disturbance within habitats used by marine mammals or their prey.

5.1.1 Underwater Sound

Marine mammals use hearing and sound transmission to perform vital life functions. Introducing sound into their environment could disrupt those behaviors. Sound (hearing and vocalization/ echolocation) serves four primary functions for marine mammals, including: 1) providing information about their environment; 2) communication; 3) prey detection; and 4) predator detection. The distances to which construction activities at West Dock would be detectable by marine mammals depends on sound source levels, frequency, ambient noise levels, the propagation characteristics of the environment, and sensitivity of the receptor (Richardson et al. 1995). The effects of sounds from industrial activities on marine mammals might include one or more of the following: tolerance; masking of natural sounds; behavioral disturbance; and temporary or permanent hearing impairment (referred to as temporary threshold shift [TTS] or permanent threshold shift [PTS]), or non-auditory physical effects (Richardson et al. 1995).

The NMFS and USFWS have defined levels of harassment for marine mammals. Level A harassment is defined as "...any act of pursuit, torment, or annoyance which has the potential to injure a marine mammal or marine mammal stock in the wild." Level B harassment is defined as "...any act of pursuit, torment, or annoyance which has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering."

In July 2016, NMFS published the *Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing: Underwater Acoustic Thresholds for Onset of Permanent and Temporary Threshold Shifts* (NMFS 2016b). The guidance document identifies the received levels, or acoustic thresholds for Level A harassment, at which individual marine mammals are predicted to experience changes in their hearing sensitivity (either temporary or permanent) for acute, incidental exposure to underwater

anthropogenic sound sources. The USFWS has not published comprehensive guidance for acoustic thresholds for marine mammals in its jurisdiction (e.g., polar bear, walrus).

The 2016 NMFS guidelines, marine mammals are separated into five functional hearing groups; source types are separated into impulsive (impact pile driving) and non-impulsive (vibratory pile driving); and require analyses of the distance to the peak received sound pressure level (Lpk) and 24-hour cumulative sound exposure level (SEL24h).

The current Level B (disturbance) NMFS threshold for assessing the onset of temporary threshold shifts (TTS) for impulsive sound is 160 decibels referenced to one microPascal root mean square (dB re 1 μ Pa rms) and 120 dB re 1 μ Pa rms for non-impulsive sound for all marine mammals.

The current Level A USFWS threshold for assessing injury (Level A) for polar bears and walruses for impulsive sound is a received level of 190 dB re 1 μ Pa rms and 180 dB re 1 μ Pa rms for non-impulsive; and the current Level B USFWS threshold for assessing disturbance (Level B) for is 160 dB re 1 μ Pa rms.

Table 8 provides a summary of the disturbance guidelines. For purposes of this evaluation, all underwater sound pressure levels (SPLs) are reported as dB re 1 μ Pa, and all airborne SPLs are reported as dB re 20 μ Pa.

The activities associated with the expansion of West Dock which would generate noise levels that exceed Level A or Level B thresholds include impact pile driving of mooring dolphins (48-inch (122 cm) pipe), vibratory pile driving of sheet piles, screeding, use of a ditchwitch, and dredging. Table 9 summarizes the estimated sound levels and frequency ranges associated with these activities.

The measured levels reported in Table 9 for impact pile driving come from Illingworth and Rodkin (2007), which is a compendium of impact and vibratory pile driving measurements. Measurements associated with vibratory pile driving of sheet piles, a ditchwitch to cut ice, a backhoe for underwater trenching, and a bulldozer for trenching (similar to the winter dredging) were measured during the construction of Northstar Island (Greene et al. 2008). All activities are relatively low frequency (<1,000 Hz) and are located in shallow waters at West Dock (<14 ft. (< 4 m)).

TABLE 8. Marine Mammal Thresholds for Injury and Disturbance from Underwater Sounds

Marine Mammals	Injury (Level A) Threshold		Disturbance (Level B) Threshold	
	Impulsive	Non-Impulsive	Impulsive	Non-Impulsive
Low-Frequency Cetaceans	219 dB L _{pk} 183 dB SEL	199 dB SEL	160 dB rms	120 dB rms
Mid-Frequency Cetaceans	230 dB L _{pk} 185 dB SEL	198 dB SEL	160 dB rms	120 dB rms
High-Frequency Cetaceans	202 dB L _{pk} 155 dB SEL	173 dB SEL	160 dB rms	120 dB rms
Phocid Pinnipeds	218 dB L _{pk} 185 dB SEL	201 dB SEL	160 dB rms	120 dB rms
Otariid Pinnipeds	232 dB L _{pk} 203 dB SEL	219 dB SEL	160 dB rms	120 dB rms
Polar Bears and Walruses	190 dB rms	180 dB rms	160 dB rms	

TABLE 9. Summary of Underwater Noise Associated with the Proposed Activity

Noise Source	Frequency Range and Concentration (Hz)	Sound Pressure Level (dB re 1 μ Pa)			Reference
		Peak	RMS	SEL	
Impact, 48 inch steel pipe	Range: 100-4,000 Hz Concentration: 125	205 dB at 10 m	195 dB at 10 m	185 dB at 10 m	Illingworth & Rodkin 2007
Vibratory, sheet pile	Range: 10-10,000 Hz Concentration: 24-25 Hz tone	--	143 dB at 100m	--	Greene et al. 2008
Ditchwitch	Range: 10-8,000 Hz Concentration: 20 Hz tone		122 dB at 100 m	--	Greene et al. 2008
Underwater trenching (bulldozer in shallow water)	Range: 10-8,000 Hz Concentration: 25-200 Hz	--	114 dB at 100 m	--	Greene et al. 2008
Underwater grading (backhoe in shallow water)	Range: 10-8,000 Hz Concentration: 31-400 Hz	--	125 dB at 100 m	--	Greene et al. 2008

The underwater noise from screeding is primarily from the cavitation of the propeller of the vessel, the screeding itself produces minimal noise relative to the noise from the vessel. Blackwell and Greene (2006) for Northstar measured 145 dB re 1 μ Pa at 164 ft. (50 m) during screeding.

Blackwell et al. (2004) measured underwater sounds associated with production drilling at Northstar, which was occurring in upland areas, on a gravel island, and reported a spreading loss of 21.5 log R. They also reported that the shallow water depth around Northstar would tend to limit the transmission of low frequencies and resulted in a cutoff of received levels in the 10-30 Hz range. They report broadband sounds from these

activities diminished to the median background level of 76-77 dB (10-10,000 Hz range) at distances between 1.8 and 5.8 miles (3 and 9.4 km) when measured under sea ice.

NMFS has required the use of practical spreading, or a propagation loss of $15 \log R$, in the absence of site-specific data. There is evidence from other studies to indicate that propagation loss of $25-30 \log R$ is possible in the Beaufort Sea. For this project, a spreading loss of $20 \log R$ would be used to calculate exclusion zones during trenching, grading, and use of ditch witch. During vibratory and impact pile driving, $17.5 \log R$ would be used to calculate exclusion zones.

The calculated distances for impact pile driving to the Level A peak thresholds are less than 16 ft. (5 m) from the source. The distances to the Level A thresholds for vibratory pile driving are approximately 0.9 miles (1,500 m) and less than 0.3 miles (50 m) for all non-pile driving activities (Table 10). Received airborne levels would be less than 100 dB threshold at less than 165 ft. (50 m) from the source.

The distance to the Level B threshold for impact pile driving is approximately 0.6 miles (1 km) from the source, and approximately 1.4 miles (2.2 km) for vibratory pile driving, and is less than 0.1 mile (180 m) for all other non-pile driving activities. In summary, underwater sound levels from any activity are expected to fall below NMFS thresholds at a distance of 1.4 miles (2.2 km) from the source. Based on measurements from other sites described above, sound levels would likely be diminished to background levels at less than 3 miles (5 km) from the source.

TABLE 10. Calculated Distance to NMFS Thresholds from Underwater Sources

			Level A LF Cetaceans			Level A MF Cetaceans			Level A Phocids			Level B Marine Mammals	
			Impulsive		Non-Impulsive	Impulsive		Non-Impulsive	Impulsive		Non-Impulsive	Impulsive	Non-Impulsive
			L _{pk}	SEL	SEL	L _{pk}	SEL	SEL	L _{pk}	SEL	SEL	rms	rms
Description	Source Level (dB)	Source Distance (m)	219	183	199	230	185	198	218	185	201	160	120
Impact – 48-inch pipe	205 pk, 195 rms, 185 SEL	10	1.50	2,549.92	-	0.34	134.37	--	1.72	1,469.31	--	1,145.05	--
Vibratory - sheet pile	143	100	--	--	30.67	--	--	3.62	--	--	19.77	--	2,253.93
Ditchwitch	122	100	--	--	3.26	--	--	0.53	--	--	2.25	--	125.89
Underwater trenching	114	100	--	--	1.30	--	--	0.21	--	--	0.89	--	50.12
Underwater grading	125	100	--	--	4.61	--	--	0.75	--	--	3.17	--	177.83
Assuming transmission loss of 20 log R for trenching, grading, and ditchwitch; 17 log R for pile driving. Impact pile driving assumes 5 hrs/day; 1,560 strikes/hr. Vibratory pile driving, ditchwitch, trenching, and grading assumes 15 hours/day.													

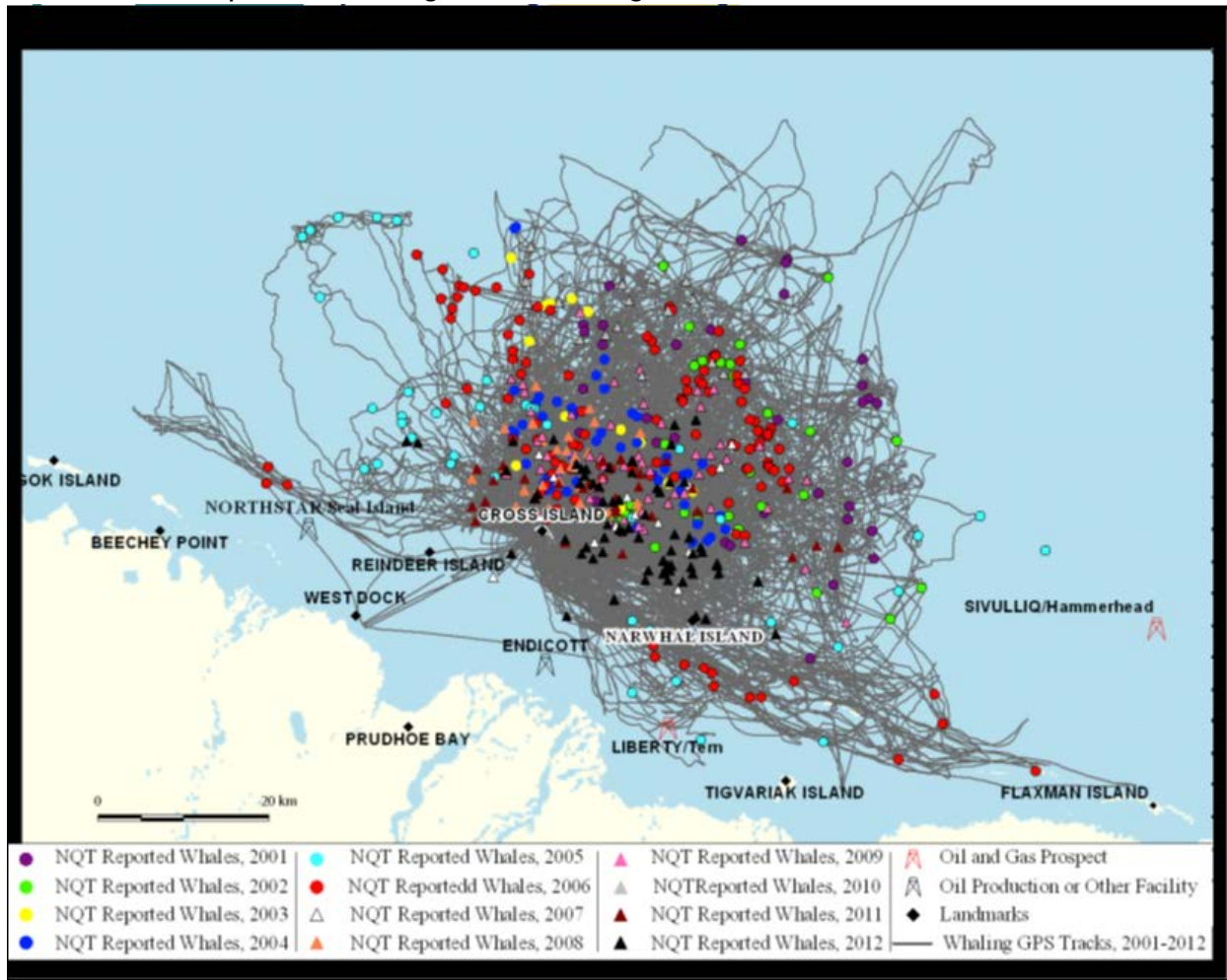
Ringed seals maintain breathing holes and create lairs (snow caves) in which they haul out and give birth, so they could be potentially exposed to airborne and underwater sounds during the sensitive birthing time period. However, there have been numerous studies associated with ringed seal responses to industrial activities near Northstar, which indicated ringed seals tolerate construction noise (Moulton et al. 2003; Blackwell et al. 2004; Williams et al. 2006). Moulton et al. (2003) conducted aerial surveys during the spring of seals on landfast ice in 1997-1999 (pre-construction) and in 2000-2001 (post-construction) and concluded that seal density were not significantly reduced by the industrial activities. Blackwell et al. (2004) observed behaviors of ringed seals during spring and winter during pile driving at Northstar and reported that none of the 23 ringed seals observed exhibited strong reactions to either acoustic or visual stimuli. Williams et al. (2006) reported that the abandonment rate of lairs/holes was not significantly different closer to the Northstar Island and ice roads versus farther away. This, plus associated aerial survey results (Moulton et al. 2005), showed that if there was altered habitat use near Northstar it was not detectable. They detected higher structure abandonment rates than previous work, and determined that the higher ringed seal structure abandonment was due mainly to the season and ice deformation.

Bearded seals are likely to be located further offshore in the winter, preferring water depths of 82 ft. (25 m) or more. Bearded seals will move shoreward in the summer toward open water, when water depths under the pack ice exceed 656 ft. (200 m). The Beaufort Sea has less favorable habitat compared to the Chukchi Sea, due to a narrower continental shelf and the lack of suitably shallow water depths under the pack ice. In the Beaufort Sea, during open water, bearded seals prefer to the continental shelf seaward of the scour zone (NMFS 2014b).

The action area extends out to Reindeer Island, which is located 6.9 miles (11.1 km) from DH3. From 2001-2012, the Nuiqsut Cross Island whaling captains did not report any

sightings of whales southwest of Cross Island during their harvest (Galganitis 2014), as shown in Figure 22. Further, as part of the scoping meeting conducted in Nuiqsut in 2014, the whaling captains indicated bowhead whales were not typically found southwest of Cross Island towards West Dock (USACE 2014). Cross Island is located 13.8 miles (22.2 km) from DH3.

FIGURE 22. Reported Whaling GPS Tracking and Observed Bowhead Whales



Reported whaling GPS tracks (gray lines) and observed bowhead whales at Cross Island 2001-2012 (from Galganitis 2014).

Given the rarity of bowhead whale sightings near the action area, and the lack of sightings within the ensonified area, impacts to bowhead whales would be minimal. Based upon the calculated distance at which noise would fall below the level at which harassment would occur (Level B), which is explained above, AGDC will monitor an exclusion zone of 0.6 miles (1,000 m) from all non-pile driving activities, screeding, use of a ditchwitch, and dredging in winter, for NMFS managed marine mammals. Also based upon the distance at which Level B harassment would no longer occur, AGDC will monitor an exclusion zone of 1.4 miles (2,200 m) from all pile driving activities, including vibratory

pile driving of sheet pile and impact pile driving of the 48 inch (122 cm) pilings, for NMFS managed marine mammals. Pile driving will shutdown before pinnipeds or cetaceans come within 2,200 m of pile driving activities. During non-pile driving activities, screeding, use of a ditchwitch, and dredging in winter, activities will shutdown before pinnipeds or cetaceans come within 0.62 miles (1,000 m) of non-pile driving activities. The exclusion zones for the two locations where protected species monitoring would occur are shown in Figures 23 and 24. Noise impacts are expected to be temporary in nature and localized, and potential impacts would be reduced through mitigation measures, including the use of PSOs and shut down zones as described in detail in Sections 1.0 and 2.0 of Appendix B.

5.1.2 Vessels

The fate of sound resulting from vessel transit is site-, season-, and weather-specific (U.S. Department of Commerce (USDOC), NOAA, NMFS 2008). Oceanographic differences in bathymetry and seafloor characteristics play an enormous role in how a sound is carried. In addition, the frequency, intensity, and pressure of a sound would affect its propagation and resulting effects; this means that the same sound could differ widely among different sites (USDOC, NOAA, and NMFS 2008). These variables make it extremely difficult to estimate how sounds from transiting vessels would be heard by and affect whales or seals in the area. However, noise from a transiting vessel is relatively minimal and all data suggest that, in general, impacts would be limited to temporary deflection away from the transiting vessel (MMS 2009a).

Barges are expected to reach the open water marshalling area around August 1. The first barges would be offloaded around August 2. The last barge would be unloaded around September 9. The barge marshalling area is located 3-5 miles (4.8 – 8 km) offshore from West Dock. Upon arrival at Prudhoe Bay the barge and tug combinations would remain offshore until they are brought to DH3 for offload. While waiting to be brought to DH3, they would either “lay on their wire” or “jog” further offshore. “Laying on their wire” is a condition where the tugs allow the tow cable to go slack and sink to the sea bed. This creates enough resistance to keep the barges in place, similar to being anchored. “Jogging” describes when the tugs keep a steady strain on the tow cable and travel in circles. Because it takes a much larger area to “jog,” “jogging” would be employed further offshore and only when the weather conditions are not favorable to laying on their wires.

Vessels associated with the proposed Project would only be at West Dock during summer months when water is typically ice-free in the action area. Seals prefer water near ice platforms on which they can haul-out. However, seals do also swim in areas of open water. Seals swimming in the water are not strongly affected by vessel noise (Richardson et al. 1995). Seals hauled out respond more strongly to vessel noise and often respond by diving into the water (Richardson et al. 1995). It is not likely that there would be ice

FIGURE 23. Exclusion Zones at Temporary Bridge Location

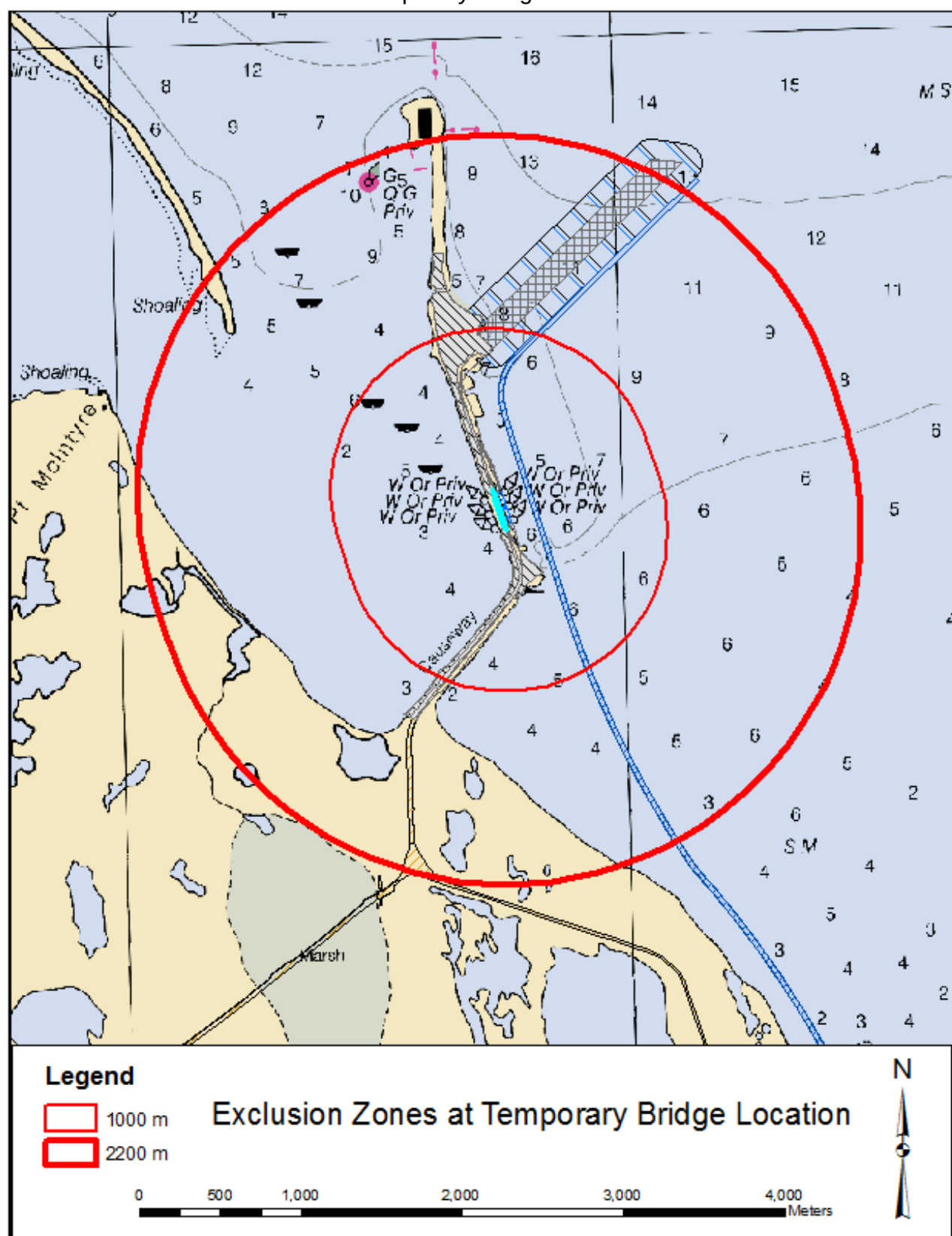
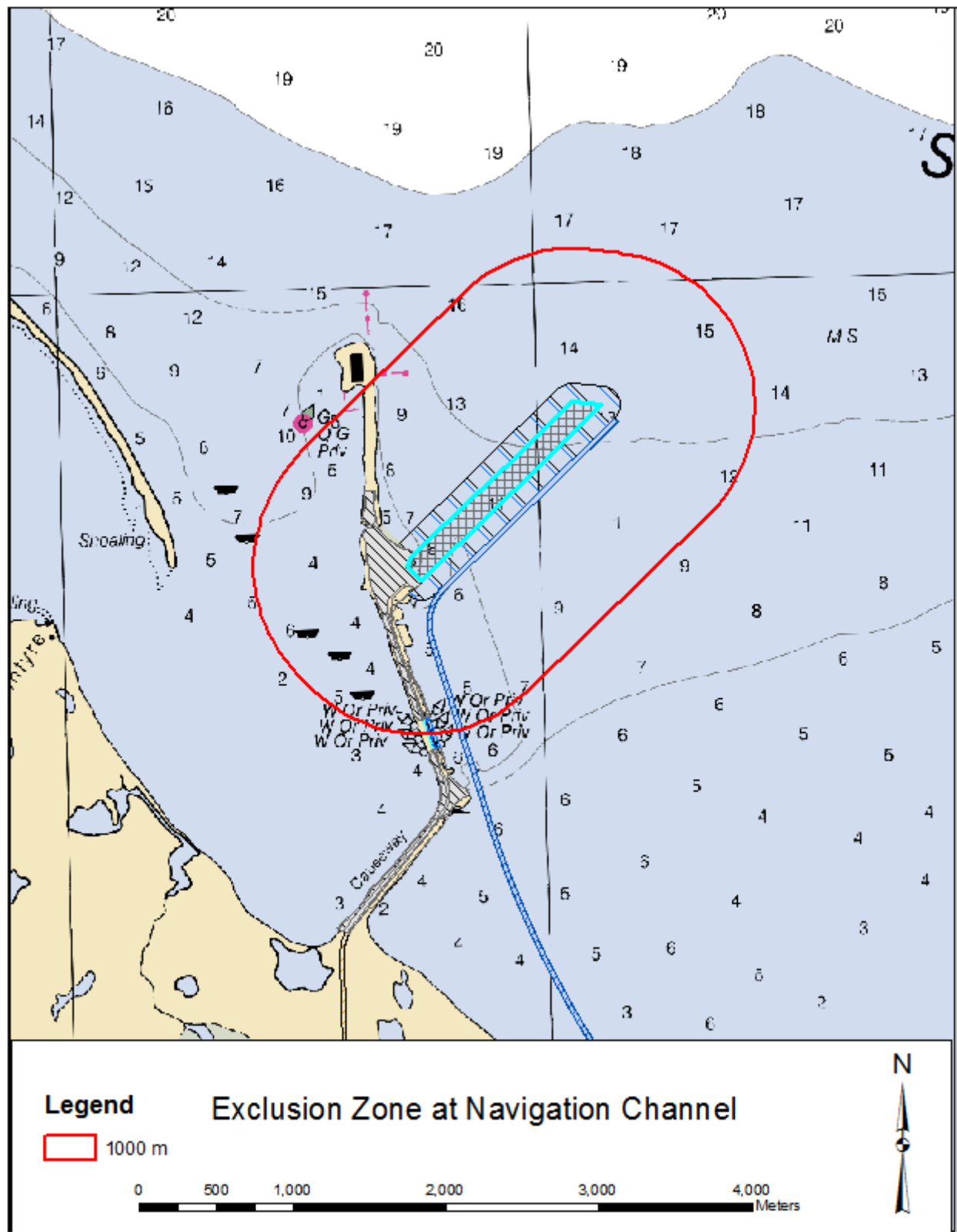


Figure 24. Exclusion Zones at Dredge Area, Navigation Channel



available for seals at West Dock during the summer when vessels associated with the Project would be transiting or staging for module offload. BOEM previously determined that increasing vessel traffic in the entire Beaufort Sea has no more than a negligible effect on ice seals (MMS [now BOEM] and NMFS 2008; NMFS 2012).

Bowhead whales would be present in the vicinity of Prudhoe Bay during the fall migration. Bowhead reactions are hunted annually for subsistence. In addition, bowhead whales have been commercially hunted within some individuals' lifetimes. The typical reaction of a bowhead whale to a vessel is to swim away. Endangered whales have been shown to react more strongly to vessels with outboard motors than those with diesel motors, as well as to vessels that approach quickly and directly rather than slower vessels moving in a direction other than toward the whale (MMS 2009a). Bowhead whales have fewer or less intense avoidance reactions when they are actively engaged in feeding or another activity (USDOC, NOAA, and NMFS 2008). In the event of bowhead whale disturbance, feeding or other behaviors resume relatively quickly after the disturbance event, usually within minutes or hours. Some individuals may return to the exact same location, though scattering may last a little longer, but displacement should also be short-term (MMS 2009a).

Data from past studies have indicated that behavioral effects on bowhead whales from oil and gas activities have been "primarily, but not exclusively avoidance." No such data have indicated that "such avoidance is long-lasting after cessation of the activity" (USDOC, NOAA, NMFS 2008). Bowhead whales in the vicinity of a transiting vessel are expected to change their swimming speed and direction in an effort to avoid the vessel or noise source to closely (USDOC, NOAA, NMFS 2008).

Data from a study that Wartzok et al. (1989) carried out in the Canadian Beaufort showed that bowheads generally ignore small vessels at distances greater than 547 yards (500 m). In the bowheads tagged and studied, 180 whales voluntarily approached within 547 yards (500 m) of small vessels. Little response was observed in these cases unless there was a sudden change in sound level resulting from a vessel accelerating. A separate Canadian study also found that data do not support the theory of decreased use of a zone due to oil and gas activities, including vessel transit (USDOC, NOAA, and NMFS 2008). Sound energy coming from transiting vessels does have the potential to mask whale sounds that would otherwise be heard. Masking may disrupt communication and detection of important resources. Due to the transient nature of transiting vessels in the area, this would be temporary and localized, and would not significantly affect the exposed whales (NMFS 2013b). Vessels staging during module offload would occur during late summer in a localized area near West Dock outside of the migration corridor of migrating bowhead whales. In the 2012 LOC, the effect to bowhead whales from vessel traffic near West Dock was determined to be insignificant (NMFS 2012). With the changes to the proposed activities near West Dock, the 23 barges would transit the area near West

Dock for a limited time, and outside the bowhead whale migration corridor, therefore the impacts to bowhead whales remains small.

No mortalities or injuries are likely to occur a result of ASAP activities. At most, vessel traffic associated with the proposed action may result in undetectable transitory avoidance behavior by very small numbers of whales with no biological consequence. Thus, with the implementation of measures, such as reduced vessel speed, monitoring and shutdown during activities that would generate Level A or Level B noise levels, and conducting activities at locations and times when bowhead whales are unlikely to be present, as listed in Sections 1.0 and 2.0 of Appendix B, the proposed actions are not likely to adversely affect bowhead whales. Given the intended mitigations such as reduced vessel speed, monitoring and shutdown during activities that would generate Level A or Level B noise levels, and conducting activities at locations and times when bowhead whales are unlikely to be present, as listed in Sections 1.0 and 2.0 of Appendix B, the Project would not result in take of whales.

5.1.3 Ice Roads and Ice Pads

Ringed seals are typically much further out at the ice shelf where water would be accessible to facilitate foraging, but seals may create lairs in the ice near the Project area. Although there may be occasional individual seals within the area of West Dock, numbers would be extremely low. The preferred habitat for dens is in waters greater than 10 ft. (3 m), which according to the 2016 NOAA chart 16061, is only present at the north end of the proposed dredge area. The dredge disposal area and the majority of the ice roads would occur over water depths less than 6 ft. (2 m). Through mitigation measures (Sections 1.0 and 2.0 of Appendix B) that include the construction of ice roads and ice pads before lairs are likely to be built, potential impacts to the seals would be avoided. Bowhead whales would not be present in the action area when ice roads and ice pads are being constructed or used as they would have already migrated to the Chukchi and Bering Seas.

5.1.4 Dredging, Discharge of Dredged and Fill Material

The discharge of fill into 11.4 acres for the widening of the causeway, discharge of up to 25,000 cubic yards (191,139 cubic meters) would be required associated with seabed preparation for the barge bridge, the dredging and disposal of 250,000 cubic yards (191,139 cubic meters) of material is required to improve access to DH3, and screeding would be needed to level the substrate in preparation for barge ballasting at DH3 and the temporary bridge.

As stated in Chapter 3 of the SEIS, water depths within the nearshore areas of Prudhoe Bay are relatively shallow and range from approximately 2 ft. to 8 ft. (0.6 to 2.4 m) (based on mean lower low water [MLLW]). Prudhoe Bay has shoals across most of its entrance; the bay proper has depths of 6 to 9 ft. (1.8 to 2.7 m). The tidal range throughout this area is very low, approximately 0.6 ft. (0.2 m). Currents in this area “are irregular and

unpredictable but seem to be caused mostly by winds and moving ice” (NOAA, 2015). The physical composition of the seafloor substrate in the general vicinity of the proposed dredging was assessed during a vibracore sampling effort conducted in 2011 (AGDC, 2016b). Although sediment types vary somewhat by location, silty fine sand and sandy silt are typical materials found in the area (AGDC, 2016b). Impacts from the permanent discharge of fill to expand the causeway should have no permanent impact on protected species. The areas to be filled are in shallow waters where ice scour occurs. These areas would be inaccessible to seals in the winter due to bottomfast ice. Bowhead whales are not known for occurring in such close proximity to West Dock, and would not be present when dredging and the discharge of gravel would occur.

Impacts to sea ice and the subsea floor through dredging would not be accessible by seals in winter as it is an area in and adjacent to bottomfast / shorefast ice that does not contain habitat that is frequented by seals due to very low productivity and the close proximity of an industrial port. The subsea surface leading into DH3 has also been dredged previously. In a permit issued in 2008, West Dock’s Operator, British Petroleum Exploration Alaska, Inc. (BPXA) was authorized to dredge up to a total of 222,000 cubic yards per year of material from the dock approaches and transit route to DH2 and DH3 (see details in AGDC 2015; AGDC 2016a). Historically, seals have not frequented the action area.

Ringed seals have not been frequently observed in or near the areas where gravel would be laid to provide a level surface for the barge bridge east of the West Dock bridge or at the temporary barge bridge abutment areas on either side of the breach. The disposal area is over bottomfast ice; this part of Prudhoe Bay is turbid in spring near breakup; the high amount of ice scour in this area make it poor foraging habitat in spring when dredge material would settle to the sea floor. Hence, seals are not historically found in this area.

The impacts from the dredging and screeding would be temporary, with natural currents and bottom scouring by ice likely to return the area back to preconstruction elevations. The dredged material and the substrate at the disposal site are similar in composition, and the dredged material has been determined to suitable for reuse in other natural environments. Disposal of dredge material on ice would help minimize the distribution of the sediment plume, reducing the effects of turbidity.

The discharge of gravel at the bridge would cause a change in the nature of bottom substrate, however, this area has been impacted by the causeway construction, and is not likely to contain high quality habitat. As stated in the DSEIS, the gravel layer placed under the temporary barge bridge would be left in place and covered with sediment after a short amount of time as nearshore sediments are repeatedly disturbed and mobilized by wave action from the coastal winds prevalent in the proposed Project Area.

Bowhead whales are unlikely to be present within the dredge disposal or fill areas. These activities are occurring in shallow waters, 3 to 6 ft. (1-2 m) deep, and bowhead whale sightings indicate that they do not come closer to shore than Cross Island.

Any turbidity plumes from the discharge of the material would be temporary and impact a relatively small area. The material to be discharged would consist of clean fill, or would be dredged material that has been determined suitable for in-water disposal.

The only Prudhoe Bay marine mammal that feeds extensively on benthic fauna is the bearded seal (although ringed seals will feed on benthic isopods). The benthic fauna in the area do not include species which were identified in Cameron et al.'s (2010) comprehensive literature view of bearded seal diet. In addition, benthic fauna abundance and diversity is very low in these areas due to the effects of grounded winter ice (Carey et al. 1984). Therefore, the low nearshore densities of benthic prey suggest that proposed dredging activity would have little effect on bearded or ring seals.

As stated in Chapter 3 of the SEIS, impacts due to dredging and disposal would alter the substrate. Overall, the effects of dredging and disposal would be localized, would occur for a period of less than 2.5 years, and affects to water quality due to turbidity or sedimentation would be temporary. With the implementation of the measures in Sections 1.0 and 2.0 of Appendix B, the overall impacts to ice seals from the discharge of dredged or fill material and from dredging would not cause a decrease in the overall fitness of the bearded or ringed seals.

5.1.5 Impact of Activity on Marine Mammal Subsistence Use

The West Dock modification activities would occur within Prudhoe Bay, which is located approximately 14 miles (23 km) southwest of Cross Island (Nuiqsut hunting location) and 120 miles (190 km) west of Kaktovik. With the mitigation measures, such as reduced vessel speed, monitoring and shutdown during activities that would generate Level A or Level B noise levels, and conducting activities at locations and times when bowhead whales are unlikely to be present, as listed in Sections 1.0 and 2.0 of Appendix B no permanent negative effects to marine mammals would occur as a result of the proposed project. The temporary disturbance of local seal populations by the construction activities at West Dock would not affect the regional subsistence harvest of seals. West Dock construction activities occurring the ice-free season would not occur during the whaling period (Aug 25-Sept 15).

5.2 THREATENED AND ENDANGERED SPECIES MANAGED BY USFWS

5.2.1 Steller's and Spectacled Eiders (Threatened)

The proposed action would result in construction, maintenance, and operation of a pipeline through potential breeding habitat of Steller's and spectacled eiders.

Habitat Loss

Suitable breeding habitat for Steller's and spectacled eiders is found within the action area from the shoreline of Prudhoe Bay south for a distance of approximately 50 miles (80 km). Project facilities and appurtenances that would occur within this area during construction and operation are listed, below, in Table 2.

Construction of the ASAP and associated GCF may result in the disturbance of a maximum of 2,478 acres (10 km²) of potential eider breeding habitat within the action area. This is a conservative worst- case estimate based on an assumption that all habitats within the ROW would be disturbed. Peak pipeline construction would last 1.5 years (2 summer, 1 winter), with some pre-construction occurring before and testing occurring after this time. West Dock modifications, dredging, and the start of GCF construction would occur in the same year leading up to the sealift. The coastal habitats near West Dock and the dredge disposal site(s) may be temporarily affected by winter or summer noise disturbance, but this would be very short-term, after which the habitat would be left to recover and provide suitable habitat for birds.

Steller's eiders using habitats in the area in the past, but they have not been known to use the area for breeding or nesting in recent years. The only location on the North Slope where Steller's eiders are known to nest consistently is the Barrow area. The use of the Prudhoe Bay area by spectacled eiders has been documented in recent years; however, observed densities of breeding spectacled eiders in the area have been relatively low, with most observed breeding pairs being reported west of the Colville River. Suitable habitat is found across the North Slope so any eiders that are displaced could use habitats in the same area or elsewhere. The habitats that would be disturbed are within the Prudhoe Bay oilfield and the corridor of the TAPS and the Dalton Highway, and therefore have undergone some disturbance.

Disturbance

Pipeline construction on the ACP would occur in the winter. Winter-time construction and the use of special methods for pipeline installation in wetlands would minimize the area of habitat that is affected. Facility construction would occur year-round, and vessel offloading would occur in summer. However, these activities would be temporary and localized during the construction period only. Disturbance could potentially occur in the portion of the action area encompassed by coastal waters near West Dock in Prudhoe Bay, and in the portions of the action area that hold terrestrial breeding or nesting habitats. Spectacled eiders are known to use the coastal waters of the Beaufort Sea for staging and migration. Males and non-breeding or unsuccessful females may be found in the waters from June to August; successful females and their broods may be found in these waters from August to early October. Construction of ASAP would involve 23 barges moving through the Beaufort Sea to West Dock during these same open-water periods. Disturbance could result from the movement and noise associated with the barge traffic, and with the human and equipment activity (e.g., pile driving) at the dock or causeway; however, observed densities of Steller's and spectacled eiders in these coastal waters are so low that disturbance from these barge trips is unlikely. Any disturbance that would occur is expected to consist of flushing and brief displacement from the path of the barges, and would not be expected to have deleterious effects on the birds.

Construction of the proposed pipeline, GCF and associated facilities would occur over a four year period. Within this four-year period, dredging near West Dock, some West Dock modifications and appurtenances in this portion of the action area would occur over two winter seasons. Spectacled and Steller's eiders are absent from the Beaufort Sea and North Slope breeding habitats (including the action area) from October through May. Transportation of the modules from West Dock to the GCF staging area would occur during summer on existing land roads. Road improvements would be necessary between West Dock and the GCF Pad and new road construction from PBU K-Pad to the GCF. Activities associated with summer module transport and the O&M of ASAP could result in the disturbance and or displacement of spectacled or Steller's eiders from available breeding, nesting, or brooding habitat. However, research conducted at oil and gas facilities on the North Slope indicate that any such effects would be minimal. The distribution of spectacled eiders in the Kuparuk Oilfield has been investigated annually since 1993 (Stickney et al. 2013). Disturbance associated with noise, vehicle traffic on roads, and general human activity associated with O&M could result in discontinued use of some available habitats adjacent or near facilities, roads, or other sites where the activities occur.

Equipment contained within the GCF would generate continuous noise over the life of the proposed action. Birds, and particularly nesting birds, can be negatively impacted by noise emitted at continuous or irregular intervals during sensitive times of the year (Drewitt and Langston 2006; Burton et al. 2002). The impacts of noise from the BPXA Endicott oil production facilities on nearby birds have been minimal, likely due to individuals becoming habituated to the sound (Noel et al. 2003). The noise levels at the GCF are anticipated to be much lower, as equipment would be housed within the facility and fitted with sound baffles to minimize noise generation.

Collisions and Direct Mortality

Onshore land-clearing and habitat disturbance associated with construction of the GCF and proposed pipeline in portions of the action area where there is potential spectacled and Steller's eiders nesting habitat, would take place during a single winter. Neither species of eider occurs on the tundra during the months that construction or land clearing would take place. Therefore there is no opportunity for destruction of eider nests, eggs, broods, or nesting adults.

Eider mortalities due to potential collisions between the birds and vehicles, vessels, or structures may occur. The presence of the GCF would increase the potential for spectacled and Steller's eiders to collide with a structure within their habitat over the life of the proposed action. Collisions are most likely to occur during migrations and periods of low visibility; however, collisions are expected to be rare events because of the very low densities of both these species in the project area.

Increased Predation

Increased human activity from the operation of the GCF may attract predators such as Arctic foxes and ravens. It has been hypothesized that increases in subsidized predators are due to availability of anthropogenic food subsidies (i.e., dumpsters and landfills) and also to increased availability of nesting and den sites (NAS 2003). Foxes and ravens are known to feed on the eggs or newborn chicks of sea ducks. Currently, facilities near the action area in Prudhoe Bay adhere to strict protocols to minimize waste that may attract predators and monitor areas that provide nesting habitat. The proposed GCF would operate under these protocols and workers would be trained to remain in compliance. These measures would ensure that O&M activities that increase human activity at the GCF and along the pipeline are not likely to adversely affect spectacled and Steller's eiders. In recent years, the availability of food subsidies to nest predators has been curtailed by the oil industry and is probably not as large a problem as it was previously (Liebezeit 2010).

Spectacled and Steller's eider nesting habitat may be disturbed by construction of the pipe-line on the ACP. It is possible that permafrost in the action area may be present over time, which could impact wetland areas (Walker and Everett 1987). If this results in the drying of small ponds or lakes, it could lead to a loss of foraging habitat, which is important for breeding spectacled and Steller's eiders and their fledglings. The effect of trenching in potential Steller's and spectacled eiders breeding habitat would be minimal, as is indicated in the 2011 USFWS Biological Opinion, attached to the 2012 FEIS (USACE 2012).

5.2.2 Polar Bears (Threatened)

The polar bear are likely the only marine mammal present at West Dock in winter at Prudhoe Bay when this work would be occurring. On the North Slope, the pipeline would be installed in winter to preserve tundra, using ice pads and ice roads. A 5ft.-wide (1.5 m wide) trench would be opened off of an ice workpad for pipe installation. After installation, at least 30 inches (76 cm) of cover would be provided above the buried pipe. The 30 inch crown would to allow settlement near to ground level to avoid having the filled trench slump and catch water or avoid runoff erosion. Backfilling generally consists of replacing the excavated material, however, clean gravel may be used as backfill when excavated materials increase potential downstream sedimentation, increase scour potential, or do not provide sufficient groundwater flow around the pipe. Where surface layer material has been segregated, in the case of an armor layer overlying fine grain materials, subsurface material would be replaced in the stratified order it was removed (AGDC 2016b). Associated facilities (GCF, camp, etc.) and civil work would occur year round. Noise impacts associated with North Slope construction are expected to be temporary in nature and localized. These potential impacts would be reduced through mitigation measures, including potential shutdown if a polar bear is detected within 500 m. As noted above, North Slope construction activities are covered under Beaufort Sea ITRs for polar bear as noted in 50 CFR 18 Subpart J, and AGDC intends to apply for authorization.

Habitat Loss

Project facilities located within the terrestrial nearshore range of the polar bear within the ACP are identified above in Table 2. The proposed action would result in construction (including West Dock modifications and dredging), maintenance, and operation of both the GCF and a segment of buried pipeline within the terrestrial range of the polar bear. Habitat losses within the footprint of the GCF and the buried pipeline would be permanent; however, suitable alternative terrestrial habitat is widespread across the North Slope and not a limiting factor for the species.

The location of the GCF and the proposed pipeline has not been surveyed to determine whether any areas contain the features necessary for polar bear denning. However, the pro-proposed GCF facility location was selected within the existing Prudhoe Bay oilfield based up-on its close proximity to existing oil and gas infrastructure and activity, and its relatively flat terrain, and the pipeline route closely follows the existing TAPS and Dalton Highway corridor. Accordingly, the area is unlikely to exhibit necessary macrohabitat characteristics for maternal denning, such as steep slopes (e.g., coastal bluffs and river banks), unobstructed access to the coast and the absence of disturbance from humans and human activities. No material dens are known to have been previously located within the proposed project foot-print. The habitat loss associated with the proposed ASAP Project is not likely to adversely affect the polar bear species.

Potential for Sound to Impact Polar Bears

Sounds that would most likely impact polar bear would be related to ice cutting with a ditchwitch (122dB), dredging, and pile driving. The Project intends on applying for an LOA from USFWS under current ITRs for oil and gas in the Beaufort Sea, as noted above. A 500m setback zone would be used for polar bear when commencing these activities.

Disturbance

The construction and operation of the GCF (including West Dock modifications and module offload) and the proposed pipeline, associated construction around West Dock, and traffic, may cause temporary behavior changes in polar bears, due to loud noise and temporary or permanent physical obstruction. Disturbance from activities resulting from the pro-proposed Project could elicit several different responses in polar bears. Noise may act as a deterrent or an attractant to bears. However, there is evidence that disturbance from stationary sources results in minor changes in the behavior of polar bears. Observations to-date include numerous instances of polar bears that encounter facilities and then change their direction of movement and leave the area. Bears are frequently observed climbing over and crossing gravel roads and causeways in Prudhoe Bay oilfields, and appear to have little fear of manmade structures (USFWS 2009a). The proposed facilities in the action area may pre-sent a small-scale, local obstruction to some individual bears' movements but the effect on the species would be negligible.

Denning females are expected to avoid the construction and operations areas due to the lack of suitable habitat and human presence. Although denning females are not expected to occur in close proximity to ASAP Project construction and operations activities, the potential to disturb a denning female exists.

The best available scientific information indicates that female polar bears entering dens, or females in dens with cubs, are more sensitive to noise than other age and sex groups (USFWS 2009a). According to Smith et al. (2007) noise from stationary activities may potentially deter females from denning nearby; however, polar bears have been known to den near industrial activities without any observed effect. On average, female polar bears den in the Beaufort Sea area in mid-November and emerge in early April (Amstrup and Gardner 1994); however, these dates can vary year-to-year depending upon sea ice, snow, and weather conditions. (Messier et al. 1994). The oil and gas industry, operating pursuant to MMPA authorizations, has successfully conducted annual den detection surveys and has implemented appropriate monitoring and protection measures, including a buffer around maternal dens, such that effects on polar bears have been minimal. Similar measures would be implemented for the ASAP Project activities through the MMPA authorization process and, accordingly, no more than a negligible effect is anticipated to occur. Trained dogs would be used to clear areas of sea ice where work would occur for polar bear that might be present.

Human-Bear Interactions

The proposed action may result in human-polar bear interactions that occur in the action area. Bears may be attracted or repelled by industry actions, depending on the circumstances. Industry activities are subject to the MMPA which prohibits the taking of polar bears without authorization. Mitigation measures required for all oil and gas projects include a site-specific plan of operation and human-bear interaction plan, to minimize impacts on both species (Sections 1.0 and 2.0 of Appendix B).

There are several mechanisms through which the incidental or intentional takes of small numbers of polar bears can be authorized under the MMPA. The most commonly used is through the issuance of ITRs. Before USFWS can provide an incidental take statement for polar bears under the ESA, take of marine mammals must first be authorized under the MMPA (MMS 2009a). For example, under this authorization the deterrence of bears from the facilities and structures is allowed (referred to as incidental take), so that bear-human interactions are prevented. This type of deterrent or “harassment” may include using vehicles to make noise, using flashing lights, or firing cracker shells. In addition, disturbance to polar bears due to increased activity in the area may result in incidental take by harassment which could also be authorized under the MMPA.

Indirect effects to polar bears are not expected as a result of the proposed Project during development or operation. Polar bears are expected to occur in the action area during the

lifetime of the Project and would not be adversely affected by project activities, except for temporary and minor disturbances to some individual bears, during construction.

5.2.3 Pacific Walrus (Not Listed / Candidate)

Vessel noise associated with summer marine transportation of construction materials to West Dock has the potential to result in transient disturbance of very small numbers of Pacific walrus. However, the presence of Pacific walrus in the action area is rare, and no detectable effects are likely to occur. Pacific walrus are known to use the central Beaufort Sea; however, their presence within the action area has been rare. Richardson et al. (1995) found that vessel noise does not seem to strongly affect pinnipeds (seals, sea lions, fur seals, and walruses) that are already in the water. Walruses may avoid moving vessels, with most reactions occurring within 0.29 miles (0.5 km) (Richardson et al. 1995) or they may approach vessels out of curiosity. The impact of vessel traffic on marine mammals generally is expected to be transient and localized. Because of the low number of walrus expected to occur in the central Beaufort Sea, and the limited amount of vessel transit occurring in the proposed action area from project activities, the potential for effects from vessel traffic are discountable. The effects of the Project to Pacific walrus would not be detectable. Therefore, the ASAP is not likely to adversely affect the Pacific walrus. There are no indirect effects on Pacific walrus anticipated as a result of the proposed Project.

5.3 Critical Habitat

5.3.1 Polar Bear (Threatened)

Polar bear critical habitat would not be substantially impacted by the project. Temporary impacts would be related to winter dredging and disposal, modification and improvement of West Dock infrastructure, and barge vessel staging and offload of GCF modules. West Dock is an industrial port with minimal historic occurrence of polar bear. The GCF, pipelines, and connecting lines would have a minor but permanent impact to the landscape and habitat potentially used by polar bear. Impacts to Polar bear are likely to be up to 25 miles (40 km) south of the Beaufort Sea coast.

5.3.2 Ringed Seal (Threatened)

Ringed seal critical habitat has been proposed but not yet been designated. However, in the event that it is designated in the future, it is not expected that the critical habitat would be substantially impacted by the Project. Impacts to sea ice and the subsea floor through dredging would not be accessible by seals in winter as it is an area in and adjacent to bottomfast / shorefast ice and that does not contain habitat that is frequented by seals due to very low productivity and the close proximity of an industrial port. The subsea surface leading into DH3 has also been dredged previously. Historically, seals have not frequented the action area.

Ringed seals have not been frequently observed in or near the areas where gravel would be laid to provide a level surface for the barge bridge east of the West Dock bridge or at

the temporary barge bridge abutment areas on either side of the breach. The disposal area is over bottomfast ice; this part of Prudhoe Bay is turbid in spring near breakup; the high amount of ice scour in this area make it poor foraging habitat in spring when dredge material would settle to the sea floor. Hence, seals are not historically found in this area.

5.4 Cumulative Effects

Cumulative effects include the effects of future state, tribal, local or private actions, not involving federal activities, that are reasonably certain to occur in the action area considered in this BA (50 CFR 402.02). Future federal actions that are unrelated to the proposed action are not considered in this section because such action would require separate consultation pursuant to Section 7 of the ESA.

All of the activities occurring within the action area are present actions that contribute to the existing environmental baseline and that are expected to continue into the future. These activities include oil and gas exploration and development on and adjacent to the North Slope; human habitation and development; vessel transportation into and use of West Dock; subsistence activities on the North Slope; and tourism. Oil and gas development activities are not subject to this cumulative effects analysis because they would be subject to federal permitting requirements and, thus, would require future Section 7 consultation. There are no data or information indicating that the extent or magnitude of the other identified state, tribal, local or private activities are likely to increase beyond their current levels. Accordingly, future state, tribal, local, and private actions are likely to consist of a continuation of those currently contributing to the environmental baseline in the action area, and the effects are expected to remain stable and within the range of effects experienced in the past and present. Because there is no indication that the extent or magnitude of state, tribal, local or private actions would increase in the foreseeable future within the action area beyond their current levels, cumulative effects are not likely to adversely affect any of the listed or proposed for listing species, or any designated critical habitat occurring within the action area.

5.5 Climate Change

Global Climate Change

Global Climate Change refers to long-term fluctuations in temperature and other elements of the Earth's climate system. Natural processes such as solar-irradiance and volcanic activity can produce variations in climate. However, the IPCC has linked global climate change and the "greenhouse effect" to steep rises in atmospheric concentrations of CO₂, methane, nitrous oxide, and synthetic halocarbons (chlorofluorocarbons, hydrofluorocarbons, perfluorocarbons, halons and sulphur hexafluoride) (IPCC 2007). Although scientific debate continues regarding the contributing factors to observed climate change and projections of trends and effects under various future scenarios, there is a current scientific consensus that increasing levels of carbon dioxide and other atmospheric greenhouse gases (GHG) are a significant cause and ongoing contributing

factor (IPCC 2007). At current rates of GHG release, average global surface temperatures could increase by 2.5 to 10°F (1.4 to 5.8°C) by the year 2100 (IPCC 2007).

General predictions of increasing climate change include, in addition to an increase in average surface temperatures, a rise in sea level, changes in oceanography (including changes in temperature, salinity, pH and sea ice), and increases in the severity of storms, floods, droughts, rainfall, heat waves and other weather anomalies. Some areas are expected to experience greater effects than other areas; however, prediction models are not sophisticated enough at the present time to make accurate regional predictions of such effects.

Arctic Climate Change

Although regional predictions of climate change based upon existing climate models are not considered reliable, there is a scientific consensus that the Arctic is already experiencing important climate changes and is expected to be one of the regions where climate change effects may be greatest. To date, many of the documented and most important effects have concerned reductions in sea ice extent and thickness in recent years. Analysis of long-term data sets indicates substantial reductions in both the extent and thickness of the arctic sea ice cover during the past 20-40 years, with record minimums in several recent years. Within the Arctic, the Beaufort Sea has experienced some of the largest declines in ice extent during the summer. Other observed Arctic changes include decreased precipitation (particularly drier summers and falls), forest decline, permafrost degradation, increased storms and coastal erosion, and changes in ocean salinity, pH and temperature.

Potential Effects of the ASAP Project on Climate Change

In 2005, the U.S. emissions of CO₂ equivalent (CO₂ eq) totaled 7,147.2 million metric tons. Alaska currently emits approximately 53 million metric tons of CO₂ eq, and by the year 2020 is expected to emit 60 million metric tons (Alaska Department of Environmental Conservation 2007).

There is no present scientific or policy (local, state, national or global) consensus regarding methodology, reliability, or relevance of estimating project-specific contributions to global climate change, or of attributing environmental impact significance to project-specific emissions of GHG. Accordingly, projected ASAP emissions cannot be causally linked in any scientifically accepted way to global climate change generally, or to climate change effects in the action area on listed species and critical habitat.

Qualitatively, probable effects of the ASAP Project are likely to be indiscernible given projected emissions, the uniform distribution of GHG concentrations globally, and the absence of any meaningful nexus between the ASAP Project and global oil and gas production and consumption rates. Moreover:

- The proposed project facilities would combust natural gas which is a low emitter of carbon CO₂ with a rate of 117 pounds (lbs)/ million British thermal units (MMBtu)

versus 161 lbs/MMBtu for fuel oil combustion or 215 lbs/MMBtu for coal combustion (Energy Information Administration 2008).

- The proposed Project would likely facilitate conversion from wood-, coal- and fuel-oil-based residential comfort heating in the Fairbanks North Star Borough, thus reducing overall GHG emissions locally.
- The proposed project facilities would likely require air quality permits which incorporate emissions reduction control technology evaluations as part of the permitting process. EPA has currently promulgated Best Available Control Technology (BACT) requirements for GHG emissions for new sources (EPA 2010).
- Stricter EPA regulation of criteria pollutants and certain hazardous air pollutants that also contribute to climate change would affect the proposed project facilities and require BACT.
- Newer technologies for emissions control of GHGs are being developed and may become available at the time the proposed project facilities are permitted and constructed.

There are no generally-applicable requirements, policies or guidance regarding appropriate mitigation measures for GHG emissions on a project-specific basis. In significant part, this is because there is no established Alaska or federal climate change or GHG emissions reduction or mitigation plans. Currently available information does not establish that solutions to these global problems may be effectively managed on an ad hoc, project-by-project basis. Moreover, currently, there are no legal requirements or specific policies that impose restrictions on the ASAP Project regarding GHG emissions, that limit or discourage production and consumption of domestic natural gas reserves, or that limit the production and consumption of natural gas from other domestic and foreign sources were the ASAP Project not approved, for the purpose of limiting or mitigating global climate change effects.

Emissions from the proposed Project are not expected to contribute in any discernible way to climate change, to climate change effects within the action area, or to effects upon listed species or critical habitat. Construction and operation of project facilities, and transiting vessel traffic in support of the proposed activities, is expected to contribute an extremely small amount of the overall GHG emissions into the planet's atmosphere and may, in some respects, ameliorate or reduce GHG emissions and climate effects that might otherwise result from the use of energy sources that produce larger amounts of GHGs than natural gas.

6.0 Determination of Effect:

The determination of effect below was based on the USFWS BiOp (USFWS 2012) and the NMFS Section 7 Letter of Concurrence (NMFS 2012) while considering the modifications to the proposed Project since the BiOp and LOC were issued.

6.1 NMFS Species

Impacts to marine mammals associated with the construction activities would be minimized by:

- dredging in winter rather than summer;
- disposal of dredge material over bottomfast ice in an area of low biological productivity;
- use of ice pads and roads; initiating construction of the sea ice roads and sea ice pads prior to March 1 to ensure that ice road and pad construction would be underway before the lairs are created, reducing the potential to crush seals or lairs; and
- monitoring an exclusion zone and employing shutdown measures during pile driving, ice cutting (i.e., use of a ditchwitch), screeding, and dredging activities. Details on PSO monitoring are provided in Sections 1.0 and 2.0 of Appendix B.

6.1.1 Bowhead Whale

Bowhead whales are not likely to be present near West Dock. Whale sightings during the hunting season indicate that the fall bowhead migration occurs closer to the 65 ft. (20 m) isopleth, which is approximately 14 miles (23 km) offshore from West Dock. The spring migration occurs even farther offshore.

All noise levels which could harm or harass bowheads would fall below the 120 dB threshold within 2.2 km of the noise source. The noise generating activities (pile driving, screeding, ditchwitching, dredging) would ensound an area that is outside the bowhead whale migration corridor.

The marshalling area is 3 to 5 miles (4.8-8 km) from West Dock. The marshalling area and West Dock are closer in to shore than the typical bowhead migration corridor. Vessel noise and impacts from vessels would also occur away from the migration corridor. Vessel traffic in the action area would cease would not occur after construction is complete.

The discharge of fill for the expansion of the causeway and for the temporary bridge, as well as the discharge of dredged material, should have no impact to bowhead whales as these activities would occur in waters too shallow for the whales to access. No contaminants would be introduced into the area as a result of the discharge of dredged or fill material.

The proposed impacts would be temporary and minor, ceasing after construction is completed. Mitigation measures, including monitoring an exclusion zone and shutdown protocol and reducing vessel speed in the vicinity of whales (Sections 1.0 and 2.0 of Appendix B) would avoid any effects of construction noise and barge traffic. The

construction and O&M activities of the proposed ASAP may affect but are not likely to adversely affect bowhead whales.

6.1.2 Bearded and Ringed Seals

Small numbers of ringed seals may be present in the area around West Dock and could be temporarily disturbed by noise associated with construction activities, including pile driving, screeding, dredging, and ditchwitching. In addition, there is potential for ring seal lairs to be located in the vicinity of West Dock in the winter. Lairs and the animals in them could be impacted by the creation of ice pads and ice roads. Bearded seals would be rare in the vicinity of West Dock.

Pile driving and other activities which cause noise levels that could harm or harass these seals would occur in relatively short periods of time. Exclusion zones and shutdown measures would be implemented during these activities.

Vessel traffic associated with the proposed Project would fall within the range of normal activity near West Dock, and such activity is not known to have had adverse impacts on ringed and bearded seals.

The discharge of fill for the expansion of the causeway and for the temporary bridge, as well as the discharge of dredged material, should have minimal impact to ice seals. The dredge disposal area would occur over bottomfast ice, and seals would not be able to use the area until there are areas of open water. The discharge of gravel in the winter would also occur in an area with little or no water under the ice, preventing use of the area by seals during construction activities. No contaminants would be introduced into the area as a result of the discharge of dredged or fill material.

In December 2014, critical habitat for the ringed seal was proposed for ice habitat used by seals for subnivean birth lairs and molting. Winter dredging activities would occur when sea ice is present. The applicant would avoid impacts to lairs by constructing ice roads and pad before March 1.

The proposed impacts would be temporary, ceasing after construction is completed. Sections 1.0 and 2.0 of Appendix B lists the measures that would be implemented to reduce potential disturbance effects associated with the proposed Project. This includes implementing an exclusion zone during noise generating activities that could harm or harass the animals, constructing ice roads and pad before March 1, and implementing measures to avoid impacts by vessel traffic. With the implementation of the mitigation measures listed in Sections 1.0 and 2.0 of Appendix B, the proposed Project may affect, and is not likely to adversely affect ringed and bearded seals.

AGDC expects that its mitigation for planned construction activities would be sufficient to avoid harassment of marine mammals and does not anticipate applying for an IHA from NMFS related to acoustic harassment associated with its activities.

6.2 USFWS Managed Species

6.2.1 Steller's and Spectacled Eiders

The construction and O&M of proposed Project is that it may affect, but is not likely to adversely affect Steller's eiders. The proposed action may adversely affect, but is not likely to jeopardize the continued existence of spectacled eiders. Bird collisions with pipeline facilities, vehicles, and vessels are likely to occur in very small numbers during periods of migration and low visibility over the life of the Project. Construction activities associated with the Project are expected to produce very temporary and local disturbances to eiders and eider habitat. During the operation and maintenance phase of the proposed Project, strict protocols would be enforced that reduce waste and deter predators from facilities, thus minimizing disturbance to breeding and nesting eiders. No detectable effects to Steller's or spectacled eider populations are expected to occur from this proposed Project.

6.2.2 Polar Bears

The proposed ASAP and the activities associated with the construction and Operations and Maintenance (O&M) of this Project may adversely affect, but are not likely to jeopardize the continued existence of polar bears. The activities may adversely affect small numbers of individual polar bears at the level of a "take" by harassment as defined in the MMPA and the ESA. Over the life of the Project, hazing of a small number of polar bears, resulting in incidental "take," is likely to occur for personnel safety purposes during the lifetime of the ASAP Project. However, the effects are likely to be limited to temporary changes in behavior, such as deflection. Neither injuries nor mortality are likely to result. AGDC would apply for an LOA under Incidental Take Regulations (ITRs) for polar bear, as authorized in 50 CFR 18 Subpart J for August 5, 2016-2021 (81 FR 52276).

Under the MMPA, the oil and gas industry has received LOAs for development operations on the North Slope and the Beaufort Sea, regarding protection of polar bears. These LOAs have required mitigation measures, such as Polar Bear Interaction Plans, which include a range of measures such as:

- Use of detection systems, such as bear monitors
- Use of safety gates and fences
- Implementation of appropriate garbage, hazardous waste, and snow management plans
- Identifying the chain of command for responding to a polar bear sighting
- Employee training programs to educate field personnel regarding bear safety procedures

The above measures would be implemented prior to construction activities and followed during construction and operation activities to minimize human interactions with polar bears. As a result, small numbers of incidental interactions with polar bears, resulting in no mortality or injury, and causing only temporary deflection and minor changes in behavior, are likely to occur. The effects of these interactions, individually and cumulatively, are likely to be negligible. Regardless, AGDC's construction activities are covered under Beaufort Sea ITRs for polar bear as noted in 50 CFR 18 Subpart J, and AGDC intends to apply for authorization. Polar bear mitigation measures would be adhered to throughout the lifetime of the Project and, accordingly, no significant adverse effects on polar bears and polar bear habitat are likely (Section 1.0 of Appendix B).

6.2.3 Pacific Walrus

As the Pacific walrus does not occur frequently in the Beaufort Sea, the construction and O&M activities associated with the proposed ASAP are not likely to adversely affect walrus. The probability of project vessels within the action area interacting with an individual or group of walrus and/or adversely affecting the walrus is extremely low and, therefore, discountable. Mitigation practices would be followed to reduce any potential disturbance vessel traffic may have if interaction with walrus occurs, but no detectable adverse effects are anticipated.

As noted above, the USFWS recently determined that a listing is not warranted at this time for walrus. The determination to not list walrus means that this Biological Assessment does not require an assessment of this species. However, because the determination to not list walrus is likely to receive legal challenge in the near future, the evaluation of impacts to the species has been left in this document despite it not being listed.

7.0 Species Outside the Action Area Managed by NMFS

The fin whale, humpback whale, Western Distinct Population Segment (DPS) Steller sea lion, North Pacific Right whale, Western North Pacific Gray whale, sperm whale, and blue whale occur outside the Action Area. To promote project-wide environmental stewardship, AGDC intends on implementing these additional voluntary conservation measures for its vessels while transiting to the West Dock Project area. Measures to reduce impacts to species outside the action area are listed in Section 3.0 of Appendix B. These measures would minimize potential impacts to whales from vessel traffic and barges travelling between Dutch Harbor and Prudhoe Bay.

7.1 Fin Whale (Endangered)

The fin whale was listed as endangered under the ESA in 1970 (FR 35:8495) and as depleted under the MMPA throughout their range. No critical habitat has been designated. The Alaska stock of fin whales can be found in the deep waters of Prince William Sound, the Bering Sea, and the Gulf of Alaska. The highest densities of Alaska stock fin whales can be found in the northern part of the Gulf of Alaska and southeastern part of the Bering

Sea during the summer (May through October) (MMS and NMFS 2008). The majority Alaska stock fin whales tend to aggregate along the mixing zones between coastal and oceanic waters that correspond roughly with the 656-ft. (200 m) isopleth, or shelf edge, in the northern North Pacific and Bering Sea (NMFS 2006). Fin whales may be seen seasonally in the southwestern Chukchi Sea, although there is no indication that such occurrences are typical (MMS and NMFS 2008). There are no reports of fin whales in the Beaufort Sea (MMS and NMFS 2008; Clarke et al. 2014), which is outside the published species range (Allen and Angliss 2013).

Current threats to the fin whale include historic commercial whaling, subsistence hunting, oil and gas-related activity, non-oil and gas industrial development, research activities, marine vessel traffic and commercial fishing.

No critical habitat has been designated for the fin whale.

7.2 Humpback Whale (Western North Pacific DPS – Endangered; Mexico DPS – Threatened)

On September 8, 2016, NMFS published a final rule changing the status of humpback whales under the ESA (81 FR 62260), effective October 11, 2016. Previously, humpback whales were listed under the ESA as an endangered species worldwide. In the 2016 rule, NMFS recognized the existence of 14 DPSs, classified four of those as endangered and one as threatened, and determined that the remaining nine DPSs do not warrant protection under the ESA.

Three DPSs of humpback whales occur in waters off the coast of Alaska: the Western North Pacific DPS, which is an endangered species under the ESA, the Mexico DPS, which is a threatened species, and the Hawaii DPS, which is not protected under the ESA (NMFS 2016a). The probability of these three North Pacific DPSs occurring in feeding areas of Alaska and Northern British Columbia is shown in Table 11.

Humpback whales are found in the Aleutian Islands, Bering Sea, Gulf of Alaska, and Southeast Alaska/northern British Columbia (Muto et al. 2016). The Western North Pacific stock of humpbacks occupy areas along the continental shelf off the Aleutian Islands and the Alaska Peninsula in summer.

TABLE 11. Probability of Humpback Whales from Three North Pacific DPSs Occurring in Feeding areas of Alaska and Northern British Columbia

Summer Feeding Area	Western North Pacific DPS (endangered)	Hawaii DPS (not listed)	Mexico DPS (threatened)
Aleutian Islands, Bering, Chukchi, Beaufort	4.4%	86.5%	11.3%
Gulf of Alaska	0.5%	89.0%	10.5%
Southeast Alaska / Northern British Columbia	0%	93.9%	6.1%

- Adapted from Wade et al. (2016); NMFS 2016a. Whales from the Central America DPS (endangered) can also occur in waters of Southeast Alaska and Northern British Columbia, but this DPS is far outside of the Project Area and is not considered in this assessment.

The northern range of the Western North Pacific stock extends throughout the Bering Sea, through the Bering Strait, and into the southern Chukchi Sea – occasional sightings have been documented in the northern Chukchi and rarely, near the Beaufort Sea boundary. Humpbacks from the Hawaii DPS and Mexico DPS (threatened) can be found throughout the Gulf of Alaska in summer, including areas of Prince William Sound, Kodiak Island, the Shelikof Strait, the Barren Islands, and the southern coastline of the Alaska Peninsula (MMS and NMFS 2008). Sightings in offshore waters of the Gulf of Alaska are generally attributed to migration into coastal waters, and some feeding may also be occurring on offshore banks (Morris et al. 1983).

Known actions that have an effect on humpback whales in the proposed action area include historic commercial whaling, subsistence hunting, oil-and-gas-related activity, non-oil and gas industrial development, research activities, marine vessel traffic and commercial fishing.

No critical habitat has been designated for the humpback whale.

7.3 Western DPS of Steller Sea Lion (Endangered)

Because of their decline, NMFS listed the Steller sea lion as threatened range-wide under the ESA in April 1990. Critical habitat has been defined for Steller's sea lions as a 20-nautical-mile (37 km) buffer around all major haul-outs and rookeries, as well as associated terrestrial, air and aquatic zones, and three large offshore foraging areas (50 Code of Federal Regulations 226.202 on Aug. 27, 1993). The population was split into two DPSs (Baker et al. 2005; Phillips et al. 2009; FR 62:30772). The Western DPS (WDPS) inhabits an area of Alaska from Prince William Sound westward to the end of the Aleutian Island chain and into Russian waters (NOAA 2010a). This segment occurs from 144 degrees W (Cape Suckling, east of Prince William Sound), westward to Russia and

Japan. The Eastern DPS (EDPS) of Steller's sea lions occurs from southeast Alaska southward to California (NMFS 2004; NMML 2010).

The WDPS was listed as endangered on May 5, 1997 (FR 62:30772), while the EDPS remained under threatened status (NOAA 2010a).

Steller's sea lions prefer the colder, temperate to sub-arctic waters of the North Pacific Ocean. Haul-outs and rookeries usually consist of beaches (gravel, rocky, or sand), ledges, and rocky reefs. In the Bering Sea and Okhotsk Sea, sea lions may also haul-out on sea ice, but this is considered atypical behavior (NOAA 2010b). During the May-July breeding season, Steller's sea lions congregate at more than 40 rookeries, where adult males defend territories, pups are born, and mating takes place. Non-reproductive animals congregate to rest at more than 200 haul-out sites where little or no breeding takes place. Sea lions continue to gather at both rookeries and haul-out sites outside of the breeding season (NMML 2010).

Threats to Steller's sea lions include subsistence hunting, contaminants, climate changes, commercial fishing, and vessel disturbances.

There is no designated critical habitat for the Steller Sea Lion in the ASAP action area.

7.4 North Pacific Right Whale

The North Pacific Right whale (*Eubalaena japonica*) was listed as endangered in 1970 under the Endangered Species Conservation Act of 1969. When the ESA was enacted in 1973, the whale was transferred to the List of Endangered and Threatened Wildlife and Plants, retaining endangered status (35 FR 18319). It remains one of the most endangered whales in the world (Critical habitat was listed in 2008, and located in an area of the Bering Sea and an area south of Kodiak Island (73 FR 19000).

The current range of the North Pacific Right whale largely unknown due to the rarity of sightings. However, western Gulf of Alaska and the southeast Bering Sea are both frequently used areas (NMFS, 2012).

One of the greatest threats to the North Pacific Right Whale is vessel collisions. Other threats include fisheries interactions, and climate change.

More information on the biology and natural history of the North Pacific Right Whale can be found at: <https://www.fisheries.noaa.gov/species/north-pacific-right-whale>, and <http://www.nmfs.noaa.gov/pr/sars/region.htm>.

7.5 Western North Pacific Gray Whale

Western North Pacific Gray whale (*Eschrichtius robustus*) was listed as endangered in 1970 under the Endangered Species Conservation Act of 1969. When the ESA was

enacted in 1973, the gray whale was transferred to the List of Endangered and Threatened Wildlife and Plants, retaining endangered status (35 FR 18319). In 1994, the eastern north pacific population was delisted (59 FR 31094) and the western north pacific DPS (W. N. Pacific gray whale) remained listed as endangered. No critical habitat is designated for this species.

The range of the W. N. Pacific gray whale is found along the coast of eastern Asia. The eastern north pacific stock is geographically isolated from the western north pacific stock, and migrates from Mexico and California, north to the coast of Alaska and Russia. The W. N. Pacific gray whale is highly depleted and is likely comprised of less than 100 individuals.

Gray whales are categorized by NMFS in the low-frequency cetacean functional hearing group, based on their generalized hearing range of 7 Hz to 35 kHz (National Marine Fisheries Service, 2016b).

Additional information on the biology and natural history of the gray whale can be found at: <http://www.nmfs.noaa.gov/pr/sars/region.htm>.

7.6 Sperm Whale

The sperm whale (*Physeter macrocephalus*) was listed as endangered in 1970 under the Endangered Species Conservation Act of 1969. When the ESA was enacted in 1973, the whale was transferred to the List of Endangered and Threatened Wildlife and Plants, retaining endangered status (35 FR 18319). No critical habitat is designated for this species.

Sperm whales are found in all the world's oceans. For management purposes, three stocks of sperm whales are currently recognized in U.S. waters: 1) Alaska (North Pacific stock) including the Gulf of Alaska, Bering Sea and the Aleutians, 2) California/Washington/Oregon, and 3) Hawaii.

Threats to the sperm whale include vessel strikes, entanglement in fishing gear, ocean noise, marine debris, climate change, oil spills and contaminants. More information on the biology and natural history of the sperm whale can be found at <https://www.fisheries.noaa.gov/species/sperm-whale> and <http://www.nmfs.noaa.gov/pr/sars/region.htm>.

7.7 Blue Whale

The Blue whale (*Balaenoptera musculus*) was listed as endangered in 1970 under the Endangered Species Conservation Act of 1969. When the ESA was enacted in 1973, the whale was transferred to the List of Endangered and Threatened Wildlife and Plants, retaining endangered status (35 FR 18319). No critical habitat is designated for this species.

The blue whale is found in every ocean. In the North Pacific, there are two sub-populations, the Eastern North Pacific and the Central North Pacific. The Eastern stock extends up the west coast of the United States and into the Gulf of Alaska and the Central North Pacific and migrates to Mexico. The Central stock extends from Russia into the Aleutians and Gulf of Alaska and migrates west to Hawaii.

The current threats to the blue whale are vessel strikes, fisheries interactions, ocean noise, habitat degradation, pollution, and climate change.

More information on the biology and natural history of the North Pacific Right Whale can be found at: <https://www.fisheries.noaa.gov/species/blue-whale>, <http://www.nmfs.noaa.gov/pr/species/mammals/whales/blue-whale.html>, and <http://www.nmfs.noaa.gov/pr/sars/region.htm>.

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Appendix A
USFWS and NMFS CORRESPONDENCE

Appendix B

1.0 Mitigation measures that will be implemented by ASAP vessel operators and construction crews

Mitigation Measures	Species
Avoid concentrations of groups of animals by all vessels.	Bowhead whale, ringed seal, bearded seal, polar bear, Pacific walrus
Not approach Pacific walruses or polar bears on ice or land closer than 805 m (.5 mi).	Pacific Walrus, polar bear
Reduce vessel speed when within 274 m (300 yards) of whales; those vessels capable of steering around such groups should do so.	Bowhead whale
Avoid multiple changes in direction and speed when within 274 m (300 yards) of whales. In addition, operators should check the waters immediately adjacent to a vessel to ensure that no whales would be injured.	Bowhead whale
Reduce vessel speed when weather conditions require, such as when visibility drops, to avoid the likelihood of injury to marine mammals.	Bowhead whale, ringed seal, bearded seal, polar bear, Pacific walrus
Implement a 24-hour monitoring plan to record and observe polar bears in the area to minimize polar bear and human interactions, thereby reducing the potential for take.	Polar bear
Reduce / eliminate polar bear attractants.	Polar bear
If a polar bear is observed in the water, within 305 m (1,000 ft.), vessels will reduce speed and avoid changes in direction or excessive movement.	Polar bear
Vessels will reduce speed when polar bears or walruses are observed in the water and must steer around the animals, if possible. Vessel speeds may be reduced during inclement visibility to avoid potential collisions.	Polar bear, Pacific walrus
Store food waste and other associated waste in containers until transferred for disposal at an approved disposal site.	Polar bear
Transfer sanitary waste from bathrooms, sewage sludge, and kitchen-associated garbage on a regular basis to ensure control of attractants.	Polar bear
Identify kitchen grease for treatment as spoilable waste.	Polar bear
Transport hazardous wastes off vessel for disposal at an approved facility.	Polar bear
Strictly prohibit employees from directly feeding animals, throwing food to animals, or improperly disposing of food wastes.	Polar bear
Ensure bear has escape route(s) prior to conducting harassment activity.	Polar bear

Choose the harassment method that would have the least effect on the bear and increase the intensity of the method or use additional methods of harassment only if necessary.	Polar bear
Shout at the bear as a method of harassment before using a projectile.	Polar bear
Monitor bear movement after harassment.	Polar bear
Designate a qualified individual or individuals to observe, record, and report on the effects of project activities on polar bears and Pacific walrus.	polar bear, Pacific walrus
Have an approved polar bear and/or walrus interaction plan on file with the USFWS and onsite.	polar bear, Pacific walrus
Train operation and construction crews regarding polar bear awareness.	Polar bear
Provide USFWS with a Plan of Cooperation that ensures that activities would not interfere with polar bear subsistence hunting and that adverse effects on the availability of marine mammals are minimized.	Bowhead whale, ringed seal, bearded seal, polar bear, Pacific walrus
Contact affected subsistence communities to discuss potential conflicts caused by location, timing, and methods of proposed operations.	Bowhead whale, ringed seal, bearded seal, polar bear, Pacific walrus
Make efforts to locate occupied polar bear dens within and near proposed areas of operation, utilizing appropriate tools, such as, forward looking infrared (FLIR) imagery and/or polar bear scent-trained dogs and report polar bear dens to the USFWS prior to the initiation of activities.	Polar bear
Observe a 1-mile operational exclusion zone around all known polar bear dens during the denning season (November-April) or until the female and cubs leave the areas.	Polar bear
Cease work in the immediate area of previously unknown occupied polar bear dens and contact the USFWS for guidance.	Polar bear
Consult with potentially affected communities and appropriate subsistence user organizations to discuss potential conflicts with subsistence marine mammal hunting caused by the location, timing, and methods of proposed operations and support activities.	Bowhead whale, ringed seal, bearded seal, polar bear, Pacific walrus
Develop and implement a site-specific, USFWS- approved, marine mammal monitoring and mitigation plan to monitor and evaluate the effects of authorized activities on marine mammals and the subsistence use of these resources.	Polar bear, Pacific Walrus
Use trained Protected Species Observers (PSOs) around project activities of concern associated with West Dock construction to alert crew of the presence of marine mammals and initiate adaptive mitigation responses and to carry out specified monitoring activities identified in the marine mammal monitoring and mitigation plan necessary to evaluate the impact of authorized activities on marine mammals and the subsistence use of these resources.	Bowhead whale, ringed seal, bearded seal, polar bear, Pacific walrus
Report the results of specified monitoring activities to the USFWS and NMFS.	Bowhead whale, ringed seal, bearded seal, polar bear, Pacific walrus

Report all observations of polar bears during any industry operation.	Polar bear
Report any incidental lethal take or injury of a marine mammal immediately to USFWS or NMFS, depending upon the species injured or killed.	Bowhead whale, ringed seal, bearded seal, polar bear, Pacific walrus
Construct or begins construction of all ice roads and ice pads before March 1.	ringed seal, bearded seal,
AGDC will implement a preapproved Spill Prevention, Control, and Countermeasure (SPCC) Plan, as required by 40 CFR 112 to prevent discharges of oil to waters of the U.S.	Steller's eider, spectacled eider, bowhead whale, ringed seal, bearded seal, polar bear, Pacific walrus
Construction activities would be scheduled to avoid effects during sensitive periods in the life cycle of wildlife to the extent practicable, including scheduling excavation activities during times of the year when major movements across the ROW occur (i.e., migrations). Construction and operational activities would be avoided or minimized to the extent practicable during sensitive periods in life cycles such as moose and caribou calving, lambing season, bear denning, raptor nesting, and nesting migratory birds.	Steller's eider, spectacled eider, bowhead whale, ringed seal, bearded seal, polar bear, Pacific walrus
The temporary barge-bridge system would remain in place the minimum time period needed to offload the modules.	Steller's eider, spectacled eider, bowhead whale, ringed seal, bearded seal, polar bear, Pacific walrus
Winter disposal would coincide with winter dredging activity. Winter activities would eliminate potential impacts to or conflicts with migratory animals (birds and marine mammals).	Steller's eider, spectacled eider, bowhead whale, ringed seal, bearded seal, Pacific walrus
Prioritize placement of gravel at West Dock during the winter months when possible to reduce impacts to birds during nesting season.	Steller's eider, spectacled eider
Comply with any USACE requirements for sediment testing and disposal. Ensure that disposal sites are properly managed (e.g., disposal site marking buoys, inspectors, the use of sediment capping and dredge sequencing) and monitored (e.g., chemical and toxicity testing, benthic recovery) to minimize impacts associated with dredge material. Dredge the marine area through the ice during the winter to minimize sedimentation effects on water quality.	Steller's eider, spectacled eider, bowhead whale, ringed seal, bearded seal, polar bear, Pacific walrus

2.0 Protected Species Observer Protocol

1. A protected species observer (PSO), able to accurately identify and distinguish species of Alaska marine mammals, will be present before and during all in-water construction activities.
2. Prior to in-water construction activities, an exclusion (i.e., shut-down) zone will be established. For this project, the exclusion zone includes all marine waters within 2,200 meters of pile driving operations and within 1,000 meters of dredging, ditchwitch, and screeding activities.
3. Pile-driving will not be conducted when visible observation of all waters within and surrounding the exclusion zone is not possible. If crews must be working during periods of darkness or bad weather, an additional PSO will be placed further up the causeway (e.g., at DH3 or STP) to ensure coverage of the entire zone and to provide a greater extent of visibility. And in addition, during activities conducted at night, artificial lights directly around the observer will be kept absent or low, so that natural light reflecting off the ice or the surface of the water will allow for identification of the presence or absence of cetaceans or pinnipeds within the exclusion zone.
4. The PSO will be positioned such that the entire exclusion zone is visible to them (e.g., situated on a platform, elevated promontory, boat or aircraft).
5. The PSO will have the following to aid in determining the location of observed listed species, to take action if listed species enter the exclusion zone, and to record these events:
 - a. Binoculars
 - b. Range finder
 - c. GPS
 - d. Compass
 - e. Two-way radio communication with construction foreman/superintendent
 - f. A log book of all activities which will be made available to Corps and NMFS upon request.
6. During daylight observations, PSOs will use reticle binoculars that are able to use the horizon and reticles to calculate distance and range finders to provide an additional estimate of distance to a marine mammal. If work must occur during dark periods, a buoy with a strobe would be used as a marker. This would be limited to a quick flash that would not interfere with observers using natural light illuminating the ice or the water. Sufficient markers shall be placed at the required 1,000 meter and 2,200 meter radius from the project site to provide a clear visual reference for the PSO.

7. The PSO will have no other primary duties than watching for and reporting on events related to marine mammals.
8. The PSO shall be in good physical condition and be able to withstand harsh weather conditions for an extended period of time. The PSO must have vision correctable to 20-20.
9. Each day prior to commencing in-water work the PSO shall conduct a radio check with the construction foreman or superintendent. The PSO shall brief the foreman or supervisor as to the shutdown procedures if any of the listed species are observed likely to enter or within the exclusion zone, and shall have the foreman brief the crew, requesting that the crew notify the PSO when a listed species is spotted.
10. The PSO will work in shifts lasting no longer than 4 hrs. with at least a 1-hr break between shifts, and will not perform duties as a PSO for more than 12 hrs. in a 24-hr period (to reduce PSO fatigue).
11. The PSO will remain onsite each day until all in-water pile driving is completed.
12. The PSO will scan the exclusion zone for the presence of listed species for 30 min before any pile-driving or removal activities take place.
 - a. If any listed species are present within the exclusion zone, pile-driving and removal activities will not begin until the animal(s) has left the exclusion zone or no listed species have been observed in the exclusion zone for 15 min (for pinnipeds) or 30 min (for cetaceans).
13. Throughout all pile-driving activity, the PSO will continuously scan the exclusion zone to ensure that listed species do not enter it.

If any listed species enter, or appear likely to enter, the exclusion zone during pile-driving activities, all driving activity will cease immediately. Pile-driving may resume when the animal(s) has been observed leaving the area on its own accord. If the animal(s) is not observed leaving the area, pile-driving activity may begin 15 min (for pinnipeds) or 30 min (for cetaceans) after the animal is last observed in the area.

14. A final PSO report will be provided to NMFS within 90 days of the completion of the project. The PSO report data will include the following for each listed marine mammal observation (or "sighting event" if repeated sightings are made of the same animal[s]):
 - i. Species, date, time, and duration for each sighting event.
 - ii. Number of animals per sighting event; and number of adults/juveniles/calves per sighting event.
 - iii. Primary, and, if observed, secondary behaviors of the marine mammals in each sighting event.

- iv. Geographic coordinates for the observed animals, with the position recorded by using the most precise coordinates practicable (coordinates must be recorded in decimal degrees, or similar standard, and defined coordinate system).
- v. Time of the most recent pile-driving or other project activity prior to marine mammal observation.
- vi. If in-water work is halted due to the presence of a marine mammal, the time of work stoppage and when work is resumed shall be recorded.

15. Though take is not authorized, if a listed marine mammal is taken (i.e., a listed marine mammal(s) is observed entering the 2,200 meter exclusion zone before pile-driving operations can be shut down), it must be reported to NMFS within one business day (contact listed at item 18 below). PSO records for listed marine mammals taken by project activities must include:

- a. All the information that must be listed in the PSO report.
- b. Number of listed animals taken.
- c. The date and time of each take.
- d. The cause of the take (e.g., impact hammer operating at maximum energy).
- e. The time the animal(s) entered the exclusion zone, and, if known, the time it exited the zone.
- f. Mitigation measures implemented prior to and after the animal entered the exclusion zone.

16. Final reports will be submitted to:

NMFS Protected Resources Division, Anchorage Office,

17. Any observations of visibly sick, dead, or injured marine mammals shall be reported immediately to the Alaska Regional Stranding Coordinator at 907-271-1332 (mandy.migura@noaa.gov).

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

3.0 Voluntary Conservation Measures

To promote project-wide environmental stewardship, AGDC intends on implementing additional voluntary conservation measures for its vessels while transiting from Dutch Harbor to the West Dock Project area.

VESSEL TRANSIT THROUGH SENSITIVE AREAS	AGDC vessels will refuel and clear customs in Dutch Harbor, which is south of North Pacific right whale Critical Habitat. In addition to North Pacific right whale (NPRW), other ESA species inhabit the waters near Dutch Harbor, including sperm whale, fin whale, humpback whale, Western North Pacific gray whale, blue whale, and Steller sea lion. • While transiting through this region, vessel operators will either: i. avoid the critical habitat area or ii. bring trained observers onboard and reduce speed to 10 knots. When NPRW are observed, vessels will seek to maintain a separation distance of at least 800m. When other whale species are observed, vessels will seek to maintain a separation distance of 300m. When pinnipeds are observed, vessels will seek to maintain a separation distance of 100m. To reduce the risk of collision with whales, vessels will slow to 5 knots or less when NPRW are within 800m, or when other whales are within 100m. Vessels do not need to reduce speed to avoid collisions with pinnipeds. Observers will follow the measures listed in the Marine Mammal Monitoring and Reporting section below. These measures will be implemented assuming that maritime conditions are safe for operation at these speeds. or iii. reduce speed to 5 knots without trained observers onboard. • Operators will maintain a ship log indicating the time and geographic coordinates at which vessels enter and exit North Pacific right whale critical habitat. • The vessel operator will not purposely approach within 5.5 km (3 nautical miles (nm)) of major Steller sea lion rookeries or haulouts where
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	vessel safety requirements allow and/or where practicable. Vessels will remain 5.5 km (3 nm) from all Steller sea lion rookery sites listed in paragraph 50 CFR 224.103 (d)(1)(iii).
VESSELS WILL ADHERE TO APPLICABLE MARINE MAMMAL DISTURBANCE-REDUCTION GUIDELINES	AGDC vessels will adhere to several applicable marine mammal-disturbance reduction guidelines, including the following: • Vessels will reduce speed when walruses are observed in the water and must steer around the animals, if possible. Vessel speeds may be reduced during inclement visibility to avoid potential collisions. • Vessels should reduce speed and maintain a minimum 805 m operational exclusion zone around group of 12 or more walruses encountered in the water. • Vessels will stay at least 300 m away from cow-calf pairs, feeding aggregations, or whales that are engaged in breeding behavior. • Vessels will stay at least 805 m away from hauled-out walrus herds to prevent a stampede and possibly injury or death of a calf. • The vessel operator will avoid: i) direct approach of whales; ii) or operate in a way to separate members of a group of whales, walruses or sea lions from other members of that group; iii) causing a whale of any species to make multiple changes in direction; and iv) pursue marine mammals. • If a whale approaches the vessel and if maritime conditions safely allow, the engine will be put in neutral and the whale will be allowed to pass beyond the vessel. If the vessel is taken out of gear, vessel crew will ensure that no whales are within 50 m of the vessel when propellers are re-engaged, thus minimizing risk of marine mammal injury. • If a North Pacific right whale is observed at a distance greater than 800 m (874 yards [yd]) from the vessel's intended course line, or other marine mammal is observed within 91 m (100 yd) of the vessel's intended course line, monitoring of the marine mammal(s) location will continue, and for whales, the direction of the vessel will be altered to maintain these minimum distances from the

	observed whale (s). Course alterations made to avoid cetacean disturbance will be made in a manner that avoids sudden changes in revolutions per minute (RPM) and cutting in front of their direction of travel. • If a North Pacific right whale is observed within 800 m (874 yd) of the vessel's intended course line, or other whale species is observed within 274 m (300 yd) of the vessel's intended course line, vessel speeds will be reduced to no greater than 5 kn, sea conditions permitting, to minimize the risk of injurious collision. While avoiding collisions with marine mammals may necessitate sudden changes in vessel RPM and heading, course alterations made to avoid marine mammal disturbance will be made in a manner that avoids sudden changes in RPM and cutting in front of their direction of travel. Vessel speed may resume to normal operating speed when North Pacific right whales are greater than 800 m (874 yd) and other whale species are greater than 274 m (300 yd) from the vessel and its intended course.
MEASURES TO MINIMIZE RISK OF HAZARDOUS SPILLS	Measures to minimize risk of spilling hazardous substances will include: • avoiding operation of watercraft in fall and winter in the presence of sea ice to the extent practicable, and, • using fully-operational vessel navigation systems composed of radar, chart plotter, sonar, marine communication systems, and satellite navigation receivers, as well as Automatic Identification System (AIS) for vessel tracking.
MARINE MAMMAL MONITORING AND REPORTING	• A minimum of two Marine mammal monitors (MMOs), either be Protected Species Observers (PSOs) or crew members who have received standard PSO training from experienced trainers, will alternate shifts during travel through North Pacific right whale critical habitat. MMOs will maintain a constant watch for all marine mammals from the bridge or other similar vantage points. At least one dedicated observer will vigilantly scan for whales at all times. Scanning will involve the use of 10-power binoculars or greater. MMOs will maintain direct contact with the vessel pilot, advising the

	pilot/operator of the position of all observed marine mammals as soon as they are observed. • MMOs must be able to accurately identify and distinguish between species of cetaceans under field conditions. • MMOs will work in shifts lasting no longer than 4 hours with at least a 1-hour break from marine mammal monitoring duties between shifts. MMOs will not perform MMO duties for more than 12 hours in a 24-hour period (to reduce fatigue). • While functioning as an MMO, that individual will have no other duty which could distract them from keeping careful watch for marine mammals near the vessel and along its intended course. At least one MMO will be actively engaged in scanning the surrounding waters at all times while transiting through North Pacific right whale critical habitat. • Prior to the transportation season, MMOs will attend a 1-day PSO training course (taught by an experienced trainer following a course syllabus approved by NMFS). Training may be delivered by video using the same syllabus. This course will: a) provide ecological information on Bering Sea marine mammals and specifics on the ecology and management concerns of North Pacific right whales; b) teach proper equipment use and methodologies in marine mammal observation and recording; and c) provide clarification of obligations including log keeping and seasonal reporting. • MMOs will record all marine mammals observed within North Pacific right whale critical habitat using NMFS-approved observation forms. Sightings of North Pacific right whales will be transmitted to NMFS within 24 hours. These sighting reports will include the following information: a. Date, time, and geographic coordinates of the sighting(s). b. Species observed, number of animals observed per sighting event; and number of
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	adults/juveniles/calves per sighting event (if determinable). c. Because sightings of North Pacific right whales are uncommon, and photographs that allow for identification of individual whales from markings are extremely valuable, photographs will be taken if feasible, but in a way that does not involve disturbing the animal (e.g., if vessel speed and course changes are not otherwise warranted, they will not take place for the purpose of positioning a photographer to take better photos. Any photographs taken of North Pacific right whales will be submitted to NMFS. • The applicant will designate an individual who is familiar with NMFS reporting procedures to collect, organize, and report on vessel travel within North Pacific right whale critical habitat and marine mammal observations that occur within that critical habitat. These reports will be submitted to NMFS by the end of the calendar year. The end-of-year report will outline the following information: a. Ship logs (time and location for when a vessel entered and exited North Pacific right whale critical habitat). b. Species, date, and time for each sighting event. c. Number of animals per sighting event; and number of adults/juveniles/calves per sighting event (if determinable). d. Geographic coordinates for the observed animals, with the position recorded by using the most precise coordinates practicable (coordinates must be recorded in decimal degrees, or similar standard (and defined) coordinate system). e. Environmental conditions as they existed during each sighting event, including sea conditions, weather conditions, visibility (km/mi), lighting conditions, and percent ice cover. f. Any photographs taken.
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- NMFS Contact Info: Reports, observation forms, ship logs, and North Pacific right whale sightings will be transmitted to: National Marine Fisheries Service, Protected Resources Division at greg.balogh@noaa.gov <<mailto:greg.balogh@noaa.gov>> , verena.gill@noaa.gov <<mailto:verena.gill@noaa.gov>> , and alicia.bishop@noaa.gov <<mailto:alicia.bishop@noaa.gov>> (individual North Pacific Right Whale sightings may also be called in to (907) 271-3023) or 907-271-1937. In the event that this contact information becomes obsolete, call 907-271-5006 for updated contact information.

If Take Occurs

Though take is not authorized, if a listed marine mammal is struck by a vessel, it must be reported to NMFS within 24 hrs. The following will be included when reporting take of a listed species:

- a. All the information that would otherwise be listed in the PSO report.
- b. Number of listed animals taken.
- c. The date, time, and location of the take.
- d. The cause of the take (e.g., vessel strike).
- e. The time the animal(s) was first observed and last seen.
- f. Mitigation measures implemented prior to and after the animal was taken.
- g. Contact information for MMO on duty at the time of the collision, ship's Pilot at the time of the collision, or ship's Captain.



United States Department of the Interior

U.S. FISH AND WILDLIFE SERVICE
Fairbanks Fish and Wildlife Field Office
101 12th Avenue, Room 110
Fairbanks, Alaska 99701
March 7, 2018



Sandy Gibson
Project Manager
Regulatory Division, North Branch
Alaska District
U.S. Army Corps of Engineers

Re: Revised Alaska Stand Alone
Pipeline – 2018 Biological Opinion
Amendment

Dear Ms. Gibson:

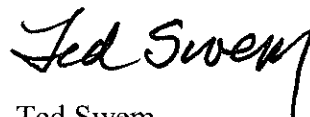
Thank you for inquiring about endangered and threatened species and critical habitats pursuant to section 7 of the Endangered Species Act of 1973 (ESA), as amended. This document transmits the U.S. Fish and Wildlife Service's (Service) amended Biological Opinion (BO) regarding proposed revisions to the Alaska Gasline Development Corporation's (AGDC) Alaska Stand Alone Pipeline (ASAP) project description. The Service consulted with the U.S. Army Corps of Engineers (USACE) on this development in a BO dated July 10, 2012, regarding effects of the action on threatened spectacled eiders (*Somateria fischeri*), Alaska-breeding Steller's eiders (*Polysticta stelleri*), polar bears (*Ursus maritimus*), designated polar bear critical habitat, and the candidate species Pacific walrus (*Odobenus rosmarus*).

The Service's July, 2012 determinations regarding effects to polar bears, and designated polar bear critical habitat remain unchanged and therefore, effects of the proposed revisions on polar bears or designated polar bear critical habitat are not evaluated further herein. Furthermore, on December 5, 2017, the Service determined the Pacific walrus was not warranted for ESA-listing. Consequently, potential impacts to Pacific walrus from the proposed revisions do not require consultation or conferencing under section 7, and are not discussed further herein. However, the proposed revisions may increase project impacts to Steller's and/or spectacled eiders. Therefore, this document describes effects of the proposed revisions on listed eiders pursuant to section 7 of the ESA

Because information regarding the status of Alaska-breeding and spectacled eiders has been improved with more recent data, we reference the Services' Programmatic BO for Wetland Impacts on the North Slope 2016-2017 for updated Status of the Species and Environmental Baseline of listed eiders (USFWS 2016). Furthermore, because the Service's evaluation of Cumulative Effects, as well as Reasonable and Prudent Measures, implementing Terms and Conditions, and Conservation Recommendations remain unchanged from the 2012 BO (USFWS 2012), these sections are not repeated herein, although they are attached for reference (Appendix 1).

Following review of the status and environmental baseline of listed eiders, and analysis of potential effects of the proposed action to these species, the Service has concluded the proposed action *is not likely to jeopardize* the continued existence of spectacled or Alaska-breeding Steller's eiders. A complete administrative record of this consultation is on file at the Fairbanks Fish and Wildlife Field Office (FFWFO), 101 12th Avenue, Fairbanks, Alaska, 99701. If you have comments or concerns regarding this BO, please contact Ted Swem, Endangered Species Coordinator, Fairbanks Fish and Wildlife Field Office at (907) 456-0441.

Sincerely,

A handwritten signature in black ink that reads "Ted Swem". The signature is written in a cursive, flowing style with a long, sweeping tail on the "m".

Ted Swem
Endangered Species Coordinator
Fairbanks FFWFO

INTRODUCTION

This document transmits the U.S. Fish and Wildlife Service's (Service) amended Biological Opinion (BO) regarding proposed revisions to the Alaska Gasline Development Corporation's (AGDC) Alaska Stand Alone Pipeline (ASAP) project description. The Service consulted with the U.S. Army Corps of Engineers (USACE) on this development in a BO dated July 10, 2012, regarding effects of the action on threatened spectacled eiders (*Somateria fischeri*), Alaska-breeding Steller's eiders (*Polysticta stelleri*), polar bears (*Ursus maritimus*), designated polar bear critical habitat, and the candidate species Pacific walrus (*Odobenus rosmarus*).

The Service's July, 2012 determinations regarding effects to polar bears, and designated polar bear critical habitat remain unchanged and therefore, effects of the proposed revisions on polar bears or designated polar bear critical habitat are not evaluated further herein. Furthermore, on December 5, 2017, the Service determined the Pacific walrus was not warranted for ESA-listing. Consequently, potential impacts to Pacific walrus from the proposed revisions do not require consultation or conferencing under section 7, and are not discussed further herein. However, the proposed revisions may increase project impacts to Steller's and/or spectacled eiders. Therefore, this document describes effects of the proposed revisions on listed eiders pursuant to section 7 of the ESA. We used information in AGDC's Draft Supplemental Environmental Impact Statement (AGDC 2017a) and revised Biological Assessment (BA; AGDC 2017b), project-specific communications with the USACE, other Service documents, and published and unpublished literature to develop this document.

Because information regarding the status of Alaska-breeding and spectacled eiders has been improved with more recent data, we reference the Services' Programmatic BO for Wetland Impacts on the North Slope 2016-2017 for updated Status of the Species and Environmental Baseline of listed eiders (USFWS 2016). Furthermore, because the Service's evaluation of Cumulative Effects, as well as Reasonable and Prudent Measures, implementing Terms and Conditions, and Conservation Recommendations remain unchanged from the 2012 BO (USFWS 2012), these sections are not repeated herein, although they are attached for reference (Appendix 1).

PROJECT DESCRIPTION

The following text focuses on revisions to the project description as aspects of the project that have not been revised were previously evaluated in the Service's 2012 BO (USFWS 2012).

Gas conditioning facility

The size of the Gas Conditioning Facility (GCF) would increase from 70 acres (0.28 km²) to 90.6 acres (0.37 km²). The GCF would be located approximately 1 mi (1.6 km) west of the existing Central Gas Facility in the Prudhoe Bay industrial complex (Figure 1). The GCF would be accessed from the west margin of the CGF by an approximately 0.71 km long, 0.02 km², access road. The GCF would also construct approximately 4,200 ft (1.3 km) of gas connecting lines supported by 171 vertical support members (VSMs). Peak construction of the GCF and pipeline is expected to require 1.5 years (2 summer seasons + 1 winter season).

GCF camp

Additionally, a 20.2 acre (0.08 km²) GCF camp would be constructed nearby to provide lodging for personnel. This camp would be accessible by two new gravel access road segments totaling 3.95 km in length and 0.19 km² (Figure 1).

Material sources

Within the action area, two new gravel material sources (MS) would be developed. A 136.89-acre (0.55-km²) material source, MS 1A-A, with two access roads is proposed near the GCF (Figure 1). The combined length of these two access roads is roughly 2.2 km, and a combined footprint of approximately (0.07 km²). Additionally, MS 1B-F would be developed within the Sagavanirktok River channel near MP 18 (Figure 2).

Natural gas pipeline

The buried, non-enriched natural gas pipeline would increase in diameter from 24 to 36 inches (61 to 91 cm), with a construction corridor of about 470 ft (143.3 m), and permanent right of way corridor of at least 53 ft (16.15 m). The currently proposed alignment would shift the pipeline location west from the 2012 alignment between mileposts (MP) 0 and MP 29.

Pipeline access road

Near MP 20, an approximately 3.7-km long, 0.12 km², gravel road would be constructed to provide access to the ASAP ROW from the Dalton Highway (Figure 2).

West Dock modifications

A single season of winter dredging would take place at West Dock to create a 9-ft (2.7 m) deep navigation channel and run basin. Dredged material would be placed nearby upon bottomfast sea ice within Prudhoe Bay. Mooring pilings would also be installed during the winter. The DH3 berths would be modified and portions of the causeway road would be widened to 60 ft (18.3 m) (Figure 3). Additionally, a temporary bridge composed of two barges would facilitate offloading and transport of large modules.

Barging operations

A 23-barge sealift would import construction materials and 53 prefabricated modules over the course of a single-season sealift. Each barge would be accompanied by an ocean-going support tug through standard marine shipping routes (Figure 4). Vessels would not transit through the Ledyard Bay Critical Habitat Unit for spectacled eiders.

Revised action area

The action area remains unchanged from that described in the 2012 BO (USFWS 2012), with the exception of the addition of the marine transit route through the Bering Sea, Bering Strait, Chukchi Sea, Beaufort Sea, and Prudhoe Bay (Figure 4).

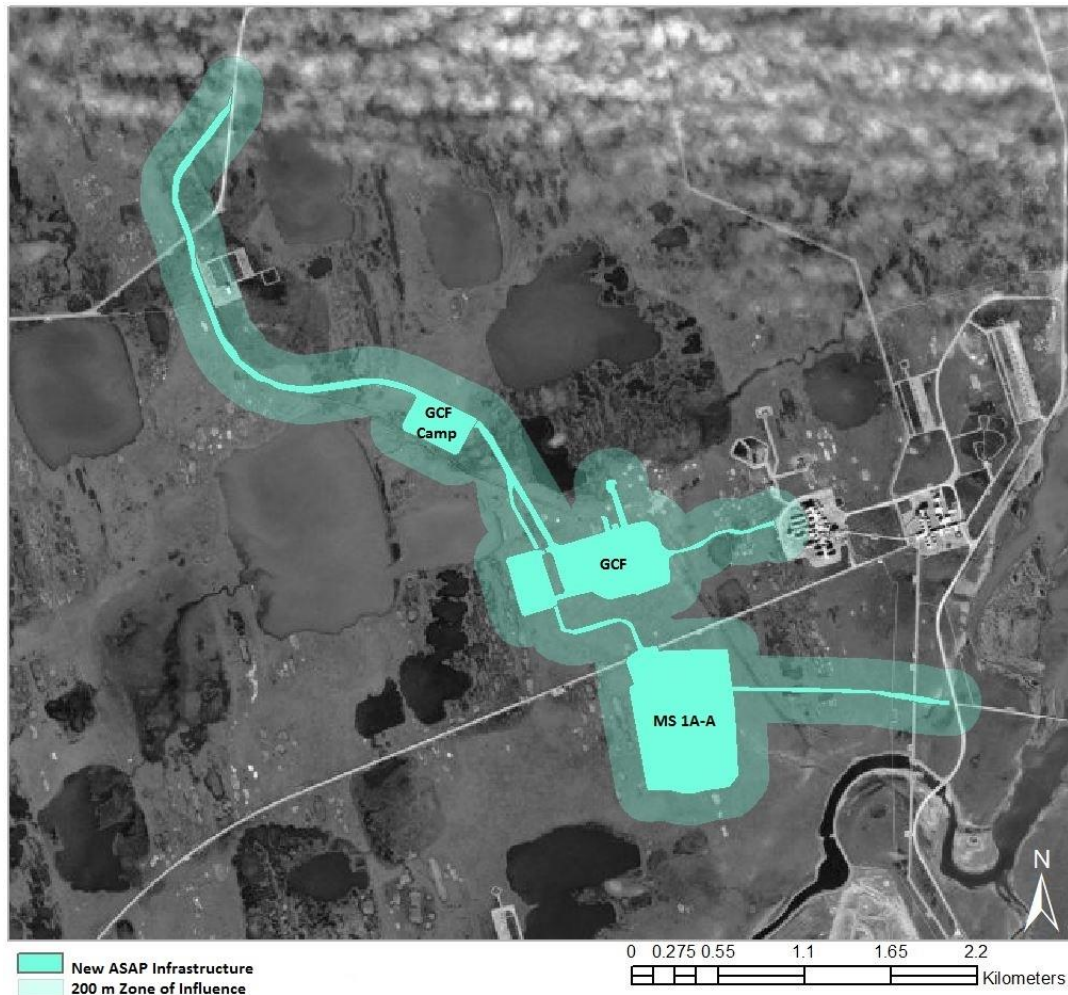


Figure 1. Detail of proposed project features and 200 m zone of influence associated with the ASAP Project within the Prudhoe Bay industrial complex. New infrastructure includes a GCF pad and access road from the existing CGF, a GCF Camp and access road, MS 1A-A and access roads, 1.3 km of elevated gas connecting lines, as well as the beginning segment of the buried ASAP gasline (not shown).

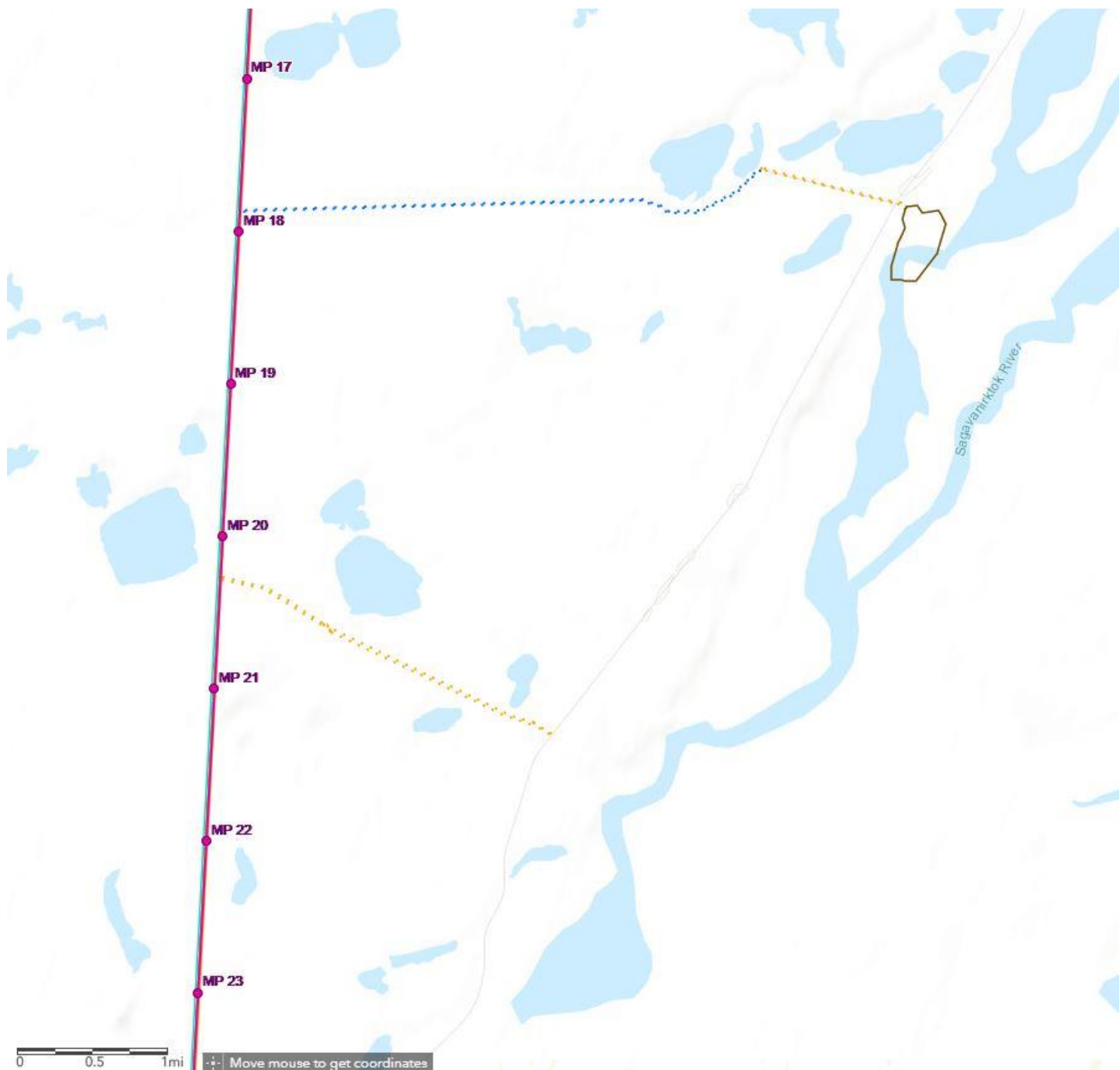


Figure 2. Material source 1B-F within the Sagavanirktok River channel near MP 18 of the proposed ASAP Project. This MS would be accessed via an existing gravel road. Near MP 20, a new gravel access road would be constructed between the ASAP ROW and the Dalton Highway.



Figure 3. The West Dock Causeway and Prudhoe Bay dredge disposal locations associated with modifications to West Dock in support of ASAP construction.

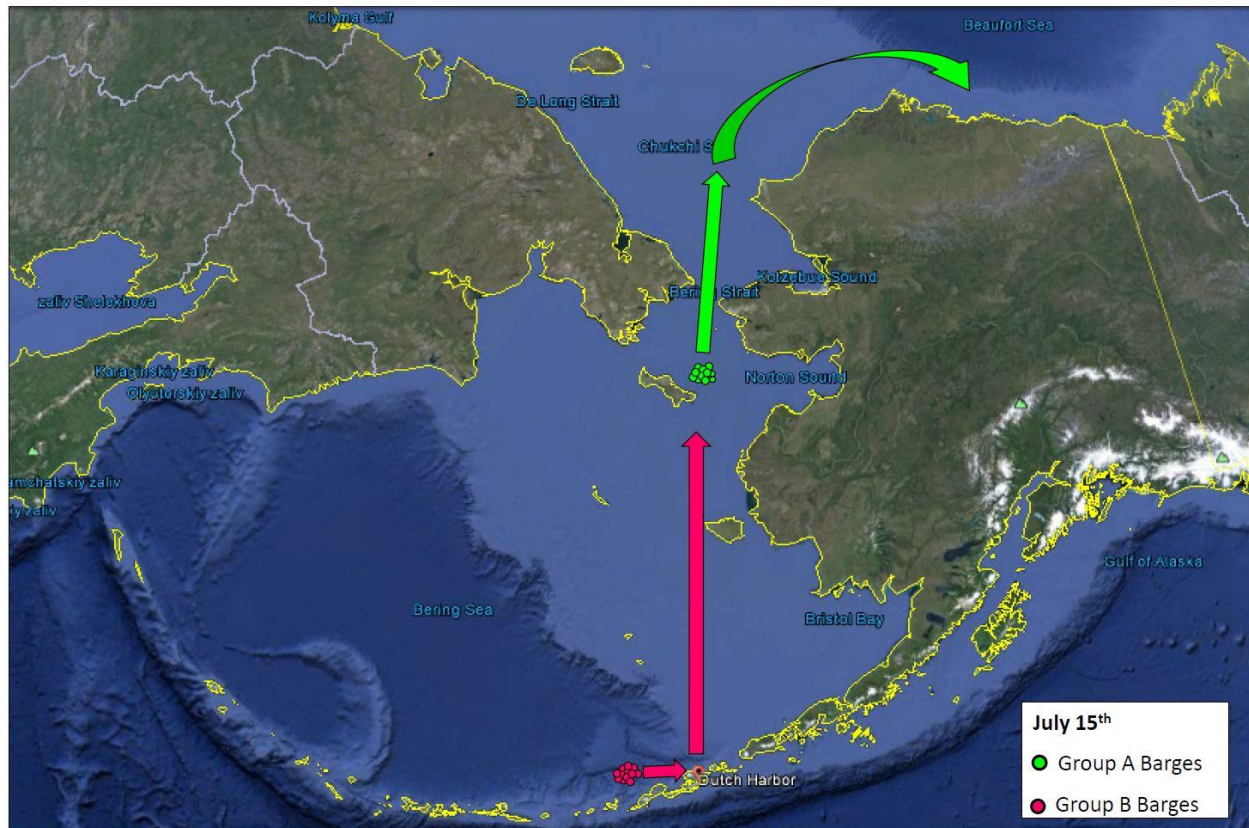


Figure 4. Proposed marine transit routes for a single season of barge and ocean-going tug operations associated with the first year of ASAP construction.

EFFECTS TO LISTED EIDERS

Effects of disturbance

Long-term terrestrial habitat loss¹

Because the applicant has adopted wintertime construction (e.g., excavation of fill and/or gravel placement on undisturbed tundra would occur during winter months), disturbance of nesting females, eggs, or young broods from construction of gravel infrastructure would be unlikely. Nonetheless, direct permanent habitat loss would result from extraction and/or placement of gravel fill impacting roughly 546.3 total acres (2.21 km²) of listed eider nesting habitat.

We also anticipate indirect habitat loss via disturbance will occur within a 200 m (656.2 ft.) zone of influence surrounding newly constructed ASAP infrastructure from on-pad activities, pipeline and road operations, as well as maintenance activities. The two principal mechanisms through which disturbance can adversely affect eiders on their breeding grounds are:

1. Displacing adults and/or broods from preferred habitats during pre-nesting, nesting, brood rearing, and migration; and

¹ Although effects to listed eiders from long-term habitat loss were evaluated in the 2012 BO, because 1) the footprint of the proposed action has changed, and 2) more current estimates of listed eider densities are available (USFWS 2015), this effects analysis supersedes the Service's 2012 evaluation regarding impacts from long-term habitat loss.

2. Displacing females from nests, exposing eggs or small young to inclement weather and predators.

We do not anticipate significant long-term habitat loss from ice road or snow trail operations associated with winter gravel extraction and/or placement. Research indicates damage from ice roads occurs on higher, drier sites with little or no damage in wet or moist tundra areas (Pullman et al. 2003) when ice roads are used. Jorgenson (1999) found impacts were limited to isolated patches of scuffed high microsites and crushed tussocks. Similarly, Yokel and VerHoef (2014), found disturbance from seismic and ice road activity was greatest in drier, shrubby habitat than in moist habitat. McKendrick (2003) studied several riparian willow areas and found although some branches were damaged, the affected plants survived. Because spectacled eiders prefer to nest in low moist tundra areas (Anderson and Cooper 1994, Anderson et al. 2009), we anticipate limited damage in higher drier tundra habitat from ice roads would not adversely affect spectacled eiders.

Loss of production

Alaska-breeding Steller's eiders are not expected to nest east of the Colville River; therefore, we expect effects of long-term habitat loss from the ASAP project on Steller's eiders would be insignificant. However, we provide an assessment of potential loss of spectacled eider production resulting from construction and operation of the ASAP project in the discussion below. BROADSCALE aerial surveys conducted in multiple years allow us to estimate how average density of spectacled eiders varies across the landscape (USFWS 2015). These estimates were developed at a coarse regional scale and are not site- or habitat-specific; however, they reflect the best available data on the density of breeding spectacled eiders in the action area (USFWS 2015). Distribution on a local scale may vary based on the availability of preferred habitats.

Although estimated spectacled eider density across the action area ranged from 0.001 to 0.35 eiders/km² (Figure 5), to estimate the number of spectacled eider pairs potentially displaced by proposed ASAP features within the action area, we multiplied the midpoint density of spectacled eider breeding pairs within the area (0.17 eiders/km² or 0.09 nests/km²; USFWS 2015) by the total estimated affected area (26.04 km²). We assume the estimated number of pairs displaced is equivalent to the number of nests or broods that may be affected. We also assume that spectacled eiders will be present and attempt to nest annually in the action area. Finally, we assume that displaced pairs will not move and successfully nest elsewhere, which is an unproven and conservative assumption. Applying these assumptions and this logic, we estimate the proposed action would cause the failure of 113 spectacled eider nests over 50 years of estimated ASAP development life:

$$0.17 \text{ birds/km}^2 \times 0.5 \text{ nests/pair} \times 26.04 \text{ km}^2 = 2.26 \text{ nests annually}$$

$$2.26 \text{ nests annually} \times 50 \text{ years} = 113 \text{ spectacled eider nests over 50 years}$$

Because the most recent population estimate for North Slope-breeding spectacled eiders is 14,814 (13,501–16,128, 90% CI; Stehn et al. 2013), we would not anticipate population level effects from the loss of roughly 2 spectacled eider nests per year, or 113 nests over a 50-year period, resulting from construction and operation of the ASAP project.

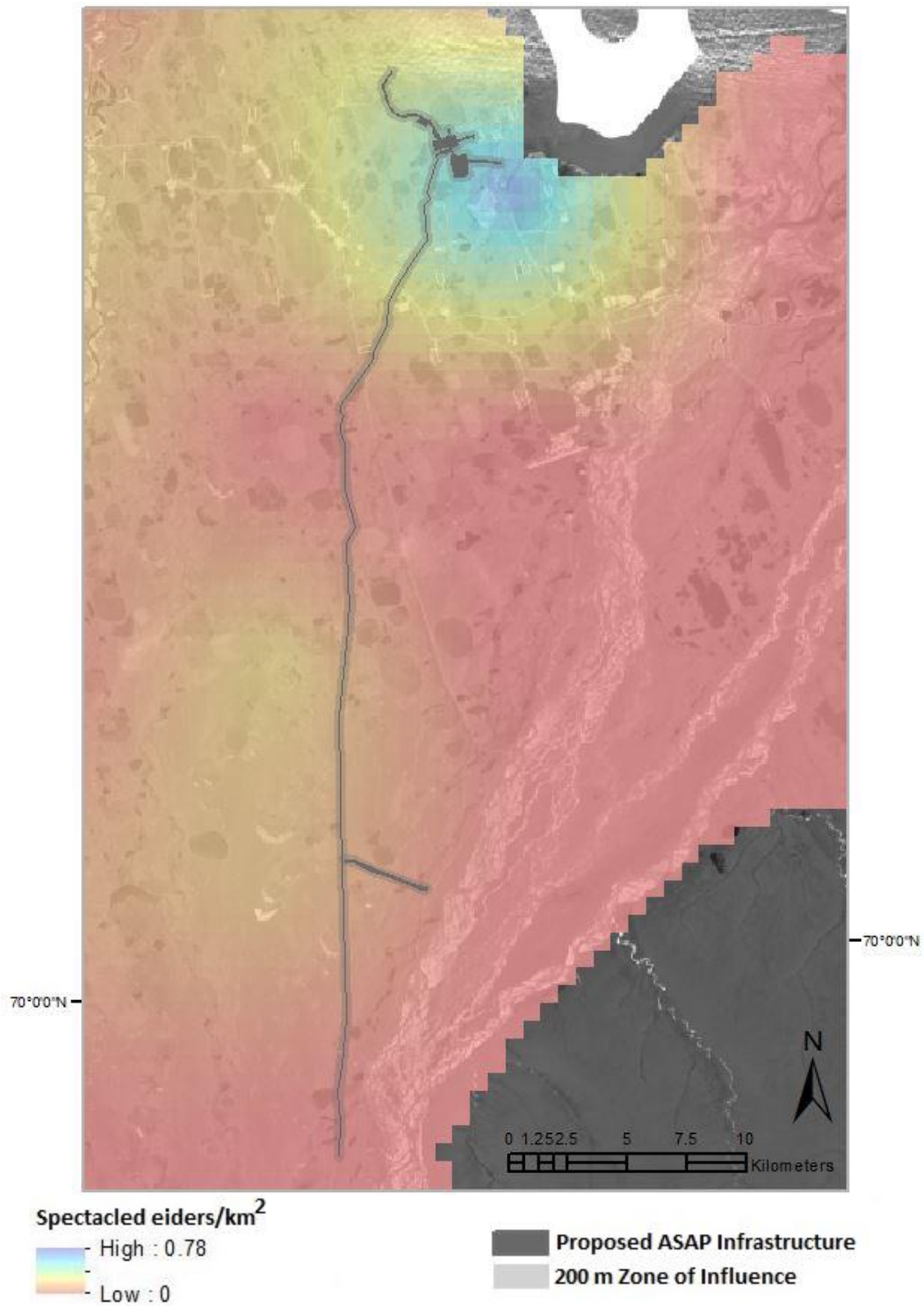


Figure 5. Estimated density distribution of spectacled eiders observed on North Slope aerial transects during breeding pair surveys in June, 2012-2015 (USFWS 2015), in relation to proposed ASAP project features within the action area.

Disturbance in marine habitat

Migratory or molting listed eiders, or those making local movements to forage in marine waters could be encountered during vessel transit through the Bering, Chukchi, or Beaufort seas. These birds could be subject to disturbance from the proposed sealift operations. However, we expect disturbance to migratory, molting, or foraging listed eiders would be minor because these individuals can respond to vessel presence or disturbance by moving away from the vessels to a safe distance. Furthermore, because vessels would avoid transiting through Ledyard Bay Critical Habitat, where spectacled eiders concentrate during molt, we would not anticipate vessel disturbance to result in appreciable impacts listed eiders.

Effects of collisions with vessels

In addition to disturbance, migratory listed eiders would also be at potential risk of collision with vessels during the proposed single season of barging operations. Worldwide, migratory birds suffer considerable mortality from collisions with man-made objects (Manville 2004). Birds involved in collisions with man-made objects may also experience severe injuries including concussions, internal hemorrhaging, and broken bones. Birds are particularly at risk of collision when visibility is impaired by darkness or inclement weather (Weir 1976). In a study of avian interactions with offshore oil platforms in the Gulf of Mexico, collision events were more common, and more severe (i.e., the number of collision incidents increased) during poor weather (Russell 2005). There is also evidence that lights on structures, particularly red steady-state lights, result in disorientation which increases collision risk (Reed et al. 1985, Russell 2005, Manville 2000). Strike rate may also be related to flight behavior, in particular, altitude (Anderson and Murphy 1988). Johnson and Richardson (1982) in their study of migratory behavior along the Beaufort Sea coast, reported that 88% of eiders flew below an estimated altitude of 10 m (32 ft) and well over half flew below 5 m (16 ft). Day et al. (2004 and 2005) also noted eider species may be particularly susceptible to collisions with offshore objects as they fly low (mean flight altitude 12.1 ± 0.8 m) and at relatively high speeds (approximately 45 mph) over water.

Although limited, the best available information with which to estimate collision risk between marine vessels and migratory birds are observations recorded during Royal Dutch Shell's (Shell) exploratory oil and gas activities in 2012. Ten vessels operating in the Chukchi Sea for 108 days recorded 131 total bird-vessel encounters, 17 of which were fatal collisions between eiders (13 king and 4 common eiders) and vessels. Of these 17 collisions, 2 involved mobile offshore drilling units, while the other 15 involved support vessels, which are reasonably similar to the barges and tugs currently planned for use in the proposed action. Considering that 10 vessels were involved in 15 fatal eider collisions, we estimate average collision rate per vessel to be 1.5 (i.e., $15 \div 10 = 1.5$ collisions/vessel) over a 108-day season.

These rates are based on reported collisions for king and common eiders during a single shortened industry season in the Chukchi Sea. Listed eider species were not among the seaduck collisions recorded in 2012, however spectacled and Steller's eiders moving through the Bering, Chukchi, and Beaufort seas during the ASAP project would also be at risk of colliding with the proposed barges and tugs, presumably in proportion to their relative abundance in seaduck populations. Assuming spectacled and Steller's eiders are equally as vulnerable to collisions as king and common eiders, and because there is no basis to assume otherwise, we believe

information on collision rates of much more abundant king and common eiders can be used to reasonably approximate collision rate for less abundant spectacled and Steller's eiders. To do this, we considered the number of observed collisions for eiders during Shell's 2012 exploratory season in the Chukchi Sea, combined with the estimated number of eiders migrating through the region, which were theoretically exposed to collision risk.

Based on a total of 705,380 eiders (529,271 king and 176,109 common eiders) recorded during migration counts near Utqiagvik in late summer and fall of 2002 (Quakenbush et al. 2004²), we very roughly estimate the risk of collision, per eider passing through the Chukchi Sea, for each vessel operating offshore to be:

$$1.5 \text{ collisions per vessel per season} \div 705,380 \text{ eiders} = 0.0000021 \text{ collisions per vessel per season}$$

We can then roughly estimate the risk of collision for listed eiders migrating through the Bering, Chukchi, and Beaufort seas, by multiplying the individual eider collision rate (described above), by the estimated abundance of spectacled and Steller's eiders from pre-nesting aerial survey data for the North Slope (Stehn et al. 2013³). These surveys estimate spectacled and Steller's eiders number approximately 14,814 (90% CI = 13,501-16,128) and 680, respectively (Stehn et al. 2013). Therefore, we estimate listed eider collision rates would be:

$$14,800 \text{ spectacled eiders} \times 0.0000021 \text{ collisions per vessel per season} = 0.031 \text{ spectacled eiders per vessel per season}$$

$$680 \text{ Steller's eiders} \times 0.0000021 \text{ collisions per vessel per season} = 0.0014 \text{ Steller's eiders per vessel per season}$$

If these figures represent the number of collisions expected per vessel moving through the Chukchi Sea, we can then approximate the number of collisions expected for 46 vessels total (23 barges, each accompanied by a tug) and in the Bering and Chukchi seas:

$$0.031 \text{ spectacled eiders per vessel} \times 46 \text{ vessels} = 1.43 \text{ spectacled eiders}$$

$$0.0014 \text{ Steller's eiders per vessel} \times 46 \text{ vessels} = 0.064 \text{ Steller's eiders}$$

Because the figures above are based on an approximately 108-day season during Shell's 2012 campaign, we have adjusted the calculations to estimate collisions over approximately 150-days⁴

²This survey was based on observed counts from a fixed location. It employed a subset of time intervals and extrapolated the data to account for intervals during which no observations were made. Because the majority of king and common eiders nest in Northern Canada, we believe these counts reasonably estimate the number of king and common eiders passing through Arctic Alaska. Listed eiders were not detected during these migration counts, presumably due to the comparative scarcity and identification challenges for spectacled and Steller's eiders.

³ These surveys were based on aerial observations of a subset of available nesting habitat on the North Slope. The data were then extrapolated to account for available nesting habitat that was not surveyed.

⁴ We expect the proposed barging operations would be of shorter duration (likely much shorter) than the length of a typical open-water season. We also acknowledge the timing of barge operations would be difficult to estimate with precision due to a number of factors including seasonal variation in sea ice conditions and marine forecasts.

of a typical open-water season as follows:

For spectacled eiders:

1.43 spectacled eider collisions $\div$ 108 days = 0.013 collisions per day; therefore,
0.013 collisions per day $\times$ 150 days = 1.98 spectacled eider collisions

For Steller's eiders:

0.064 Steller's eider collisions $\div$ 108 days = 0.00059 collisions per day; therefore,
0.00059 collisions per day $\times$ 150 days = 0.089 Steller's eider collisions

The reliability of these estimates may be limited by several biases. For example, 1) collisions are often episodic, and those resulting from light attraction in inclement weather may be particularly so, such that observations collected on a few vessels in a single year may not be representative of collisions in general, 2) monitoring for collisions is difficult and an unknown number of collisions may go undetected, even by trained bird observers, and 3) low visibility often coincides with increased collisions (Ronconi et al. 2015), which may increase the number of undetected collisions. However, these estimates are based on the best information available. Therefore, the Service estimates loss of roughly 2 adults and/or fledged juvenile spectacled eiders, and no Steller's eiders from collisions with vessel operations during the proposed ASAP project.

Because the most recent population estimate for North Slope-breeding spectacled eiders is 14,814 (13,501–16,128, 90% CI; Stehn et al. 2013), we would not anticipate population level effects from the loss of 2 spectacled eider adults and/or fledged juveniles during the proposed single season of barging operations.

CONCLUSION

Regulations (51 CFR 19958) that implement section 7(a)(2) of the ESA define “jeopardize the continued existence of” as “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.”

Listed eiders

In evaluating impacts of the proposed ASAP project to listed eiders, the Service identified potential adverse effects from direct and indirect long-term habitat loss as well as collisions with vessels involved in barging operations. Using methods explained in the *Effects of the Action* section, the Service estimates potential loss of production of up to 113 spectacled eider nests, as well as 2 spectacled eider adults and/or fledged juveniles from collisions. Given that the loss in production would occur over an estimated 50-year development life, and the overall estimated

Therefore, lacking greater certainty in project timing, we have conservatively extrapolated our estimate to cover a full open-water season. We believe this represents an overestimation of collision risk to listed eiders. Furthermore, because appreciable collision risk to listed eiders is not expected despite this acknowledged overestimation, we expect actual collision risk to listed eiders may be considerably less than the level predicted.

loss of is a very small proportion of the estimated North Slope-breeding population of spectacled eiders (13,501–16,128, 90% CI; Stehn et al. 2013), we believe spectacled eider loss that may result from the proposed ASAP project would not significantly affect the likelihood of survival and recovery of this species. Furthermore, adverse effects to Alaska-breeding Steller's eiders are not anticipated.

Therefore, after reviewing the current status of the species, environmental baseline, and effects of the action, the Service concludes the proposed action is *not likely to jeopardize the continued existence* of spectacled or Alaska-breeding Steller's eiders by reducing appreciably the likelihood of survival and recovery in the wild by reducing reproduction, numbers, or distribution of these species.

Future Consultation

This BO's determination of non-jeopardy is based on the assumption that the USACE and their agents will consult with the Service on future activities related to the ASAP project that are not evaluated in this document. For example, although overhead powerlines and/or guyed communication towers are not included in the project as described, if these features were proposed to be added in the future, the Service would need to evaluate the impact of those features on listed eiders and re-initiation of formal consultation may be necessary.

In addition to listed eiders, the area affected by the proposed action may now or hereafter contain plants, animals, or their habitats determined to be threatened or endangered. The Service, through future consultation, may recommend alternatives to future development within the action area to prevent impacts that will contribute to a need to list such a species or their habitat. The Service may require alternatives to proposed actions that are likely to result in jeopardy to the continued existence of a proposed or listed threatened or endangered species, or result in the destruction or adverse modification of designated or proposed critical habitat. The Federal action agencies should not authorize actions that may affect such species or critical habitat until it completes its obligations under applicable requirements of the ESA as amended (16 U.S.C. 1531 et seq.), including completion of any required procedure for conference or consultation.

INCIDENTAL TAKE STATEMENT

Section 9 of the ESA and Federal regulations pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct. "Harm" is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. "Harass" is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns that include, but are not limited to, breeding, feeding or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action, is not considered a prohibited taking provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement (ITS).

USACE has a continuing duty to regulate the activity covered by this ITS. If USACE 1) fails to assume and implement the terms and conditions, or 2) fails to require the applicant to adhere to the terms and conditions of the ITS through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse.

Spectacled eiders

The activities described and assessed in this BO may adversely affect spectacled eiders through direct and indirect long-term habitat loss and collisions with vessels. Methods used to estimate spectacled eider take from habitat loss and collisions are described in the *Effects of the Action* section. Based on these estimates, the Service authorizes *loss of production from 113 spectacled eider nests* from long-term habitat loss, as well as *2 adults and/or fledged juveniles* from collisions resulting from the proposed action⁵.

While the incidental take statement provided in this consultation satisfies the requirements of the ESA, it does not constitute an exemption from the prohibitions of take of listed migratory birds under the more restrictive provisions of the Migratory Bird Treaty Act. However, the Service will not refer the incidental take of any migratory bird or bald eagle for prosecution under the Migratory Bird Treaty Act of 1918, as amended (16 U.S.C. §§ 703–712), or the Bald and Golden Eagle Protection Act of 1940, as amended (16 U.S.C. §§ 668–668d), if such take is in compliance with the terms and conditions specified herein.

REINITIATION NOTICE

This concludes formal consultation for the ASAP Project. As provided in 50 CFR 402.16, re-initiation 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:

1. The amount or extent of incidental take for spectacled eiders is exceeded over the period covered by this BO;
 - a. More than 113 spectacled eider nests over 50 years;
 - b. More than 2 adult and/or fledged juveniles lost due to collisions with vessels;
2. New information reveals effects of the action that may affect listed species in a manner or to an extent not considered in this opinion;
3. The agency action is subsequently modified in a manner that causes an effect to listed species or critical habitat not considered in this opinion; or
4. A new species is listed or critical habitat is designated that may be affected by the action.

⁵ Incidental take of spectacled eiders authorized by this ITS is not additive to the incidental take estimated and authorized by the 2012 BO ITS. Rather, this ITS supersedes and replaces incidental take of spectacled eiders authorized by the 2012 BO to reflect changes to the project description.

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APPENDIX 1

Reasonable and Prudent Measures, Terms and Conditions, and Conservation Recommendations excerpted from the Service's 2012 Biological Opinion for Biological Opinion for the Alaska Stand Alone Gas Pipeline.

11. REASONABLE AND PRUDENT MEASURES

These reasonable and prudent measures (RPMs) and their implementing terms and conditions (T&Cs) aim to minimize the incidental take anticipated from activities described in this BO.

We have not identified RPMs or terms and conditions for polar bears. However, the Service anticipates that AGDC would obtain and comply with the terms and conditions of a LOA under the Beaufort Sea ITRs, pursuant to the MMPA.

As described in *Section 8 – Incidental Take Statement*, activities conducted by the USACE and their agents are anticipated to lead to incidental take of spectacled eiders through long-term habitat loss and disturbance of nesting females during the life of the project.

RPM 1 – Breeding spectacled eiders may remain on tundra in the action area through late August, but are considered to be most vulnerable to the effects of disturbance through the early brood-rearing stage. Accordingly, off-pad activities and pipeline maintenance within the action area should not be scheduled between June 1 and July 31 to the extent practicable.

12. TERMS AND CONDITIONS

To be exempt from the prohibitions of Section 9 of the Act, MBM Office must comply with the following terms and conditions, which implement the RPMs described above. These terms and conditions are non-discretionary.

T&C 1 – The AGDC has scheduled all construction activities outside of the eider breeding window. Changes to this schedule that affect the timing of proposed activities relative to spectacled eider nesting and brood-rearing periods should be reported to USFWS so that potential effects to eiders can be evaluated.

13. CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. We recommend the following actions be implemented:

1. Ravens are known to depredate eider nests near Barrow, AK (Quakenbush et al. 2004, Rojek 2008) and are potentially significant predators of spectacled eider eggs elsewhere on the North Slope, including oil fields. The Service recommends that AGDC remove any nest materials from accessible raven nest locations prior to egg laying, in addition to developing and implementing techniques designed to render their structures unattractive to breeding ravens.

2. While no collisions between spectacled eiders and project structures are anticipated, the Service recommends reporting all sea duck collisions to the Endangered Species Branch, Fairbanks Fish and Wildlife Field Office to improve our understanding of potential collision risks to eiders in the Prudhoe Bay area. Please contact Ted Swem at 907-456-0441.