U.S. Fish and Wildlife Service

Marine Mammals Management Office
Anchorage, Alaska

Final Environmental Assessment

for an

Incidental Harassment Authorization for
Pacific Walruses (*Odobenus rosmarus divergens*) in
Alaska and Associated State and Federal Waters

during

Installation of the Quintillion Fiber Optic Cable

August 11, 2016

FINDING OF NO SIGNIFICANT IMPACT

Issuance of an authorization for incidental harassment of Pacific walruses (*Odobenus rosmarus divergens*) during installation of a fiber optic network by Quintillion Subsea Operation, LLC

Based on a review and evaluation of the information contained in the supporting reference below, I have concluded that the Preferred Alternative, authorization of the incidental harassment of small numbers of marine mammals during specific activities (other than commercial fishing) at specific geographical areas, will not significantly affect the quality of the human environment, and that the preparation of an Environmental Impact Statement (EIS) on this action is not required by Section 102(2) of the National Environmental Policy Act or its implementing regulations. An EIS will, accordingly, not be prepared.

Supporting Reference

1. U.S. Fish and Wildlife Service, Marine Mammals Management. 2016. Final Environmental Assessment for an Incidental Harassment Authorization for Pacific Walruses (*Odobenus rosmarus divergens*) in the Bering, Chukchi, and Beaufort Seas, Alaska. Department of the Interior, Anchorage, Alaska.

Approved by: _____ Date: 7/11

ACTING Regional Director, Region 7
U.S. Fish and Wildlife Service

Proposed Action:

Issuance of an authorization for take of small numbers of Pacific walruses (*Odobenus rosmarus divergens*) by harassment incidental to installation of the Quintillion fiber optic cable in the State of Alaska and associated Federal waters, from August 11 – November 15, 2016.

Geographic Location:

The Federal waters of the northern Bering, Chukchi, and Southern Beaufort Seas, the marine water of the State of Alaska, and coastal land adjacent to Nome, Kotzebue, Point Hope, Wainwright, Barrow, and Oliktok Point, Alaska.

Type of Statement: Final Environmental Assessment

Date: August 2016

Responsible Official:

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Abstract:

This Environmental Assessment analyzes the environmental impacts of a proposal by the U.S. Fish and Wildlife Service, Alaska Region, to authorize the incidental take of small numbers of Pacific walruses under the Marine Mammal Protection Act of 1972, as amended, in the State of Alaska and associated Federal waters of the northern Bering Sea, Chukchi Sea, and Southern Beaufort Sea. The applicant, Quintillion Subsea Operation, LLC, has requested the Incidental Harassment Authorization for the planned installation of fiber optic cable on the sea floor in summer and fall, 2016. We anticipate no take by injury or death and include none in the authorization will be for take by harassment only.

Citation:

U.S. Fish and Wildlife Service, Marine Mammals Management. 2016. Final Environmental Assessment for an Incidental Harassment Authorization for Pacific Walruses (*Odobenus rosmarus divergens*) in Alaska and Associated State and Federal Waters during Installation of the Quintillion Fiber Optic Cable. Department of the Interior. Anchorage, Alaska.

Executive Summary

The U.S. Fish and Wildlife Service (Service) prepared this Environmental Assessment (EA) to determine whether the direct, indirect, and cumulative impacts related to the issuance of an Incidental Harassment Authorization (IHA) under the Marine Mammal Protection Act (MMPA) for take of Pacific walruses (*Odobenus rosmarus divergens*) during the installation of a fiber optic cable network would constitute a significant Federal action. If we determine the potential impacts are not significant, this analysis, in combination with other analyses incorporated by reference, may support a Finding of No Significant Impact (FONSI) for issuance of the IHA.

Quintillion Subsea Operation, LLC, (Quintillion) proposes to install cable using up to three cable-laying ships simultaneously during summer and fall, 2016. The cable network would be installed in Federal waters of the northern Bering, Chukchi, and Southern Beaufort Seas, in marine waters of the State of Alaska, and on coastal land adjacent to Nome, Kotzebue, Point Hope, Wainwright, Barrow, and Oliktok Point. Project activities could cause Pacific walruses to be harassed. Harassment is a form of take defined under the MMPA. Take of a small number of animals from incidental harassment may be permitted under an IHA if the taking will have a negligible impact on the species or stock, will not have an unmitigable impact on the availability of the species for subsistence use, and if the Service establishes permissible methods of take and mitigation measures which effect the least practicable impact on the species or stock and its habitat.

The installation of fiber optic cable could affect approximately 500 Pacific walruses (0.3 percent of the population) by exposing them to the sights and sounds of the cable-laying activities and by causing temporary habitat changes. Pacific walruses are most likely to respond by moving away from the activities. The project will not affect the ability of Pacific walruses to move to other areas, nor will it alter the availability of other suitable habitat. Pacific walruses will not need to move far in relation to their normal travel patterns, will not be displaced for long, and are not likely to be injured by Quintillion's operations. Impacts to subsistence harvest by Native Alaskans will be minimized. For these reasons, the Service has determined that the required conditions for issuance of an IHA can be met, and proposes to authorize the incidental taking by harassment of small numbers of Pacific walruses from date of issuance of the IHA through November 15, 2016. We base these findings on potential and documented impacts of disturbance on Pacific walruses, scientific studies on this species, commercial data, and current information regarding the life history and status of the species.

The Proposed Action (issuance of an IHA) would allow Quintillion to engage in activities that have the potential to cause incidental take of Pacific walruses without violation of the MMPA. Authorization would be limited to Level B harassment only (any act of pursuit, torment, or annoyance that disturbs a Pacific walrus by causing disruption of behavioral patterns, including, but not limited to migration, breathing, nursing, breeding, feeding, or sheltering). The Service would stipulate the permissible methods of taking and required mitigation, monitoring, and reporting of such taking in order to reduce or minimize negative impacts to Pacific walruses.

Under the No Action Alternative, the IHA would not be issued, and incidental take of Pacific walruses would not be authorized. Quintillion would be responsible for preventing incidental take in compliance with the MMPA. The No Action Alternative would not prohibit Quintillion from constructing the fiber optic network.

This EA provides an evaluation of the reasonably foreseeable environmental impacts of issuance of the IHA, as required by the National Environmental Policy Act. Based on available information, the Service concludes that issuance of an IHA for the Quintillion cable-laying project activities from August 11 through November 15, 2016, would not significantly affect the quality of the natural or human environment provided that all the recommended mitigation measures set forth in the EA and the IHA are implemented. Therefore, an Environmental Impact Statement is unnecessary in this proceeding.

Acronyms and Abbreviations

ANCSA	Alaska Native Claims Settlement Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
DPS	Distinct Population Segment
EA	Environmental Assessment
EIS	Environmental Impact Statement
ESA	Endangered Species Act
EWC	Eskimo Walrus Commission
FONSI	Finding of No Significant Impact
FR	Federal Register
HSWUA	Hanna Shoal Walrus Use Area
IHA	Incidental Harassment Authorization
IPCC	Intergovernmental Panel on Climate Change
ITR	Incidental Take Regulation, plural: ITRs
MMPA	Marine Mammal Protection Act
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
POC	Plan of Cooperation
PSO	Protected Species Observer
PTS	Permanent Threshold Shift
QWC	Qayassiq Walrus Commission
ROV	Remotely Operated Vehicle
SAR	Stock Assessment Report
SEL	Sound Exposure Level
Service	U.S. Fish and Wildlife Service
TTS	Temporary Threshold Shifts
U.S.C.	U.S. Code
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

Units of Measure

dB	Decibel (see Key Definitions)
dB_{rms}	Root-mean-square decibel (see Key Definitions)
ft	Foot
Hz	Hertz
kHz	Kilohertz
m	Meter
MHz	Megahertz
mi	Mile
min	Minute
s	Second
km	Kilometer
kn	Knot
m/s	Meters per Second
mph	Miles per Hour
µPa	Micropascal

Key Definitions

Applicant – Quintillion Subsea Operation, LLC, who has petitioned the U.S. Fish and Wildlife Service to issue an intentional harassment authorization for Pacific walruses.

dB – Decibel level, a measure of sound pressure level; all dB levels herein are re: 1 µPa underwater and re: 20 µPa in air.

dB_{rms} – Root-mean-squared decibel level, the square root of the average of the squared sound pressure level over some duration (typically 1 second). The dB_{rms} is used herein unless otherwise indicated.

Ensonification zone – The area surrounding a sound source where received sound levels may exceed a specified threshold.

Geographic region – The area specified for inclusion in the proposed Incidental Harassment Authorization. It includes Federal waters of the northern Bering, Chukchi, and Southern Beaufort Seas, the marine water of the State of Alaska, and coastal land adjacent to Nome, Kotzebue, Point Hope, Wainwright, Barrow, and Oliktok Point, as in Figure 1.

Harass – For non-military readiness activities, any act of pursuit, torment, or annoyance that: has the potential to injure a marine mammal or marine mammal stock in the wild (**Level A harassment**); or has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering (**Level B harassment**).

Incidental take – Take events that are infrequent, unavoidable, or accidental. It does not mean that the taking must be unexpected.

Least practicable adverse impact – This term is not defined in the MMPA or its enacting regulations, but it sets a standard for assessment of mitigation measures. It establishes

that such measures should be those that are capable of being done and are effective in reducing the impact of the specified activities, but also not so restrictive as to make activities unduly burdensome or impossible to undertake and complete.

Mitigation – An action that reduces the consequences of an activity for an animal, including measures to prevent exposure or to reduce frequency, duration, or intensity of exposure**.**

Mitigation zone – The area surrounding a sound source where received sound levels may exceed a specified threshold and presence of a marine mammal within this zone will initiate mitigation actions such as a power down or shut down of the sound source.

Negligible impact – An impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival.

No Action Alternative – The alternative wherein no authorization for take would be issued.

Proposed Action – Issuance of an incidental harassment authorization for activities associated with the installation of the proposed Quintillion fiber optic cable, including mobilization, preliminary work, survey work, cable laying, post-burial work, activities of support crews, and demobilization occurring from date of issuance through November 15, 2016.

Small numbers – Our small numbers analysis evaluates whether the number of marine mammals anticipated to be taken is *small relative or proportional to the size of the overall population*. A more precise formulation of "small numbers" is not possible because the concept is not capable of being expressed in absolute numerical limits. The Court of Appeals for the Ninth Circuit has expressly approved this definition (*Center for Biological Diversity v. Salazar*, 695 F.3d at 905-907). The statutory definition is provided at 16 U.S.C. 1362; however, the Service no longer relies upon or applies this regulatory definition. The Court of Appeals for the Ninth Circuit (*Center for Biological Diversity v. Salazar*, 695 F.3d 893, 902-907 [9th Cir. 2012]) has determined that the regulatory definition conflates "small numbers" with "negligible impact," whereas the MMPA establishes these as separate standards.

Sound exposure level (SEL) – A measure of energy. Specifically, it is the dB level of the time integral of the squared-instantaneous sound pressure normalized to a 1-s period.

Specified Activity – Quintillion's proposed fiber optic cable-laying project.

Take – To harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any marine mammal.

Unmitigable adverse impact – An impact resulting from the specified activity that: (1) is likely to reduce the availability of the species to a level insufficient for a harvest to meet subsistence needs by causing the marine mammals to abandon or avoid hunting areas, directly displacing subsistence users, or by placing physical barriers between marine mammals and subsistence hunters; and (2) cannot be sufficiently mitigated by other measures to increase the availability of marine mammals to allow subsistence needs to be met.

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Chapter 1. PURPOSE AND NEED FOR THE PROPOSED ACTION

1.1 Introduction

All species of marine mammals are protected under the Marine Mammal Protection Act (MMPA; 16 U.S.C. 1361, *et seq.*). The responsibilities for the protection, conservation, and management of marine mammals under the MMPA are shared by the U.S. Fish and Wildlife Service (Service) and the National Marine Fisheries Service (NMFS). Species within the Service's jurisdiction include sea otters (*Enhydra lutris*), Pacific walruses (*Odobenus rosmarus divergens*), dugongs (*Dugong dugon)*, the West Indian manatee (*Trichechus manatus*), and polar bears (*Ursus maritimus*). The MMPA prohibits the taking of marine mammals, except as explicitly allowed by the MMPA, or as authorized by permit. To "take" means to harass, hunt, capture, or kill, or to attempt to harass, hunt, capture, or kill any marine mammal (16 U.S.C. 1362[13]). "Harassment," as defined by the MMPA, means any act of pursuit, torment, or annoyance which: (i) has the potential to injure a marine mammal or marine mammal stock in the wild (the MMPA calls this "Level A harassment"), or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to migration, breathing, nursing, breeding, feeding, or sheltering (the MMPA calls this "Level B harassment").

Under section 101(a)(5)(D) of the MMPA, the Service may authorize the incidental take of small numbers of marine mammals by harassment upon the request of a U.S. citizen for a period of up to 1 year provided certain statutory and regulatory procedures are followed and the Service makes the following determinations: (a) take is of a small number of animals; (b) take will have a negligible impact on the species or stock; and (c) take will not have an unmitigable impact on the availability of the species or stock for subsistence uses. The Service refers to this as an "Incidental Harassment Authorization" (IHA). If an IHA is to be issued, the Service must establish permissible methods of take, means of effecting the least practicable impact on the species or stock and its habitat, and requirements for the monitoring and reporting of takings.

On October 29, 2015, the Service's Region 7 Marine Mammal Management Office (hereafter, the Service or "we") received a request from Quintillion Subsea Operation, LLC (Quintillion or "the applicant") to provide an IHA for take by harassment of Pacific walruses (also referred to hereafter as "walruses") and polar bears that may occur incidental to a cable-laying project in the marine waters and coastal lands of Alaska, specifically the marine waters of the northern Bering, Chukchi, and Southern Beaufort Seas and coastal land adjacent to Nome, Kotzebue, Point Hope, Wainwright, Barrow, and Oliktok Point (Figure 1, page 9) in summer and fall, 2016. Quintillion updated its IHA application on February 3, 2016. Quintillion subsequently withdrew its application for incidental take of polar bears on April 25, 2016, citing several factors, including changes to the project that reduce the already-low probability of encounters with polar bears.

This Environmental Assessment has been prepared in response to Quintillion's request for an IHA. This EA analyzes the direct, indirect, and cumulative effects of issuance of an IHA (the "Proposed Action") and a No Action Alternative to determine if issuance of an IHA for Quintillion's project is a major Federal action that significantly affects the quality of the human

environment. This EA is prepared in accordance with the National Environmental Policy Act of 1969 (NEPA), as amended (42 U.S.C. 4321, *et seq.*), and the Council on Environmental Quality (CEQ) regulations in 40 CFR 1500-1508. This statute and the implementing regulations require that the Service, as a Federal agency:

- Assess the environmental impacts of the Proposed Action;
- Identify adverse effects that cannot be avoided, if the Proposed Action is implemented;
- Evaluate alternatives to the Proposed Action, including a No Action Alternative; and
- Describe the cumulative impacts of the Proposed Action together with other past, present, and reasonably foreseeable future actions.

The IHA will not authorize the Quintillion cable project. Rather, the IHA will: (i) establish permissible methods of take and mitigation requirements; (ii) prescribe means of effecting the least practicable impact on the availability of the species for subsistence uses; and (iii) identify requirements for monitoring and reporting to better understanding the effects on the species.

1.2 Purpose and Need

The applicant proposes to construct a subsea fiber optic cable through areas of the Bering, Chukchi, and Beaufort Seas that provide habitat for walruses. Walruses that encounter the project activities will be exposed to humans, vessels, machinery, cable-laying equipment, and all the sights, sounds, and smells of this work. Such exposure has the potential to disturb walruses by causing biologically significant disruption of behavioral patterns, including, but not limited to, migration, nursing, feeding, or sheltering, and therefore could cause nonlethal incidental take by harassment. Without prior authorization, such take is prohibited by the MMPA.

In February 2015, the Service determined that Quintillion had submitted an adequate and complete petition demonstrating both the need and potential eligibility for issuance of an IHA in connection with the proposed cable-laying activities. The Service, under section 101(a)(5)(D) of the MMPA, has a corresponding duty to determine whether and how we can authorize take by Level B harassment incidental to the activities described in the applicant's petition.

The dual purposes of this EA are:

1. To fulfill the requirements of the MMPA by:
    a. Evaluating the amount of take that would be authorized by the IHA;
    b. Determining whether such take would have a negligible impact on affected marine mammal species or stocks;
    c. Determining whether such take would have an unmitigable adverse impact on the availability of marine mammals for taking for subsistence uses; and
    d. Describing mitigation and monitoring measures to effect the least practicable adverse impact from any incidental take that may occur.
2. To fulfill the requirements of the NEPA by:
    a. Analyzing the probable environmental impacts of a Proposed Action;
    b. Analyzing a reasonable range of alternatives that achieve the purpose and need for the Proposed Action, and analyzing a No Action Alternative;

c. Evaluating the effects of the Proposed Action (the issuance of the IHA) on the human environment; and
d. Determining if the Proposed Action is a major Federal action that significantly affects the quality of the human environment.

Our described purpose and need guide us in developing reasonable alternatives for consideration, including alternative means of mitigating potential adverse effects. Any alternatives considered under the NEPA must meet the agency's statutory and regulatory requirements. Thus, the conditions of an IHA may require us to consider alternative mitigation and monitoring measures in order for us to make our determinations under the MMPA.

1.3 Laws, Regulations, Agreements, and Policies

1.3.1 Marine Mammal Protection Act

The MMPA establishes a broad moratorium on the taking and importation of marine mammals and marine mammal products, except as explicitly allowed by the MMPA, or as authorized by permit. Section 101(a)(5)(D) of the MMPA directs the Service to allow, upon request of a United States citizen, the incidental but not intentional taking of small numbers of marine mammals of a species or population stock, while engaging in a specified activity (other than commercial fishing) within a specified geographic region for a period not to exceed 1 year, if we make certain findings and provide a notice of a proposed IHA to the public for review. The Service must find, based on the best scientific evidence available, that the total of such taking associated with the specified activity will have a negligible impact on the species or stock and will not have an unmitigable adverse impact on the availability of the species or stock for subsistence uses. Conditions may be specified for the proposed activities that allow these findings to be made. We must use the best available information from all commercial and scientific sources to evaluate the activities' impacts and make these findings.

The terms "small numbers," "negligible impact," and "unmitigable adverse impact" are defined in 50 CFR 18.27—the Service's regulations governing take of small numbers of marine mammals incidental to specified activities. "Small numbers" is defined as a portion of a marine mammal species or stock whose taking would have a negligible impact on that species or stock. However, we do not rely on that definition here, as it conflates the terms "small numbers" and "negligible impact," which we recognize as two separate and distinct requirements. Instead our small numbers determination evaluates whether the number of marine mammals likely to be taken is small relative to the size of the overall population. "Negligible impact" is defined as an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to adversely affect the species or stock through effects on annual rates of recruitment or survival. "Unmitigable adverse impact" is an impact resulting from the specified activity that: (1) is likely to reduce the availability of the species or stock to a level insufficient for a harvest to meet subsistence needs by causing the marine mammals to abandon or avoid hunting areas, directly displacing subsistence users, or by placing physical barriers between marine mammals and subsistence hunters; and (2) cannot be sufficiently mitigated by other measures to increase the availability of marine mammals to allow subsistence needs to be met.

If an IHA is to be issued, the Service must set forth the following: (1) permissible methods of taking; (2) means of effecting the least practicable impact on the species or stock and its habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance; and (3) requirements pertaining to the monitoring and reporting of such takings. Habitat areas of significance for walruses in the project area include: (a) marginal sea ice zones, (b) areas with consistent polynyas in consolidated pack ice or multiyear ice, (c) areas of high benthic productivity, (d) areas where nutrient-rich ocean currents converge, and (e) terrestrial haulouts. The proposed activities will not be conducted in the vicinity of sea ice, eliminating potential impacts to the first two habitat types. Areas of high benthic productivity and convergence of nutrient-rich currents are important because they generate important feeding areas. The Service must therefore specify avoidance and minimization measures for effecting the least practicable impact of the Proposed Action on important feeding areas and terrestrial haulouts.

Also, we must publish a notice of a proposed IHA in the *Federal Register* for public notice and comment. An IHA promulgated pursuant to section 101(a)(5)(D) of the MMPA does not permit, approve, or otherwise allow any individual or class of commercial, industrial, or development activity to occur. Additional definitions of the terms used in the EA are listed under Key Definitions (page v).

Subsistence harvest by Native Alaskans is authorized under MMPA section 101(b). The MMPA allows Alaska Natives who reside in Alaska and dwell on the coast of the North Pacific Ocean or the Arctic Ocean to harvest walruses if such harvest is for subsistence purposes or for purposes of creating and selling authentic Native handicrafts and clothing, as long as the harvest is not done in a wasteful manner. The MMPA does not restrict the number, season, or age of walruses that can be harvested in Alaska.

The status of each species or stock protected by the MMPA is documented in periodic stock assessment reports (SARs) pursuant to MMPA section 117. Each SAR includes a description of the stock's geographic range, a minimum population estimate, current population trends, current and maximum net productivity rates, optimum sustainable population levels, allowable removal levels, and estimates of annual human-caused mortality and serious injury through interactions with commercial fisheries and subsistence hunters. The most recent revisions to the walrus SAR were published in 2014 (USFWS 2014).

1.3.2 Endangered Species Act (ESA)

The ESA (16 U.S.C. 1531 *et seq*.) establishes statutory requirements for conservation of fish, wildlife, and plants in danger of or likely to become in danger of extinction. Section 4 of the ESA (16 U.S.C. 1533) provides authority for the listing of species, subspecies, or distinct population segments as either threatened or endangered, and for the designation of critical habitat for listed species. After a species has been listed as threatened or endangered, the provisions of the ESA afford protection to such species and to designated critical habitat in the form of various procedural and substantive requirements and prohibitions. For example, under section 7 of the ESA (16 U.S.C. 1536), all Federal agencies must ensure through consultation with the Service (or, depending upon the affected species, the NMFS of the National Oceanic and Atmospheric Administration [NOAA]) that actions authorized, funded, or carried out by such agencies are not

likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of designated critical habitat. In addition, under sections 4(d) (for threatened species) and 9 (for endangered species) of the ESA [16 U.S.C. 1533(d) and 1538], the taking of listed species is or may by regulation be prohibited, except pursuant to an incidental take authorization or statutory exemption. No incidental take authorization pursuant to the ESA may be issued for ESA-listed marine mammals, unless authorization for the incidental take has been obtained pursuant to section 101(a)(5)(D) of the MMPA.

The status of the Pacific walrus was evaluated in response to a 2008 petition to list this species under the ESA. The Service concluded that listing may be warranted but is precluded by higher priority actions (76 FR 7634, February 10, 2011). Accordingly, the Pacific walrus was designated as a candidate species. A thorough evaluation of the status of the species was completed and is available at 76 FR 7634. In addition, the Service released a separate status review in January 2011 (Garlich-Miller et al. 2011). By September 2017, the Service must either propose adding Pacific walrus to the ESA list or determine that listing is no longer warranted. Consistent with established agency policy, the Service's Ecological Service has evaluated the effects of the Proposed Action on the Pacific walrus and has determined that it will not jeopardize the continued existence of the species. This evaluation and finding is available on the Service's website at *http://www.fws.gov/alaska/fisheries/mmm/iha.htm*.

1.3.3 National Environmental Policy Act (NEPA)

Section 102 of the NEPA (42 U.S.C. 4332(C)) mandates a thoughtful and reasonably thorough analysis of the probable environmental impacts of a proposed major Federal action, including analysis of both a reasonable range of alternatives that achieve the purpose and need for the Proposed Action, and analysis of a No Action Alternative. Such an analysis is referred to as an environmental impact statement (EIS). An Environmental Assessment (EA) is a concise document that provides sufficient information and analysis to determine whether preparation of an EIS is necessary. Pursuant to the NEPA, preparation of an EIS is required for major Federal actions that may significantly affect the quality of the human environment. An EIS is not required if, after preparation of an EA, a Federal agency issues a Finding of No Significant Impact (FONSI). Accordingly, the NEPA does not establish substantive statutory or regulatory standards or compel a particular decision to approve, modify, or disapprove a proposal. The requirements of the NEPA are entirely procedural.

The procedural provisions outlining Federal agency responsibilities under the NEPA are provided in the CEQ's implementing regulations (40 CFR 1500-1508). These regulations direct agencies to reduce excessive paperwork and eliminate repetitive discussion of issues by tiering to or incorporating by reference existing NEPA documents (40 CFR 1502.20-21). This EA adheres to these recommendations by summarizing the issues discussed in broader or pre-existing NEPA documents and adopting these discussions by reference. In the present context, this approach is particularly relevant and useful with respect to discussion of aspects of climate change. This EA incorporates by reference current information on climate change in the offshore and onshore areas of the Arctic from the following NEPA documents:

- *Alaska Outer Continental Shelf, Chukchi Sea Planning Area - Oil and Gas Lease Sale 193 in the Chukchi Sea, Alaska, Final Second Supplemental Environmental Impact Statement* (BOEM 2015) at 3.1.9 (Climate Change); and
- *National Petroleum Reserve-Alaska Final Integrated Activity Plan/Environmental Impact Statement* (BLM 2012) at 3.2.1.1 (Climate Change on the North Slope).

1.3.4 Co-Management Agreements

The 1994 amendment to the MMPA included provisions for the development of cooperative agreements between the Service and Alaska Native organizations to conserve marine mammals and provide for the co-management of subsistence use by Alaska Natives. Section 119 of the MMPA amendments authorized the appropriation of funds to implement co-management activities in Alaska. Together with the Service, the Indigenous People's Council for Marine Mammals, U.S. Geological Survey (USGS), and NMFS developed a Memorandum of Agreement to provide the foundation and direction for the use of co-management funds. Cooperative agreements have been adopted between the Service and the Eskimo Walrus Commission (EWC) for management of walruses. Alaska Native organizations participate in a variety of management issues including biological sampling programs, harvest monitoring, collection of Native knowledge, international coordination on management issues, and development of local conservation plans.

1.4 Scope of Analysis

In accordance with NEPA and CEQ implementing regulations, this document analyzes whether the Proposed Action (issuance and implementation of the IHA) will result in impacts constituting a major Federal action that significantly affects the quality of the human environment. As stated previously, issuance of the IHA pursuant to the MMPA would not authorize cable-laying activities. This document's scope of analysis includes the direct, indirect, and cumulative effects of issuance of the IHA on elements of the human environment, particularly Pacific walruses. Issuance of an IHA is contingent upon the Service's findings that the impact of the specified activities will have a negligible impact on the species or stock and will not have an unmitigable adverse impact on the availability of the species or stock for subsistence uses. Therefore, we also analyze the impacts of the specified activities on walruses. Analysis of effects of the activities demonstrates whether these findings can be made, and whether the IHA can be issued. This EA does not further evaluate effects on the elements listed in Table 1 because issuing IHAs for walrus would not significantly affect those elements.

Table 1. Components of the human environment not affected by issuance of the proposed Incidental Harassment Authorization

Biological	Physical	Socioeconomic / Cultural
Amphibians	Air Quality	Commercial Fishing
Marine Mammals (Except Pacific Walruses)	Essential Fish Habitat	Military Activities
	Geography	Recreational Fishing
	Land Use	Shipping and Boating
Invasive Species	Oceanography	National Historic Preservation Sites
Seabirds	State Marine Protected Areas	National Trails
Plants	Federal Marine Protected Areas	Low Income Populations
Fish	National Estuarine Research Reserves	Minority Populations
Aquatic organisms	National Marine Sanctuaries	Nationwide Inventory of Rivers
Ecologically Critical Areas	Park Land	Public Health and Safety
	Prime Farmlands	Historic and Cultural Resources
	Wetlands	
	Wild and Scenic Rivers	[Top]

Chapter 2. PROPOSED ACTION AND ALTERNATIVES

2.1 No Action Alternative

Under the No Action Alternative, no authorization for incidental take would be issued. Because the IHA does not authorize the proposed cable-laying activities directly, the lack of an IHA would not necessarily preclude Quintillion from conducting the activities. The mitigation measures imposed by the IHA for reducing the effects of activities on walruses would not be required. Should the applicant decide to proceed without the IHA and the associated mitigation measures, the likelihood, frequency, or intensity of take could increase. The moratorium and prohibitions on the taking of marine mammals imposed by the MMPA would remain in effect and the applicant would be liable for penalties should a take occur.

The provisions in section 101(a)(5)(D) of the MMPA require the Service to allow the incidental, but not intentional, taking of small numbers of marine mammals, subject to the requisite findings that the specified activity will have a negligible impact on the identified species or stocks, and there will be no unmitigable adverse impact on the availability of the species or stocks for subsistence use by Alaska Natives. Accordingly, if these finding are made based upon the best available scientific information, the No Action Alternative would not meet this requirement.

2.2 Alternatives not Considered Feasible or Practicable

The Service considered whether other alternatives could meet the purpose and need and support Quintillion's proposed activities. An alternative that would allow for the issuance of an IHA with no required mitigation or monitoring was considered but eliminated from consideration, as it would not be in compliance with the MMPA and therefore would not meet the purpose and need. We also considered whether an IHA that incorporated mitigation and monitoring measures

other than those described in the preferred alternative could be issued. The MMPA requires the selected mitigation measures to be those that achieve the least practicable impact on the species and its habitat and on subsistence uses. An alternative action based on the mitigation measures that meet this criteria would not be substantially different than the Proposed Action, i.e., it would still allow issuance of take with appropriate mitigation measures. An alternative with mitigation measure that do not meet the "least practicable impact" standard would not be permissible under the MMPA. For these reasons, this alternative was not analyzed further in this document.

2.3 Preferred Alternative – Issuance of Incidental Harassment Authorization

The Preferred Alternative is the issuance of an IHA for the nonlethal, incidental, unintentional take by Level B harassment of small numbers of Pacific walruses during cable-laying activities in the marine waters of Alaska and impacted coastal communities, as described in this document and in the applicant's petition. We neither anticipate nor propose authorization for intentional take or take by injury or death. The final IHA will be effective immediately after the date of issuance (on or after approximately August 8, 2015), through November 15, 2016.

The final IHA would also incorporate the mitigation, monitoring, and reporting requirements described in this proposal. The applicant would be expected and required to implement and fully comply with those requirements. If the nature or level of activity changes or exceeds that described in this proposal and in the IHA petition, or the nature or level of take exceeds that projected in this proposal, the Service will reevaluate its findings. The Service may modify, suspend, or revoke the authorization if the findings are not accurate or the mitigation, monitoring, and reporting requirements described herein are not being met.

The proposed IHA analyzed the potential impacts of this alternative in detail (81 FR 40902, June 23, 2016). We incorporate those analyses by reference in this EA and briefly summarize them here, along with mitigation and monitoring measures and reporting requirements that are proposed for inclusion in the final IHA. The mandatory mitigation and monitoring measures are a combination of those proposed by the applicant and those developed by the Service.

2.3.1 Geographic Location

Quintillion is proposing to install 1,904 kilometers (km) (1,183 miles [mi]) of submerged fiber optic cable on the sea floor of Alaska and associated Federal waters during the open water season of 2016. The planned cable project will occur in the marine waters of the northern Bering, Chukchi, and Southern Beaufort Seas, in waters of the State of Alaska, and on coastal land of Alaska (Figure 1). The main trunk line is 1,317 km (818 mi) in length. The branching lines range between 27 km (17 mi) and 233 km (145 mi) in length and extend between the trunk line and the coastal communities of Nome, Kotzebue, Point Hope, Wainwright, and Barrow. Another branching line will extend to Oliktok Point, located 260 km (162 mi) southeast of Barrow. This line will connect over land with the community of Nuiqsut and the Prudhoe Bay industrial center. Additional project details are available in Quintillion's IHA application, available online at *http://www.fws.gov/alaska/fisheries/mmm/iha.htm*.

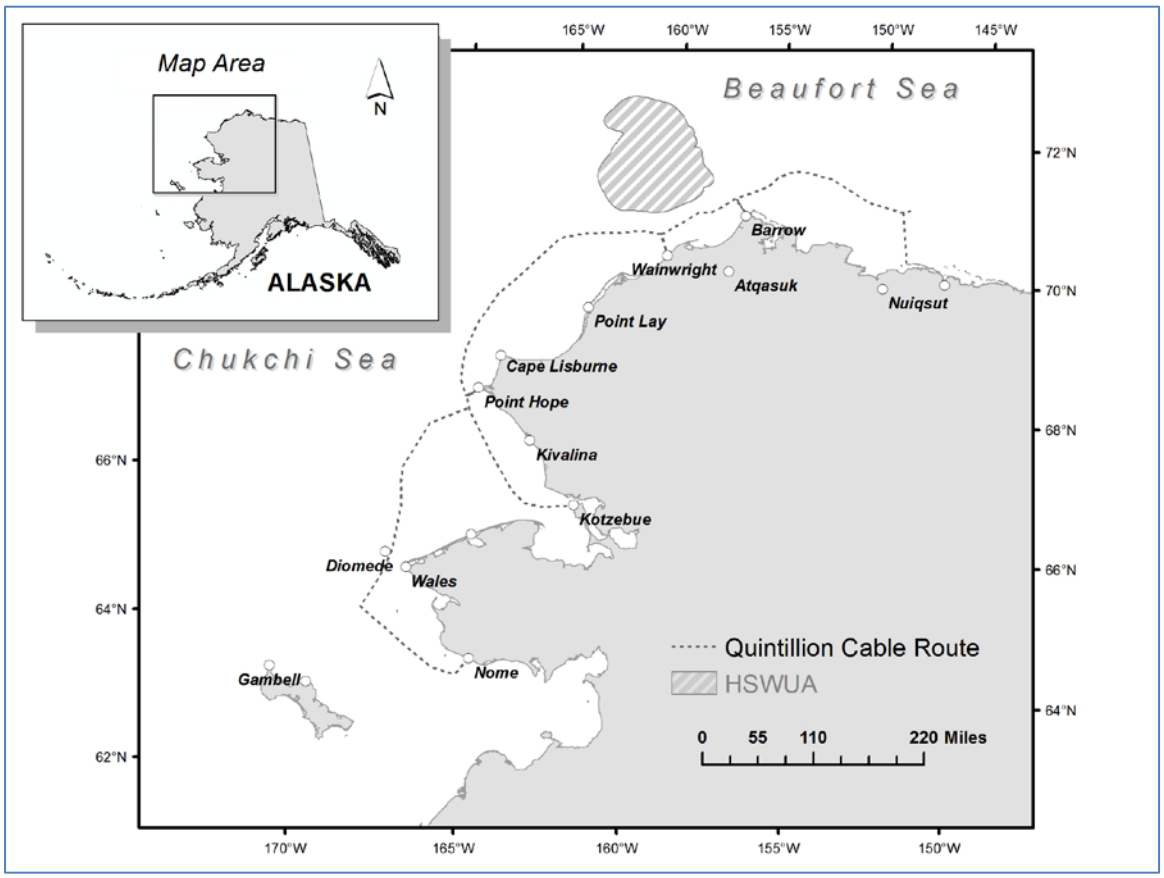

Figure 1. Geographic area of the Quintillion Subsea Operations, LLC proposed fiber optic cable network featuring the Hanna Shoal Walrus Use Area (HSWUA). [Top]

2.3.2 Description of Activities

All activities associated with the cable-laying project, including mobilization, preliminary work, cable laying, post-burial work, and demobilization of survey and support crews are proposed to occur during June 1 – October 31, 2016. Operations in the Bering Sea will begin near Nome in mid-June and follow the receding sea ice northward into the northern Bering Sea. Work in the Bering Sea between Nome and the Bering Strait is proposed to occur from mid-July to mid-August 2016. Work in the open water of the Chukchi Sea north of the Bering Strait and in the Beaufort Sea will be done in August and September. Nearshore cable landing work near Oliktok Point, Barrow, Wainwright, and Point Hope will begin in July and will continue in August – October while work is also being conducted offshore. Work may be conducted day or night. The operations will take approximately 150 days within the work window.

Before cable is laid, a grapnel run will be completed along the proposed cable route. A grapnel is an anchor with three or more flukes, used for grappling or dragging. The objective of the

operation is the clearance of any seabed debris. The grapnel run will employ towed grapnels and will be conducted by a tugboat. Any debris recovered during these operations will be discharged ashore and disposed of in accordance with applicable regulations. If any debris cannot be recovered, then a local reroute will be planned to avoid the debris.

The cable-laying operations will be conducted from the Cable Ship (C/S) *Ile de Brehat* and/or its sister ships (*Ile de Sein, Ile de Batz*). The three ships may operate simultaneously in different locations. All three ships are 140 meters (m) or 460 feet (ft) in length and 23 m (77 ft) in breadth, with berths for a crew of 70. Each ship is propelled by two 4,000-kilowatt (kW) fixed-pitch propellers. Dynamic positioning is maintained by two 1,500-kW bow thrusters, two 1,500-kW aft thrusters, and one 1,500-kW fore thruster. Sound source measurements have not been conducted for the C/S *Ile de Brehat*, but noise measurements for similar vessels are 171 – 180 dB at 1 m (Nedwell et al. 2003; Samsung 2009; Deepwater Wind 2012).

Support vessels include a tug and barge that will be primarily used for nearshore operations on the branch lines. Submerged cable components will include the cable, interconnecting hardware, and repeaters. The cable will be placed on the sea floor surface or will be buried. Burial method will depend on substrate, depth, and location. Echo sounders, transceivers, and transponders will be used to monitor the water depth and the position of equipment on the sea floor.

Where cable is to be laid on the sea-floor surface, the cable ships will install the cable as close as possible to the planned route with the correct amount of cable slack to enable the cable to conform to the contours of the sea floor without loops or suspensions. A slack plan will be developed that uses direct bathymetric data and a catenary modeling system to control the ship and the cable payout speeds to ensure the cable is accurately placed. A dive team and the tug and barge will lay cable in nearshore waters too shallow for the C/S *Ile de Brehat*.

Burial methods will depend on water depth. In depths greater than 12 m (39.4 ft), the cable will be buried using a burial plough pulled by the cable ship. The plough is pulled by a tow wire as cable is fed through a depressor into a trench. Burial depth is controlled by adjusting the front skids. The normal tow speed is approximately 600 meters per hour (m/hr) (0.37 miles per hour [mph] or 0.32 knots [kn]). During cable laying, the cable ship will not be able to alter course or speed to avoid marine mammals, but the slow speed and constant sound production will provide ample warning, allowing Pacific walruses to retreat before they are close enough to be harmed.

In water depths less than 12 m (39.4 ft), burial will be by a tug-pulled jet sled, tracked Remotely Operated Vehicle (ROV), or by a dive team using hand-jetting equipment. Burial depths will generally be 2 – 3 m (6.6 – 9.8 ft). Near shore, where seasonal ice scouring occurs, the cable will be floated on the surface and then pulled through an existing horizontal directionally drilled bore pipe to the beach manhole where it will be spliced to the terrestrial cable. The floated cable portion will then be lowered to the sea floor by divers and buried (using a burial method as described above) from the bore pipe seaward. While it is expected that the cable trenches will fill in by natural current processes, it is important to ensure that cable splices and interconnections are fully buried. To ensure proper burial at critical locations, the ROV will be used to conduct inspection and burial along an estimated 10 km (6.2 mi) of the burial route.

2.3.3 The Nature and Level of Proposed Take

The project is most likely to encounter Pacific walruses in the Chukchi Sea in August and September. The cable-laying activities are proposed for the northern Bering Sea after mid-July when most animals have moved either northward into the Chukchi Sea or southward to Bristol Bay, where no project activities are proposed. The Beaufort Sea is outside of the normal range of the species and is, therefore, considered "extralimital." Encounters there are unlikely.

When Pacific walruses are encountered, they may react to the presence of the vessels or the sounds of the activities. Thrusters, echo sounders, and beacon transceivers that will be used by the cable-laying ships during this project may generate noise levels capable of causing acoustic harassment to Pacific walruses in the local area. Dynamic positioning thrusters, in particular, produce non-impulse sound levels above the 160-decibel (dB) threshold considered by the Service to be capable of causing harassment of walruses. All dB levels given herein are dB_{rms} re: 1 µPa, unless otherwise specified (dB_{rms} refers to the root-mean-squared dB level, the square root of the average of the squared sound pressure level over some duration—typically 1 second).

Quintillion is requesting incidental take by Level B harassment of 500 Pacific walruses from disruption of behavioral patterns and exposure to sound levels exceeding 160 dB. The number of actual takes from sound exposure will depend upon the number of individuals occurring within the 160-dB ensonification zone. The "ensonification zone" is the area surrounding a sound source where received sound levels may exceed the specified threshold. Quintillion is not requesting authorization for take by Level A harassment. Quintillion does not believe that Level A take will occur because the project is not expected to generate noise levels at or above the level considered by the Service to have the potential to cause injury within the range of frequencies audible to walruses. Quintillion estimates that the project will generate sound levels no greater than 180 dB. Based in part on conclusions reached by the NOAA, the Service considers only sound levels above 190 dB to have the potential to cause injury to Pacific walruses and result in take due to Level A harassment (e.g., NMFS 1998; HESS 1999).

Prior to issuing an IHA in response to this request, the Service must evaluate the level of activities described in the application, the associated potential impacts to Pacific walruses, and the potential effects on the availability of the species for subsistence use. The Service is tasked with analyzing the impact that the proposed lawful activities will have on Pacific walruses during normal operating procedures.

2.3.4 Proposed Mitigation and Monitoring

In order to issue an incidental take authorization under section 101(a)(5)(D) of the MMPA, the Service must, where applicable, set forth the permissible methods of take and other means of effecting the least practicable impact on the Pacific walrus and its habitat, and on the availability of the species or stock for subsistence uses. Particular attention must be paid to habitat areas of importance, including haulouts and feeding areas. Monitoring and mitigation measures were developed to minimize the potential impacts and ensure the least practicable impact to Pacific walruses. As part of these mitigation measures, Quintillion will communicate closely with the EWC and the villages to ensure subsistence harvest is not disrupted. A Plan of Cooperation

(POC) has been developed and will be implemented to structure and facilitate coordination with subsistence users. Work will be scheduled to minimize activities in hunting areas during subsistence harvest periods. Quintillion has also developed a Marine Mammal Monitoring and Mitigation Plan (4MP). Habitat areas where Pacific walruses engage in particularly sensitive activities (such as feeding or resting at haulouts) will be avoided. Adaptive measures, such as temporal or spatial limitations, will be applied in response to the presence of Pacific walruses.

Avoidance

For the proposed Quintillion subsea cable-laying operations in the Bering, Chukchi, and Beaufort Seas and coastal lands of Alaska, the primary means of minimizing potential consequences for Pacific walrus and subsistence users is routing the cable to avoid concentration areas and important prey habitat. Most of the main trunk line will be laid 30 – 150 km (19 – 93 mi) offshore, thereby avoiding nearshore Pacific walrus concentrations and terrestrial haulouts. Where cable end branches will come ashore, landings will be conducted at right angles to the coastline and immediately adjacent to the respective village (except at Oliktok Point where no village exists) to minimize nearshore activities and avoid areas where haulouts may occur. No work will be done within 50 km (31.1 mi) of Point Lay, where large haulouts are likely, or within 20 km (12.4 mi) of Hanna Shoal, where feeding aggregations may occur. Cable-laying activities will not be performed by multiple vessels simultaneously where doing so would create overlapping ensonification zones. Quintillion's operations must avoid sea ice for safety reasons. In doing so, Quintillion will avoid ice habitat used by Pacific walruses. The cable-laying operation will occur at a slow speed of 600 m/hr (0.37 mph or 0.32 kn), and it is, therefore, highly unlikely that cable-laying activities could cause injury. Collisions between vessels and Pacific walruses are rare, and when they do occur, they usually involve fast-moving vessels.

Acoustic Monitoring

Measures included in the IHA to monitor and reduce the frequency and severity of behavioral responses to the activities will include acoustic monitoring, visual observation by vessel-based protected species observers (PSOs), and adaptive measures in response to observations. The primary purpose of these mitigation measures is to detect marine mammals and avoid vessel interactions during the pre- and post-cable-laying activities. Due to the nature of the activities, the vessel will not be able to shut down or change speed or direction during cable-laying operations.

Quintillion plans to monitor ensonification zones, conduct sound source verification, and contribute to passive acoustic monitoring efforts. Acoustic injury to Pacific walruses can occur if received noise levels exceed 190 dB. The cable-laying activities are not expected to produce noise levels capable of acoustic injury, and Quintillion is not requesting authorization of take by Level A harassment. Therefore, no shutdown zones will be necessary for this activity. Take by Level B harassment may occur due to exposure to sound at greater than 160-dB levels. For this reason, observers will monitor the 160-dB ensonification zone for the presence of Pacific walruses. Quintillion has committed to monitoring the 120-dB zone for marine mammals. The 160-dB zone is well within the 120-dB zone and, therefore, will be included in the monitoring area.

Sound source verification will be conducted during early-season operation of one cable-lay ship and anchor-handling tug. Results will be used to calibrate the 120-dB and 160-dB ensonification zones. If sound source verification indicates that sound levels produced during operations will be higher than expected (greater than 190 dB at frequencies less than 40 kHz), Quintillion will coordinate with the Service to evaluate additional mitigation options.

Passive acoustic monitoring will be conducted by the 2016 joint Arctic Whale Ecology Study (ARCWEST)/Chukchi Acoustics, Oceanography, and Zooplankton Study Extension (CHAOZ–X) with support from Quintillion. The current mooring locations for the passive acoustic monitoring portion of the joint program align closely with the proposed Quintillion cable route. Acoustic data from these locations in 2016 will provide information on the distribution and composition of the marine mammal community and the acoustic effects of the cable-laying activity on the local environment where the route passes close to these stations.

Vessel-Based Protected Species Observers (PSOs)

Quintillion will employ PSOs during cable-laying operations to monitor 120 dB and 160 dB zones of ensonification. Observers will conduct vessel-based monitoring for Pacific walruses during all daylight periods of operation throughout the cable-laying operation. The duties of PSOs will include: watching for marine mammals and identifying Pacific walruses; recording their numbers, locations, distances, and reactions to the survey operations; and documenting take by harassment. A sufficient number of trained PSOs will be required onboard each survey vessel to achieve 100 percent monitoring coverage during all periods of cable-laying operations in daylight with a maximum of 4 consecutive hours on watch and a maximum of 12 hours of watch time per day per PSO. Nighttime observations will be made opportunistically using night-vision equipment.

Each vessel will have an experienced field crew leader to supervise the PSO team, which will contain individuals with prior experience as marine mammal monitoring observers, including experience specific to Pacific walruses. New or inexperienced PSOs will be paired with an experienced PSO so that the quality of marine mammal observations and data recording is kept consistent. Resumes for candidate PSOs will be made available for the Service to review. All observers will have completed a training course designed to familiarize individuals with monitoring and data collection procedures. Fujinon 7 × 50 or equivalent binoculars and laser range finders (Leica LRF 1200 or equivalent) will be provided to PSOs.

All location, weather, and marine mammal observation data will be recorded onto a standard field form or database. Global positioning system and weather data will be collected at the beginning and end of a monitoring period and at every half-hour in between. Position data will also be recorded at the change of an observer or the sighting of a Pacific walrus. Enough position data will be collected to map an accurate charting of vessel travel. Observations of Pacific walruses will also include group size and composition (adults/juveniles), behavior, distance from vessel, presence in applicable ensonification zones, and any apparent reactions to the project activities. Data forms or database entries will be made available to the Service.

Adaptive Measures

When the cable ships are traveling in Alaskan waters to and from the project area (before and after completion of cable laying), and during all travel by support vessels, operators will implement the following measures:

- Take reasonable precautions to avoid potential interaction with walruses by changing speed or course when Pacific walruses are observed within 805 km (0.5 mi). Changes in speed or course will be achieved gradually to avoid abrupt maneuvers whenever possible.
- Do not approach Pacific walruses within 805 km (0.5 mi).
- Reduce speed to less than 2.6 meters per second (m/s or 5 kn) to prevent collisions with walruses when visibility drops due to inclement weather, rough seas, or at night).
- Vessels may not be operated in such a way as to separate members of a group of Pacific walruses from other members of the group.
- Activities are not planned near known haulouts, but if Pacific walruses are observed on land, vessels will maintain a 1-mile (1,610-m) separation distance.
- Behavioral responses indicating Level A take of a Pacific walrus due to project activities shall be reported to the Service immediately, including separation of mother from young, stampeding haulouts, injured animals, and animals in distress. Quintillion must confirm the Service has received the report within 24 hours.

Measures To Reduce Impacts to Subsistence Users

The Service requires holders of an IHA to cooperate with the Service and other designated Federal, State, and local agencies to monitor the impacts of their activities on marine mammals and subsistence users. Quintillion has coordinated with the Service, NOAA, and the Army Corps of Engineers, along with communities and subsistence harvest organizations. Specifically, Quintillion has coordinated with EWC, Barrow Whaling Captains Association members and Board, the Community of Wainwright, Wainwright Whaling Captains, Point Hope Community, Tikigaq Whaling Captains, the Northwest Arctic Borough, Kotzebue City Management, the Community of Kotzebue, Maniilaq Association, Kawerak Inc., the Nome Community, and Kuukpik Corporation. Communications will continue throughout the project and may include announcements on KBRW and KOTZ radio stations, messaging on the Alaska Rural Communications Service television network, newsletters, and 1–800 comment lines. At the end of the cable installation process, Quintillion will conduct community meetings in Nome, Kotzebue, Point Hope, Wainwright, and Barrow to discuss and summarize project completion. In coordination with these agencies and organizations, Quintillion has agreed to the following actions to minimize effects on subsistence harvest by Alaska Native communities:

- Plan routes in offshore waters away from nearshore subsistence harvest areas.
- Schedule operations to avoid conflict with subsistence harvest.
- Develop and implement a POC to coordinate communication.
- Participate in the Automatic Identification System for vessel tracking to allow the cable-laying fleet to be located in real time.

- Distribute a daily report by email to all interested parties identified in the POC. Daily reports will include vessel activity, location, subsistence/local information, and any potential hazards.

Reporting Requirements

Quintillion must keep the Service informed of the impacts of authorized activities on Pacific walruses by: (1) immediately reporting any injury or mortality due to project activities and verifying receipt of report within 24 hours; (2) submitting project reports; and (3) notifying the Service upon project completion or end of the work season.

Weekly reports will be submitted to the Service each Thursday during cable-laying activities. The reports will summarize project activities, monitoring efforts conducted by PSOs, results of sound source verification, the number of Pacific walruses detected, the number of Pacific walruses exposed to sound levels greater than 160 dB[1], and descriptions of all behavioral reactions indicating harassment by project activities. A technical report will be submitted to the Service within 90 days after the end of the project or the end of the open-water season, whichever comes first. The report will describe all monitoring activities conducted during cable-laying activity and provide results. The report will include:

- Monitoring effort summary (hours of monitoring, activities monitored, number of PSOs).
- A summary of project activities completed and additional work yet to be done.
- Analyses of the factors influencing visibility and detectability of marine mammals (e.g., sea state, number of observers, and fog/glare).
- Discussion of location, weather, ice cover, sea state, and other factors affecting the presence and distribution of Pacific walruses.
- Number, location, distance/direction from the vessel, and initial behavior of any sighted Pacific walruses upon detection.
- Dates, times, locations, heading, speed, weather, and sea conditions (including sea state and wind force), as well as description of the specific cable-laying activity occurring at the time of the Pacific walrus observation.
- Estimated distance from the animal(s) at closest approach and at the end of encounter.
- An estimate of the number of Pacific walruses that have been exposed to the thruster noise (based on visual observation) at received levels greater than or equal to 120 dB and 160 dB with a description of the responses (changes in behavior).

[1] The Service considers take by Level B harassment to occur whenever Pacific walruses are exposed to sound levels of 160 dB or greater, or when behavior indicates harassment (fleeing, leaving a haulout, separation of members from a group, etc.). Quintillion has committed to monitoring both the 120-dB and 160-dB isopleth and reporting the behaviors of all Pacific walruses therein. We expect Quintillion's estimates of take to include all observations within the 160-db zone and any Pacific walruses exhibiting a behavioral response indicating harassment by project activities, regardless of location. The Service will review observation reports and make final determinations regarding take.

- An estimate of number of Pacific walruses experiencing Level B take[1], along with estimates of uncertainty, with uncertainty expressed by the presentation of confidence limits, a minimum-maximum, posterior probability distribution, or another applicable method, with the exact approach to be selected based on the sampling method and data available.
- A description of the mitigation measures implemented during project activities and their effectiveness for minimizing impacts to Pacific walruses.
- An analysis of the effects of Quintillion's operations on Pacific walruses.
- Occurrence, distribution, and composition of all Pacific walrus sightings, including date, water depth, numbers, age/size/gender categories (if determinable), group sizes, visibility, location of the vessel, and location of the animal (or distance and direction to the animal from the vessel) in the form of electronic database or spreadsheet files.
- A discussion of any specific Pacific walrus behaviors of interest.

Notification of Injured or Dead Marine Mammals

In the unexpected event that the Quintillion's activity or any associated work causes the take of a Pacific walrus in a manner not authorized by the IHA, such as an injury or mortality (e.g., ship-strike), Quintillion will report the incident to the Service immediately. Quintillion must confirm the Service has received the report within 24 hours. The report will include the following:

- Time, date, and location (latitude/longitude) of the incident;
- Name and type of vessel involved;
- Vessel's speed during and leading up to the incident;
- Description of the incident;
- Description of all sound sources used in the 24 hours preceding the incident;
- Water depth;
- Environmental conditions (e.g., wind speed and direction, cloud cover, and visibility);
- Description of all Pacific walrus observations in the 24 hours preceding the incident;
- Description of the animal(s) involved;
- Fate of the animal(s); and
- Photographs or video footage of the animal(s) (if equipment is available).

Quintillion will also be required to cease or suspend its activities in such an event until such time that the Service has reviewed the circumstances of the prohibited take, determined whether additional mitigation measures are necessary to minimize further taking, and notifies Quintillion that it can resume its activities.

In the event that Quintillion discovers an injured or dead Pacific walrus, and the lead PSO determines that the injury or death is not associated with activities authorized in the IHA (e.g., previously wounded animal, carcass with moderate to advanced decomposition, or scavenger damage), Quintillion must report the incident to the Service within 48 hours of the discovery. Quintillion will provide photographs, video, or other documentation to the Service. [Top]

Chapter 3. AFFECTED ENVIRONMENT

3.1 Physical Environment

Our Proposed Action and No Action Alternative relate only to the authorization of incidental take of Pacific walruses and not to the physical environment. Certain aspects of the physical environment are relevant to our Proposed Action, and we briefly summarize them here.

3.1.1 Climate and Ecological Conditions

The regional conditions of Alaska's northern oceans are dominated by ocean currents and the seasonal expansion and retraction of sea ice. The Bering, Chukchi, and Beaufort Seas are integrally connected but each has unique oceanographic features. The Bering Sea has been designated by NOAA as a major Large Marine Ecosystem. It is one of several biologically productive subarctic seas and is influenced by both the Arctic and the North Pacific Ocean. The Bering Sea is home to large bird and marine mammal populations. Alaskan Bering Sea fisheries generate half of the marine harvest in U.S. waters. The topography of the Bering Sea is dominated by a deep ocean basin to the south and west, and a large continental shelf to the north and east. The continental shelf is shallow—mostly less than 50 m (160 ft) deep—and continues through the Bering Strait into the Chukchi Sea to the north. Waters from the North Pacific Ocean flow northward over the continental shelf, through the Bering Strait, over the Chukchi Sea Shelf, and into the Arctic Ocean (Figure 2). These currents carry nutrient-rich waters that fuel high planktonic and benthic productivity and support the abundant sea life for which the northern seas of Alaska are known.

North of the Bering Strait lies the Chukchi Sea. During the winter, extent of the sea ice reaches into, but does not cover the Bering Sea, while much of the Chukchi Sea is normally ice-covered. Extensive yearly sea-ice cover imposes light limitation, prolonged and strong vertical stability of the water column and low nutrient supply. Much of the biological productivity in the Chukchi Sea is carried in from the Bering Sea, but in recent years, massive algal blooms have been documented beneath the sea ice (Frey et al. 2012). In summer, ice retreats to the northern Chukchi Sea, or in low-ice years, the Arctic Ocean.

The Beaufort Sea lies off the northern coast of Alaska. Most of the Beaufort Sea is greater than 1,000 m deep. It is characterized by its severe climate. Historically, only a narrow band of up to 100 km (62 mi) of open water occurred along the northern Alaskan coast in late summer. The Beaufort sea hosts about 80 species of zooplankton, more than 70 species of phytoplankton, and nearly 700 species of polychaetes, bryozoans, crustaceans and mollusks, but their total volume is relatively small due to the cold climate and low primary productivity (Parsons and Lear 1993).

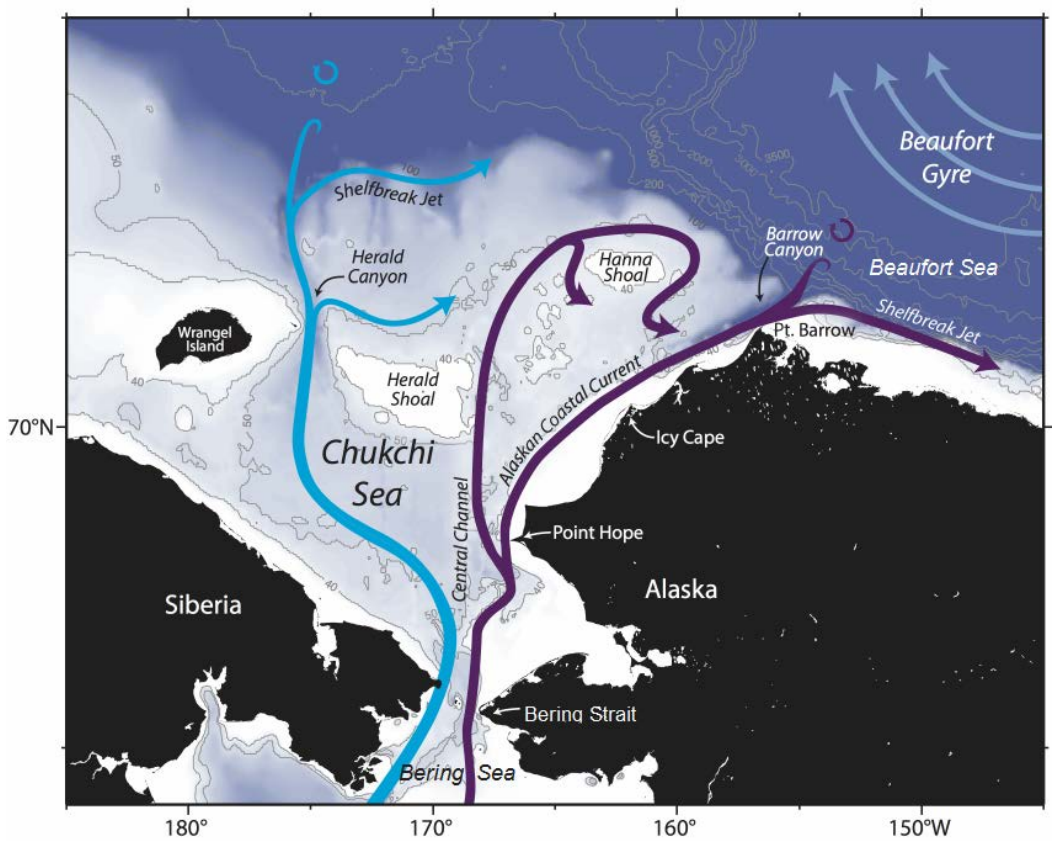

Figure 2. Bathymetric map of the Chukchi Sea and surrounding area with geographical place names and ocean currents (modified from Gong and Pickart 2015). [Top]

3.1.2 Sea Ice Characteristics

Sea ice in the region of the cable-laying project can be characterized by its seasonal variation:

- **Summer (open water).** The open water season usually begins in June. The shore-fast ice melts and the pack ice recedes northward, resulting in areas of open water along the coast. By mid-July, much of the lagoon and open-shelf areas are ice-free. The extent of open water along the coast varies from year to year depending upon climatic factors, but it reaches its fullest extent in August or September. There is considerable variation from year to year and the edge of the pack ice in September ranges from about 19 to 106 km (12-66 mi) offshore (Labelle et al. 1983). In recent years, however, the sea ice has exhibited record lows in extent, and it forms later in the fall and retreats earlier in the summer (Cavalieri et al. 1996)**.**

- **Broken ice**. The broken ice period is when the sea transitions from ice-covered to open water (break up) and from open water to ice-covered (freeze up). These periods usually occur in June and October, respectively.

- **Winter (ice-covered)**. Winter conditions begin with freeze up and an increase in the amount of sea ice. From November through May, ice covers nearly all of the Chukchi and Beaufort Sea. The ice reaches a maximum thickness of approximately 2 m (6 ft) by March or April. The winter sea ice can be divided into three distinct zones: landfast ice, shear, and pack ice.

    - **Landfast ice**. The landfast ice zone extends from the shore out to the zone of grounded ridges. These ridges first form in about 7 – 13 m (24 – 45 ft) of water but by late winter may extend to deeper water. Pressure from wind and water currents stress floating sheets of ice resulting in deformation and displacement. Ice deformations form ridges and rubble fields. As winter progresses, displacement and deformation decrease because the ice in the landfast zone thickens and strengthens and becomes more resistant to movement.

    - **Shear**. Seaward of the landfast ice zone is the shear zone. The shear zone is a region of dynamic interaction between stable landfast ice and moving ice. The violent interactions between ice zones create ice ridges. These ridges are usually about 1 – 2 m (3 – 6 ft) in height, but may reach heights of 6 m (20 ft). Channels of open water (leads) are created through the ice, providing habitat for marine mammals.

    - **Pack ice**. The pack ice zone lies seaward of the shear zone and includes first-year ice and multi-year ice. The first-year ice forms in the fractures, leads, and polynyas (large areas of open water). First-year ice varies in thickness from less than 2 cm to greater than a meter (1 in – 3.2 ft). Multi-year ice is ice that has persisted for more than 1 year.

3.1.3 Climate Change

There is widespread consensus within the scientific community that atmospheric temperatures on earth are increasing and that these increases will continue for at least the next several decades. Scientific analyses presented by the Intergovernmental Panel on Climate Change (IPCC) show that most of the observed increase in global average temperature since the mid-20th century cannot be explained by natural variability in climate, and is “extremely likely” (defined by the IPCC as 95 percent or higher probability) due to the observed increase in greenhouse gas concentrations in the atmosphere resulting from human activities, particularly carbon dioxide emissions from use of fossil fuels (IPCC 2014a). The Intergovernmental Panel on Climate Change (IPCC) released its Fifth Assessment Report providing extensive updates on the evolving science of climate change, including the Arctic (IPCC 2014a). Among other things, the IPCC estimates that global net warming will occur into the future as the mean surface temperature increases up to 3.7° F (1.48° C) by the year 2100 (IPCC 2013).

High latitude regions, including Alaska and the surrounding oceans, are especially sensitive to the effects of climate change (Smol et al. 2005; Schindler and Smol 2006). Researchers have projected that surface temperatures in the Arctic will increase faster than elsewhere in the world due to major regional and global feedback processes. This phenomenon has been termed “Arctic

Amplification." One factor contributing to this momentum is reduction in surface albedo (reflectivity) of the Arctic region in the summer from lower sea ice and snow cover and from retraction of glaciers and the Greenland ice sheet (Jeffries et al. 2014). According to the USGS, the observed changes in sea-ice extent, the timing of spring snowmelt, changes in permafrost, increases in area of forest fires, and increases in ocean temperatures are occurring faster than expected due to this phenomenon (Markon et al. 2012).

The Arctic's rapid rate of warming has resulted in substantial reductions in both the extent and thickness of sea-ice cover over the past 40 years (IPCC 2014a, Meier et al. 2014, Frey et al. 2015; Figure 3). The annual mean extent of Arctic sea ice decreased 3.5 to 4.1 percent per decade over the period 1979 to 2012; the annual minimum extent declined by over 12 percent per decade during that time frame (IPCC 2014a). The trend of continued decline of Arctic sea ice is expected to continue for the foreseeable future (Amstrup et al. 2008, Overland and Wang 2013).

In the Arctic, sea ice is receding earlier in the summer season and farther north than in the past. Sea ice returns later in the season than observed in the past, with multi-year ice becoming thinner as well. This set of circumstances contributes to a longer open water season. Record minimum and near record minimum extent of sea ice has been documented several times in recent years. Continued decline of sea ice in the Beaufort and Chukchi Sea is supported by the most recent climate models (Douglas 2010; IPCC 2014b).

Climate projections for the North Slope of Alaska vary, particularly when extended decades into the future. However, average summer and winter temperatures are generally expected to increase, shifts are expected to occur in patterns of precipitation, snowfall, and snowmelt. River levels may rise, flooding events increase, and the annual period of frozen ground is likely to decrease (Clement et al. 2013, Leonawicz et al. 2016)

The impacts of climate change are discussed under section 3.2 Biological Environment, as well as under section 4.2.5 Cumulative Impacts. For additional information regarding climate change in the Beaufort and Chukchi Seas, see BOEM (2015) section 3.1.9 (Climate Change), and Garlich-Miller et al. (2011) section 3.2.1 (Global Climate Change) and section 3.2.2 (Summary: Effects of Global Climate change on the Pacific Walrus Population), incorporated here by reference.

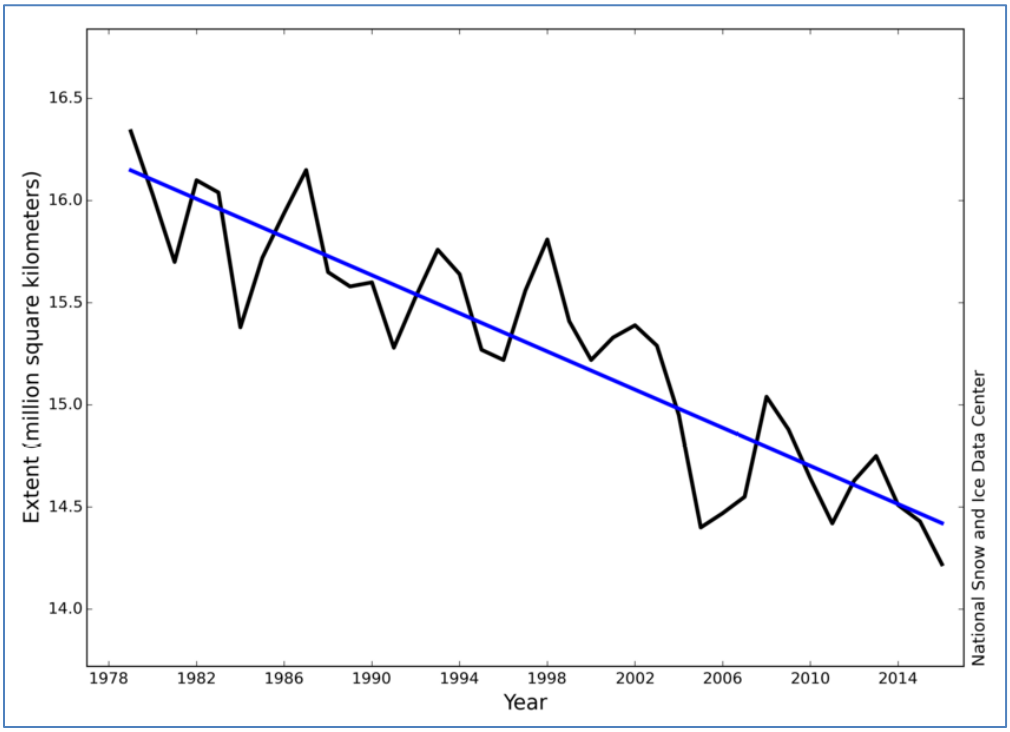

Figure 3. Average monthly Arctic Sea ice extent February 1979 – 2016 (NSIDC 2016). [Top]

3.2 Biological Environment

3.2.1 Pacific walrus (Odobenus rosmarus divergens)

The stock of Pacific walruses is composed of a single panmictic population inhabiting the shallow continental shelf waters of the Bering and Chukchi Seas (Lingqvist et al. 2009; Berta and Churchill 2012; Figure 4). The size of the Pacific walrus population has never been known with certainty. In 2006, the United States and Russia conducted a joint aerial survey in the pack ice of the Bering Sea using thermal imaging systems and satellite transmitters to count Pacific walruses in the water and hauled out on sea ice. The number within the surveyed area was estimated at 129,000 with 95 percent confidence limits of 55,000 to 507,000 individuals. This estimate is considered a minimum, as weather conditions forced termination of the survey before large areas were surveyed (Speckman et al. 2011).

Distribution is largely influenced by the extent of the seasonal pack ice and prey densities. From April to June, most of the population migrates from the Bering Sea through the Bering Strait and into the Chukchi Sea. Pacific walruses tend to migrate into the Chukchi Sea along lead systems that develop in the sea ice. During the open-water season, Pacific walruses are closely associated with the edge of the seasonal pack ice from Russian waters to areas west of Point Barrow, Alaska. Most of these animals remain in the Chukchi Sea throughout the summer months, but a few occasionally range into the Beaufort Sea. Oil and gas industry observers reported 35 sightings east of Point Barrow (~156.5° W) between 1995 and 2012 (Kalxdorff and Bridges 2003; AES Alaska 2015; USFWS unpublished data).

The pack ice usually advances rapidly southward in late fall, and most Pacific walruses return to the Bering Sea by mid- to late-November. During the winter breeding season, three concentration areas form in the Bering Sea where open leads, polynyas, or thin ice occur (Fay et al. 1984; Garlich-Miller et al. 2011). While the specific location of these groups varies annually depending upon the sea-ice extent, one group generally occurs near the Gulf of Anadyr, another south of St. Lawrence Island, and a third in the southeastern Bering Sea south of Nunivak Island.

Pacific walruses are usually found in waters of 100 m (328 ft) or less although they are capable of diving to greater depths. They use sea ice as a resting platform over feeding areas, as well as for giving birth, nursing, passive transportation, and avoiding predators (Fay 1982; Ray et al. 2006). Native hunters have reported incidences of Pacific walruses preying on seals; other items such as fish and birds are occasionally taken (Sheffield and Grebmeier 2009; Seymour et al. 2014), but benthic invertebrates are the primary food source. Foraging trips may last for several days, during which walruses dive to the bottom nearly continuously. Most foraging dives last 5 – 10 minutes, and occur between surface intervals of 1 – 2 minutes. The disturbance of the sea floor by foraging Pacific walruses releases nutrients into the water column, provides food for scavenger organisms, contributes to the diversity of the benthic community, and is thought to have a significant influence on the ecology of the Bering and Chukchi Seas (Ray et al. 2006).

The seasonal distribution of Pacific walruses in the project area is associated with the distribution and extent of broken pack ice (Fay et al. 1984; Garlich-Miller et al. 2011; Aerts et al. 2014). During years of high summer sea-ice cover in the Chukchi Sea, most Pacific walruses are expected to remain with the ice and feed in areas like Hanna Shoal (see Figure 1). During low-ice years when the edge of the pack ice recedes north from the Chukchi Sea to the Arctic Basin, where waters are too deep to forage, Pacific walruses typically leave the ice and haul out on beaches (such as near Point Lay). Pacific walruses spend approximately 20 − 30 percent of their time out of the water. They are highly gregarious and tend to travel and haul out onto ice or land in groups. Hauled-out Pacific walruses are often in close physical contact.

The best available at-sea density estimates come from Aerts et al. (2014), who conducted shipboard surveys for marine mammals in the Chukchi Sea from 2008 to 2013. Their highest recorded summer densities were in the low-ice years of 2009 (0.040 walrus/km^2) and 2013 (0.041 walrus/km^2). During the heavy-ice years of 2008 and 2012, densities were 0.001 and 0.006 walrus/km^2, respectively.

Climate-driven trends in the Chukchi Sea are associated with an increase in the frequency of low-ice years, during which the sea ice retreats beyond the Chukchi Sea continental shelf. Long-term data shows that substantial reductions in both the extent and thickness of Arctic sea-ice cover have occurred in the past 40 years (Meier et al. 2014; Frey et al. 2015). Stroeve et al. (2012) estimated that since 1979, the minimum area of fall Arctic sea ice declined by over 12 percent per decade through 2010. Record minimum areas of fall Arctic sea-ice extent were recorded in 2002, 2005, 2007, and 2012 (lowest on record). The overall trend of continued decline of Arctic sea ice is expected to continue (Stroeve et al. 2007; Amstrup et al. 2008; Hunter et al. 2010, Overland and Wang 2013).

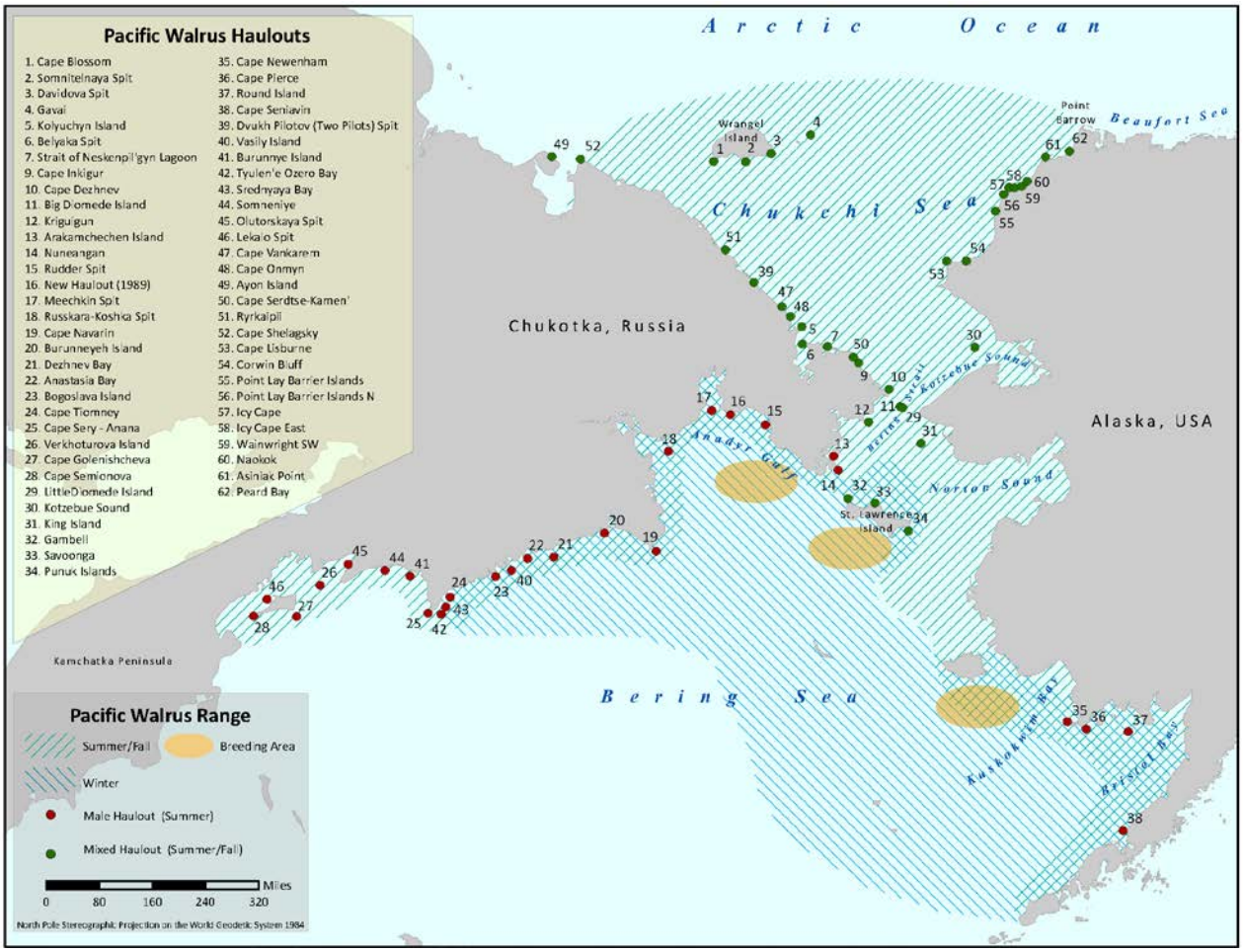

Figure 4. Distribution of the Pacific walrus in the Bering and Chukchi seas in winter and summer. From Garlich-Miller et al. (2011), modified from Smith (2010) [Top]

The reduction of summer Arctic sea ice may have population-level effects for Pacific walruses in the future (80 FR 80595, December 24, 2015). Possible impacts to Pacific walruses resulting from diminishing sea-ice cover include potential shifts in range, habitat use, local abundance, and use of terrestrial haulouts. In recent years, large haulouts have been common in the eastern Chukchi Sea. The barrier islands north of Point Lay, Alaska, have held large aggregations of up to 20,000 − 40,000 animals in late summer and fall (Monson et al. 2013). Pacific walruses hauled out near Point Lay have travelled to Hanna Shoal during feeding bouts.

Large coastal haulouts, such as those that have formed at Point Lay, tend to be more concentrated than those on widely dispersed sea ice. Such aggregations may be more susceptible to stampedes, disease transmission, and targeted predation than smaller groups. The risk of stampede-related injuries increases with the number of animals at a haulout. Stampedes may be caused by predators or by disturbances from humans or other sources. Predators include polar bears and killer whales (*Orcinus orca*) (Frost et al. 1992; Melnikov and Zagrebin 2005). High concentrations of walruses could also cause local prey depletion, leading to longer foraging trips, increased energy costs, and potential effects on female condition and calf survival. Additional

information on the biology and status of the species, including a revised stock assessment report (79 FR 22154, April 21, 2014), is available at *http://www.fws.gov/alaska/fisheries/mmm/*.

3.3 Socio–Economic Environment

Subsistence harvest of Pacific walruses by Alaska Natives plays an important role in the culture and economy of villages throughout coastal Alaska. Walrus meat is a subsistence food and ivory is used to manufacture traditional arts and crafts. The sale of handicrafts made of walrus ivory is an important source of income in some remote Alaska Native communities. The limited cash that Alaska Native villagers can make from handicrafts is vital to sustain their subsistence hunting and fishing way of life (Pungowiyi 2000). Although walrus harvests are part of the subsistence traditions of many rural communities along the coast of the Beaufort, Chukchi and Bering Seas, bowhead whales, seals, caribou (*Rangifer tarandus*), and fish are the dominant subsistence food sources.

3.3.1 Subsistence Harvest Levels and Trends

The MMPA allows Alaska Natives to harvest Pacific walruses for subsistence purposes or for the purposes of creating authentic Native articles of handicraft and clothing, provided this is accomplished in a non-wasteful manner. The proposed cable-laying activities will occur within the marine subsistence areas used by Alaska Natives from the villages of Nome, Wales, Diomede, Kotzebue, Kivalina, Point Hope, Point Lay, Wainwright, Barrow, and Nuiqsut, all of which annually hunt Pacific walruses, except Nuiqsut. Between 2006 and 2012, approximately 1,308 Pacific walruses were harvested annually in Alaska (USFWS unpublished data). This estimate is of reported harvest only and has not been corrected for struck and lost animals or underreporting. Most of the harvest (87 percent) was taken by the villages of Gambell and Savoonga on St. Lawrence Island, located 135 km (84 mi) south of the geographic region of the Quintillion cable project.

The villages within the project area harvested an average of 81 Pacific walruses per year from 2006 – 2015. The village of Diomede (population of ~115) harvested 26 percent of these (~21 per year). Diomede is located on Little Diomede Island in the center of the Bering Strait. Twice a year the vanguard of the walrus population passes through the Strait when migrating between wintering and summering grounds providing harvest opportunities for Diomede hunters. Pacific walruses will also occasionally haul out on Little Diomede Island during the summer and fall (Garlich-Miller and Burn 1999).

Pacific walruses are also an important resource for inhabitants of Wainwright and Wales. Wainright, a village with a population size of 556, took approximately 26 Pacific walruses annually from 2006 – 2015. Wainright also harvests beluga and bowhead whales. The village of Wales (population ~145), located on the eastern edge of the Bering Strait, harvested an average of six Pacific walruses each year (USFWS unpublished data). By comparison, Nome also harvested six Pacific walruses per year, and Barrow harvested 14 per year from 2006 – 2015. Nome and Barrow both have populations of approximately 4,000 people, and Pacific walrus is not as important in the subsistence diet as other resources.

Kotzebue, Kivalina, Point Hope, and Point Lay each harvested fewer than five Pacific walruses annually from 2006 – 2015, suggesting harvest of this species in these villages is more opportunistic than focused. The communities of Savoonga, Brevig Mission, Chefornak, Elim, Gambell, Hooper Bay, King Island, Kipnuk, Shaktoolik, Shishmaref, Teller, Togiak, and Toksook Bay all harvested one or more per year on average from 2006 – 2015, but are outside of the geographic region of the project.

3.3.2 Effects of Subsistence Harvest on the Species

Pacific walruses have been an important subsistence resource for coastal Alaskan and Russian natives for thousands of years and will continue to be into the foreseeable future. Combined harvest mortality for the United States and Russian Federation from 1960 through 2000 ranged from 3,200 – 16,100 animals per year (mean: 6,993; Angliss and Allen 2009). Estimated annual harvest from 2000−2014 averaged 3,207 Pacific walruses per year (USFWS unpublished data). These mortality estimates include corrections for under-reported harvest (U.S. only) and struck and lost animals. Since 2000, harvest estimates have declined by about 3 percent per year. In 2013 and 2014, U.S. harvest levels were estimated to be less than 1,400 animals per year (including struck-and-lost animals).

Factors affecting harvest levels include the cessation of Russian commercial walrus harvests after 1991, changes in political, economic, and social conditions of subsistence hunters in Alaska and Chukotka, and the effects of variable weather and ice conditions (Angliss and Allen 2009). Recent low U.S. harvest levels are primarily due to unfavorable sea ice conditions during the harvest season and inclement weather that has kept hunters on shore.

The Russian harvest is now larger than the U.S. hunt, with approximately 1,800 and 1,500 animals harvested in 2013 and 2014, respectively (Shadbolt et al. 2014). Resource managers in Russia have concluded that the population has declined and have reduced harvest quotas in recent years accordingly, based in part on the lower abundance estimate generated from the 2006 survey (Kochnev 2004; Kochnev 2005; Kochnev 2010; pers. comm.; Litovka 2015, pers. comm.). The quota in 2000 was 3000 animals; by 2010, it was just 1300 (Shadbolt et al. 2014). No statewide harvest quotas exist in Alaska.

Harvest levels are currently less than 3 percent of the estimated population size. Although this level of harvest is currently thought to be sustainable, substantial uncertainty regarding the population status and trend makes it difficult to quantify appropriate removal levels (Garlich-Miller et al. 2011). If the carrying capacity of walrus habitat declines due to changes in sea ice, the absolute number of animals harvested will need to decline in sync with population size or the level of female and calf harvest will need to be reduced for subsistence harvest to remain sustainable. Jay et al. (2011) used Bayesian network modeling to determine that the additive effects of loss of sea ice and an unchanged subsistence harvest level would likely cause a "worsening condition" (i.e., change the walrus population state from robust or persistent to vulnerable, rare, or extirpated) for the Pacific walrus. However, if the declining trend in harvest removals continues, the subsistence harvest will likely remain sustainable. [Top]

Chapter 4. ENVIRONMENTAL CONSEQUENCES

The impacts of Federal actions must be evaluated to determine whether the action will significantly affect the quality of the human environment. In this section, an analysis of the environmental consequences of issuing an IHA for take of Pacific walruses by harassment and alternatives to that Proposed Action are presented.

4.1 Alternative 1 – No Action Alternative

Under the No Action Alternative there would be no IHA issued under the MMPA for incidental unintentional non-lethal take of Pacific walruses as a result of otherwise lawful cable-laying activities in the northern Bering, Chukchi, and Southern Beaufort Sea region. There would be no associated monitoring, reporting, and mitigation requirements. Takings that result from Quintillion's activities, unless otherwise authorized by sections 101(a)(4)(A), 109(h) or 112(c) of the MMPA, or qualifying for an exemption, would be subject to the prohibitions found in the MMPA and could result in enforcement actions for violation of the MMPA.

The No Action Alternative would not prohibit Quintillion's activities. Other Federal and state agencies, such as the U.S. Army Corps of Engineers, the U.S. Coast Guard, the Federal Communications Commission, and the State of Alaska are responsible for permitting cable installation activities on waters and lands within the specified region. If an IHA were not issued, cable-laying activities may occur without the mitigation measures, monitoring, and reporting required by the IHA.

4.2 Alternative 2 (Preferred Alternative) – Issuance of an Incidental Harassment Authorization with Mitigation Measures and Additional Requirements

Under this alternative, the Service would issue an IHA valid from August 11 through November 15, 2016, that would address the proposed cable laying outlined in the application if such takes will have no more than a negligible impact on small numbers of animals. In addition, the analysis must find that any takes will not have an unmitigable adverse impact on the availability of the species for subsistence purposes. Section 101(a)(5)(D) of the MMPA states that the Secretary of the Interior may allow the incidental, but not intentional, taking of marine mammals provided that these findings are made and permissible methods of taking and means of effecting the least practicable impact are specified, where applicable.

Under this alternative, the measures described in section 2.3.4 Proposed Mitigation and Monitoring, would be implemented to minimize potential adverse impacts from the proposed cable-laying activities, as well as provide data to improve our ability to evaluate the effects on Pacific walruses and the subsistence use of this resource. The IHA will be conditioned to afford additional protection to sensitive areas, such as areas frequented by feeding or resting animals and subsistence hunting areas.

4.2.1 Potential Impacts on the Biological Environment

The only component of the biological environment that may be affected by the Proposed Action is the Pacific walrus population in the northern Bering, Chukchi, and Southern Beaufort Seas. Proposed cable-laying activities in the Chukchi Sea may encounter Pacific walruses, but encounters in the Beaufort and Bering Seas are unlikely. The Southern Beaufort Sea east of 153°W is extralimital; encounters are unlikely there. Project activities are scheduled to occur in the northern Bering Sea after mid-July, when most Pacific walruses have moved north into the Chukchi Sea or south to Bristol Bay. No project activities are planned in Bristol Bay or in the Bering Sea south of Nome.

Activities in the Chukchi Sea in July and August have the greatest degree of overlap with areas used by Pacific walruses. Project activities occurring in these areas in September and October may also encounter Pacific walruses. Noise, vessel traffic, and human activities associated with the project have the potential to disrupt normal behavioral patterns including migration, nursing, and feeding. Use of thrusters, echo sounders, and beacon transceivers could generate noise levels capable of causing acoustic harassment near the project area and are discussed in the following section.

Noise Disturbance

Pacific walruses hear sounds both in air and in water. Kastelein et al. (1996) tested the in-air hearing of a Pacific walrus from 125 hertz (Hz) to 8 kilohertz (kHz) and determined the animal could hear all frequency ranges tested, but the most sensitivity was between 250 Hz and 2 kHz. Kastelein et al. (2002) tested underwater hearing and determined that range of hearing was 1 kHz – 12 kHz with greatest sensitivity at 12 kHz. The small sample size of one animal warrants caution; other pinnipeds can hear up to 40 kHz. Many of the noise sources generated by the Quintillion cable project are likely to be audible to Pacific walruses. Exposure to high levels of underwater sound may cause hearing loss in nearby animals and disturbance of animals at greater distances. Sound attenuates in air more rapidly than in water, and airborne sound levels and frequencies likely to be produced by the Quintillion project are unlikely to cause hearing damage unless marine mammals are very close to the sound source.

Acoustic sources operating during cable laying will include thrusters, plows, jets, ROVs, echo sounders, and positioning beacons. Of these, the dominant source of radiated underwater noise at frequencies less than 200 Hz is propeller cavitation from the vessel propulsion systems (Ross 1976). The cable ships will each maintain dynamic positioning during cable-laying operations by using two 1,500-kW bow thrusters, two 1,500-kW aft thrusters, and one 1,500-kW fore thruster. Sound source measurements have not been conducted specific to the C/S *Ile de Brehat*, but acoustic studies for similar vessels have shown thruster noise measurements of 171 – 180 dB at 1 m (Nedwell et al. 2003; Samsung 2009; Deepwater Wind 2012).

Echo sounders, transceivers, and transponders will be used to conduct hydroacoustic surveys of water depth and to guide the position of the plow and ROV. Sound levels produced by these sources can range from 210 – 226 dB at 1 m, but are generally at frequencies above the hearing sensitivities of Pacific walruses; typical frequencies are 24 kHz – 900 kHz. Some surveys use

frequencies as low as 50 Hz or as high as 2 megahertz (MHz). Pulses of sound are produced every 1 to 3 seconds in narrow downward-focused beams; there is very little horizontal propagation of noise. Commercial sonar systems may generate lower frequency side-lobes audible to marine mammals, but these are generally produced at sound levels unlikely to cause harm (Deng et al. 2014). Depending on the action, the area, and the acoustics involved, sound from multiple sources may combine synergistically or partly cancel out. Cable ships will not operate simultaneously in close proximity to each other (within 10 km [6.2 mi]).

Marine mammals in general have variable reactions to noise sources, particularly mobile sources such as marine vessels. Reactions depend on the individuals' prior exposure to the disturbance source, their need or desire to be in the particular habitat or area where they are exposed to the noise, location relative to the disturbance, and whether the disturbance source is visible or odorous. Pacific walruses are typically more sensitive to disturbance when hauled out on land or ice than when they are in the water. The Quintillion cable project will be carried out away from the edge of the seasonal pack ice and terrestrial haulouts. This will minimize potential interactions with large concentrations of Pacific walruses in the project area, which typically favor sea-ice habitats or land-based haulouts.

Potential impacts from noise include displacement from preferred foraging areas, increased stress, energy expenditure, interference with feeding, masking of communications, or temporary hearing loss. Potential acoustic injuries from exposure to high levels of sound may manifest in the form of temporary or permanent changes in hearing sensitivity. The underwater hearing abilities of the Pacific walruses have not been studied sufficiently to develop species-specific criteria for preventing harmful exposure. Sound pressure level thresholds have been developed for other members of the pinniped taxonomic group, above which exposure is likely to cause behavioral responses and injuries (Finneran 2015).

Historically, NOAA has used 190 dB as a threshold for predicting injury to pinnipeds and 160 dB as a threshold for behavioral impacts from exposure to impulse noise (NMFS 1998; HESS 1999). The behavioral response threshold was developed based primarily on observations of marine mammal responses to airgun operations (e.g., Malme et al. 1983a, 1983b; Richardson et al. 1986, 1995). Southall et al. (2007) assessed relevant studies, found considerable variability among pinnipeds, and determined that exposures between ~90 – 140 dB generally do not appear to induce strong behavioral responses in pinnipeds in water, but an increasing probability of avoidance and other behavioral effects exists in the 120 – 160-dB range.

The NOAA 190-dB injury threshold is an estimate of the sound level likely to cause a permanent shift in hearing thresholds (permanent threshold shift or PTS). This value was modelled from temporary threshold shifts (TTS) observed in pinnipeds (NMFS 1998; HESS 1999). Southall et al. (2007) reviewed the literature and derived behavior and injury thresholds based on peak sound pressure levels of 212 dB (peak) and 218 dB (peak) respectively. Because onset of TTS can vary in response to duration of exposure, Southall et al. (2007) also derived thresholds based on sound exposure levels (SEL). The SEL can be thought of as a composite metric that represents both the magnitude of a sound and its duration. The study proposed threshold SELs weighted at frequencies of greatest sensitivities for pinnipeds of 171 dB SEL and 186 dB SEL for behavioral impacts and injury respectively (Southall et al. 2007). Kastak et al. (2005) found

exposures resulting in TTS in pinniped test subjects ranging from 152 – 174 dB (183 – 206 dB SEL). Reichmuth et al. (2008) demonstrated a persistent TTS, if not a PTS, after 60 seconds of 184 dB SEL. Kastelein (2012) found small but statistically significant TTSs at approximately 170 dB SEL (136 dB, 60 min) and 178 dB SEL (148 dB, 15 min).

Based on these data and applying a precautionary approach in the absence of empirical information, we assume it is possible that Pacific walruses exposed to 190-dB or greater sound levels from underwater activities could suffer injury from PTS. Pacific walruses exposed to underwater sound pressure levels greater than 180 dB could suffer temporary shifts in hearing thresholds. Repeated or continuous exposure to sound levels between 160 and 180 dB may also result in TTS, and exposures above 160 dB are more likely to elicit behavioral responses than lower level exposures.

The acoustic thresholds for marine mammals under NOAA's jurisdiction are currently being revised and are available in draft form (NOAA 2015, NOAA 2016). Interim guidance from NOAA recommends a 120-dB generic acoustic threshold for MMPA Level B take from non-impulsive underwater sound (NOAA undated). We evaluated the applicability of this threshold for walruses and found insufficient evidence to conclude that Pacific walruses are likely to experience Level B take from non-impulsive underwater sounds at 120 dB. The available information indicates that walruses are most similar to otariid pinnipeds in their underwater hearing abilities (Kastelein et al. 1996; Hemilä et al. 2006). The NOAA 120-dB threshold was developed primarily from behavioral studies of gray whales and bowhead whales rather than pinnipeds (e.g., Malme et al. 1983a, 1984, 1988; Richardson et al. 1985, 1986, 1990; Ljungblad et al. 1988; Richardson and Malme 1993). Among marine mammals, otariid pinniped appear to be less sensitive to underwater sound than phocid pinnipeds and most whales (Southall et al. 2007; Finneran 2015). None of the available research indicates that TTS is likely to occur in otariid pinnipeds due to short-term exposure to 120-dB continuous sound (Kastak et al. 1999, Kastak et al. 2005, see also, Southall et al. 2007). Extended exposures to high level of sound are unlikely given walruses' capacity for travel. Pacific walruses may travel up to 30 km (19 mi) per day at rates that can typically range from 0.3 – 0.5 km/hr (0.2 – 0.3 mi/hr) and may reach up to 1.3 km/hr (0.8 mi/hr) or more (Jay et al. 2010, 2014). We therefore conclude that there is not sufficient support for the use of the 120-dB NOAA threshold to define acoustic harassment of walruses.

The Service's underwater sound mitigation measures include employing PSOs to establish and monitor 160-dB, 180-dB, and 190-dB isopleth mitigation zones centered on any underwater sound source greater than 160 dB. For projects that produce sound levels greater than 180 dB, the 180-dB and 190-dB zones are monitored to ensure no marine mammals are in the zone before the sound-producing activity begins and during the activity. The Quintillion project is not expected to produce sound at this level. The 160-dB zone will be monitored; Pacific walruses in this zone will be assumed to experience take due to Level B harassment.

Quintillion has committed to monitoring Pacific walruses exposed to sound greater than 120 dB. Animals exposed to sound levels greater than 120 dB but less than 160 dB will be monitored, but are not likely to experience take. Prolonged exposure to continuous sound below 160 dB can cause some level of TTS in otariid pinnipeds (Kastak et al. 1999, Kastak et al. 2005, see also,

Southall et al. 2007). In this project, the ongoing production of noise and the speed limitations of the cable-laying vessels will ensure that walruses will not be exposed to sound at levels near 160 dB without prior exposure to gradually increasing sound levels well below 160 dB. The increasing volume of an approaching vessel will provide ample warning, allowing walruses to depart the area and avoid prolonged exposure to high sound levels. In addition, the relatively small ensonification zones (120-dB radius = 2.3 km [1.4 mi]) and constant progress of the vessels (0.6 km/hr [0.4 mi/hr]) will ensure that walruses will not be displaced far or for long periods of time in relation to their normal movement patterns. Movements in response to Quintillion's activities are not likely to be significantly different from the typical movements of foraging walruses and therefore will not represent a disruption of normal behavioral patterns.

As mentioned previously, Pacific walruses show variable reactions to noise. Relatively minor reactions, such as increased vigilance, are not likely to disrupt biologically important behavioral patterns and, therefore, do not constitute take by harassment, as defined by the MMPA. However, more significant reactions have been documented in response to vessel noise. For example, icebreaking activities in the Chukchi Sea were observed to displace some Pacific walrus groups up to several kilometers away (Brueggeman et al. 1990). Approximately 25 percent of groups on pack ice responded by diving into the water; most reactions occurred within 805 m – 1 km (0.5 – 0.6 mi) of the ship. However, groups of hauled-out Pacific walruses beyond these distances generally showed little reaction to icebreaking activities (Brueggeman et al. 1990, 1991). Reactions such as fleeing a haulout or departing a feeding area have the potential to disrupt biologically significant behavioral patterns, including nursing, feeding, and resting, and may result in decreased fitness for the affected animal. These reactions meet the criteria for Level B harassment under the MMPA. Industry activities producing high levels of noise or occurring in close proximity also have the potential to illicit extreme reactions (Level A harassment) including separation of mothers from young or instigation of stampedes, resulting in death of the offspring or death by trampling respectively.

Cable-laying activities are expected to occur in regions of the Chukchi Sea used by Pacific walruses (including areas between Hanna Shoal and Point Lay). Some animals may be disturbed or displaced by these activities. The Proposed Action will include measures to avoid the potential for injury from noise exposures and extreme behavioral reactions to project noise. Measures include minimizing probability of encounters by working during times when sea ice is not present and avoiding terrestrial haulouts. Cable vessels will not operate in areas where doing so would allow animals to be exposed to simultaneous noise from more than one cable ship. The PSOs will monitor acoustic ensonification zones during cable laying to document take and during pre- and post-cable-laying activities to maintain at least an 805-m (0.5-mi) distance from Pacific walruses. These measures are expected to reduce the intensity of disturbance events and to minimize the potential for injuries to animals. With the adoption of the mitigation measures required by this IHA, the Service concludes that the only anticipated effects from noise generated by Quintillion's project would be short-term behavioral alterations of small numbers of Pacific walruses.

Vessel-Based Activities

Pacific walruses may be disturbed by vessel-based activities during Quintillion's project activities. The responses of Pacific walruses to the sights, sounds, and smells of humans, machinery, and vessels are highly variable and may depend on the context of the encounter. Responses may include: altered headings; increased swimming rates; increased vigilance; changes in dive, surfacing, respiration, feeding, and vocalization patterns; and hormonal stress production (i.e., see Richardson et al. 1995; Southall et al. 2007; Ellison et al. 2011). Pacific walruses use the project area for feeding, resting, and migrating, and for in-season travel, and are most likely to be exposed to the project activities while travelling or feeding in areas away from the coast. They are most likely to respond by retreating from cable-laying activities.

The Chukchi Sea contains important foraging habitat. Jay et al. (2012) tracked radio-tagged Pacific walruses to estimate areas of foraging and occupancy in the Chukchi Sea during June – November of 2008 – 2011 (years when sea ice was sparse over the continental shelf; Figure 5). High use areas were observed in the relatively shallow waters of Hanna Shoal. Based on this information, the Service designated 24,600 km^2 (9,500 mi^2) of the Chukchi Sea as the Hanna Shoal Walrus Use Area (HSWUA; see Figure 1). The proposed cable route is outside of the HSWUA. Some Pacific walruses may be foraging outside the HSWUA and could be displaced while using peripheral feeding areas. Pacific walruses that are displaced while foraging in peripheral feeding areas or while traveling between Hanna Shoal and coastal haulouts are likely to expend some additional energy avoiding the activities. Effects of displacement within foraging areas and from travel routes will depend on the ability of the affected animals to reach and use alternate areas. There are no anticipated events or activities that will restrict availability of or access to other suitable foraging habitat or alternate travel routes during this project.

Pacific walruses may cross paths with cable-laying and support vessels while migrating or traveling to foraging or resting areas. The reaction of Pacific walruses to vessel traffic is dependent upon vessel type, distance, speed, and an animal's previous exposure to disturbances. For example, low-frequency diesel engines have been observed to cause fewer disturbances than high-frequency outboard engines (Fay et al. 1984). Pacific walruses may respond to at-sea cable-laying work by exhibiting brief startling reactions or by temporarily vacating the area. There is no long-term biologically significant impact to Pacific walruses expected from the proposed subsea cable-laying activity.

Disturbance that occurs while Pacific walruses are resting at a haulout may have the greatest potential for harmful impacts. Disturbance events in the Chukchi Sea have been known to cause groups to abandon land or ice haulouts and occasionally result in trampling injuries or cow-calf separations, both of which are potentially fatal (USFWS 2015a). Anecdotal observations by Pacific walrus hunters and researchers also suggest that males tend to be more tolerant of disturbances than females (Fay et al. 1984). Females with dependent calves are considered least tolerant of disturbance and most likely to flee a haulout. Calves and young animals at terrestrial haulouts are particularly vulnerable to trampling injuries.

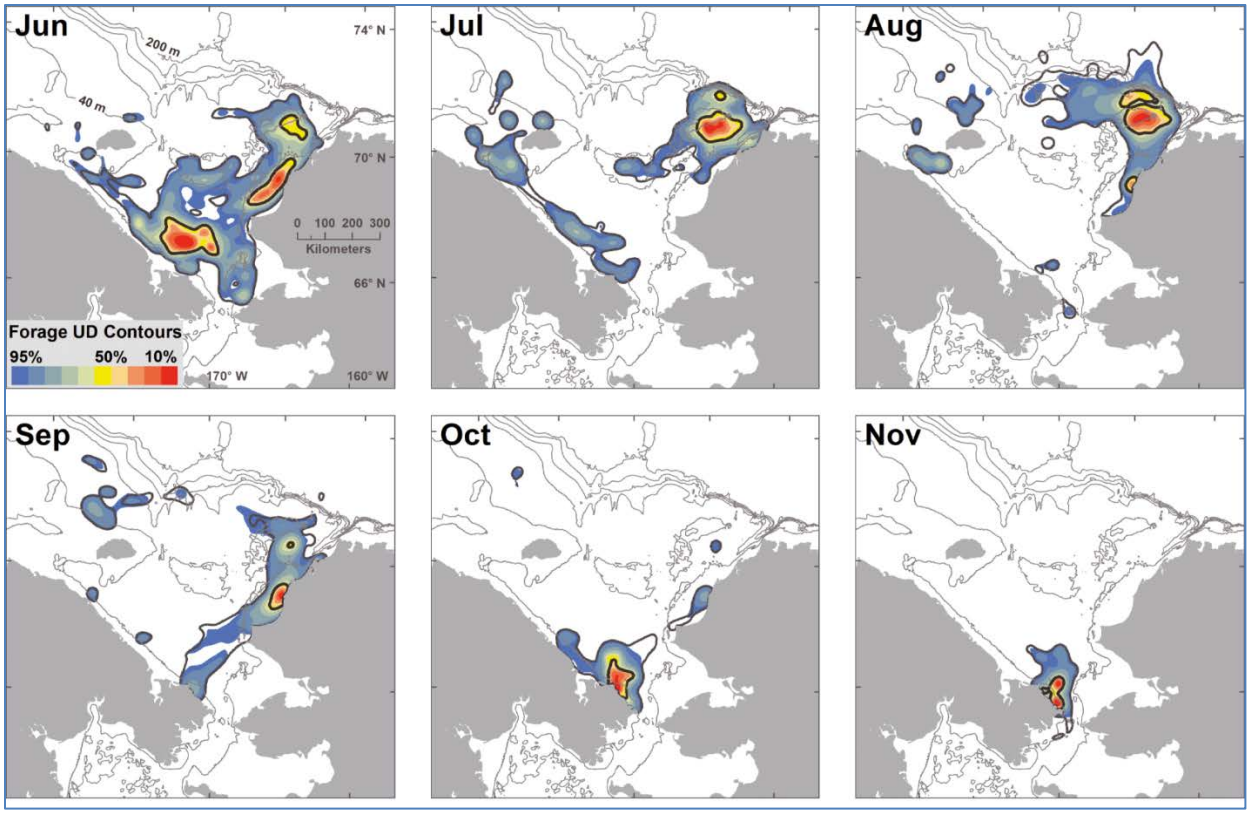

Figure 5. Utilization distribution estimates (UDs) of Pacific walrus foraging (red to blue color ramp contours, 10 - 95% UDs) and occupancy (solid line contours, 50 and 95% UDs) in the Chukchi Sea, 2008 - 2011 (Jay et al. 2012). [Top]

The Quintillion cable project activities are planned to avoid disturbance of haulouts. Pacific walrus densities in the Chukchi Sea are highest along the edge of the pack ice, and the proposed activities are scheduled to avoid pack ice. The probability of encountering haulouts in pack ice is, therefore, low. Operations may encounter aggregations of Pacific walruses hauled out onto sparse patches of ice or when cable branches are installed at beach landings. Cable end branches will be placed perpendicular to the coastline and adjacent to the respective village to minimize nearshore activities. Landing locations were selected with input from local residents to avoid areas where haulouts are more likely to occur. No nearshore work will be done near Point Lay, where large haulouts are likely.

Vessel traffic and human presence could temporarily interrupt the feeding, resting, and movement of Pacific walruses. Because offshore activities are expected to move through the Chukchi Sea, impacts associated with cable laying are likely to be temporary and localized. The anticipated effects include short-term behavioral reactions and displacement of small numbers of Pacific walruses in the vicinity of active operations. Areas affected by the Quintillion project will be small compared to the regular movement patterns of the population, indicating that animals will be capable of retreating from or avoiding the affected areas. Animals that encounter the project may exert more energy than they would otherwise due to temporary cessation of feeding, increased vigilance, and retreat from the project area, but would be expected to tolerate

this without measurable effects on health or reproduction. Adoption of the measures described in section 2.3.4 Proposed Mitigation and Monitoring, are expected to reduce the intensity of disturbance events and minimize the potential for injuries to animals

Take Estimate

The Service anticipates that incidental take of Pacific walruses may occur during Quintillion's cable-laying project. Noise, vessels, and human activities could temporarily interrupt feeding, resting, and movement patterns. The project component most likely to result in take is cavitation noise produced by the thrusters during dynamic positioning of the cable-laying vessel. The elevated underwater noise levels may cause short-term, temporary, nonlethal, but biologically significant changes in behavior that the Service considers to be Level B harassment. Other project activities, such as the use of an ROV, tug and barge, dive team, and support vessels are considered to have a limited potential for disturbance leading to take.

For non-impulse sounds, such as those produced by the dynamic positioning thrusters during Quintillion's subsea cable-laying operation, the Service uses the 190-dB isopleth to indicate the onset of Level A harassment. The activities are not expected to generate noise above 180 dB within frequencies audible to Pacific walruses; therefore, there is no 180-dB or 190-dB mitigation zone from the proposed project. No project activities are expected to result in take by Level A harassment.

Quintillion provided calculations to estimate take by Level B harassment based on the estimated number of Pacific walruses that may occur within the 120-dB isopleth produced by the dynamic positioning thrusters during the proposed cable-laying operation. Quintillion used the 120-dB threshold based on NOAA interim guidelines, but the Service expects take by Level B harassment to occur due to exposure to sound levels greater than 160 dB. The estimate of take based on the 120-dB isopleth will account for all animals exposed to sound levels higher than 120 dB, including those exposed to sound levels greater than 160 dB. The Service evaluated these calculations to determine whether the necessary MMPA findings could be made per Quintillion's petition, rather than requiring Quintillion to revise their evaluation. We expect Quintillion's calculations to overestimate the number of Pacific walruses that will be taken. Quintillion provided a full description of the methodology used to estimate take by harassment in its IHA petition; that methodology is summarized in the following paragraphs.

The estimate of the numbers of Pacific walruses that could be harassed (Level B take) by exposure to thruster noise during cable-laying operations was determined by multiplying the maximum seasonal density of Pacific walruses by the total area in the northern Bering, Chukchi, and Southern Beaufort Seas of Alaska (to 153°W) that will be ensonified by any sound level greater than 120 dB. The acoustic footprint (total ensonified area) was determined by assuming that dynamic positioning would occur along all trunk and branching lines within the fiber optics cable network, regardless of the vessel used or activity conducted.

Various acoustic investigations have modeled distances to the 120 dB isopleth for water depths similar to where Quintillion would be operating with results ranging between 1.4 – 3.5 km (0.9 – 2.2 mi) (Samsung 2009; Deepwater Wind 2013). However, these ranges were based on

conservative modeling that included maximum parameters and worst-case assumptions. Hartin et al. (2011) measured dynamic positioning noise from the 104-m (341-ft) Drill Ship *Fugro Synergy* while operating in the Chukchi Sea. It used 2,500-kW thrusters (more powerful than those used on the *C/S Ile de Brehat*) and produced frequencies of 110 – 140 Hz. The 90th percentile radius to the 120-dB isopleth was 2.3 km (1.4 mi). Because this radius is a measured value from the same water body where Quintillion's cable-laying operation would occur, as opposed to a conservatively modeled value from the Atlantic Ocean, this value is used in calculating marine mammal exposure estimates.

The area of the 120-dB isopleth at any one instant is estimated to be up to 16.6 km^2 (6.2 mi^2) centered on the cable-laying vessel (radius [r] = 2.3 km; Area = πr^2). A total of 49.8 km^2 (18.6 mi^2) may be ensonified at one time if all three cable-laying vessels are in operation in different locations. The sum total of submerged cable length is 1,904 km (1,183 mi), but total cable length within Pacific walrus habitat (west of 153°W) is 1,691 km (1,051 mi). Assuming that the radius to the 120-dB isopleth is 2.3 km (1.4 mi), the total ensonified area represents a swath that is 1,691 km (1,051 mi) in length and 4.6 km (2.8 mi) in width (2 × 2.3 = 4.6 km) or 7,780 km^2 (3,004 mi^2) total (4.6 × 1,691 ≈ 7,780).

The number of Pacific walruses that may be exposed to harassment by the Quintillion cable project was estimated by multiplying the seasonal density of walruses by the total area (7,780 km^2) that would be ensonified by thruster noise greater than 120 dB. Given the continuing trend for light summer ice conditions, it was assumed that 2016 will be similar to 2013. Therefore, Quintillion used the 2013 density estimate from Aerts et al. (2014) of 0.041 walrus/km^2 in the take estimation. The result is an estimated 319 Pacific walruses that might be exposed (0.041 × 7,780 ≈ 319).

While the estimate of exposure was generated using a conservative in-water density value, it does not take into account the potential for encounters with large groups of Pacific walruses moving between Hanna Shoal and Point Lay, or near the Wainwright and Barrow shore ends. During marine mammal observations made for offshore oil and gas activities in the Chukchi Sea in 2015, PSOs recorded 500 sightings of 1,397 individual Pacific walruses (Ireland and Bisson 2016). The average number of walruses per observation was only 1.5, but on several occasions, groups of more than 100 animals were observed. The maximum group size was 243 animals. Taking into consideration the possibility that any encounter might include large groups, Quintillion estimated that a total take of up to 500 Pacific walruses may occur.

An estimated take of 500 Pacific walruses is small relative to the most recent stock abundance estimate. It is 0.39 percent of the best available estimate of the current population size of 129,000 animals (Speckman et al. 2011) (500/129,000 ≈ 0.0039). No injuries or mortalities are anticipated to occur as a result of Quintillion's subsea cable-laying operation, and none will be authorized. Additionally, animals in the area are not expected to incur hearing impairment (TTS or PTS) or non-auditory physiological effects. The takes that are anticipated and would be authorized are expected to be limited to short-term Level B harassment in the form of brief startling reactions and/or temporary displacement. No long-term biologically significant impacts to marine mammals are expected from the subsea cable-laying activity.

4.2.2 Potential Impacts on the Physical Environment

The preferred action is issuance of an IHA for incidental take of walruses. The authorization of incidental take, and any take by disturbance that will result, will have no impact on the physical environment. The associated cable-laying activities may have such impacts.

Effects on Pacific Walrus Habitat

Components of walrus habitat at greatest risk of impact from the Quintillion cable project are food resources. Pacific walruses feed primarily on immobile benthic invertebrates. The Quintillion cable project will occur on the shelf regions of the northern Bering, Chukchi, and Beaufort Seas where physical habitat is characterized as flat with a bottom substrate of mud, sand, or gravel, or a combination of the three (Naidu 1988; Feder et al. 1989; Smith 2010). These habitats support benthic and epibenthic fauna. Feder et al. (1989) identified four benthic fauna assemblages in the Chukchi Sea that are a reflection of the relative presence and mix of gravel, sand, and mud. Areas of muddy-sandy-gravel were dominated in abundance by the tube-dwelling amphipod *Byblis gaimardi* and the juvenile barnacle *Balanus crenatus*. The muddy areas were dominated by the polychaete *Maldane glebifex* and the clams *Macoma* spp. and *Nucula bellotti*. The sandy area assemblage was dominated by *B. crenatus* barnacles and tube-dwelling amphipods including *Ampelisca macrocephala*. The sandy gravel areas included sand dollars (*Echinarachnius parma*) and the cockle *Cyclocardia rjabininae*. Feder et al. (1989) also conducted trawl surveys in the Chukchi to characterize the benthic fauna. Invertebrates they found to dominate abundance were brittle stars (*Ophiura sarsi*), Tanner crab (*Chionoecetes opilio*), and crangonid shrimp.

Bivalve clams of the genera *Macoma*, *Serripes*, and *Mya* appear to be the most important prey based on both stomach contents and prey availability at Pacific walrus feeding areas (Sheffield and Grebmeier 2009). Feder et al. (1989) found summer and fall feeding areas in the Chukchi Sea to be dominated by muddy substrates supporting high biomasses of *Macoma calcarea* clams. The HSWUA is the most important foraging area for Pacific walruses (Brueggeman et al. 1990, 1991; MacCracken 2012; Jay et al. 2012). The unique bathymetric and current patterns at Hanna Shoal deposit nutrients from the Bering Sea on the ocean floor where they feed a rich benthic ecosystem.

Potential habitat impacts are associated with physical disturbance of the sea floor, effects of high sound levels, or a fuel or oil spill. Cable burial operations, including trenching and jetting, will disturb linear segments of the sea floor up to approximately 2 – 3 m (6.6 – 9.8 ft) in depth and width. Plough trenching will create a displaced wedge or berm; water currents and gravity are expected to backfill the displaced sediment into the trench. Jetting results in greater suspension of sediments. Suspended sediments may take days to settle and be transported by currents well away (up to several kilometers) from the trench. Larger suspended particles generally settle within about 20 m (66 ft). The maximum amount of cable to be buried is 1,904 km (1,183 mi). Trench widths of 3 m (9.8 ft) along this length could disturb a total area of 6 km^2 (2.3 mi^2).

Impacts to Pacific walrus habitat and prey include: (1) crushing of benthic and epibenthic invertebrates with the plough blade, plough skid, or ROV track; (2) dislodgement of benthic

invertebrates onto the surface where they may die; and (3) the settlement of suspended sediments away from the trench where they may clog gills or feeding structures of sessile invertebrates or smother sensitive species (BERR 2008). Recolonization of benthic communities in northern latitudes is slow. Conlan and Kvitek (2005) observed 65 – 84 percent recolonization at 8 – 9 years after disturbance. Beuchel and Gulliksen (2008) found significant differences between disturbed and undisturbed areas until 13 years after disturbance.

Sea-floor trenching will leave a lasting impact within the cable corridor, but will have only a minor effect on the benthic community in a local area. Linear trenching of this scale will affect approximately 0.3 percent of each square km intersected by the cable route. This is an insignificant portion of the total sea floor available for Pacific walrus foraging. Further, none of the activity will occur in the HSWUA. The overall effects of physical disturbance to benthic resources will be negligible.

Potential project impacts to Pacific walrus habitat also include acoustic impacts to prey resources. Injury from thruster noise is unlikely. Continuous noise levels from ship thrusters are generally below 180 dB, and do not create high enough sound pressure levels to cause tissue or organ injury. Nedwell et al. (2003) measured noise associated with cable trenching operations offshore of Wales, and found that levels (178 dB at the source) did not cause significant avoidance reactions in fish. Acoustic exposure at higher levels can cause physical damage and/or mortal wounds in fishes (Hastings and Popper 2005), but little research has been conducted on the effects of sound on invertebrates (Normandeau Associates, Inc. 2012). Christian et al. (2003) concluded that there were no obvious effects from seismic surveys on crab behavior and no significant effects on the health of adult crabs. Pearson et al. (1994) had previously found no effects of seismic surveys upon crab larvae for exposures as close as 1 m (3.3 ft) from the array, or for mean sound pressures as high as 231 dB. Invertebrates such as mussels, clams, and crabs do not have auditory systems or swim bladders that could be affected by sound pressure. Squid and other invertebrate species have complex statocysts that resemble the otolith organs of fish that may allow them to detect sounds (Budelmann 1992). Normandeau Associates, Inc. (2012) concluded that invertebrates are sensitive to local water movements and to low-frequency particle accelerations generated by sound sources in their close vicinity. Based on these results, impulsive hydroacoustic surveys could acoustically impact local marine communities, but only within a limited area. From an ecological community standpoint, these impacts are considered minor. No significant reduction in quality or availability of Pacific walrus food resources is expected.

Effects of a Spill

Just as physical disturbance and acoustic sources could affect Pacific walruses and their habitat, so too could an accidental spill. Potential spills could involve fuel, oil, lubricants, solvents, and other substances used aboard the cable ships or support vessels. An oil spill or unpermitted discharge is an illegal act; IHAs do not authorize takes of marine mammals caused by illegal or unpermitted activities. If a spill did occur, the most likely impact upon Pacific walruses would be exposure to spilled oil, which may cause injury, illness, or possibly death depending on degree and duration of exposure and the characteristics of the spilled substance. A large spill could result in a range of impacts from reduced food availability to chronic ingestion of

contaminated food. Spill response activities, especially use of dispersants, may increase the cumulative impact of a spill on Pacific walrus habitat by making oil more bioavailable for uptake by filter feeders and benthic invertebrates (e.g., Epstein et al. 2000; Hansen et al. 2012). However, the overall effect on the environment of spill response activities given a spill are expected to be lower than the level of impact of the spill alone (USFWS 2015b). The effects of a spill event would depend on the amount, substance, and specific circumstances of the spill, but small spills, such as could occur in connection with the activities proposed by Quintillion, are unlikely to have negative impacts on Pacific walruses.

4.2.3 Socio-economic Impacts

There are only a few locations where the proposed project area could overlap with local subsistence harvest areas. These include the portion of the route passing between the villages of Diomede and Wales, and the branching line into Wainwright. The proposed route is expected to pass about 25 km (16 mi) east of Little Diomede Island. Presence of ice is needed for any spring Pacific walrus hunts from Diomede, and the Quintillion cable-laying vessel cannot operate in the presence of ice.

Pacific walruses are harvested from Wainwright and Barrow during July and August from drifting ice floes (Bacon et al. 2009). Most are killed within 32 km (20 mi) of shore, but some are taken by both villages as far as 64 km (40 mi) offshore (SRB&A 2012). The Quintillion cable route will pass within 30 km (19 mi) of both villages, and the branching lines will go directly to both Wainwright and Barrow. However, given the hazard ice floes pose to the cable-laying project, Quintillion will not be operating within either village's subsistence hunt area when seasonal sea ice is present. Thus, the cable-laying project is not expected to affect the annual Pacific walrus hunts by either Wainwright or Barrow. For the remaining villages, the annual harvest is relatively low and generally occurs when ice is present, or occurs well away from the proposed cable route (in the case of Point Lay, the route will run well offshore of the village).

Based on the proposed cable-laying timetable relative to the seasonal timing of the various village harvest periods, an overlap in cable laying and Pacific walrus hunting is not expected. However, Quintillion will continue to work closely with the EWC and the affected villages to minimize any effects cable-laying activities might have on subsistence harvest, including scheduling the laying of branching lines to avoid periods when Pacific walruses are present.

4.2.4 Effects of Mitigation Measures

The Service has carefully evaluated Quintillion's mitigation measures and considered a range of other measures of ensuring that the cable project will have the least practicable impact on Pacific walruses and their habitat. Our evaluation considered the following: (1) the manner in which, and the degree to which, the successful implementation of the measures are expected to minimize adverse impacts to Pacific walruses; (2) the proven or likely efficacy of the measures to minimize adverse impacts as planned; and (3) the practicability of the measures for applicant implementation.

The expected effects of the prescribed mitigation measures are as follows:

- Avoidance of injury or death of Pacific walruses.
- Reduction in the numbers of Pacific walruses exposed to activities expected to result in the take of marine mammals.
- Reduction in the number of times individuals would be exposed to project activities.
- A reduction in the intensity of exposures to activities expected to result in the take of Pacific walruses.
- Avoidance or minimization of adverse effects to Pacific walrus habitat, especially haulout areas, sea ice, and foraging areas.
- An increase in the probability of detecting Pacific walruses through vessel-based monitoring, allowing for more effective implementation of mitigation measures.
- Reduction in the likelihood of affecting Pacific walruses in a manner that would alter their availability for subsistence uses.

Based on our evaluation of the mitigation measures, the Service has determined that these measures provide the means of effecting the least practicable impact on Pacific walruses and their habitat, including feeding areas and haulouts. These measures will also minimize any effects the project will have on the availability of the species or stock for subsistence uses.

4.2.5 Cumulative Impacts

Cumulative impacts are defined as "the impacts on the environment which results from the incremental impacts of the action when added to other past, present, and reasonably foreseeable future action regardless of what agency (Federal or non-Federal) or person undertakes such other actions" (40 CFR 1508.7). Climate change, subsistence harvest, vessel traffic, and oil and gas industry activities have contributed to current environmental conditions in the project area and could cumulatively affect Pacific walrus status in the future.

Commercial and Subsistence Harvest

Walruses have an intrinsically low rate of reproduction and are thus limited in their capacity to respond to hunting. Lack of information on current population size or trend makes assessment of sustainable harvest rates difficult. Communities located in the geographic region of the proposed Quintillion cable project have reported 807 walruses harvested from 2006 to 2015. Recent overall harvest levels are lower than historic highs. Future harvest levels may rebound to pre-2012 levels (around 1,300 animals landed and reported per year), stabilize at lower levels similar to those in recent years (500 – 600 animals), or fluctuate between these levels.

Climate Change

The continued decline of sea ice is supported by the most recent climate models (IPCC 2014b; Douglas 2010). Walruses rely on suitable sea ice as a substrate for resting between foraging bouts, calving, molting, isolation from predators, and protection from storm events. When sea ice recedes beyond shallow feeding areas on the continental shelf to the deep waters of the Polar Basin, walruses tend to relocate to coastal areas to rest on land. The number of walruses using

land based haulouts along the Chukchi Sea coast during the summer months, and the duration of haulout use, has increased significantly over the past decade. In recent years scientists have documented tens of thousands of animals hauling out at some locations along the Russian and Alaskan coasts (Kavry et al. 2008). Disturbance can cause walruses to stampede into the water. Stampede-related injuries are especially dangerous for calves and young animals in herds, whose deaths have particularly high impacts on population (Udevitz et al. 2013).

Reasonably foreseeable future impacts to walruses as a result of diminishing sea ice cover include: shifts in range and abundance; increased vulnerability to predation and disturbance; declines in available prey species; increased mortality rates resulting from storm events; and premature separation of females and dependent calves. Secondary effects on animal health and condition resulting from reductions in suitable foraging habitat may also influence survivorship and productivity. Garlich-Miller et al. (2011) assumed that future summer sea ice loss could result in a reduced walrus population over time.

Commercial Fishing and Marine Vessel Traffic

Available data from the Beaufort and Chukchi Seas suggest that walruses rarely interact with commercial fishing and marine vessel traffic. Walruses are closely associated with sea ice, which limits their interactions with fishing vessels and barge traffic. However, as previously noted, the temporal and seasonal extent of the sea ice is projected to diminish in the future. Commercial shipping through the Northwest Passage and Siberian Arctic waters may develop in coming decades. Commercial fishing opportunities may also expand if the sea ice continues to diminish. The result could be increased fishing and shipping operations in walrus habitat and increased interactions between walruses and marine vessels.

Offshore Oil and Gas Related Activities

Oil and gas activities affect the environmental conditions of the Chukchi and Beaufort Seas. Exploration, development, and production have been ongoing in the Beaufort Sea since the late 1960s. Pacific walruses do not normally range into the Beaufort Sea, and documented interactions between oil and gas activities and walruses have been minimal. Exploration in the Chukchi Sea has occurred periodically since 1987; several exploratory wells have been drilled, most recently in 2015. Activities in the Chukchi Sea to date have not resulted in population level impacts to the Pacific walrus or unmitigable adverse impacts to subsistence use of this resource.

The Service assessed the effects of oil and gas on the Pacific walrus population in 2011 and concluded that at current levels, oil and gas exploration posed a relatively minor threat (76 FR 7634, February 10, 2011). Because of the transitory nature of past oil and gas activities in any given region, oil and gas activities are not thought to have had lasting effects on individuals or groups. However, we noted that a large oil spill could have adverse impacts on the population depending on timing, location, amount and type of oil, and efficacy of response efforts. Activities occurring in sensitive locations could also have adverse impacts on walruses.

The Service and other regulating agencies, including the Bureau of Ocean Energy Management, the Environmental Protection Agency, and the U.S. Coast Guard, regulate the activities of oil and

gas industry operators in the Chukchi and Beaufort Seas in order to avoid and minimize environmental impacts (e.g., BOEM 2012; BOEM 2015). The Service works to monitor and mitigate potential impacts on walruses through Incidental Take Regulations (ITRs) authorized under the MMPA (76 FR 47010, August 3, 2011; 78 FR 33212, June 12, 2013). The current ITRs provide special considerations to limit potential impacts to walruses in the HSWUA, particularly during July – September, when walruses may be concentrated in large numbers in this food rich environment.

Summary of Cumulative Impacts

Hunting pressure, climate change, and the expansion of commercial activities all have the potential to impact Pacific walruses. Combined, these factors are expected to present challenges to future management and regulatory efforts. The success of future management will rely in part on continued investments in research investigating population status and trends and habitat use patterns. The effectiveness of various mitigation measures and management actions will also need to be continually evaluated through monitoring programs and adjusted as necessary. Climate change is of particular concern. The observed and projected losses of sea-ice habitats in the Chukchi and Beaufort Seas will likely result in continued changes in seasonal distributions and habitat use patterns of walruses. It is difficult to forecast the rate and magnitude of future population changes because of the uncertainty inherent in future sea-ice projections, as well as uncertainty in the relationships between habitat changes and population demographics. The effects of climate change will need to be considered as more information on the status of the Pacific walrus population becomes available.

Contribution to Cumulative Impacts

The activities proposed by Quintillion may result in some incremental cumulative impacts to walruses through displacement or disturbance, and the associated disruption of important biological behaviors. However, less than 0.4 percent of the population is likely to interact with Quintillion's activities. Required monitoring and mitigation measures, designed to minimize interactions between authorized projects and walruses, are also expected to limit the severity of any behavioral responses. Therefore, we conclude that the proposed activities, as mitigated through the measures included in the IHA, would contribute only a negligible increase over and above the effects of baseline activities currently occurring, as well as future activities that are reasonably likely to occur within the period covered by the IHA. [Top]

Chapter 5. CONCLUSIONS

5.1 Small Numbers

For small take analyses, the statute and legislative history do not expressly require a specific type of numerical analysis, leaving the determination of "small" to the agency's discretion. In this case, we propose a finding that the Quintillion project will affect up to 500 Pacific walruses, and that this constitutes a small number of animals. Factors considered in our small numbers

determination included the number of Pacific walruses in the affected area, the size of the affected area relative to available habitat, and the expected efficacy of mitigation measures.

First, the number of Pacific walruses inhabiting the project's impact area is small relative to the size of the Pacific walrus population. The potential exposures for the 2016 cable-laying period, based on estimated density plus an additional allowance for the clumped distribution of Pacific walruses, is approximately 500 animals. This is about 0.39 percent of the population size of 129,000 estimated by Speckman et al. (2011).

Second, the area where the project activities would occur is a relatively small fraction of the available habitat of the Pacific walrus. Cable-laying activities will have temporary impacts to Pacific walrus habitat along a 1,691-km (1,051-mi) linear corridor of marine water and coastal land of Alaska. Sound levels greater than 120 dB may be produced by propeller cavitation in an area of up to 16.6 km^2 (6.2 mi^2) centered on each cable ship. Up to three ships may operate in different locations at one time, resulting in a combined area of ensonification up to 49.8 km^2 (18.6 mi^2). Trenching of the sea floor may disturb the benthos along the cable route, affecting a total area of approximately 6 km^2 (2.3 mi^2). These impacts will be temporary and localized, and will not impede the use of an area after the project activities in that area are complete.

Third, monitoring requirements and mitigation measures are expected to limit the number of incidental takes. The cable route will avoid sea ice, terrestrial haulouts, and important feeding habitat. Adaptive mitigation measures will be applied by the support fleet and when cable ships are in transit. These measures will include changes in speed or course when Pacific walruses could come within 805 m (0.5 mi), and are expected to help prevent take by Level A harassment and to minimize take by Level B harassment. Monitoring will be conducted by PSOs to watch for unexpected impacts and report to the Service. No take by injury or death is anticipated or authorized. Monitoring and reporting will allow the Service to reanalyze and refine future take estimates and mitigation measures as activities continue in Pacific walrus habitat in the future. Should the Service determine based on the monitoring and reporting to be conducted throughout Quintillion's activities that the effects are greater than anticipated, the authorization may be modified, suspended, or revoked.

For these reasons, we propose a finding that the Quintillion project will involve takes by Level B harassment of only a small number of animals.

5.2 Negligible Impact

The Service proposes a finding that any incidental take by harassment that may result from the Quintillion cable-laying operation cannot be reasonably expected to, and is not reasonably likely to, adversely affect the Pacific walrus through effects on annual rates of recruitment or survival, and would, therefore, have no more than a negligible impact on the species or stock. In making this finding, we considered the best available scientific information, including: (1) the biological and behavioral characteristics of the species; (2) the most recent information on species distribution and abundance within the area of the proposed project; (3) the potential sources of disturbance during the project; and (4) the potential responses of Pacific walruses to this

disturbance. In addition, we reviewed material supplied by the applicant, other operators in Alaska, our files and datasets, data acquired from NOAA, published reference materials, and Pacific walrus experts.

Pacific walruses are likely to respond to Quintillion's activities with temporary behavioral modification or displacement. These reactions are unlikely to have consequences for the health, reproduction, or survival of affected animals. The major source of disturbance is likely to be production of sound by propeller cavitation during dynamic positioning by the cable-laying vessels. Sound production is not expected to reach levels capable of causing harm, and Level A harassment (harassment that has the potential to injure Pacific walruses) is not authorized. Sound source verification will be conducted to ensure that this assessment is accurate.

Responses of Pacific walruses to disturbance would most likely include diving or swimming away from the sound source, which may entail the temporary, but not sustained, interruption of foraging, resting, or other natural behaviors. Affected animals are expected to resume normal behaviors soon after exposure, with no lasting consequences. Thus, we do not expect take (i.e., disturbance) by Level B harassment by means of exposure to sound levels of 160 – 190 dB to affect annual rates of recruitment or survival or result in adverse effects on the species or stock.

Our finding of negligible impact applies to incidental take associated with Quintillion's activities as mitigated by the avoidance and minimization measures. These mitigation measures are designed to minimize interactions with and impacts to Pacific walruses. These measures, and the accompanying monitoring and reporting requirements, are required for the validity of our finding and are a necessary component of the IHA. For these reasons, we propose a finding that the Quintillion project will have a negligible impact on Pacific walruses.

5.3 Effects on Subsistence Uses

We propose a finding that the anticipated harassment caused by Quintillion's activities would not have an unmitigable adverse impact on the availability of Pacific walruses for taking for subsistence uses. In making this finding, we considered the timing and location of the activities and the timing and location of subsistence harvest activities and patterns, as reported through the Service's Marking, Tagging, and Reporting Program in the project area. We also considered the applicant's consultation with potentially affected subsistence communities and the mitigation measures that will be applied for avoiding impacts to subsistence harvest.

5.4 Least Practicable Adverse Impacts

We find that the mitigation measures required by the IHA will effect the least practicable adverse impacts from incidental take likely to occur in association with Quintillion's activities. In making this finding, we considered the biological characteristics of Pacific walruses, their geographic distribution, the nature of the project, the potential effects Quintillion's activities on walruses and subsistence uses, the documented impacts of similar activities, data provided by monitoring programs in the Beaufort and Chukchi Seas, and alternative mitigation measures.

5.5 Conclusion Summary

To fulfill the requirement of NEPA, we analyzed the probable environmental impacts of issuance of an IHA for incidental take walruses from the proposed Quintillion fiber optic cable-laying activities occurring between the date of issuance and November 15, 2016 in the State of Alaska and associated Federal waters of the northern Bering, Chukchi, and Southern Beaufort sea. We also considered a No Action Alternative. The Proposed Action (the issuance of the IHA) primarily affects the biological and socio-economic components of the human environment. In particular, the issuance of an IHA will affect Pacific walruses by authorizing incidental take during the Quintillion cable-laying project while imposing mitigation and monitoring requirements. In order to determine whether the Proposed Action is a major Federal action that significantly affects the quality of the human environment, we reviewed the effects of the proposed cable-laying activities on walruses, including impacts from noise, vessel-based activities, habitat impacts, and oil spills. We evaluated these impacts in light of cumulative effects from subsistence harvest, climate change, vessel traffic, and past oil and gas activities.

Most of the impacts of cable-laying activities on Pacific walruses will be short-term disturbances. Walruses may change their location or alter their behavior in response to project noise, or when exposed to the sights, sounds, and smells associated with vessels-based activities. The majority of these disturbances will have no impacts on the survival or reproduction of the individual and no impacts to the population.

The primary environmental threat to Pacific walruses is from the effects of climate change. In the future, declines in sea ice may affect walrus health (body condition), distribution, breeding success, and ultimately, abundance. The long-term effects from climate change on Pacific walruses are uncertain.

After considering the effects of oil and gas development, production, and exploration activities and related activities, given the cumulative impacts from climate change and other sources, we find that the total expected takings associated with Quintillion's activities will affect no more than small numbers and will have no more than a negligible impact on the Pacific walrus population inhabiting the project area. Impacts of the proposed project are not anticipated to diminish the availability of walruses for subsistence use. The monitoring, reporting, and mitigation measures required are designed to ensure that the proposed cable-laying activity will have the least practicable adverse impact on Pacific walruses and their habitat, and on the availability of the species for subsistence use.

We have concluded that approval and issuance of an authorization for the nonlethal, incidental take by Level B harassment of small numbers of Pacific walruses in Alaska and associated Federal waters during cable-laying activities conducted by Quintillion would not significantly affect the quality of the human environment, and that the preparation of an EIS for these actions is not required by section 102(2) of NEPA or its implementing regulations. [Top]

Chapter 6. CONSULTATION AND COORDINATION

6.1 Request for Public Comments

The Service published a Federal Register notice regarding the proposed IHA and the Draft EA on June 23, 2016 (81 FR 40902, USFWS 2016). The Federal Register notice informed the public that we sought comment on both the proposed IHA and the Draft EA; the comment period was thirty days. These documents were also made available on the Service's webpage (*https://www.fws.gov/alaska/fisheries/mmm/iha.htm*). The Service received one comment letter from the Marine Mammal Commission. No other comments were received from agencies, tribal groups, local governments, non-governmental organizations, or the public at large. We reviewed and evaluated the comments received for substantive issues, new information, and recommendations.

6.2 Response to Comments

The Marine Mammal Commission made three recommendations regarding: (1) Sound sources considered for Level B harassment; (2) reporting measures, and (3) timing of activities. Each recommendation is restated in small font, followed by the Service's response.

> 1. The Commission recommended that the Service remove all reference to the 160-dB threshold for continuous sound sources in the final authorization, and reassess whether Level B harassment take of walruses is expected to occur from Quintillion's cable-laying activities based on a 120-dB threshold. The Commission cited four issues in making this recommendation: (a) the 120-dB threshold for non-impulsive noise developed by NOAA for pinnipeds; (b) the applicant's use of the 120-dB threshold in the application materials; (c) lack of clarity as to why the Service selected a 160-dB threshold for continuous sound in apparent contrast with previous Service documents (79 FR 58800 and 79 FR 51591); and (d) a need for the Service to coordinate further with NOAA regarding these thresholds.

The Service offers the following reply to points (a)–(d):

a. The Commission recommended that the 120-dB threshold for non-impulsive noise developed by NOAA for pinnipeds be applied to Pacific walruses. The NOAA 120-dB criterion has been adopted as a generic threshold, but it has limitations. Since the development of these thresholds in the late 1990s, the understanding of the effects of noise on marine mammal hearing has advanced. While NOAA has recognized the need for updated acoustic criteria, final guidance was not available for development of the IHA. In the meantime, NOAA continues to use these generic thresholds as interim guidance (NOAA undated). In the IHA, we examined the current information to determine the appropriate acoustic threshold levels for walruses exposed to noise from the Quintillion project. We determined that there is insufficient evidence to conclude that Pacific walruses are likely to be taken by harassment from continuous noise at the 120-dB level. Text was added to section 4.2.1 on page 29 clarifying our evaluation. We also

considered whether sound exposures below 160 dB would likely result in take. Information summarizing this assessment was also added to section 4.2.1 on page 29.

b. The Commission questioned why the Service used a different sound threshold than used in the Applicant's evaluation of impacts. Quintillion, in their application for an IHA, estimated take of Pacific Walruses that could occur if take included all walruses potentially exposed to sound levels of 120 dB or greater. Quintillion presumably modelled the evaluation of impacts to walruses on their evaluation of impacts to other marine mammals developed for NOAA. The Service reviewed Quintillion's application and found that the materials provided sufficient information to allow us to evaluate the project and make appropriate findings against the standards of the MMPA. We did not require Quintillion to revise their evaluation because it was feasible to conduct our evaluation based on the information provided without additional information or revisions from Quintillion. We recognize that this decision was not explicitly discussed in the proposed IHA or Draft EA and that a discussion would provide added clarity to readers. We have added text to section 4.2.1 on page 33 of the EA.

c. The Commission expressed concern regarding an apparent lack of consistency by the Service in use of sound thresholds, citing 79 FR 58800 and 79 FR 51591 as examples. The Service has no approved criteria for determining when Level A or Level B take occurs due to sound exposure in marine mammals. Until criteria have been established, we must continue to assign thresholds based on the best available information relevant to the situation at hand. The Service's use of thresholds in 79 FR 58800 and 79 FR 51591 demonstrates this point. In 79 FR 58800, the Service in Region 8 applied the 120-dB threshold for continuous noise for southern sea otters in Monterey Bay Harbor, California. In 79 FR 51591, Region 7 set a received underwater sound level of 160 dB as a threshold for Level B take by disturbance for sea otters. While that IHA did not clearly specify whether that threshold applied to both continuous and impulse sound, it did find that sea otters could be exposed to continuous sound exceeding 120 dB that would not result in take, suggesting that 160 dB was the threshold for both continuous and impulse noise. In using separate criteria, the Service reflects a careful evaluation of the unique characteristics of these projects and the affected species. Neither example is directly applicable to walruses. Our evaluation for the Quintillion IHA is consistent with contemporary and recent evaluations for walruses (73 FR 33212, June 11, 2008; 76 FR 47010, August 3, 2011; 78 FR 35364, June 12, 2013; 81 FR 52276, August 5, 2016).

d. The Commission recommended that the Service coordinate with NOAA regarding these thresholds. The Service has reviewed recent NOAA authorizations and the information cited therein. We welcome collaboration and coordination with NOAA for the management of our marine mammal trust species. The Service and NOAA share some common conservation and management responsibilities. However, the Service and NOAA are distinct agencies with unique missions, mandates, and procedures. While NOAA has responsibility for most marine mammals, the Service only has responsibility for polar bears, Pacific walruses, sea otters, and manatees. There are significant and fundamental differences in the biology, behavior, conservation, and management needs

between these species and our agencies. The Service relies upon our own expertise regarding our trust species and will continue to collaborate and coordinate with NOAA, when appropriate.

2. The Commission recommended that the Service require Quintillion to (1) report immediately any walrus injury or mortality, and (2) cease its activities until such time that the Service reviews the circumstances of the prohibited take, determines whether additional mitigation measures are necessary to minimize further taking, and notifies Quintillion that it can resume its activities.

The proposed IHA stated that Quintillion must report immediately any injury or mortality due to proposed activities; in another place in the document, it stated that Quintillion would require reporting the incident within 24 hours, but it did not explicitly require a response within 24 hours. We recognize the need for clarity regarding this reporting requirement and have clarified language in the IHA specifying that Quintillion must report mortality or injuries immediately. We also recognize that communications in remote Alaska may be difficult, and have added the following language to the final IHA, "Quintillion must confirm the Service has received the report within 24 hours." We agree that Quintillion should be required to cease or suspend its activities in such an event until such time that the Service reviews the circumstances of the prohibited take, determines whether additional mitigation measures are necessary to minimize further taking, and notifies Quintillion that it can resume its activities. This requirement has also been added to the final IHA and revisions have been made in section 2.3.4 on page 16.

3. The Commission recommends that, in the future, the Service publish and finalize proposed incidental take authorizations before planned activities are expected to begin and if not, that the period of activities and estimated numbers of takes be adjusted accordingly.

The Service agrees with the Commission and will endeavor to process IHA requests and when appropriate, publish and finalize IHAs as expeditiously as possible in the future.

6.3 Modifications to the Draft EA

The following changes were made to the Draft EA in addition to those in the previous section:

1. Terms referring to the Proposed Action and the specified activities were revised to avoid confusion. We revised text throughout the document replacing "proposed (Quintillion) activities" with "project activities" or "Quintillion's activities" and limiting the use of "Proposed Action" to refer only to the issuance of IHA, and "specified activities" to refer only to the activities proposed by Quintillion.

2. Text was revised in the Key Definitions section clarifying the meaning of the term "least practicable adverse impacts."

3. A Least Practicable Adverse Impacts section was added on page 42 summarizing our conclusions regarding the MMPA's least practicable adverse impacts requirement. [Top]

Chapter 7. REFERENCES

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