Programmatic Biological Opinion
for
Polar Bears (*Ursus maritimus*), Polar Bear Critical Habitat, and Conference Opinion for the Pacific Walrus (*Odobenus rosmarus divergens*)
on
Beaufort Sea Incidental Take Regulations

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List of Abbreviations

AOGA = Alaska Oil & Gas Association
BLM = Bureau of Land Management
BO = biological opinion
BOEMRE = Bureau of Ocean Energy Management, Regulation and Enforcement
BOP = blowout preventer
BPXA = BP Exploration (Alaska), Inc.
CFR = Code of Federal Regulations
COE = U.S. Army Corps of Engineers
CS = Chukchi Sea polar bear population
DLP = defense of life & property
EA = Environmental Assessment
EIS = Environmental Impact Statement
ESA = Endangered Species Act of 1973, as amended
FFWFO = Fairbanks Fish & Wildlife Field Office (of the Service, Fairbanks, AK)
FLIR = Forward Looking Infrared imagery
FR = Federal Register
Industry = oil and gas industry
ITS = Incidental Take Statement
ITRs = Incidental Take Regulations
IUCN = International Union for the Conservation of Nature
LOA = Letter of Authorization (under the MMPA)
MMM = Marine Mammal Management Office (of the Service, Anchorage, AK)
MMO = marine mammal observer
MMPA = Marine Mammal Protection Act of 1972, as amended
MMS = Minerals Management Service (now BOEMRE)
NB = Northern Beaufort Sea polar bear population
NEPA = National Environmental Policy Act
NPR-A = National Petroleum Reserve-Alaska
NWT = Northwest Territory
OCs = organochlorine compounds
OCS = outer continental shelf
PBSG = Polar Bear Specialist Group
POC = Plan of Cooperation
POPs = persistent organic pollutants
PVA = population viability analysis
Regulations = incidental take regulations for oil and gas exploration activities in the Beaufort Sea and adjacent northern coast of Alaska
SBS = Southern Beaufort Sea polar bear population
SDC = steel drilling caisson
Secretary = Secretary of the Department of the Interior
Service = U.S. Fish and Wildlife Service
USGS = U.S. Geological Survey

1. Introduction

This document transmits the U.S. Fish and Wildlife Service's (Service) programmatic biological opinion (BO) in accordance with section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 *et seq*., ESA), on effects to the polar bear (*Ursus maritimus*) and polar bear critical habitat of the Service's proposed action (Action), in connection with proposed incidental take regulations (Regulations) for oil and gas exploration, development, and production activities in the Beaufort Sea and adjacent northern coast of Alaska. The Regulations were proposed on March 11, 2011 (76 FR 13454), and the proposed Action covered in this BO is described in detail in Section 2. In addition, as the Pacific walrus (*Odobenus rosmarus divergens*) is a candidate species under the ESA, this document also serves as a conference opinion on the effects of the proposed Action on the Pacific walrus (*Odobenus rosmarus divergens*). Potential effects of oil and gas activities on other listed species (e.g., Steller's and spectacled eiders) have been and will be consulted on separately; this BO pertains exclusively to potential effects to marine mammals and their critical habitat.

The proposed Regulations considered in this Action would provide authorization under the Marine Mammal Protection Act of 1972, as amended (16 U.S.C. 1361 *et seq.*, MMPA) for the nonlethal, unintentional *incidental tak*e of s*mall numbers* of Pacific walruses and polar bears, pursuant to Section 101(a)(5)(A) of the MMPA (16 U.S.C. § 1371(a)(5)(A)). The Regulations, proposed by the Service's Marine Mammal Management (MMM) Office, would be in effect for five years from their date of issuance.

The Service has responsibility for managing take of polar bears and Pacific walruses (walrus) under the MMPA and ESA. Section 101(a)(5) of MMPA allows for the incidental take of small numbers of marine mammals, in response to requests by U.S. citizens engaged in a specified activity (other than commercial fishing) in a specified geographic region; section 7(o)(2) of ESA allows for exemptions, under certain circumstances, to the section 9 take prohibitions for endangered and threatened species incidental to otherwise lawful activities that have Federal involvement or control. If a marine mammal species is listed as endangered or threatened under the ESA, the requirements of both MMPA and ESA must be met before the incidental take can be authorized.

For the Service to consider allowing incidental take under MMPA, a written request for specific regulations must be submitted to the Service containing detailed information on the activity as a whole and impacts of the total potential take. The Service evaluates the impacts resulting from all entities conducting the specified activity, not just the impacts from one entity's activities. If the Service finds the total taking expected from the specified activity (in this case, all oil and gas activities during the duration of the Regulations) 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, specific regulations will be issued that establish permissible methods of taking and other means of affecting the least practicable adverse impact on the species.

For the Service to exempt incidental take under ESA, the Service must conclude that the take associated with a Federal action (1) is not likely to jeopardize listed species or destroy or

adversely modify designated critical habitat, (2) results from an otherwise lawful activity, and (3) is incidental to the purpose of the action. Further, the exemption provided as a result of formal consultation must include measures to minimize take. Therefore, consistent with ESA and regulations at 50 CFR §402.14(i), incidental take statements for marine mammals are not included in formal consultations until regulations, authorizations, or permits under section 101(a)(5) of the MMPA are in effect. Generally, if an action meets the MMPA standard of negligible impact in a specified geographic area of consideration, there should be little potential for the action to jeopardize the species.

Background of Proposed Regulations

Incidental take regulations for the Beaufort Sea and adjacent northern coast of Alaska have been in place almost continuously since 1993 (58 FR 60402; 60 FR 42805; 64 FR 4328; 65 FR 5275; 65 FR 16828; 68 FR 66744; 71 FR 43926). These regulations provided oil and gas entities (Industry) the ability to obtain letters of authorization (LOAs) for the nonlethal, incidental take of polar bears and walrus. Since the regulations have been in place no lethal take of polar bears or walrus has occurred in connection with oil and gas activities in Alaska.

On April 22, 2009, the Alaska Oil and Gas Association (AOGA) submitted a petition to renew the incidental take regulations for the Beaufort Sea area (Figure 1) to provide continued authorization for the nonlethal incidental take of small numbers of walruses and polar bears from oil and gas exploration, development and production activities in the Beaufort Sea from 2011–2016. The projected oil and gas activities in the application included offshore and onshore exploration activities and new and ongoing development and production activities. MMM reviewed AOGA's application and concluded that oil and gas industry exploration, development, and production activities will only take *small numbers* of Pacific walrus and polar bears, and based on past history no lethal take is anticipated. Specifically, MMM anticipated MMPA incidental take of up to 150 polar bears and 10 Pacific walrus annually (76 FR 13454: 13484). Therefore, MMM concluded that the above-mentioned activities within the specified geographical region will have a *negligible impact* on these species and the total expected takings *will not have an unmitigable adverse impact on the availability of walrus and polar bears for subsistence use by Alaska Natives*.

Pursuant to this request, the Regulations as proposed would require Industry to obtain individual Letters of Authorization (LOAs) from the Service for specific oil and gas exploration, development and production activities. The LOAs would contain project-specific mitigation measures as appropriate; LOAs for exploration and development projects would be valid for a specified period not to exceed one year. LOAs for production would require annual monitoring reports to be provided and would be valid for the duration of the Regulations.

Definitions of key terms used in this BO are listed below. Additional definitions for MMPA terms can be found in 50 CFR Part 18; additional definitions for ESA terms can be found at 50 CFR §402.

MMPA Terms:

Incidental, but not intentional, taking - take events that are infrequent, unavoidable, or accidental. This does not mean that the taking must be unexpected.

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.

Small numbers – refers to a portion of a marine mammal species or stock whose taking would have a negligible impact on that species or stock.

Take - to harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any marine mammal. For activities other than military readiness activities or scientific research conducted by or on behalf of the Federal government, the MMPA defines harassment as any act of pursuit, torment, or annoyance which: (1) has the potential to injure a marine mammal or marine mammal stock in the wild (the MMPA calls this Level A harassment); or (2) 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).

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

ESA Terms:

Incidental take – take of listed fish or wildlife species that results from, but is not the purpose of, carrying out an otherwise lawful activity conducted by a Federal agency or applicant.

Jeopardize the continued existence - to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species.

Listed species – any species of fish, wildlife or plant which has been determined to be endangered or threatened under section 4 of the ESA.

May affect - the appropriate conclusion when a proposed action may pose any effects on listed species or designated critical habitat.

Take - to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in any such conduct. Harm is further defined by the Service as an act which actually kills or injures wildlife, and may include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering. Harass is defined by the Service as actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering.

Threatened species – any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

2. Description of the Action

This section provides a description of the proposed Action evaluated in this BO. The Action under consideration consists of the Regulations proposed under section 101(a)(5) of the MMPA, and any oil and gas exploration, development and production activities for which LOAs may be issued pursuant to the Regulations for the nonlethal, unintentional incidental take of polar bears and Pacific walruses. MMM anticipates MMPA incidental take of up to 150 polar bears and 10 Pacific walrus annually (76 FR 13454: 13484). Activities authorized by the LOAs must meet the requirements specified in the Regulations and summarized later in this section, including permissible methods by which polar bears and walruses may be taken, mitigation measures to ensure that the least practicable adverse impact on the species and the availability of these species for subsistence uses, and requirements for monitoring and reporting. As a result, the proposed Action evaluated in this BO includes consideration of these mitigation measures and other requirements.

While the proposed Action would authorize the incidental take of polar bears and walruses, the Action would not permit, fund or otherwise authorize any individual oil and gas activities to be conducted at specific locations. Such individual oil and gas activities will require all appropriate Federal and/or State permits before they may proceed. For example, these activities may require permits or other authorizations from such federal agencies as the Bureau of Ocean Energy Management, Regulation and Enforcement (BOEMRE), the Army Corps of Engineers (COE), the Bureau of Land Management (BLM) or the Environmental Protection Agency (EPA). As such, the Service will conduct separate section 7 consultations as needed on these individual Industry activities in the Beaufort Sea as they are proposed. To the extent that proposed future individual oil and gas activities fall within the scope of and are fully consistent with the proposed Action evaluated in this BO, additional consultation for these activities may not be needed. If other federal agencies' actions fall outside of the scope of the proposed Action, the actions will need to be consulted on separately.

The description of the proposed Action includes information from the proposed Regulations (76 FR 13454, March 11, 2011), the Draft Environmental Assessment: Proposed Rule to Authorize the Incidental Take of Small Numbers of Polar Bear (*Ursus maritimus*) and Pacific Walrus (*Odobenus rosmarus divergens*) During Oil and Gas Activities in the Beaufort Sea and Adjacent Coastal Alaska (dated May 10, 2011), the draft biological assessment, and other communications.

Information Required to Obtain a Letter of Authorization

To obtain an LOA, an applicant must provide specific information to the Service, including:

(1) A description of the activity, the dates and duration of the activity, the specific location, and the estimated area affected by that activity, i.e., a Plan of Operation.

(2) A site-specific plan to monitor any effects of the activity on the behavior of polar bear and Pacific walrus that may be present during the ongoing activities. The monitoring program must document any effects to these marine mammals and estimate the actual level and type of any take. The monitoring requirements will vary depending on the activity, the location, and the time of year.

(3) A site-specific polar bear awareness and interaction plan.

(4) Documentation that the requester has consulted with Alaska Native subsistence communities and, where relevant, has put in place a Plan of Cooperation to mitigate potential conflicts between the proposed activity and subsistence hunting. This Plan of Cooperation, discussed below, must identify measures to minimize adverse effects on the availability of polar bear and Pacific walrus for subsistence uses if the activity takes place in or near a traditional subsistence hunting area. Some of these measures may include, but are not limited to, mitigation measures described in §18.128.

Letter of Authorization - Specific Measures

The Service requires mitigation, monitoring, and reporting measures be conducted by any LOA holder. These measures include:

(a) Holders of LOAs must cooperate with the Service and other designated Federal, State, and local agencies to monitor the impacts of oil and gas exploration, development, and production activities on polar bears and Pacific walruses.

(b) Holders of LOAs must designate a qualified individual or individuals to observe, record, and report on the effects of their activities on polar bear and Pacific walrus.

(c) Holders of LOAs must have an approved polar bear and/or walrus interaction plan on file with the Service and on site, and certain personnel will be required to conduct polar bear awareness training. Interaction plans must include:
    (1) The type of activity and, where and when the activity will occur, i.e., a plan of operation;
    (2) A food and waste management plan;
    (3) Personnel training materials and procedures;
    (4) Site at-risk locations and situations;
    (5) Bear and walrus, when relevant, observation and reporting procedures; and
    (6) Bear and walrus, when relevant, avoidance and encounter procedures.

(d) All applicants for an LOA must contact affected subsistence communities to discuss potential conflicts caused by location, timing, and methods of proposed operations and submit to the Service a record of communication that documents these discussions. If appropriate, the applicant for an LOA must also submit a Plan of Cooperation that ensures that activities will not interfere with subsistence hunting and that adverse effects on the availability of polar bear or Pacific walrus will be minimized.

(e) If deemed appropriate by the Service, holders of an LOA will be required to hire and train polar bear monitors to alert crew of the presence of polar bears and initiate adaptive mitigation responses.

(f) Mitigation measures that may be required on a case-by-case basis include:
    (1) The use of trained marine mammal monitors associated with marine activities. The Service may require a monitor on the site of the activity or on board drill ships, drill rigs, aircraft, icebreakers, or other support vessels or vehicles to monitor the impacts of Industry's activity on polar bear and Pacific walrus.
    (2) The use of den habitat map developed by the USGS. A map of potential coastal polar bear denning habitat can be found at: http://alaska.usgs.gov/science/biology/polar_bears/pubs.html. This measure ensures that the location of potential polar bear dens is considered when conducting activities in the coastal areas of the Beaufort Sea.
    (3) The use of Forward Looking Infrared (FLIR) imagery, polar bear scent-trained dogs, or both to determine the presence or absence of polar bear dens in area of the activity.
    (4) Restricting the timing of the activity to limit disturbance around dens.
    (5) Requiring a 1-mile exclusion buffer surrounding known dens. If known occupied dens are located within an operator's area of activity, the Service will require a 1-mile exclusion buffer around the den to limit disturbance or require that the operator conduct activities after the female bears emerge from their dens. The Service will review these requirements for extenuating circumstances on a case-by-case basis.

(g) For exploratory and development activities, holders of a LOA must submit a report to our Alaska Regional Director (Attn: Marine Mammals Management Office) within 90 days after completion of activities. For production activities, holders of a LOA must submit a report to our Alaska Regional Director (Attn: Marine Mammals Management Office) by January 15 for the preceding year's activities. Reports must include, at a minimum, the following information:
    (1) Dates and times of activity;
    (2) Dates and locations of polar bear or Pacific walrus activity as related to the monitoring activity; and
    (3) Results of the monitoring activities required under subsection (g) of this section, including an estimated level of take.

(h) Monitoring requirements include, but are not limited to:
    (1) For all activities, all sightings of polar bears and walrus must be recorded. Information within the sighting report will include, but is not limited to:
        a) Date, time, and location of observation;
        b) Number of bears: sex and age;
        c) Observer name and contact information;
        d) Weather, visibility, and ice conditions at the time of observation;
        e) Estimated closest point of approach for bears from personnel and facilities;
        f) Industry activity at time of sighting, possible attractants present;

g) Bear behavior;
h) Description of the encounter;
i) Duration of the encounter; and
j) Actions taken.

Other proposed mitigation, monitoring, and reporting requirements are explained on pages 13490 to 13493 of the Proposed Rule (76 FR 13454).

Description of Industry Activities

This section briefly describes the types and scale of oil and gas activities projected to occur in the Beaufort Sea Region over the specified time period (2011–2016) under the proposed Action. This description is organized into sections describing exploration, development, and production activities, which are the first three stages of bringing oil and gas to market. Generally, production activities are permanent and year-round, while exploration and development activities are temporary and seasonal. We provide a general description of activities that may take place under these three stages and briefly describe ongoing and proposed activities at specific sites/facilities. We also categorize activities as occurring on or offshore. Some sites have may have facilities in multiple stages (e.g., both development and production facilities), and we attempt to clarify the instances in which this is the case.

The description of Industry activities is summarized from the proposed Regulations (76 FR 13454). Because the request by AOGA for the promulgation of the Regulations is dated 2009 and included preliminary dates for some of the activities below, dates for completion of some infrastructure development or lease sales may change. If requests for LOAs exceed the projected scope of activity analyzed under the Regulations, the Service would reevaluate its findings to determine if they continue to be appropriate before further LOAs are issued. Additionally, the Service may re-initiate section 7 consultation on the Regulations in accordance with the applicable standards set forth in 50 CFR Sec. 402.16.

Exploration Activities

Exploration activities may occur on or offshore. The location of new exploration activities will, in part, be determined by future State and Federal oil and gas lease sales. Projected onshore exploration activities include geological surveys, geotechnical site investigations, ice roads, oil well construction, gravel pad construction, oil spill prevention exercises, e.g., response, and cleanup drills, and site restoration and remediation. Projected offshore exploration activities include activities as described above and reflective seismic exploration, vibrator seismic data collection, airgun and water gun seismic data collection, explosive seismic data collection, vertical seismic profiles, subsea sediment sampling, construction and use of drilling structures such as caisson-retained islands, ice islands, bottom-founded structures [steel drilling caisson (SDC)], and ice pads. Offshore exploration activities could also include the development of staging facilities.

The number of exploratory programs is expected to be comparable to that which occurred during the effective period of the previous incidental take regulations (2006-2011), although the location of exploration projects may shift to different locations. Existing offshore exploration sites will likely remain in operation, and new offshore and onshore exploration is also planned.

Below we describe lease sales that will influence the location of exploration activities, as well as existing and planned offshore exploration activities that will likely take place during the time period of the proposed Action.

State of Alaska Lease Sales: Industry activities may occur during the proposed Action on State of Alaska lands currently leased, and on lands subject to future lease sales. On state lands within the geographic area of the proposed Action, there are approximately 977 active leases, encompassing approximately 1.3 million hectares (3.3 million acres) on land, and 224 active leases in the state waters of the Beaufort Sea, encompassing 249,000 hectares (615,296 acres).

Northwest and Northeast Planning Area of NPR–A: The BLM manages NPR-A. The area of activity for the proposed Action includes the Northwest and Northeast planning areas. Limited exploration is expected at existing wells and new areas resulting from lease sales. Between 1999 and 2010, six lease sales occurred and a total of 255 tracts covering 1,052,923 hectares (1,883,478 million acres) are now held by Industry. From 2000 to 2009, 29 exploratory wells were drilled in the Northeast and Northwest planning areas. ConocoPhillips Alaska Inc. (CPAI) is planning to continue exploration activities in the Northeast Planning Area during the proposed Action.

OCS Lease Sales: BOEMRE manages the Alaska Outer Continental Shelf (OCS). Lease sales in the Beaufort Sea were held in 2003, 2005, and 2007 for a total of 241 tracts covering 117,916 hectares (291,376 acres). Currently, no lease sales are planned by BOEMRE for 2007-. As part of an arctic-wide analysis (Beaufort and Chukchi seas), BOEMRE has begun preparing the multiple-sale Environmental Impact Statement (EIS) to support future lease sales in the Beaufort Sea. While it is not known at this time what areas will eventually be leased, it is probable that at least some seismic exploration and possibly some exploratory drilling will take place during the 5-year period of the proposed Action.

Offshore Exploration – Existing Oil Field Units
During the proposed Action, exploration activities are anticipated to occur in the offshore environment and continue in the current oil field units, including those projects identified by Industry below.

Oooguruk Unit: The Oooguruk Unit is located adjacent to and immediately northwest of the Kuparuk River Unit (KFU) in shallow waters of the Beaufort Sea, near Thetis Island.

Nikaitchuq Unit: The Nikaitchuq Unit is located near Spy Island, north of Oliktok Point and the Kuparuk River Unit (KRU), and northwest of the Milne Point Unit.

Ataruq (*Two Bits*): This Kerr-McGee Oil and Gas Corporation project is located about 7.2 km (4.5 mi) northwest of the KRU Drill Site 2M. The area consists of two onshore prospects and covers about 2,071 hectares (5,120 acres). The Ataruq project has received all necessary permits and authorizations for construction but not for operation.

ION Seismic Activity: ION is planning offshore seismic activity in the late open-water and into the ice-covered season. Activities are expected to consist of an estimated 3,000 to 5,000 miles of

2D seismic line acquisition and site clearance surveys in the eastern Beaufort Sea. Seismic activity will likely consist of two vessels, one active in seismic acquisition and the second providing logistical support and ice-breaking capabilities.

Shell Offshore Exploration Activities: Shell anticipates conducting an exploration drilling program, called the Suvulliq Project, on BOEMRE Alaska OCS leases in 2011–2016. Generally, the arctic drilling seasons are from July through October in the Beaufort Sea. If permitted, Shell will use a floating drilling vessel and ice management and oil spill response (OSR) barges and/or vessels for one or more drilling seasons. A site clearance and a shallow hazards study during the open water season are also planned.

Development Activities

Projected development activities during the proposed Action include construction of roads, pipelines, waterlines, gravel pads, camps (personnel, dining, lodging, maintenance, water production, and wastewater treatment), runways, and transportation (automobile, airplane, and helicopter) infrastructure. Activities may also include installation of electronic equipment, well drilling, drill rig transport, personnel support. As described below, some sites may complete development and transition to production during the proposed Action; therefore, some development sites operated seasonally may transition to year-round operations during production.

Point Thompson: The Point Thomson reservoir is approximately 32 km (20 mi) east of the Badami field, and is leased from the State by ExxonMobil. ExxonMobil completed exploration activities via two wells, and is planning development and production activities, including for natural gas; therefore, this site may contain development and production activities during the proposed Action. If ExxonMobil obtains additional State leases and federal permits, proposed development may include additional wells, field facilities, and pipelines.

Cape Simpson Support Program; Ukpeagvik Inupiat Corporation (UIC): UIC, a development activity with onshore and offshore components, entered into lease agreements with the North Slope Borough to operate North Slope facilities between Prudhoe Bay and Barrow in support of oil and gas exploration activities. UIC is developing a staging area at Cape Simpson, between Smith Bay and Dease Inlet, on the Beaufort Sea coast. Activities likely to occur during their operations on the North Slope are: marine transportation and barging; fixed and temporary camp operations, equipment and materials staging and storage, flight operations, ice road construction, and exploration site support.

Liberty. BP Exploration (Alaska), Inc. (BPXA) is developing the Liberty field, using ultra extended-reach drilling (uERD) technology to access an offshore reservoir from existing onshore facilities. The Liberty reservoir is located in federal waters in Foggy Island Bay about 13 km (8 mi) east of the Endicott Satellite Drilling Island (SDI). Drilling of the initial well and first oil production may occur during the proposed Action.

North Shore Development. Brooks Range Petroleum Company (BRPC) is proposing the North Shore Development Project to produce oil from several relatively small, isolated hydrocarbon accumulations on the North Slope. The fields are close to existing Prudhoe Bay infrastructure,

and production will concentrate on the Ivishak and Sag River sands prospects. Horizontal drilling technology and long-reach wells will be used to maximize production while minimizing surface impacts.

Potential gas pipeline. The TransCanada Corporation has proposed to construct a natural gas pipeline to transport natural gas from the North Slope to North American markets. Only 25 miles (40 km) would occur within the Action Area. Initial stages of the gas pipeline development, such as environmental studies and route selection, could occur during the 5-year period of the proposed Action. The project also includes a gas treatment plant in the Prudhoe Bay area with associated construction activities including dock/causeway improvements and barge channel dredging.

Nikaitchuq Unit. The Nikaitchuq Unit is located near Spy Island, north of Oliktok Point and the KRU, and northwest of the Milne Point Unit. Development and production activities may occur during the proposed Action. Future drilling will be from a small gravel island shoreward of the barrier islands. Additional operations may include approximately 13 miles of underground pipeline connecting the offshore sites to a mainland landfall and onshore facilities pad near Oliktok Point.

Production Activities

Production activities are permanent and year-round, and include personnel transportation (automobiles, airplanes, helicopters, boats, rolligons, cat trains, and snowmobiles) and unit operations (building operations, oil production, oil transport, restoration, remediation, and improvement of oil field operations). Existing North Slope production operations extend from the oilfield units of Alpine in the west to Point Thomson and Badami in the east. Badami and Alpine are developments without permanent access roads; access is available to these fields by airstrips, barges, and seasonal ice roads. Oil pipelines extend from these fields and connect to the Trans Alaska Pipeline System (TAPS). Proposed production activities will likely increase the total area of the Industrial footprint by the addition of new facilities, such as drill pads, pipelines, and support facilities.

Onshore Production Activities

Alpine and Associated Satellite Facilities. This CPAI complex is the westernmost oilfield on the North Slope, and is about 14 km (9 miles) from Nuiqsut and 50 km west of the Kuparuk oilfield. No permanent road connects Alpine with the Kuparuk oilfield; small aircraft provide supplies and crew changeovers. Major resupply activities occur in the winter using an annually constructed ice road.

"Alpine" refers to the existing main production pad that contains the base camp that houses about 540 employees, storage area, main airstrip, processing facility that connects to TAPS and the first drilled well, CD-1. CD-2 (a pad connected to CD-1 via road), CD-3 (a remote pad with an airstrip), and CD-4 (a pad connected to CD-1 via road) are existing satellite production pads. Together Alpine, CD-2, CD-3, CD-4, and associated roads/airstrips cover 65.9 hectares (162.92 acres) of state lands in/near the Colville River Delta. In addition to the ongoing production activities CPAI has proposed to develop three new satellite sites which are in NPR-A (CD-5,

CD-6, and CD-7) and possibly roads connect them to existing pads via roads/bridges. These activities may all occur during the proposed Action.

Prudhoe Bay Unit. More than 1,100 wells are currently in operation in the greater Prudhoe Bay oilfields, just over 900 of which are producing oil (others are for gas or water injection). The developed area for the Prudhoe Bay Unit is approximately 2,785 hectares (6,883 acres). The Base Operations Center on the western side of the Prudhoe Bay oilfield can accommodate 476 people, the nearby Main Construction Camp can accommodate up to 680 people, and the Prudhoe Bay Operations Center on the eastern side of the field houses up to 488 people. Additional contract or construction personnel can be housed at facilities in nearby Deadhorse or in temporary camps placed on existing gravel pads.

Kuparuk River Unit. The Greater Kuparuk Area includes camps, the main operations center, the satellite oilfields of Tarn, Palm, Tabasco, West Sak, about 900 wells, over 50 gravel pads, and covers approximately 603 hectares (1,508 acres). The Kuparuk Operations Center and Kuparuk Construction Camp are able to accommodate up to 1,200 people. The Kuparuk Industrial Center is primarily used for personnel overflow during the winter in years with a large amount of construction.

Greater Point McIntyre. The Greater Point McIntyre Area encompasses the Point McIntyre field and nearby satellite fields of West Beach, North Prudhoe Bay, Niakuk, and Western Niakuk. The Point McIntyre area is located 11.3 km (7 mi) north of Prudhoe Bay. BPXA produces the Point McIntyre area from two drill site gravel pads.

Milne Point. Located approximately 56 km (35 mi) northwest of Prudhoe Bay, the Milne Point oilfield consists of more than 220 wells drilled from 12 gravel pads. Milne Point produces from three main fields: Kuparuk, Schrader Bluff, and Sag River. The total area of Milne Point and its satellites is 94.4 hectares (236 acres) of tundra, including 31 km (19 mi) of gravel roads, 64 km (40 mi) of pipelines, and one gravel mine site. The Milne Point Operations Center has accommodations for up to 300 people. Currently, cold heavy oil production with sand (CHOPS) technology is being tested at Milne South Pad.

Badami. The Badami field is located approximately 56 km (35 mi) east of Prudhoe Bay and is currently the most easterly oilfield development on the North Slope. This field is currently in "warm storage" status, i.e., site personnel are minimized and the facility is maintained at a minimal level. It currently is not producing oil reserves. The Badami development area is approximately 34 hectares (85 acres) of tundra including 7 km (4.5 mi) of gravel roads, 56 km (35 mi) of pipeline, one gravel mine site, and two gravel pads with a total of eight wells. There is no permanent road connection from Badami to Prudhoe Bay.

Offshore Production Activities

Endicott. The Endicott oilfield is located approximately 16 km (10 mi) northeast of Prudhoe Bay. The Endicott oilfield was developed from two man-made gravel islands connected to the mainland by a gravel causeway. The operations center and processing facilities are located on the 18-hectare (45-acre) Main Production Island. Approximately 80 wells have been drilled to develop the field. Two satellite fields drilled from Endicott's Main Production Island access oil

from the Ivishak formation: The total area of Endicott development is 156.8 hectares (392 acres) of land with 25 km (15 mi) of roads, 47 km (29 mi) of pipelines, and one gravel mine site. Approximately 100 people are housed at the Endicott Operations Center.

Northstar. The Northstar oilfield is located 6 km (4 mi) northwest of the Point McIntyre field and 10 km (6 mi) from Prudhoe Bay in about 39 feet of water. The reservoir has been developed from a 2-hectare (5-acre) artificial island, which will eventually contain 19 producing wells, six gas injector wells, and one solids injection well. A subsea pipeline connects facilities to the Prudhoe Bay oilfield. Access to Northstar is via helicopter, hovercraft, and boat.

Oooguruk Unit. The Oooguruk Unit is located adjacent to and immediately northwest of the KRU in shallow waters of the Beaufort Sea, near Thetis Island. Facilities include an offshore drill site and onshore production facilities pad. In addition, a subsea 5.7-mile flowline transports produced fluids from the offshore drill site to shore, where it transitions to an aboveground flowline supported on vertical support members for 3.9 km (2.4 mi) to the onshore facilities for approximately 3.3 hectares (8.2 acres). The offshore drill site (2.4 hectares, 6 acres) is planned to support 48 wells drilled from the Nuiqsut and Kuparuk reservoirs. The wells are contained in well bay modules, with capacity for an additional 12 wells. Pioneer (Oooguruk's operator) is proposing production facilities west of KRU drill site 3S on State oil and gas leases. These facilities would consist of two drill sites near the Colville River delta mouth, a tie-in pad adjacent to DS-3S, gravel roads, flow lines, and power lines. Drilling of the initial appraisal well is planned to start in 2013, with first oil production as early as 2015.

3. The Action Area

The Action Area consists of the geographic area in which oil and gas activities covered in the Action could occur i.e., the area covered by the proposed Regulations), and the area in which the direct and indirect effects of the proposed Action upon polar bears, polar bear critical habitat or walruses may occur.

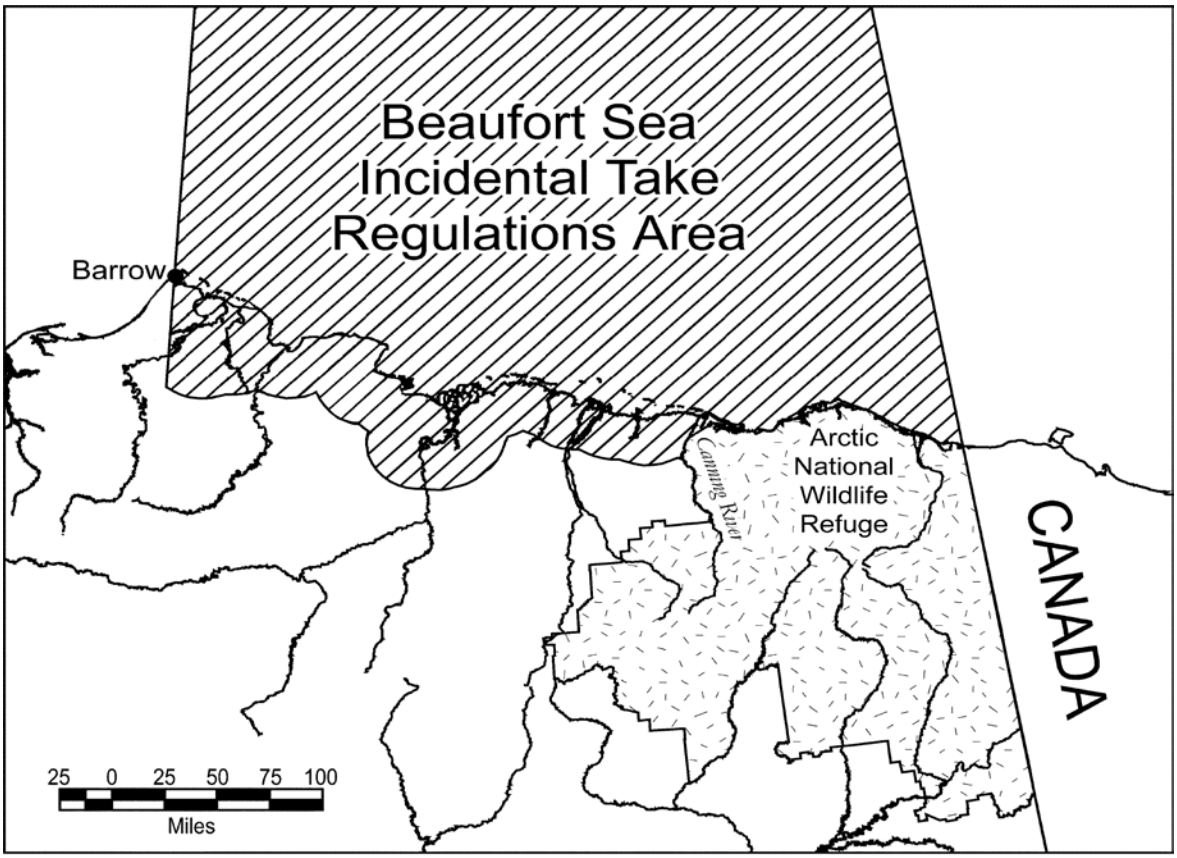

Figure 1. Specific geographic area covered by the Beaufort Sea incidental take regulations.

From: Marine Mammals; Incidental Take During Specified Activities (Proposed Rule); 76 FR 13454

4. Status of Species

Status of the Pacific Walrus

Abundance and Distribution

The Pacific walrus is a social and gregarious pinniped that ranges into the East Siberian Sea and Beaufort Sea (Fay 1982: 7–21, Figure 1 in Garlich-Miller et al. 2011). Pacific walruses are ecologically distinct from other walrus populations, primarily because they undergo significant seasonal migrations between the Bering and the Chukchi Seas and rely principally on broken pack ice habitat to access offshore breeding and feeding areas (Fay 1982: 279). Waters deeper than 100 m (328 ft) and the extent of the pack ice are factors that limit distribution to the north (Fay 1982: 23). Walruses are rarely spotted south of the Alaska Peninsula and Aleutian archipelago; however, migrant animals (mostly males) are occasionally reported in the North Pacific (Service 2010, unpublished data). Unlike other pinnipeds, walruses are not adapted for a

pelagic existence and must haul out on ice or land regularly to rest between feeding bouts (Ray et al. 2006, 76 FR 7634: 7638). Individual groups may range from less than 10 to more than 1,000 animals (Gilbert 1999: 75–84; Ray et al. 2006).

Based on harvest data from the 18th and 19th centuries, Fay (1982: 241) speculated that the pre-exploitation population was represented by a minimum of 200,000 animals. Since that time, population size is believed to have fluctuated in response to varying levels of human exploitation. Large-scale commercial harvests are believed to have reduced the population to 50,000–100,000 animals in the mid- 1950s (Fay et al. 1997: 539). The population apparently increased rapidly in size during the 1960s and 1970s in response to harvest regulations that limited the take of females (Fay et al. 1989: 4). Population estimates from between 1975 and 1990 obtained via aerial ranged from 201,039 to 290,000 individuals. In a 2006 survey in the pack ice of the Bering Sea, the number of walruses within the surveyed area was estimated at 129,000 (95% CI: 55,000; 507,000; Speckman et al. 2010). However, uncertainty exists regard the accuracy of this estimate because field crews experienced weather difficulties that forced the early termination of this survey, and differences in survey methods among years means that establishing a trend in population estimates is not possible (76 FR 7634: 7639).

Pacific walruses are highly mobile, and their distribution varies markedly in response to seasonal and interannual variations in sea-ice cover. During the January to March breeding season, walruses congregate in the Bering Sea pack ice in areas where open leads (fractures in sea ice caused by wind drift or ocean currents), polynyas (enclosed areas of unfrozen water surrounded by ice), or thin ice allow access to water (Fay 1982: 21; Fay et al. 1984: 89– 99). The specific location of winter breeding aggregations varies annually depending upon the distribution and extent of ice. Breeding aggregations have been reported southwest of St. Lawrence Island, Alaska; south of Nunivak Island, Alaska; and south of the Chukotka Peninsula in the Gulf of Anadyr, Russia (Fay 1982, p. 21, Mymrin et al. 1990: 105–113, Figure 1 in Garlich-Miller et al. 2011). In spring, as the Bering Sea pack ice deteriorates, most of the population migrates northward through the Bering Strait to summer feeding areas over the continental shelf in the Chukchi Sea. However, several thousand animals, primarily adult males, remain in the Bering Sea during the summer months, foraging from coastal haulouts in the Gulf of Anadyr, Russia, and in Bristol Bay, Alaska (Figure 1 in Garlich-Miller et al. 2011).

Summer distributions (both males and females) in the Chukchi Sea vary annually, depending upon the extent of sea ice. When broken sea ice is abundant, walruses are typically found in patchy aggregations over continental shelf waters. Individual groups may range from less than 10 to more than 1,000 animals (Gilbert 1999: 75–84, Ray et al. 2006: 405). Summer concentrations have been reported in loose pack ice off the northwestern coast of Alaska, between Icy Cape and Point Barrow, and along the coast of Chukotka, Russia, as far west as Wrangel Island (Fay 1982: 16–17, Gilbert et al. 1992: 1–33, Belikov et al. 1996: 267–269). In years of low ice concentrations in the Chukchi Sea, some animals range east of Point Barrow into the Beaufort Sea; walruses have also been observed in the Eastern Siberian Sea in late summer (Fay 1982: 16–17; Belikov et al. 1996: 267– 269). The pack ice of the Chukchi Sea usually reaches its minimum extent in September. In years when the sea ice retreats north beyond the continental shelf, walruses congregate in large numbers (up to several tens of thousands of animals in some locations) at terrestrial haulouts on Wrangel Island and other sites along the

northern coast of the Chukotka Peninsula, Russia, and northwestern Alaska (Fay 1982: 17, Belikov et al. 1996: 267–269, Kochnev 2004: 284–288, Ovsyanikov et al. 2007: 1–4, Kavry et al. 2008: 248–251). In late September and October, walruses that summered in the Chukchi Sea typically begin moving south in advance of the developing sea ice. Satellite telemetry data indicate that male walruses that summered at coastal haulouts in the Bering Sea also begin to move northward towards winter breeding areas in November (Jay and Hills 2005: 197). The male walruses' northward movement appears to be driven primarily by the presence of females at that time of year (Freitas et al. 2009: 248–260).

Range-wide Threats and Uncertainties

On February 10, 2011, the Service issued a *12-month Finding on a Petition to List the Pacific Walrus as Endangered or Threatened* (Finding; 76 FR 7634). In the Finding, the Service evaluated and considered five factors ((A) the present or threatened destruction, modification, or curtailment of its habitat or range; (B) overutilization for commercial, recreational, scientific, or educational purposes; (C) disease or predation; (D) the inadequacy of existing regulatory mechanisms; or (E) other natural or manmade factors affecting its continued existence) in concluding that listing the Pacific walrus as threatened was warranted but precluded by other higher priority listing actions under the ESA. We discuss these factors below.

Factor A -- Loss of sea ice is likely to cause walruses to become increasingly dependent on coastal haulouts for most of the summer and into the fall and early winter, which has several consequences. First, high concentrations at coastal haulouts will likely lead to localized prey depletion and decreased body condition as walruses expend increasing amounts of energy as they travel further from shore in search of prey (76 FR 7634: 7646). Second, an increased dependence on coastal haulouts is likely to cause walruses to experience increased anthropogenic and natural disturbance; exposure to disturbance at coastal haulouts will likely to lead to increased injury and mortality via trampling as walruses stampede into the water following disturbances (76 FR 7634: 7648). Third, as they become increasingly dependent on coastal haulouts, walruses will become more susceptible to predation by polar bears (especially on calves) and hunting by humans. Predators and human hunters may also indirectly cause calves to be crushed and die by causing stampedes (76 FR 7634: 7648).

Factor B -- Pacific walrus have been an important subsistence resource for coastal Alaskan and Russian Natives for thousands of years (Ray 1975) and its harvest is likely to continue into the foreseeable future (76 FR 7634: 7673); however, adequate regulations for this harvest are lacking (76 FR 7634: 7661). No Statewide harvest quotas exist in Alaska, although some local harvest management programs exist. Subsistence harvest reporting in the U.S. is required under section 109(i) of the MMPA and is administered through a Marking, Tagging, and Reporting Program (MTRP; 50 CFR 18.23(f)). Compliance rates vary annually with estimates from 60 to 100 percent. The Russian reporting program, administered through the Russian Agricultural Department, has traditionally been conducted by village hunting teams. However, unaffiliated hunting has increased, and no mechanism exists for these individuals to report their harvest, which creates a harvest rate with an unknown low bias (Kochnev 2010, pers. comm). Additionally, Russians do not adjust harvest estimates for animals struck and lost. The Service uses a 42 percent correction factor to estimate total subsistence harvest levels for both countries.

Recent (2003–2007) annual harvest removals in the U.S. and Russia have ranged from 4,960 to 5,457 annually, or approximately 4 percent of the minimum population estimate of 129,000 animals (USFWS 2010). However, lack of information/uncertainty regarding the population status and trend makes it difficult to quantify sustainable removal levels (Garlich-Miller et al. 2011). Harvest is likely to continue at or near current levels, despite population declines in response to loss of summer sea ice (76 FR 7634:7657).

Factor C. The occurrence and effects of diseases and parasites on walrus appear to be minor. Although predation by polar bears on walrus has been observed, no population-level effects have been documented (76 FR 7634: 7659). As sea ice declines and walrus spend more time on coastal haulouts, however, it is likely that polar bear predation will increase due to increased interaction between these species, but the Service could not conclude with sufficient reliability that disease, predation, and parasites will rise to the level of a threat (i.e., a stressor that contributes to the risk of extinction) to the Pacific walrus population in the foreseeable future (76 FR 7634: 7659-7660).

Factor D. The analysis of the adequacy of laws and regulations regarding Pacific walrus focused on the two primary threats (i.e., stressors that contribute to the risk of extinction) to the walrus: the loss of sea-ice habitat and subsistence harvest. The Service concluded that there are no known regulatory mechanisms in place at the national or international level that are likely to effectively reduce or limit greenhouse gas emissions, and thus regulatory mechanisms do not currently exist to effectively address the loss of sea-ice habitat. Likewise, this analysis concluded that adequate regulatory mechanisms are not currently in place to address the threat that continued levels of subsistence harvest pose to the Pacific walrus as the population declines in the foreseeable future.

Factor E. The other natural or manmade stressors analyzed in the Finding were pollution and contaminants; oil and gas exploration, development, and production; commercial fisheries interactions; shipping; oil spills; and icebreaking activities. The Service concluded that none of the above stressors are a threat that contributes to the risk of extinction to the Pacific walrus, and they are not likely to become a threat that contributes to the risk of extinction in the foreseeable future (76 FR 7634: 7671). Because oil and gas related activities are relevant to this BO, we summarize this potential stressor in the Effects section for the walrus.

Summary

The Pacific walrus ranges across the shallow continental shelf waters of the northern Bering Sea and Chukchi Sea, occasionally ranging into the East Siberian and Beaufort Seas. A recent survey estimated the population estimate for this species to be 129,000, although uncertainty exists regarding the accuracy of this estimate. Factors associated with climate change (i.e., loss of sea ice) and hunting, the main causes of population loss, are likely to continue into the foreseeable future.

Status of the Polar Bear

Due to threats to its sea ice habitat, on May 15, 2008 the Service listed the polar bear (*Ursus maritimus*) as threatened (73 FR 28212) throughout its range under the ESA. In the U.S., the

polar bear is also afforded protection under the MMPA and is managed by MMM. The polar bear is also protected under the Convention on International Trade in Endangered Species of Wildlife Fauna and Flora (CITES) of 1973.

Abundance and Distribution

Polar bears are widely distributed throughout the Arctic where the sea is ice-covered for large portions of the year. Sea ice provides a platform for hunting and feeding, for seeking mates and breeding, for denning, for resting, and for long-distance movement. Polar bears primarily hunt ringed seals, which also depend on sea ice for their survival, but they also consume other marine mammals (73 FR 28212).

The total number of polar bears is estimated to be 20,000-25,000 with 19 recognized management subpopulations or "stocks" (Obbard et al. 2010). The International Union for Conservation of Nature and Natural Resources, Species Survival Commission (IUCN/SSC) Polar Bear Specialist Group ranked 11, four, and three of these stocks as "data deficient," "reduced," and "not reduced," respectively (Obbard et al. 2010). The status designation of "data deficient" for 11 stocks indicates that the estimate of the worldwide polar bear population was made with known uncertainty.

Warming-induced habitat degradation and loss are negatively affecting some polar bear stocks, and unabated global warming will ultimately reduce the worldwide polar bear population (Obbard et al. 2010). Loss of sea ice habitat due to climate change is identified as the primary threat to polar bears (Schliebe et al. 2006, 73 FR 28212, Obbard et al. 2010). Patterns of increased temperatures, earlier spring thaw, later fall freeze-up, increased rain-on-snow events (which can cause dens to collapse), and potential reductions in snowfall are also occurring. In addition, positive feedback systems (i.e., sea-ice albedo) and naturally occurring events, such as warm water intrusion into the Arctic and changing atmospheric wind patterns, can amplify the effects of these phenomena. As a result, there is fragmentation of sea ice, reduction in the extent and area of sea ice in all seasons, retraction of sea ice away from productive continental shelf areas throughout the polar basin, reduction of the amount of heavier and more stable multi-year ice, and declining thickness and quality of shore-fast ice (Parkinson et al. 1999, Rothrock et al. 1999, Comiso 2003, Fowler et al. 2004, Lindsay and Zhang 2005, Holland et al. 2006, Comiso 2006, Serreze et al. 2007, Stroeve et al. 2008). These climatic phenomena may also affect seal abundances, the polar bear's main food source (Kingsley 1979, DeMaster et al. 1980, Amstrup et al. 1986, Stirling 2002). However, threats to polar bears will likely occur at different rates and times across their range, and uncertainty regarding their prediction makes management difficult (Obbard et al. 2010).

Bowhead whale carcasses have been available to polar bears as a food source on the North Slope since the early 1970s (Koski et al. 2005) and therefore may affect their distribution locally. As many as 65 polar bears have been observed feeding at a single bowhead whale carcass (Miller et al. 2006). Barter Island (near Kaktovik) has had the highest recorded concentration of polar bears on shore (17.0 $\pm$ 6.0 polar bears/100 km) followed by Barrow (2.2 $\pm$ 1.8) and Cross Island (2.0 $\pm$ 1.8). The high number of bears on/near Barter Island is thought to be due to the proximity to ice edge and higher ringed seal density at Barter Island (Schliebe et al. 2008), rather than the amount of whale harvest as the Kaktovik harvest is lower than that at Barrow or Cross Island.

Stable isotope analysis of polar bears in 2003 suggested that bowhead whale carcasses may have contributed 11-26% (95% CI) of the late winter (i.e. February through March) diet of the sampled population (Bentzen et al. 2007). In the winter of 2003-2004, the proportion was lower, at around 0-41% (Bentzen et al. 2007). A wide range of isotope values further suggested that consumption of bowhead whales varied widely among individual bears (Bentzen et al. 2007). Because most bears feed on bowhead whale during the fall harvest and sampling from this study represented only the late winter diet, consumption may differ from what was determined in this study.

Threats to the Polar Bear

Subpopulations of polar bears face different combinations of human-induced threats, making the conservation and management of polar bears challenging (Obbard et al. 2010). The largest human-caused loss of polar bears result from subsistence hunting of the species, but for most subpopulations where subsistence hunting of polar bears occurs, it is a regulated and/or monitored activity (Obbard et al. 2010). Other threats include accumulation of persistent organic pollutants in polar bear tissue, tourism, human-bear conflict, increased development in the Arctic (Obbard et al. 2010). The polar bear, with an estimated population of 20,000-25,000 individuals, is a circumpolar species that depends on sea ice for its survival. Loss of sea ice due to climate change is the largest threat to polar bears worldwide, and uncertainty exists regarding the numbers of bears in some stocks and how other human activities interact to ultimately affect the worldwide polar bear population.

Status of Polar Bear Critical Habitat

The Service designated polar bear critical habitat on November 24, 2010 (75 FR 76086). The Primary Constituent Elements (PCEs) of critical habitat for the polar bear are:

1) **Sea-ice habitat** used for feeding, breeding, denning, and movements, which is sea ice over waters 300 m (984.2 ft) or less in depth that occurs over the continental shelf with adequate prey resources (primarily ringed and bearded seals) to support polar bears.
2) **Terrestrial denning habitat**, which includes topographic features, such as coastal bluffs and river banks, with the following suitable macrohabitat characteristics:
    a) Steep, stable slopes (range 15.5–50.0), with heights ranging from 1.3 to 34 m (4.3 to 111.6 ft), and with water or relatively level ground below the slope and relatively flat terrain above the slope;
    b) Unobstructed, undisturbed access between den sites and the coast;
    c) Sea ice in proximity to terrestrial denning habitat prior to the onset of denning during the fall to provide access to terrestrial den sites; and
    d) The absence of disturbance from humans and human activities that might attract other polar bears.
3) **Barrier island habitat** used for denning, refuge from human disturbance, and movements along the coast to access maternal den and optimal feeding habitat, which includes all barrier islands along the Alaska coast and their associated spits, within the range of the polar bear in the United States, and the water, ice, and terrestrial habitat within 1.6 km (1 mi) of these islands (no-disturbance zone).

Critical habitat does not include manmade structures (e.g., houses, gravel roads, generator plants, sewage treatment plants, hotels, docks, seawalls, pipelines) and the land on which they are located existing within the boundaries of designated critical habitat on the effective date of this rule.

As described in the status sections for the Pacific Walrus and Polar Bear, sea ice, including ice designated as critical habitat, is rapidly diminishing. Terrestrial denning locations in Alaska do not appear to be a limiting factor. However, rain-on-snow events may decrease den quality, and later onset of freeze-up in the fall may limit sea ice in proximity and therefore access to terrestrial denning habitat (72 FR 1064). Erosion of barrier islands and the Arctic shoreline, presumably caused by climate change (Mars and Houseknecht 2008), may be changing terrestrial denning habitat by creating or destroying bluffs.

Human activities such as ground-based vehicular traffic and low-flying aircraft occur in polar bear critical habitat. These activities may temporarily create disturbance between den sites and the coast (e.g., disturbance from ice roads), and may temporarily degrade the ability of barrier island habitat from being a refuge from human disturbance. For example, vessels may need to use barrier islands to weather out a storm, and this may interfere with a polar bear's ability to use barrier islands for the same purpose. However, these activities are usually infrequent and have short-term effects.

Summary

While other activities may diminish the quality of polar bear critical habitat, the primary factor affecting its status is loss of the sea ice critical habitat unit from climate change.

5. Environmental Baseline

The environmental baseline is the current status of listed species, their habitats, and any designated critical habitat resulting from past and ongoing human and natural factors in the Action Area. Also included are the anticipated impacts of other proposed and ongoing Federal projects in the Action Area. Thus, we considered the following activities/factors in this analysis:

- Pacific walrus and polar bear abundance, distribution, and trends (when known) and factors affecting these population indices in the Action Area, including loss of sea ice resulting from climate change and subsistence harvest;
- Proposed planning area documents and permits issued by BOEMRE, BLM, the Corps, and the EPA for Industry-related development, some of which are described in this Action;
- Lease sales by BOEMRE and BLM;
- Annual summer programmatic for activities in the NPR-A (e.g., the 2011 summer programmatic BO) for the next five years;
- NPR-A permits for winter travel on- and offshore for non-oil and gas activities for the next five years;
- Research in the NPR-A and OCS;

- U.S. Coast Guard operations;
- Polar bear research by the U.S. Geological Survey, MMM of the Service, and the North Slope Borough;
- Passive and preventative deterrence measures; and
- Non-Federal activities such as snow machine and recreation in the Action Area.

Baseline of the Pacific Walrus

In years of low ice concentrations in the Chukchi Sea, some animals range east of Point Barrow into the Beaufort Sea (Fay 1982). However, although Pacific walruses can occur in the Beaufort Sea, they do so in extremely very low numbers. This is because habitat is limited by a relatively narrow continental shelf. The deeper less productive waters of this area provide poor feeding grounds. From 1994 to 2004, industry monitoring programs recorded 10 animals. During Pacific walrus movement studies from 2007-2009, the U.S. Geological Survey showed that only a few tagged walruses entered the extreme western portion of the Beaufort Sea near Barrow (http://alaska.usgs.gov/science/biology/walrus/tracking.html).

Baseline of the Polar Bear

The southern Beaufort Sea stock (SBS) occurs in the Action Area with some intermingling with the Chukchi/Bering Sea stock (CBS; Figure 2). Because the proposed Regulations focus on management within and adjacent to the Beaufort Sea, we focus our discussion on the status of the Beaufort Sea stock.

The SBS is distributed across the northern coasts of Alaska, Yukon, and Northwest territories of Canada. Estimates of the population size of the SBS were 1,778 from 1972 to 1983 (Amstrup et al. 1986), 1,480 in 1992 (Amstrup 1995), and 2,272 in 2001 (Amstrup, USGS unpublished data). Declining survival, recruitment, and body size (Regehr et al. 2006, Regehr et al. 2009, Rode et al. 2010), and low population growth rates during years of reduced sea ice (2004 and 2005), and an overall declining population growth rate of 3% per year from 2001 to 2005 (Hunter et al. 2007) suggest that the SBS is now declining, and Regehr et al. (2006) estimated the SBS to be 1,526 (95% CI = 1,211; 1,841). The status of this stock is listed as ‘reduced’ by the IUCN (Obbard et al. 2010) and ‘depleted’ under the MMPA. Based on industry observations and coastal survey data acquired by the Service, up to 125 individuals of the southern Beaufort Sea population have been observed during fall period between Barrow and the Alaska-Canada border.

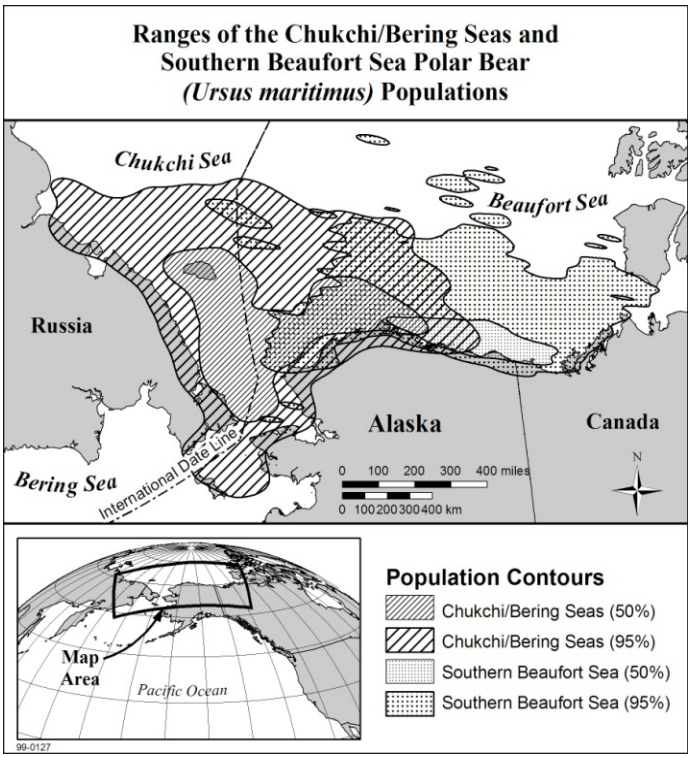

Figure 2. Ranges of Alaska polar bear stocks (USFWS 2009)

Threats and Possible Stressors in the Action Area

As with the Pacific walrus, the two main stressors in the Action Area for the polar bear are loss of sea ice resulting from climate change and subsistence hunting. We discuss these factors and others that may be affecting the population in the Action Area.

Loss of Sea Ice

Declines in sea ice have occurred in optimal polar bear habitat in the southern Beaufort and Chukchi seas between 1985 to 1995 and 1996 to 2006, and the greatest declines in 21st century optimal polar bear habitat are predicted to occur in these areas (Durner et al. 2009). These stocks are vulnerable to large-scale dramatic seasonal fluctuations in ice movements which result in decreased abundance and access to prey, and increased energetic costs of hunting. The CBS and the SBS are currently experiencing the initial effects of changes in sea ice conditions (Rode et al. 2010, Regehr et al. 2009, and Hunter et al. 2007). Regehr et al. (2010) found that the vital rates of polar bear survival, breeding rates, and cub survival declined with an increasing number of ice-free days/year over the continental shelf, and suggested that declining sea ice affects these vital rates via increased nutritional stress.

Subsistence Harvest

Subsistence hunting of polar bears occurs in the Action Area. Regulation of this harvest, which is considered sustainable, is based upon a voluntary harvest agreement between the Inuvialuit of Canada and the Inupiat of Alaska, who share subsistence hunting traditions within this polar bear population, with harvest quota levels set by the Inuvialuit-Inupaiq (I-I) council. The I-I council recently set a quota of 70 polar bears (email T. DeBruyn, August 13, 2010) based on a population estimate of 1,526 (Regehr et al. 2006, email T. DeBruyn, August 13, 2010). The

reported annual average combined (Alaska-Canada) harvest for the southern Beaufort Sea from 2004 to 2009 was 44, and the 2008/2009 reported harvest for North Slope villages was 25 (DeBruyn et al. 2010).

Polar Bear Research

Currently, several ongoing polar bear research programs take place in the Action Area. The long-term goal of these research programs is to gain information on the ecology and population dynamics of polar bears to help inform management decisions, especially in light of climate change. These activities may cause short-term adverse effects to individual polar bears targeted in survey and capture efforts and may incidentally disturb those nearby. In rare cases, research efforts may lead to injury or death of polar bears. Polar bear research is authorized through permits issued under the MMPA. These permits include estimates of the maximum number of bears likely to be directly harassed, subjected to biopsy darting, captured, etc., and include a condition that halts a study if a certain number of deaths, usually four to five, occur during the life of the permit; permits are typically for five years.

Previous Incidental Take Regulations

Incidental Take Regulations have been issued under the MMPA for oil and gas activities in and beside the Beaufort Sea since 1993. As part of the LOAs issued pursuant to these Regulations the oil and gas industry is required to report the number of polar bears observed, their response, and if deterrence activities were required (see below). Reports from 2006 -2009 show that on average 306 polar bears are observed by industry each year (the actual numbers per year ranged from 170 to 420). 81% of bears observed showed no change in their behavior, 4% altered their behavior moving away from (or towards) the industrial activity, while the remaining 15% were subject to intentional hazing or other deterrence actions (described below).

Deterrence Activities and Intentional Take Authorization

Polar bear deterrence activities associated with non-Industry and Industry activities takes place in the Action Area. The Service previously consulted on a Final Rule regarding passive and preventative deterrence measures that any person can use when working in polar bear habitat (75 FR 61631). These methods are likely to cause at most only short-term changes in behavior, such as bears running away from the disturbance. However, intentional take LOAs allow trained individuals to use other mechanisms (e.g., use of projectiles) to deter polar bears away from human structures and activities. Industry-related intentional take authorizations are described further in the discussion of the Interdependent and Interrelated Actions in Section 6 (Effects of the Action) of this document.

Other Activities

Polar bear viewing at sites such as the whale bone piles may result in disturbance of polar bears by humans on foot, ATVs, snow machines, and other vehicles. Activities associated with the oil and gas industry have the potential to impact polar bears and their habitat. These activities are regulated and authorized through the issuance of regulations under the MMPA, and since the regulations went into effect in 1993, there has been no known instance of a polar bear being killed as a result of industrial activities (USFWS 2008). We discuss these effects extensively in the Effects of the Action section of this document.

Summary

The primary concern for polar bears in the action area is loss of sea ice. While other stressors threats are managed, they are not currently thought to be significant threats to polar bear populations, each could become more significant in combination with future effects of climate change and the resultant loss of sea ice.

Baseline of Polar Bear Critical Habitat

As the Action Area constitutes a large proportion of the entire critical habitat area, the condition of PCEs in the Action Area is similar to those in the entire critical habitat designation. Several ongoing and previously consulted upon Federal actions that may affect critical habitat in the Action Area have been considered. These include research on polar bears by USGS and FWS, summer activities and research in NPR-A, contaminated site remediation and restoration, and development projects in and close to North Slope villages. While some of the activities in these projects may have small scale, short term, localized impacts to critical habitat PCEs none of these projects, when considered individually or cumulatively, were determined likely to have significant adverse effects to critical habitat.

6. Effects of the Action on the Species and Critical Habitat

This section includes an analysis of the direct and indirect effects of the proposed Action on Pacific walrus, polar bears, and polar bear critical habitat and the effects of interrelated and interdependent activities. MMM, in proposing the Regulations, made a "negligible effects" determination under the MMPA based upon review of the nature, scope, and timing of the proposed oil and gas activities and mitigation measures, and in consideration of the best available scientific information (76 FR 13454: 13483). MMM analyzed effects of the proposed Regulations on polar bears at the level of the SBS. MMM also considered the following factors in making this determination: (1) the behavior and distribution of walruses and polar bears utilizing areas that overlap with Industry is expected to limit the amount of interactions between walruses, polar bears, and Industry; (2) the predicted effects of proposed activities on walruses and polar bears will be nonlethal, temporary passive takes of animals; (3) the footprint of authorized projects is expected to be small relative to the range of polar bear and walrus populations; (4) mitigation measures will limit potential effects of Industry activities; and (5) the potential impacts of climate change for the duration of the Regulations (2011–2016) has the potential to displace polar bears and walruses from the geographic region(76 FR 13454: 13483).

The proposed Action would allow some nonlethal incidental take of Pacific walruses and polar bears, require mitigation measures to avoid or minimize potential adverse effects from Industry activity, require monitoring of the effectiveness of such measures and documentation of incidental takes of these marine mammals. The proposed Action, therefore, would benefit walruses and polar bears not only by minimizing potential take, but also through collection of information to inform marine mammal management in the Beaufort Sea and elsewhere.

Effects of the Action on Pacific Walrus

The Beaufort Sea is outside the normal range of the Pacific walrus and the likelihood of encountering walruses during Industry operations is very low. As stated in the environmental

baseline for this species, walrus occur very rarely in the Action Area. However, during the proposed Action, Industry operations may occasionally encounter small groups of walruses swimming in open water or hauled out onto ice floes or along the coast. Although interactions are expected to be infrequent, proposed activities could potentially result in disturbances. In the proposed Regulations, the Service anticipated that no more than 10 MMPA takes at "level B" harassment will occur annually (76 FR13454: 13484). The responses of walruses to disturbance stimuli are variable, but generally, individual walruses that are hauled out are more sensitive to disturbance than swimming individuals. Disturbance events are known to cause walrus groups to abandon land or ice haulouts in a stampede and occasionally result in trampling injuries or cow-calf separations, both of which are potentially fatal. Calves and young animals at the perimeter of the haulouts appear particularly vulnerable to trampling injuries. Males tend to be more tolerant of disturbances than females, individuals tend to be more tolerant than groups, and females with dependent calves are the least tolerant of disturbances. To reflect the differential response of walruses to disturbance related to whether they are swimming or hauled out, we have organized this analysis into effects to walruses swimming in open water and those hauled out on land, ice, and industry infrastructure. Impacts that could result from a potential oil spill are discussed separately.

Effects of Open-water Activities on Walruses in the Water

General noise disturbance. Vessel traffic will likely increase when offshore Industry expands and may increase if warming waters and seasonally reduced sea ice cover alter northern shipping lanes. Noise typically generated by Industry activities (not including seismic activities), whether stationary or mobile, has the potential to disturb walruses. They react variably to noise from vessel traffic; however, it appears that low-frequency diesel engines cause less of a disturbance than high-frequency outboard engines. Underwater noise from vessel traffic in the Beaufort Sea may ''mask'' ordinary communication among individuals by preventing them from locating one another. Aircraft such as helicopters also create noise that may disturb swimming walruses. Noise may disturb walruses via displacement from preferred foraging areas, increase stress and energy expenditure, interference with feeding, and masking of communications (76 FR 13454: 13466). However, walruses previously exposed to noise or those intent on staying in a particular area (e.g., to forage) may tolerate noise. LOAs issued under these Regulations will require minimization measures to reduce noise impacts on walruses, especially more sensitive demographics (i.e., required flight altitudes near hauled out groups). Adoption of mitigation measures (e.g., 800-m (0.5-mi) exclusion zone for marine vessels around walrus groups observed on ice) are expected to reduce the intensity of disturbance events and minimize the potential for injuries to animals. Additionally, any disturbance will likely be limited to a few individuals because walruses rarely occur in the Action Area. Thus, general noise disturbance from Industry will likely only result in minor, temporary changes in behavior (e.g., temporary change in direction or swimming speed).

Noise from seismic activities. Seismic and high-resolution site clearance surveys typically take place during open water conditions when walrus numbers are expected to be low; therefore, seismic operations in the Beaufort Sea are only expected to encounter individual animals, or at the most small groups ($\leq$3). Seismic operations introduce substantial levels of noise into the marine environment. Although the hearing sensitivity of walruses is poorly known, source levels associated with marine 3D and 2D seismic surveys are thought to be loud enough to cause

temporary hearing loss in other pinniped species. Therefore, it is possible that walruses within the 180-decibel safety radius for seismic activities could suffer temporary shifts in hearing thresholds which could interrupt communication among individuals, causing some walruses to become separated from a group.

The potential for severe or long-term adverse effects to swimming walruses (e.g., permanent separation from a group) will be minimized through mitigation measures in LOAs. Previous open-water seismic exploration detected very few walruses, and future seismic activities are expected to occur in the same areas. Therefore, seismic activities will likely only affect a few walruses. If disturbance does occur, mitigation measures described in the proposed Action will minimize effects to short-term behavioral alterations, such as walruses swimming away from seismic exploration vessels. Thus, we expect effects to walruses from these activities to be very minor.

Industry infrastructure as physical obstructions and attractants. It is unlikely that walrus movements in the water would be displaced by offshore stationary facilities because walruses can easily swim around such infrastructure. Walruses may experience disturbance from vessel traffic, and their reaction would vary given the vessel type, distance, speed, and previous exposure to disturbances. Vessel traffic could temporarily interrupt the movement of walruses or displace some animals when vessels pass through an area, but this displacement would likely have a minor effect that would be of a short duration.

Effects of Industry Activities on Hauled-out Walruses
Disturbance from mobile sources. Support vessels and/or aircraft servicing seismic and drill operations may encounter small aggregations of walruses hauled out on sea ice. The sight, sound, or smell of humans and machines could potentially displace these animals from ice haulouts. Walruses are most likely to occur along the edge of the pack ice, and most barges and vessels associated with Industry activities travel in open-water and avoid large ice floes or land where walruses are likely to be found. Therefore, ice management and aircraft flying near ice edges or other haul out areas are the activities most likely to disturb hauled-out walruses.

Reactions of hauled-out walruses to aircraft vary with range, aircraft type, and flight pattern, as well as walrus age, sex, and group size. While healthy, well-rested walruses that change their behavior from resting to swimming after a disturbance would most likely only experience a small level of temporary stress, tired walruses or those already under stress may not be able to feed or carry out other life functions until they find another place to haul out and rest. Walruses may react by entering the water. Fixed-winged aircraft are less likely to elicit a response than helicopter overflights. Walruses are particularly sensitive to changes in engine noise and are more likely to stampede when planes turn or fly low overhead. Researchers conducting aerial surveys for walruses in sea ice habitats have observed little reaction to fixed-winged aircraft above 457 m (1,500 ft.; USFWS unpubl. data). Although the intensity of the reaction to noise is variable, walruses are probably most susceptible to disturbance by fast-moving and low-flying aircraft (100 m above ground level). In 2002, a walrus hauled out near the SDC on the McCovey prospect was disturbed when a helicopter landed on the SDC. Minimization measures included in LOAs will minimize potential effects of disturbance from aircraft. Because we expect that industry will encounter very few walruses in the Action Area via aircraft and will employ

minimization measures when walruses are encountered, we expect that effects of these activities will be minor.

Ice management. Some offshore drilling and seismic operations may involve the use of ice-hardened vessels to manage incursions of sea ice. Ice management operations have the greatest potential for creating disturbances because walruses are more likely to be encountered in sea ice habitats, and ice management operations typically require the vessel to accelerate, reverse direction, and turn rapidly thereby maximizing propeller cavitations and producing significant noise.

Previous monitoring efforts in the Chukchi Sea suggest that icebreaking activities can displace some walrus groups up to several kilometers away; however, most groups of hauled-out walruses showed little reaction beyond 800 m (0.5 mi). The monitoring efforts concluded that effects of the drilling operations on walruses were limited in time, geographical scale, and only affected a small proportion of the total Pacific walrus population (76 FR 13454: 13467). We expect that walrus hauled out on the ice in the Action Area will react similarly to those in the Chukchi Sea, and that mitigation measures required in LOAs will minimize effects of drilling and ice management operations. Additionally, we expect that very few walruses will be affected because very few walruses occur in the Action Area.

Industry infrastructure as attractants. Walruses could be attracted to and haul out on equipment or infrastructure in the offshore environment. Endicott, BP's Saltwater Treatment Plant (located on the West Dock Causeway), Oooguruk, and Northstar are the offshore facilities that could produce noise that has the potential to disturb walruses. Liberty, as part of the Endicott complex, will also have this potential when it commences operations. A few walruses have been observed in the vicinity of these facilities. Three walruses have hauled out on Northstar Island since its construction in 2000, and a walrus was observed swimming near the Saltwater Treatment Plant in 2004. In 2007, a female and subadult walrus were observed hauled-out on the Endicott Causeway. If walruses are attracted to structures, they may subsequently be frightened by the presence of human activity, which can cause a change in behavior from resting to swimming or deserting the area. Alternatively, orphaned calves (caused by natural events) can exhibit curious behavior. They may haul out on facilities, swim up to boats/vessels or follow them.

Because very few walruses occur in the Action Area, most likely only a few walruses would haul out on Industry-related structures at any given time, which minimizes the risk to smaller individuals to being crushed by a stampede. Additionally, measures included in LOAs will further minimize effects of disturbance. Therefore, we expect disturbance of walrus hauled out on Industry infrastructure to occur rarely, and when it occurs will have only a minor effect on the walruses in the Action Area.

Disturbance of benthic prey. Walruses feed primarily on immobile benthic invertebrates. Some dredging and core sampling may take place as part of the proposed Action, and this could disturb benthic prey upon which walrus feed. However, the area disturbed by these activities is expected be small relative to the size of the Action Area, and the Action Area is not the primary foraging habitat for walruses. Therefore, the effect of the proposed Action on walruses from potential disturbance of benthic prey is projected to be very small.

Effects of a Potential Oil Spill

Spill(s) of crude or refined oil products are likely to occur as a result of the proposed Action. However, the impacts resulting from a spill are dependent on numerous factors including: effectiveness of spill response, weather conditions, time of the year, location / habitat type (e.g., tundra, gravel pad, ponds, or marine waters), and perhaps most significantly the size of a spill. While there is an extremely high probability that small (defined by BOEMRE as <1,000 bbl) spills will occur, based on the history of oil development on Alaska's North Slope, the relatively small amount of development (relative to other major centers of oil production), and the types of activities in the proposed Action (both during exploration and production) a large spill to marine waters is considered to be very unlikely to occur (see Appendix 3 for further details) and cannot be said to be reasonably expected to occur.

Effects of a Small Oil Spill

It is likely that small spill(s) of refined oil (e.g., fuel leaks from vessels) or chemicals will occur during the timeframe of the proposed Action. Small spills in the terrestrial environment are extremely unlikely to impact walrus because the oil/chemical would have to flow off land and into the marine environment.

A small spill to marine waters has the potential to impact walruses. However, walruses may not be severely affected by an oil spill through direct contact. Walruses have thick skin and blubber layers for insulation and very little hair. Thus, they exhibit no grooming behavior, which lessens their chance of ingesting oil. Heat loss is regulated by control of peripheral blood flow through the animal's skin and blubber. The peripheral blood flow is decreased in cold water and increased at warmer temperatures. Direct exposure of walruses to oil is not believed to have any effect on the insulating capacity of their skin and blubber, although it is unknown if oil could affect their peripheral blood flow.

However, damage to the skin of pinnipeds can occur from contact with oil because some of the oil penetrates the skin, causing inflammation and death of some tissue. The dead tissue is discarded, leaving behind an ulcer. While these skin lesions have only rarely been found on oiled seals, the effects on walruses may be greater because of a lack of hair to protect the skin. Direct exposure to oil can also result in conjunctivitis. Like other pinnipeds, walruses are susceptible to oil contamination in their eyes and continuous exposure to oil may cause permanent eye damage, and prolonged exposure (24 hours) to hydrocarbon fumes has been shown to have significant adverse health effects on pinnipeds.

Any oil spill to marine waters in the Action Area will result in a spill response effort. Walruses are sensitive to disturbance, and may be adversely affected by the activities and significant human presence that would result from these spill response activities (see disturbance effects above).

While it is possible that walruses may be impacted by a small spill to marine waters, as stated previously, the Beaufort Sea is not within the primary range for the Pacific walrus and very low numbers are present in the Action Area. Therfore, the probability of walruses encountering oil or chemicals from a small spill in the Action Area, or being adversely affected by disturbance

from oil spill response efforts are extremely low, and at most very few individuals would be affected.

Effects of a Large Oil Spill

To date there have been no large oil spills (>1,000 bbl) from offshore oil and gas activities off Alaska's North Slope. While some onshore oil spills have occurred, oil hasn't reached marine waters and is unlikely to were future spills to occur because oil on land is easily contained, and for much of the area (NPR-A) there are stipulations and required operating procedures and stipulations requiring oil facilities be set back from the coastline and waterbodies. This further increases the probability that oil would be contained / prevented from reaching the marine environment.

As described in Appendix 3 the probability of a large spill to marine waters is very low, and therefore, cannot be said to be reasonably certain to occur (Appendix 3). If a large spill to marine waters does occur during the open-water season, oil in the water column could drift offshore and possibly encounter a small number of walruses that may be present in the Action Area. Spilled oil during the ice-covered season that is not cleaned up could become part of the ice substrate and be eventually released back into the environment during the following open-water season. Walruses may also be exposed to oil that has accumulated at the edge of a contaminated shore or ice lead as they repeatedly enter and exit the water in these types of habitat. Similar to small spills, any walruses present in the area of a spill would likely be disturbed by spill response activities. While the disturbance is an impact it would also reduce the probability that walruses would be exposed to oil.

If a large oil spill were to occur most of the benthic fauna (including walruses prey) that come in contact with oil would be killed. Bivalves that survived could become contaminated from oil in bottom sediments, possibly resulting in slower growth and a decrease in reproduction. Bivalve mollusks, a preferred prey species of the walrus, are not effective at processing hydrocarbon compounds, resulting in highly concentrated accumulations and long-term retention of the contamination within the organism. In addition, because walruses feed primarily on mollusks, they could be more vulnerable to a loss of this prey species than other pinnipeds that feed on a larger variety of prey. Furthermore, complete recovery of a bivalve mollusk population could take 10 years or more, forcing walruses to find other food resources or move to other areas.

However, because very few walruses occur in the Action Area, and because it does not support productive feeding grounds for walrus, even were a large spill to occur the potential effect on the walrus population is low, and would be limited to a few individuals.

Effects of Interrelated and Interdependent Actions

Interdependent actions are defined as actions having no independent utility apart for the proposed action, while interrelated actions are defined as actions that are part of a larger action and depend upon the larger action for their justification (50 CFR §402.02). The Service did not identify any interrelated and interdependent actions.

Summary

Industry noise disturbance and associated vessel traffic may have a more pronounced impact than physical obstructions or human encounters on walruses in the Beaufort Sea. Walruses may temporarily flee from human activity when disturbed. If they are on land, ice, or industry structures, walrus may enter the water and swim away. Walruses encountering human activity may swim away or temporarily stop foraging. Because very few walruses occur in the Action Area, however, we expect few walruses to be affected by the proposed Action. Additionally, LOAs issued under the proposed Regulations will require mitigation measures to reduce disturbance impacts on walruses. No disturbance events or lethal takes have been reported to date (73 FR 33212) and only 10 walruses are anticipated to be taken annually due to "level B" harassment under the MMPA (76 FR 13454: 13484). Thus, we consider the likely effects of the proposed Action on walrus populations to be minimal.

Effects of the Action on Polar Bears

Typically, most polar bears occur in the active ice zone, far offshore, hunting throughout the year, which limits the chances of impacts from industry activities which mostly occur inland, along the coast, or in the nearshore environment. Encounters with polar bears from industry activities are most likely to occur during fall and winter when polar bears may be found in larger numbers in the coastal environment, as they may have abandoned the sea ice due to melting or may be searching for food, e.g., whale carcasses, or, for pregnant females, may be searching for suitable den sites. Bears also spend a limited time on land to feed or move to other areas. If fall storms and ocean currents deposit bears on land, they may remain along the coast or on barrier islands for several weeks until the ice returns.

Because polar bears are present in the Action Area, industry-polar bear interactions are likely to occur. Bears could be repelled from or attracted to sounds, smells, or sights associated with industry activities. Encounters could occur anywhere, but are most likely to occur near coastal areas. Based on records of industry activites to date, no lethal take is anticipated during the proposed Action; however, industry activities could directly affect polar bears by causing disturbance from noise, disturbance from mobile sources such as air and vessel traffic, during offshore seismic exploration and exploratory drilling operations, and by obstructing movements with infrastructure. These effects are expected to differentially affect denning and non-denning (e.g., transient and hunting) polar bears; thus, we separately analyze effects below based on these demographics. Other effects to polar bears include habituation to Industry activities and Industry infrastructure as attractants; we separately analyze these effects because they can affect denning and non-denning polar bears differently. We then discuss mitigation measures and the anticipated amount of incidental MMPA take under the proposed Action. This section also includes an analysis of a potential oil spill.

Effects on Denning Polar Bears

Polar bears can den on land and on sea ice. As the potential impacts to polar bears from industry activities in these two environments are similar, the effects described in this section are relevant to bears denning in either environment.

Effect of noise disturbance on denning bears. Female polar bears entering dens and those in dens with cubs are more sensitive than other bears to industry activities. Noise from industry

activities (stationary or mobile and on ice or on land) could disturb bears at den sites and depending on the timing in the denning cycle could have varying effects on the female bear and family group. During the early stages of denning, when the pregnant female has limited investment at the site, disturbance could cause her to abandon the site in search of another one. At emergence cubs are acclimating to their ‘‘new environment’ and the female bear is vigilant to protect to her offspring. Visual, acoustic, and olfactory stimuli may disturb the female to the point of abandoning the den site before the cubs are physiologically ready to move. For example, in 2006, a female and two cubs emerged from a den 400 meters from an active river crossing construction site. The female abandoned the den site within hours of the cub emergence three days later. In 2009, a female and two cubs emerged from a den site within 100 meters of an active ice road with heavy traffic and abandoned the site within 3 days. Such occurrences are infrequent and isolated. It should be noted that reactions of bears to human activity are highly variable as some bears are more tolerant of stimuli than others. For example, in 2011, a female bear denned throughout the winter on an active industrial island and only became known to the company when she naturally emerged from her den site approximately 50 meters from human activity. She eventually abandoned her den naturally.

Known polar bear dens around industry activities, discovered opportunistically or from planned surveys, are monitored by the Service. These sites are only a small percentage of the total active polar bear dens for the SBS in any given year, and LOAs issued to industry, as well as industry polar bear interaction plans, stipulate procedures when a bear, or a bear with cubs are encountered. At that time, mitigation, such as activity shutdowns near the den and 24-hour monitoring of the den site may be implemented limiting human-bear interactions, thereby allowing the female bear to naturally abandon the den and minimize impacts to the animals. For example, in the spring of 2010, an active den site was observed approximately 60 meters from a heavily used ice road. A 1-mile exclusion zone was established around the den, closing a 2-mile portion of the road. Monitors were assigned to observe bear activity and monitor human activity to minimize any other impacts to the bear group. These mitigation efforts minimized disturbance to the bears and allowed them to naturally abandon the den site.

Mobile sources of disturbance on denning bears. Although vehicles on ice or land could hypothetically travel over dens causing them to collapse, this is unlikely to occur because industry routinely coordinates with the Service to determine where their activities are relative to known dens and denning habitat. LOA provisions require Industry to avoid known polar bear dens by one mile and often require Industry to search potential denning habitat using den detection techniques, such as Forward-looking Infrared (FLIR) technology. Occasionally, Industry encounters an unknown den. Between 2002 and 2010, six previously unknown maternal polar bears dens were encountered by Industry. Once a previously unknown den is identified Industry must report its location to the Service and mitigation measures described in polar bear interaction and response plans are implemented. These may include a one-mile exclusion area around the newly-found den and 24-hour monitoring of the site to minimize disturbance.

Denning bears may also abandon or depart their dens early in response to repeated noise produced by extensive aircraft overflights. Mitigation measures, such as minimum flight elevations over polar bears or areas of concern and flight restrictions around known polar bear

dens, will be required in LOAs, as appropriate, to reduce the likelihood that bears are disturbed by aircraft.

Effects on Non-denning Polar Bears
Effects from offshore/nearshore seismic/exploration activities on non-denning polar bears. Offshore Industry activities include barging activities and vessel-based exploration activities such as ocean-bottom cable (OBC) and shallow hazards surveys. These activities avoid ice floes and the multiyear ice edge where polar bears are most likely to occur. As polar bears have only rarely been documented swimming in open-water miles from the ice edge or ice floes we expect that polar bears will rarely encounter these offshore activities.

On-ice seismic/exploration operations such as vehicle and non-permanent camps associated with seismic projects do take place. However, Industry did not report any polar bear observations during seismic activity during the five-year period ending August 1, 2011 and we have no information to suggest the number of these activities is likely to increase, or that polar bears are changing their behavior in a way that would make them more likely to encounter these activities.

Effects to nearshore/offshore transient or hunting bears would be limited to small-scale alterations of bear movements such as polar bears avoiding Industry activities. If polar bears approach and are disturbed by on-ice Industry activities, they will likely move away. Underwater sound, such as air guns would minimally directly affect on-ice polar bears because bears are unlikely to hear underwater sound above ice. If an encounter between a vessel and a swimming bear occurs, it would most likely result in only a minor disturbance (e.g., the bear may change its direction or temporarily swim faster) as the vessel passes the swimming bear. Swimming bears are also expected to be minimally affected by underwater sounds such as airguns because sound in open water would be attenuated; additionally, polar bears generally do not dive much below the surface and they normally swim with their heads above the surface, where noises produced underwater are weak (Greene and Richardson 1988, Richardson et al. 1995).

Disturbance from mobile sources on non-denning polar bears. Routine aircraft traffic is expected to have little effect on polar bears; however, overflights of fixed-wing aircraft for monitoring purposes or helicopters used for re-supply of industry operations could disturb polar bears. We expect non-denning polar bears to experience only short-term changes in behavior, such as evading the plane by retreating from the stimulus, which would not have long-term impact on individuals.

Polar bears are known to run from sources of noise and the sight of icebreakers, other vessels, and aircraft, especially helicopters. Polar bears may respond by moving from their original positions (by running, trotting, or walking), or jumping into the water if on land or ice. The effects of fleeing from vehicles are likely to be minimal if the event is temporary, the animal is otherwise unstressed, and it is a cool day. However, on a warm spring or summer day, a short run may be enough to overheat a polar bear, and a bear already experiencing stress that swims a long distance could require rest for a long period prior to reinitiating essential life functions such as feeding. Additionally, small cubs could become separated from their mothers.

Possible Habituation or Conditioning to Noise
Polar bears near routine industrial noise may habituate to these stimului and show less vigilance than bears not exposed to such stimuli. For example, during the ice-covered seasons of 2000–2001 and 2001–2002, active dens were found 0.4 km and 0.8 km (0.25 mi and 0.5 mi) of remediation activities on Flaxman Island in the Beaufort Sea with no observed impact to the polar bears (Smith et al. 2007). Habituation to stimulus such as noise is generally considered to be positive because polar bears may experience less stress from Industrial activity; however, it may also increase the risk of human-bear encounters.

Industry Activities as Attractants
Because polar bears can be curious and permanent structures can provide habitat (e.g., resting), industrial activities and structures could serve as an attractant. Structures no longer in use can provide polar bear habitat free of disturbance. For example, the Staging Pad, an isolated, abandoned gravel pad isolated approximately 7 km northeast of the Milne Point Central Processing Facility, is the most consistent location of polar bear denning on the North Slope; eight maternal dens have occurred on this man-made pad in the last nine years. Bears have also successfully denned on a decommissioned exploration gravel pad on Cross Island and on the runway ramp at the Bullen Point LRRS.

Depending on the tolerance threshold of individual bears to human activity, some bears may use structures that are being used by industry, especially exploration facilities in the coastal or nearshore environment. In some cases, bears may benefit from the presence of infrastructure. For example, the two man-made causeways on the North Slope (the STP/West Dock Causeway and the Endicott Causeway) have created resting habitat (over approximately 7 miles worth in linear length) for polar bears since their construction in the 1980s. Multiple observations from Endicott and West Dock throughout the years have recorded bears resting, traversing, or otherwise "using" the causeways. However, such use of infrastructure by bears could result in increased human – bear encounters that could, in turn, result in unintentional harassment, intentional hazing (under separate authorization, 76 FR 13454: 13468) see Interrelated Effects section below), or possibly a situation where a bear is killed because it posed an immediate threat to human life. Bears have been observed using infrastructure as resting areas to escape weather (a female bear resting for 2 days on the bank of the Milne Point Road in 2007) and presumably for an elevated vantage point (a family group resting on an elevated pad at Oliktok Point in 2007). The offshore environment sites account for the majority of the polar bear observations. According to AOGA, the offshore facilities of Endicott, Liberty, Northstar and Oooguruk accounted for 47% of the bear observations between 2005 and 2008 (182 of 390 sightings). The conditions of the LOAs both reduce the number of human-bear interactions, and the severity of negative consequences to polar bears when interactions do occur.

Mitigation Measures
Most human-bear interactions involve transient polar bears for which the potential to affect essential life functions is minimal. Under the proposed Action, Industry will be required to develop interaction plans, and personnel will be required to participate in onsite polar bear training. This training, educates field personnel about the dangers of bear encounters and how to implement safety procedures in the event of a bear sighting. The training allows on-site personnel to detect bears and respond safely and appropriately. In the past this response often

included leaving an area where bears are seen until the bear leaves the area. Occasionally, and when appropriate, the response may involve deterring the bear from the site (76 FR 13454: 13470). Effects of deterrence activities are described in more detail in the Interrelated Effects section below.

While potential disturbance associated with infrastructure usually involves transient bears that would be minimally affected by disturbance, interaction plans and training are also expected to minimize disturbance to non-transient bears. For example, in the spring of 2011, a female bear emerged from a maternal den she had constructed in the bagged island armor of ENI's Spy Island Development. The island was not in use when she initiated denning, but the den was discovered when Industry returned in the spring. In coordination with the Service, Industry temporarily left the island until the female emerged naturally with a cub and abandoned the den site (i.e., did not abandon early due to human disturbance).

MMPA Take

From 2006 to 2009, an annual average of 306 polar bears, (ranging from 170 in 2006 to 420 in 2009), have been observed during oil and gas activities; some of these sightings are likely re-sightings of previously observed bears. For most sightings (81 percent of these observations), no interaction occurred (the Service uses the term 'interaction' as it is defined in human-bear conflict management, where an interaction is "…when a person(s) and bear(s) are mutually aware of one another"). The remaining 19% of observed polar bears were deflected from their travel routes, moved away from the disturbance by walking trotting, running, or swimming, or were attracted to and moved towards the site. In four percent of all sightings, bears clearly altered their behavior in a manner described above, and for 15 percent of all sightings, incidental take under the MMPA via harassment was followed by intentional hazing or other deterrence of bears for the safety of the bear and industry workers. The number of bears taken by Level B harassment due to oil and gas activities in the past five years has ranged from the mid-60s to slightly over 100 annually. Thus, the Service anticipates that the proposed Action will result in a maximum of 150 takes of polar bears by Level B harassment annually (or 750 during the time frame of the proposed Action.) All of these takes are anticipated to be nonlethal, involving only minor and temporary changes in bear behavior. Through the implementation of mitigating measures included in the proposed Action, none of these takes under the MMPA are expected to interfere with essential life functions such as breeding and feeding.

Effects of a Potential Oil Spill

As described above for walrus, spills of crude or refined oil products are likely to occur as a result of the proposed Action. However, the vast majority of these spills will either be to the terrestrial environment (where the probability of impacts to polar bears is extremely low) or be small (<1,000 bbl). Large marine spills are considered unlikely and therefore cannot be considered to be reasonably expected to occur.

<u>Effects of a Small Spill</u>

Small spills of oil or other chemicals are likely to occur. A small spill in the terrestrial environment will be unlikely to affect polar bears as these spills can be easily contained and polar bears deterred from the affected area. However, a spill occurring in the marine

environment poses more of a risk to polar bears in part because oil is more difficult to clean up in the marine environment than on land.

The effects of fouling fur or ingesting oil or other chemicals involved, could be short-term or result in death. The effects of crude oil on polar bears were demonstrated by Oritsland et al. (1981) when polar bears were exposed experimentally to oil for prolonged periods of time. Effects included acute inflammation of nasal passages, marked epidermal responses, anemia, anorexia, biochemical changes indicative of stress, renal impairment, and death. Many effects did not become evident until several weeks after the experiment (Oritsland et al. 1981). Oiling of the pelt reduces its insulation value, and irritation or damage to the skin by oil may further contribute to impaired thermoregulation. Experiments on live polar bears and pelts showed that the thermal value of the fur decreased significantly after oiling, and oiled bears showed increased metabolic rates and elevated skin temperature.

Oiled bears are also likely to ingest oil as they groom to restore the insulation value of the oiled fur. Oil ingestion by polar bears through consumption of contaminated prey, by grooming or by nursing could have pathological effects, depending on the amount of oil ingested and the individual's physiological state. Death could occur if a large amount of oil were ingested or if volatile components of oil were aspirated into the lungs. Two of three bears died in the Canadian experiment, and it was suspected that the ingestion of oil was a contributing factor to the deaths. Ingestion of sub-lethal amounts of oil can have various physiological effects on a polar bear, depending on whether the animal is able to excrete or detoxify the hydrocarbons. Petroleum hydrocarbons irritate or destroy epithelial cells lining the stomach and intestine, thereby affecting motility, digestion, and absorption.

Polar bears swimming in, or walking adjacent to, an oil spill could inhale petroleum vapors. Vapor inhalation by polar bears could result in damage to various systems, such as the respiratory and the central nervous systems, depending on the amount of exposure. Exposure to other chemicals may also kill polar bears. For example, in April 1988 a dead polar bear was found on Leavitt Island, approximately 9.3 km northeast of Oliktok Point. The cause of death was poisoning by a mixture that included ethylene glycol (antifreeze) and Rhodamine B dye. While the bear’s death was human-caused, the source of the mixture was unknown.

Current management practices employed by Industry, such as requiring the proper use, storage, and disposal of hazardous materials, minimize the potential occurrence of such incidents. In the event of a small oil spill, it is also likely that polar bears would be intentionally hazed to keep them away from the area, further reducing the likelihood of impacting individuals, albeit while causing stress and disturbance in those individuals. Because of spill containment and/or weathering, and because the likelihood of a polar bear coming into contact with a small spill at any given time is low, the effects of a small spill would be short-term, localized, and at most affect very low numbers of individuals.

Potential Effects of a Large Oil Spill

As described above for walruses, the probability of a large spill occurring is low and cannot be said to be reasonably certain to occur. Although the majority of the polar bears in the Action Area spend much of their time offshore on sea ice, some bears are likely to encounter oil

regardless of the season or location should a large spill occur (76 FR 13454: 13473). However, very few polar bears would likely come into contact with oil on land because of deterrence activities, and oil spilled on land would be easier to clean up than oil in the marine environment.

In addition to the direct impacts that exposure to oil may cause (as described above) a large spill could result in persistent toxic subsurface oil and chronic exposure even at sub-lethal levels can have long-term effects on wildlife (Peterson et al. 2003). Long-term oil effects could be substantial through interactions between natural environmental stressors and compromised health of exposed animals, and through chronic, toxic exposure as a result of bioaccumulation. Polar bears are biological sinks for pollutants because they are the apical predator of the Arctic ecosystem and are also opportunistic scavengers of other marine mammals. Additionally, their diet is composed mostly of high-fat sealskin and blubber, (Norstrom et al. 1988). Polar bears would therefore, be susceptible to the effects of bioaccumulation of contaminants associated with spilled oil, which could affect the bears' reproduction, survival, and immune systems.

Were a large spill to occur polar bears would be most susceptible to the impacts during the open-water and broken-ice periods (summer and fall) when nearshore and offshore polar bear densities are greatest. Polar bear use of coastal areas during the fall open-water period has increased in recent years in the Beaufort Sea. A study using data collected from 2001 to 2005 during the fall open-water period concluded: (1) on average approximately four percent of the estimated 1,526 polar bears in the Southern Beaufort population were observed onshore in the fall (i.e., 122); (2) 80 percent of these bears onshore (i.e., 98) occurred within 15 km of subsistence-harvested bowhead whale carcasses, where large congregations of polar bears have been observed feeding; and (3) sea ice conditions affected the number of bears on land and the duration of time they spent there (Schliebe et al. 2006). Hence, bears concentrated in areas where beach-cast marine mammal carcasses occur during the fall would likely be the most susceptible to oiling. It is possible that a large marine oil spill occurring or persisting into the fall in the Action Area could contact and kill tens of polar bears. However, for much of the Action Area polar bears occur at extremely low densities and hence few bears would be impacts, while there are discrete sites which seasonally support larger numbers of polar bears were an oil spill to reach these areas the number of polar bears that may be impacted at these sites could be significantly decreased by hazing during oil spill response efforts.

Not only is the probability of a large oil spill to marine waters in the Action Area low, while such an event could kill tens of polar bears this level of impact does not rise to the level which would jeopardize the continued survival and recovery of polar bears.

Interdependent and Interrelated Actions

Interdependent actions are defined as actions having no independent utility apart for the proposed action, while interrelated actions are defined as actions that are part of a larger action and depend upon the larger action for their justification (50 CFR §402.02). LOAs issued under the Regulations will require applicants to develop polar bear interaction plans, and these plans could include polar bear deterrence. These deterrence activities, which are necessary tools to prevent the lethal take of polar bears or potential for injury to personnel, are not part of the proposed Action at issue, as the proposed Action would allow for the authorization of only certain types of unintentional take. However, because industry activities in the proposed Action

could ultimately be subject to intentional deterrence, we consider such deterrence activities to be an interrelated action to the proposed Action here. The Service issues special LOAs to appropriately-trained individuals which authorize intentional taking of polar bears for both human and bear safety pursuant to 101(a)(4)(A), 109(h), and 112(c). In a separate consultation, the Service concluded that acoustical and vehicular deterrence methods that anyone can perform are not likely to adversely affect polar bears (75 FR 61631), and these methods would not require authorization via LOAs. Intentional take LOAs would allow trained individuals to use other mechanisms (e.g., chemical repellants, electric fences, ad projectiles such as bean bags projected from a shotgun) to deter polar bears away from Industry infrastructure and personnel, and would allow Service to require mitigation measures and ensure minimum standardized training in the use of deterrence methods.

As with disturbance to polar bears from the proposed Action, polar bears could experience temporary disturbance and stress from some deterrence activities (e.g., from acoustical devices, moving vehicles, spotlights) and may walk, run or swim away. For healthy bears, any stress they experience from this activity will likely be short term; bears that have walked or swam long distances may experience longer periods of stress and may have to rest elsewhere prior to resuming normal activities such as feeding. Bears that are deterred using more aggressive methods (e.g., projectiles such as bean bags and rubber bullets), would likely experience stress, short-term pain and could be bruised.

From 2006 through 2010, Industry reported the sightings of 1,414 polar bears, of which 209 (15%) were intentionally harassed, or deterred (C. Perham, pers. communication, email, July 12, 2011). Annually, the percent of total bears sighted that were deterred ranged from ranged from 9% in 2010 to 43% in 2006, with an average of 15%. For the purposes of this BO, we project that similar numbers of bears will be deterred during the proposed Action. For the majority of the deterrence events, no contact with the bear is anticipated to occur, and we expect that most of these deterrence events will cause only minor, temporary behavioral changes (e.g., a bear runs or swims away). A few deterrence events will likely use techniques that will contact the individual bear, such as deterrence projectiles, described below.

Past deterrence activities include the use of projectiles (e.g., bean bags or rubber bullets) that hit the bear. During the effective time period of the previous incidental take regulations, between zero and five polar bears were deterred via bean bags and between zero and one were deterred via rubber bullets annually. For the purposes of this BO, we conservatively estimate that annually, five and one polar bear will be deterred via bean bags or rubber bullets, respectively, for a total of 30 deterrence events with projectiles of polar bears during the proposed Action. This number is included in the total number of bears projected to be deterred.

Summary

Up to 150 polar bears could be harassed annually due to the effects of the proposed Action. Most polar bears will respond only with minor changes of behavior without long-term effects on individuals. As an effect of an interrelated action to the proposed Action, polar bears may be intentionally hazed (e.g., with noise, vehicles, or projectiles) to reduce interactions between humans and bears, the vast majority of which are expected to respond with minor, short-term changes in behavior.

Effects on Polar Bear Critical Habitat

Physical Effects on the Primary Constituent Elements of Critical Habitat

All three critical habitat units were in part designated because they provide habitat for movements (sea ice and barrier island units) or access to and from the coast and den sites (terrestrial denning unit) for polar bears. Existing structures are excluded from critical habitat. However, human activities (e.g., noise produced by equipment and visual stimuli) at these facilities, especially those located on the coast where most polar bears are observed may interfere with the capability of critical habitat adjacent to facilities to provide their intended function, for example if polar bears alter travel routes to avoid contact with these facilities, and avoid denning, hunting, and resting near existing structures.

Effects of ice-breaking. Ice-hardened vessels operating around offshore exploratory drill rigs could temporarily create leads in the ice, thus making the ice platform unavailable to polar bears. Although lease sales in marine waters encompass a large area of sea ice critical habitat, very few exploratory drilling operations (up to three) will likely take place during the proposed Action, and impacts to sea ice critical habitat are expected to occur over a very small portion of the Action Area. Because effects are expected to be localized and small scale relative to the size of critical habitat, they are not expected to affect the ability of polar bears to use the remaining sea ice critical habitat for feeding, breeding, denning, and movements.

Effects on sea ice prey resources. Sea ice with adequate prey resources (primarily ringed and bearded seals) are an element of sea ice critical habitat. Industry activities could affect the abundance of ringed and bearded seal in localized areas in the nearshore environment via disturbance, or by creating an attractant for prey near ice breaking activities, which could then attract polar bears, but given the small geographic area of these effects, particular in relation to to the size of the critical habitat unit, potential impacts to polar bears are limited.

Industry structures as barriers to movement. Existing structures and structures proposed for construction during the proposed Action, especially infrastructure that extends continuously from the coastline to the offshore facilities (e.g., Endicott and West Dock causeways, as well as the facilities supporting them), have the potential to act as barriers to movements of polar bears (76 FR 13454: 13470). Even though existing structures are not included in designated critical habitat, they could cause polar bears to use adjacent critical habitat differently. During periods of ice, bears may more easily avoid human structures in all critical habitat units because they can easily travel over ice. However, during the ice-free period, bears may choose to swim to avoid human activity on the mainland, especially in areas where structures are closely spaced. Thus, existing and proposed structures could interfere with the ability of polar bears to use critical habitat for its intended purpose, and this is most likely to occur during the ice-free season. However, polar bears can climb and cross gravel roads and causeways, and have frequently been observed crossing existing roads and causeways in the Prudhoe Bay oilfields suggesting that structures associated with oil and gas development do not act as a significant barrier to polar bear movements.

Currently, the configuration of structures allows for polar bears to transverse and leave the Action Area to carry out essential life functions, although polar bears may alter their travel route

to go around/avoid contact with structures; alternatively, polar bears may travel over infrastructure such as roads (polar bears can climb and cross gravel roads, and have frequently been observed crossing existing roads and causeways in the Prudhoe Bay oilfields). The footprint of industry structures is expected to increase during the time frame of the proposed Action. While the new footprint could interfere with the use of localized areas of critical habitat for movements, we do not anticipate the new footprint will prevent polar bears from using critical habitat as a travel corridor as this highly mobile animal is able to move around the structures, or climb over them.

While new structures may be created within polar bear critical habitat, not all little of this habitat is likely to lose its value or preclude bears from using elements of critical habitat near the structures or the structures themselves. Depending on the tolerance threshold of individual bears to human activity, some bears may use critical habitat even after new structures are built on it and it is in use. Bears have used oil industry structures as resting areas to escape weather (e.g., a female bear rested for two days on the bank of Milne Point Road in 2007, and multiple bears have used the STP/West Dock and Endicott causeways as resting and travel habitat) and presumably for an elevated vantage point (a family group rested on an elevated pad at Oliktok Point in 2007). New structures may also create habitat bears can use, especially once it is abandoned. Denning habitat has also been created by industry structures as polar bears have historically used structures as the substrate for maternal dens, and new structures could provide similar habitat.

Effects of Disturbance

Because the terrestrial denning and barrier island critical habitat units include lack of human disturbance as a PCE, the Service must separately analyze effects of disturbance on polar bears from its effects on critical habitat. The section of Effects on Polar Bears included an analysis of possible effects of disturbance on polar bears and whether these effects rise to the level of take under the ESA. In contrast, this section contains an analysis of disturbance on the ability of critical habitat to hold the value (e.g., lack of disturbance from humans) for which it was designated. Therefore, this section references disturbance of polar bears if it is meaningful to the discussion of the capability of critical habitat to support polar bears, but it is not a re-analysis of effects on polar bears and possible take.

Vehicles such as rolligons that travel on ice or ice roads could cause disturbances making portions of all three critical habitat units temporarily unavailable for denning. If the road is established and used consistently prior to the onset of denning, then dens most likely will not be established in the area. Ice roads used annually could cause the same area to be unavailable for denning each winter, while ice roads or trails used once or for only one during one season would likely not preclude the use of the area for denning in subsequent years. The tolerance threshold of polar bears to human activity is an important factor when examining coastal industry activities and likely varies by individual bear.

Aircraft could also make portions of all three critical habitat units temporarily unavailable for use by polar bears. Polar bears disturbed on barrier islands may run and/or enter the water and start swimming; thus they stop using the habitat for the value which it was designated (i.e., for denning, a refuge from human disturbance, and movement along the coast to access maternal den

and optimal feeding habitat). Evidence that bears can be re-sighted during repeated surveys in one fall season indicates that most of these disturbances are likely to be temporary (e.g., likely lasting a few moments to about five minutes) and the value of critical habitat will return to a zone free of human disturbance once the helicopter leaves. Thus, we expect temporary aerial disturbance will have no long-term effects on the intended purpose of designated barrier island critical habitat and the no disturbance zone. Persistent aircraft travel (e.g., to and from offshore oil rigs), however, could displace polar bears from localized areas in the flight path.

On ice activities and operations occurring near the ice edge could displace seals from pupping lairs or haulouts, and seals could abandon breathing holes near Industry activity. Additionally, Industry could scare polar bears away from seal kills. If this occurs, the ability of sea ice critical habitat to provide foraging habitat to polar bears may be adversely affected. However, these disturbances will likely only temporarily affect a few ice seals and affect only a small proportion of sea ice critical habitat.

Historically, the majority of industry-bear observations occur within one mile of the coastline because bears use this area as travel corridors. Bears traversing along the coastline or traveling from to and from den sites and the coast could encounter coastal industry facilities. As bears encounter these facilities, the chances for human-bear interactions increase. Persistent disturbance from overflights or vessels operating within one mile of barrier islands could prevent use of localized areas of barrier island critical habitat. However, these industry activities will only occur in localized areas and, therefore, are not expected to prevent use of the remaining barrier island critical habitat.

Industry will likely construct some structures within terrestrial denning critical habitat, which would prevent use or reduce the conservation role of some localized areas. However, these activities are projected to occur only in localized areas and would not prevent use of the remaining terrestrial denning critical habitat.

Effects of Small Spills

As described earlier, we anticipate that small spills may occur as a result of the Action. Small spills could make localized areas of critical habitat unavailable temporarily because of disturbance while clean up occurred or temporarily decrease the value of critical habitat through contamination. However, due to the temporary nature of these impacts (e.g., spill response activities) and small scale of these impacts any impacts to critical habitat resulting from a small spill will be minor.

Effects of Large Spills

As described earlier, the probability of a large spill occurring is low and cannot be said to be reasonably certain to occur. However, were a large spill to occur it would likely have a greater effect on critical habitat in the marine environment than on land where a spill can be more easily contained. A large spill on land could make a small portion of terrestrial denning critical habitat unavailable to polar bears during clean up operations because polar bears would most likely be deterred away from the oil spill area. Sea Ice and Barrier Island units would be the most affected in the event of a large spill. Spill response and cleanup activities could take place for years,

causing persistent disturbance within critical habitat that could decrease its value via human disturbance for an extended time.

Oil could remain in the water, on ice, or on shore where polar bears can access it. Thus, critical habitat may lose its value by continually exposing polar bears to contaminants. Additionally, spilled oil or other chemicals can concentrate and accumulate in leads and openings that occur during spring break up and autumn freeze-up periods. Such a concentration of spilled oil/chemicals would increase the chance that seals would be oiled, the main food source of polar bears. A local reduction in ringed seal numbers as a result of directly affecting seals or by affecting their prey could temporarily decrease the conservation role of sea ice critical habitat for polar bears (i.e., for hunting), as could deterrence activities to keep polar bears away from contaminated areas.

Oil spilled in the marine environment could wash up on the coast of the mainland or on barrier islands where polar bears may contact it. Individuals oiled along the coast or in sea ice or barrier island units could transport oil or other chemicals into the denning critical habitat unit, thus contaminating portions of it. While a portion of critical habitat could be affected if a large spill were to occur, the likelihood of a large spill is very low and cannot be said to be reasonably certain, further the amount of critical habitat that could be affected is small when compared to the size of the entire critical habitat unit.

Interrelated and Interdependent Effects

Deterrence activities could prevent polar bears from using localized areas of critical habitat adjacent to existing and future industry structures. This area, however, would be small such that, deterrence events are not expected to prevent polar bears from using the rest of critical habitat in the Action Area.

Summary

The proposed Action includes construction of new structures and ice breaking that could affect PCEs and eliminate the ability of polar bears to use of some localized areas of critical habitat. Disturbance from some ongoing and future activities could prevent the use of some localized areas of critical habitat. The effects of some disturbance (e.g., from winter ice travel) would be temporary, while other disturbances within critical habitat would be more persistent (e.g., disturbance in critical habitat adjacent to development activities). Small spills of chemicals and associated cleanup activities could temporarily degrade the value of localized areas of critical habitat. Large spills are not reasonably expected to occur. While Industry activities associated with LOAs under the proposed Regulations may adversely affect localized areas of critical habitat, enough polar bear critical habitat will remain available to polar bears such that polar bear critical habitat will still be able to provide the function and conservation role for which it was designated.

7. Cumulative Effects

Under the ESA, cumulative effects are the effects of future State, Tribal, local or private actions that are reasonably certain to occur in the Action Area. Future Federal actions that are unrelated

to the proposed action are not considered in this section because they require separate consultation under the ESA.

Polar Bears

Subsistence Harvest
The most significant source of polar bear mortality is man. Before MMPA was enacted in 1972, polar bears were taken by sport hunters and residents. Between 1925 and 1972, the mean reported harvest in Alaska was 186 bears per year. Seventy-five percent of these were males, as cubs and females with cubs were protected. Since 1972, only Alaska Natives from coastal Alaskan villages have been allowed to hunt polar bears for their subsistence uses or for handicraft and clothing items for sale. The Native hunt occurs without restrictions on sex, age, or number provided that the population is not determined to be depleted. From 1980 to 2005, the total annual harvest for Alaska averaged 101 bears: 64 percent from the Chukchi Sea and 36 percent from the Beaufort Sea. Other sources of mortality related to human activities include bears killed during research activities, euthanasia of sick and/or injured bears, and defense of life kills by non-Natives (Brower et al. 2002). A management concern is the possible inadvertent over-harvest of the SB stock, particularly if they become increasingly nutritionally-stressed or populations decline due to the combination of the threats due to loss of sea ice, increased atmospheric and oceanic transport of contaminants into the region, increases in both expanse and duration of open water in summer and fall; human activities, including hydrocarbon exploration and development within the near-shore environment.

Marine Vessel Traffic
Polar bears spend the majority of their time on pack ice during the open-water season, which limits their interaction with fishing vessels and barge traffic. However, polar bears are known to run from sources of noise and the sight of vessels. The effects of fleeing may be minimal if the event is short and the animal is otherwise unstressed, but a short run on a warm spring or summer day could overheat a polar bear. If predictions for the decrease in the temporal and seasonal extent of the sea ice are realized, more vessels may transit the area encountering polar bears more frequently. Researchers have observed bears may swim long distances during the open water period seeking either ice or land. With diminished ice, swimming bears may become vulnerable to exhaustion and storms because ice floes are dissipating and unavailable or unsuitable for use as haul outs or resting platforms.

Walrus
Like polar bears the most significant source of walrus mortality occurs from hunting. Other potential impacts to walrus are disturbance from human activities and vessel traffic. However, although Pacific walruses can occur in the Beaufort Sea, they do so in extremely very low numbers. Therefore, the cumulative effects of these impacts to the walrus population are very low.

Polar Bear Critical Habitat
While other activities, Federal and non-Federal, may diminish the quality of polar bear critical habitat, the primary factor affecting its status is loss of the sea ice critical habitat unit from climate change.

Human activities such as hunting, scientific research, aircraft and ship movements may create disturbance between den sites and the coast (e.g., disturbance from ice roads), and may temporarily degrade the ability of barrier island habitat from being a refuge from human disturbance. However, these activities are usually infrequent and are of a short duration and are not expected to result in significant cumulative effects.

Summary of Cumulative Effects

Hunting pressure, loss of sea ice and climate change**,** and the expansion of commercial activities have potential to impact polar bears, walrus, and polar bear critical habitat. Combined, these factors could present challenges to future conservation and management efforts. The success of future management efforts 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 need to be continually evaluated through monitoring programs.

8. Conclusion

Regulations (50 CFR 402) that implement section 7(a)(2) of the ESA define "jeopardize the continued existence of" as to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species. For the issuance of incidental take regulations under the section 101(a)(5)(A) of the MMPA, the Service must (1) find, based on the best scientific evidence available, that the total take for the specified time period will have a negligible impact (i.e., an impact 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) on the species or stock and will not have an unmitigable adverse impact on the availability of the species or stock for subsistence uses; (2) prescribe regulations setting forth permissible methods of taking and other means of effecting the least practicable adverse impact on the species and its habitat and on the availability of the species for subsistence uses, and (3) prescribe regulations pertaining to the monitoring and reporting of such taking (50 CFR 18.27(b)). In making such determinations, the Service must consider information regarding the effects of the activity on the species as described in implementing regulations for section 101(a)(5) of the MMPA (50 CFR 18.27(d)) as well as conduct a NEPA analysis that results in a similar evaluation to that required for making the "jeopardy/no jeopardy" call under section 7 of the ESA.

An analysis of whether an action is likely to jeopardize the continued existence of listed species under the ESA differs from an assessment of whether the action is likely to have no more than a "negligible effect" on the species *or stock* under the MMPA. The jeopardy analysis also requires a determination of whether the direct and indirect effects resulting from the proposed Action, as well as cumulative effects and the effects of interrelated and interdependent actions, in light of the environmental baseline and status of the species, are likely to jeopardize the continued existence of Pacific walrus and polar bears. However, the negligible effect determination only considers "impact[s] resulting from the specified activity."

With regard to the polar bear, the portion of the population evaluated for a jeopardy determination is the range-wide population, as the species is listed as threatened throughout its entire range. For the negligible impact determination, however, only those stocks which are potentially affected by the proposed Regulations are evaluated (i.e., Southern Beaufort Sea stock). Therefore, while the jeopardy analysis considers additional factors in its analysis, it is reasonable to expect that an action independently evaluated under the MMPA for the polar bear would be determined to have more than a negligible impact before, and in some cases well before, a jeopardy conclusion would be reached under the ESA. However, for the Pacific walrus, the evaluation under the ESA and MMPA are both made at the level of the same portion of the population - namely, the rangewide species.

Polar Bear

As described in the effects of the Action section of this BO, the proposed Action may adversely affect polar bears. The most significant potential effect to denning bears is disturbance. However, the potential for these impacts to occur is significantly reduced as Industry will implement the requirements of LOAs issued under the proposed Regulations, which require that activities do not occur within 1 mile of a known polar bear den. Occasionally (<1 / year average from 2002 – 2010) an unknown den maybe discovered. In these cases under the terms of the LOAs mitigation measures will be immediately put in place to prevent any further disturbance of the mother / cubs. These requirements significantly reduce the potential adverse effects to denning polar bears of Industry activities in the Action Area.

Non-denning bears may also be adversely affected by Industry activities such that they change their behavior and move away from the source of disturbance, or perhaps are attracted to it which may in turn lead to the bear being hazed. Again these effects are relatively minor, with no lethal take anticipated, and will be minimized by implementation of the requirements of the LOAs.

Small spills of oil or chemicals to marine waters may occur. Given disturbance and hazing that would be implemented during spill response, the small size of the area that could be affected these effects would be limited to low numbers of polar bears. A large oil spill to marine waters could adversely affect tens of bears in the Action Area, however, it cannot be said to be reasonably certain to occur. Further, even though this would be a significant impact, this level of take would not jeopardize the continued existence of the species which is listed globally and has an estimated population of 20,000 – 25,000 individuals.

After reviewing the current status of the polar bear; the environmental baseline for the Action Area, the effects of the Action; documented impacts of industry activities on the species; data provided by monitoring programs in the Beaufort and Chukchi seas since the first regulations in 1993, and the cumulative effects, it is the Service's biological opinion that the proposed action is not likely to jeopardize the continued existence of the polar bear.

Pacific Walrus

As detailed in the *Effects of the Action* section of this BO noise disturbance, vessel and aircraft traffic may result in minor, temporary changes in the behavior of a few walrus. Marine-based seismic surveys could also result in very low numbers walrus becoming separated from their group or other behavioral changes. Small spills of oil are likely to occur although given the low

density of walrus in the Action Area and disturbance from the resulting spill response it is very unlikely walrus would be oiled. A large spill to marine waters is not reasonably certain to occur. However, were such an event to take place adverse effects to walrus would be limited because of the scarcity of walrus in the Action Area.

While the proposed Action may adversely affect walrus these severity of these effects is limited because very few walrus occur in the Action Area, because potential impacts will be avoided or minimized through Industries implementation of the requirements of the LOAs issued under the Regulations.

In addition, the proposed Regulations, while allowing a "small number" of walrus (up to 10 annually) to be incidentally taken by harassment, provide a mechanism requiring that mitigating measures are implemented, monitored, and reported on annually. Thus, the Regulations are expected to contribute to the collection of additional information that will aid in developing and/or further refining mitigating measures for future industry activities.

Because so few walrus are expected in the Action Area and the effects of any walruses that may be impacted are expected to be minor, and no lethal take is anticipated. We believe the proposed Action, when considered within the context of the environmental baseline, and cumulative effects, and given the estimated range wide population of 129,000 walrus, is not likely to appreciably reduce the likelihood of survival and recovery of the Pacific walrus, and therefore are not likely to jeopardize its continued existence.

Polar Bear Critical Habitat

Although Industry activities may adversely affect primary constituent elements within a portion of polar bear critical habitat in the Action Area via new development or ice breaking activities, these activities will be limited to a very small proportion of the extensive critical habitat and will not affect the ability of the remaining critical habitat to support polar bears. While disturbance within polar bear critical habitat may prevent some polar bears from using small portions of critical habitat for essential life functions either temporarily (e.g., disturbance caused by land vehicles) or persistently (e.g., disturbance at permanent facilities adjacent to critical habitat), polar bears will still be able to carry out essential life function in the remaining areas of critical habitat. Thus, the three critical habitat units will still be able to provide their intended function and conservation role. In conclusion, after considering the indirect and direct effects of the Action, the cumulative effects identified, as well as the effects of interrelated and interdependent actions, when considered in conjunction with the environmental baseline the Service believes the proposed Action is not likely to destroy or adversely modify critical habitat.

9. Administration of the Programmatic Biological Opinion

This BO considers the effects to polar bear, Pacific walrus, and polar bear critical habitat of the Service's proposed action (Action), in connection with proposed incidental take regulations (Regulations) for oil and gas exploration, development, and production activities in the Beaufort Sea and adjacent northern coast of Alaska.

The BO concluded that the sum total of these activities, when considered along with the environmental baseline, status of the species and critical habitat, and cumulative effects would not jeopardize the continued existence of the species or adversely modify critical habitat. In part, this conclusion relies on the determination that the activities that may be authorized under the Regulations would only result in negligible impacts to small numbers of marine mammals (annually 10 and 150 takes of Pacific walrus and polar bears, respectively). The analysis in this BO projects the total amount of take expected from the proposed Action based on the best available information. However, consistent with ESA and regulations at 50 CFR §402.14(i), incidental take statements for marine mammals are not included in formal consultations until regulations, authorizations, or permits under section 101(a)(5) of the MMPA are in effect Accordingly, the Service defers authorizing incidental take until an LOA authorizing take under the MMPA is issued.

Upon receipt of a request for an LOA MMM will:

- Determine whether the request falls within the parameters established in the proposed Action.
  - If no, additional evaluation is necessary to determine if LOA/ITS mitigation measures will be sufficient to bring the request within the parameters of the proposed Action.
    - If additional measures are not sufficient and/or cannot be implemented by the applicant, a separate consultation may be required.
- For requests that fall within the parameters of the proposed Action, MMM will issue a combined LOA/ITS that will provide incidental take coverage under both Acts (see Appendix 3). Issuance of the LOA/ITS concludes ESA consultation for that action.
- Each LOA will require applicants to report take of polar bears to the Service. The report will cover required compliance with the Acts' requirement to monitor take.

While the incidental take statement in this document is technically provided to the Service's MMM and the LOA applicant, we anticipate that other Federal agencies involved in permitting the exploration actions covered by the Regulations will also seek to fulfill their section 7 responsibilities by seeking consultation with the Service. So long as the activities covered by such consultations comply with the Regulations, we would expect these consultations to be completed by linking to this intra-Service biological opinion.

10. Incidental Take Statement

Pacific Walrus and Polar Bear

Pursuant to section 101(a)(5) of the MMPA, and as amended in 2007, and implementing regulation at 50 CFR §18.27, and 50 CFR Section 216 and §229, the following measures are required to be consistent with the total taking allowable under the MMPA authorization and to effect the least practical adverse impact on the species and its habitat and on the availability of the species for subsistence uses:

Mitigation, monitoring and reporting measures are required by the Service for each LOA issued under Regulations. Accordingly, the following will also be required under the Regulations):

(a) Holders of LOAs must cooperate with the Service and other designated Federal, State, and local agencies to monitor the impacts of oil and gas exploration, development, and production activities on polar bears and Pacific walruses.

(b) Holders of LOAs must designate a qualified individual or individuals to observe, record, and report on the effects of their activities on polar bear and Pacific walrus.

(c) Holders of LOAs must have an approved polar bear and/or walrus interaction plan on file with the Service and on site, and certain personnel will be required to conduct polar bear awareness training. Interaction plans must include:
    (1) The type of activity and, where and when the activity will occur, i.e., a plan of operation;
    (2) A food and waste management plan;
    (3) Personnel training materials and procedures;
    (4) Site at-risk locations and situations;
    (5) Bear and walrus, when relevant, observation and reporting procedures; and
    (6) Bear and walrus, when relevant, avoidance and encounter procedures.

(d) All applicants for an LOA must contact affected subsistence communities to discuss potential conflicts caused by location, timing, and methods of proposed operations and submit to the Service a record of communication that documents these discussions. If appropriate, the applicant for an LOA must also submit a Plan of Cooperation that ensures that activities will not interfere with subsistence hunting and that adverse effects on the availability of polar bear or Pacific walrus will be minimized.

(e) If deemed appropriate by the Service, holders of an LOA will be required to hire and train polar bear monitors to alert crews of the presence of polar bears and initiate adaptive mitigation responses.

(f) Mitigation measures that may be required on a case-by-case basis include:
    (1) The use of trained marine mammal monitors associated with marine activities. The Service may require a monitor on the site of the activity or on board drill ships, drill rigs, aircraft, icebreakers, or other support vessels or vehicles to monitor the impacts of Industry's activity on polar bear and Pacific walrus.
    (2) The use of den habitat map developed by the USGS. A map of potential coastal polar bear denning habitat can be found at: http://alaska.usgs.gov/science/biology/polar_bears/pubs.html. This measure ensures that the location of potential polar bear dens is considered when conducting activities in the coastal areas of the Beaufort Sea.
    (3) The use of Forward Looking Infrared (FLIR) imagery, polar bear scent-trained dogs, or both to determine the presence or absence of polar bear dens in area of the activity.
    (4) Restricting the timing of the activity to limit disturbance around dens.
    (5) Requiring a 1-mile exclusion buffer surrounding known dens. If known occupied dens are located within an operator's area of activity, the Service will require a 1-mile exclusion buffer around the den to limit disturbance or require that the

operator conduct activities after the female bears emerge from their dens. The Service will review these requirements for extenuating circumstances on a case-by-case basis.

(g) For exploratory and development activities, holders of a LOA must submit a report to our Alaska Regional Director (Attn: Marine Mammals Management Office) within 90 days after completion of activities. For production activities, holders of a LOA must submit a report to our Alaska Regional Director (Attn: Marine Mammals Management Office) by January 15 for the preceding year's activities. Reports must include, at a minimum, the following information:
    (1) Dates and times of activity;
    (2) Dates and locations of polar bear or Pacific walrus activity as related to the monitoring activity; and
    (3) Results of the monitoring activities required under subsection (g) of this section, including an estimated level of take.

(h) Monitoring requirements include, but are not limited to:
    (1) For all activities, all sightings of polar bears and walrus must be recorded. Information within the sighting report will include, but is not limited to:
        a) Date, time, and location of observation;
        b) Number of bears: sex and age;
        c) Observer name and contact information;
        d) Weather, visibility, and ice conditions at the time of observation;
        e) Estimated closest point of approach for bears from personnel and facilities;
        f) Industry activity at time of sighting, possible attractants present;
        g) Bear behavior;
        h) Description of the encounter;
        i) Duration of the encounter; and
        j) Actions taken.

Other proposed mitigation, monitoring, and reporting requirements are explained on pages 13490 to 13493 of the Proposed Rule (76 FR 13454).

Take authorized via intentional harassment LOAs will be permitted as needed under separate authority (101(a)(4)(A), 109(h), and 112(c) of the MMPA). Under the ESA, take cannot be authorized until it is authorized under the MMPA; therefore, we are not including an incidental take statement for take resulting from intentional take LOAs.

11. Reasonable and Prudent Measures

Pacific Walrus and Polar Bear

Pursuant to §7(b)(4) of the ESA, the following reasonable and prudent measures are necessary and appropriate to minimize take:

1. Reduce adverse impacts to polar bears and walrus from oil and gas exploration, development, and production activities by incorporating all standard mitigation measures identified in the proposed Action, as clarified in the proposed Regulations, and all site/project specific mitigation measures included in individual LOAs.
2. Ensure that no further LOAs are issued when total take approaches 150 polar bears and 10 Pacific walrus annually.

The measures described below are non-discretionary, and will be binding conditions of any permit issued to an LOA applicant for the exemption in section 7(o)(2) of the ESA to apply. MMM will regulate the activity covered by this incidental take statement to ensure the LOA holders adhere to the terms and conditions of the ITS through enforceable terms that are added to the permit or grant document, so that the protective coverage of section 7(o)(2) does not lapse. In order to monitor the impact of incidental take, the MMM will provide annual monitoring reports to the FFWFO as specified in the ITS. [50 CFR 402.14(i)(3)]

In the accompanying BO, the Service determined that total take anticipated as a result of the issuance of the proposed Action under section 101(a)(5)(A) of the MMPA is not likely to result in jeopardy to the polar bear. No lethal take is anticipated.

The Service anticipates that mitigating measures required by the proposed Action, as set forth in the proposed Regulations and included in site-specific LOAs will minimize potential adverse impacts of oil and gas activities on polar bears. The Service does not identify additional necessary measures to reduce impacts under the ESA because all identified measures to mitigate impacts are included in the Regulations or will be required in LOAs. Therefore, the following Reasonable and Prudent Measures and their implementing terms and conditions require compliance with mitigating measures provided through the Regulations and LOA process.

12. Terms and Conditions

Polar Bear and Pacific Walrus

In order to be exempt from the prohibitions of section 9 of the ESA, the MMM must comply with the following terms and conditions, which implement the reasonable and prudent measure described above and outline required reporting/monitoring requirements. These terms and conditions are non-discretionary.

1. MMM will require the implementation of appropriate mitigation measures by applicants to minimize impacts to Pacific walrus and polar bears through the Regulations and project-specific LOAs.
2. LOA monitoring reports will be provided to the MMM per stipulations in the LOA by the industry operator. Reports shall include, but not be limited to, (1) the amount of take anticipated and type of take authorized in each LOA/ITS for Pacific walrus and polar bears, (2) the amount and type of take that actually occurs for Pacific walrus and polar bears, and (3) other polar bear and Pacific walrus observations that did not result in take.

3. MMM will review cumulative incidental take periodically within the year (e.g., quarterly) from industry reports so to ensure total take does not exceed 150 polar bears or 10 Pacific walrus annually.

As lethal take is not anticipated, specific procedures for handling or disposing of carcasses (50 CFR 402.14(i)(1)(v)), are not necessary.

13. Conservation Recommendations

Section 7(a)(1) of the ESA directs Federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. The Service has the following conservation recommendation for this action.

- The status of Pacific walrus and polar bears needs to be monitored throughout the duration of these Regulations. The Service has particular concern about the response of Pacific walrus and polar bears, at the individual and population levels, to the quickly changing environmental conditions in the action area of the Beaufort Sea and coastal northern Alaska. It recommends the Service and its agents in this action (permitting agencies and industry) promote collection of baseline data to help increase understanding of how the effects of climate change will affect polar bears inhabiting Alaska. For example, ongoing studies include those led by the USGS Alaska Science Center, in cooperation with the Service, to examine Pacific walrus and polar bear habitat use, reproduction, and survival relative to a changing sea-ice environment. Specific objectives are to evaluate polar bear habitat availability and quality as influenced by ongoing climate changes and response by polar bears; effects of changes in sea-ice environment on condition of adults, numbers and sizes of offspring, and survival of offspring to weaning (recruitment); and population structure.

- For new construction, MMM should advise industry on ways to minimize impacts on Pacific walruses, polar bears, and polar bear critical habitat.

14. Reporting Requirements

MMM will provide the FFWFO with an annual report containing the location (e.g., facility) where incidental takes occurred with demographic information (e.g., sex and age of bears) and a brief description of the Industry activity that caused the take and the reaction of the bear(s). Please also summarize the total number of takes for that year.

15. Re-initiation Notice

This concludes formal consultation on effects to polar bears on the proposed Action. As provided in 50 C.F.R. 402.16, re-initiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if

(1) The amount or extent of annual incidental take is exceeded;
(2) New information reveals effects of the action agency that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion;
(3) The agency action is subsequently modified in a manner that causes an effect to listed or critical habitat not considered in this opinion; and/or
(4) A new species is listed or critical habitat designated that may be affected by the action.

Thank you for your cooperation in the development of this biological and conference opinion. If you have any comments or require additional information, please contact Ted Swem, Endangered Species Branch Chief, Fairbanks Fish and Wildlife Field Office, 101 12th Ave., Fairbanks, AK, 99701, Telephone: 907/456-0441.

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Appendix 1: Summary of Conference/Consultation Activities

10/22/2010 – MMM sends FFWFO an early rough draft of proposed Beaufort Sea Incidental Take Regulations (Regulations).

12/07/2011 – Final Rule for designated polar bear critical habitat is published in Federal Register, making consultation for effects of Regulations necessary.

02/10/2011 – Pacific walrus finding of "warranted but precluded" is published in the Federal Register, which makes this species a candidate; therefore, the Service must conference on effects of the Regulations on this species.

3/11/2011 – Proposed Beaufort Sea Incidental Take Regulations are published in the Federal Register.

5/10/2011 – FFWFO receives draft Biological Assessment form from MMM.

05/23/2011 – Conference call with WO, RO, MMM, and FFWFO regarding the Regulations to clarify oil spill risk analysis and "small numbers" (150 polar bears, 10 walrus) in proposed Regulations.

05/24/2011 – FFWFO sends additional questions to MMM to request additional information for the BO

06/03/2011 – FFWFO receives additional information from MMM for the BO

06/07/2011 to 06/13/2011 – FFWFO and MMM speak in person (at a polar bear diversionary feeding workshop in Anchorage), over the phone, and via email to clarify final details in the Regulations and information needed for the BO.6/13/2011 – Conference call with FFWFO, MMM, RO and the Solicitors to finalize timeline for BO. FFWFO receives final Regulations being reviewed in WO from MMM.

06/27/2011– Draft BO sent to MMM and Solicitors for review.

Appendix 2: LOA/ITS Content

The LOA Cover Letter will include these statements:

> Per the Programmatic Biological Opinion for the Beaufort Sea Incidental Take Regulations for Polar Bear, Pacific Walrus, and Polar Bear Critical Habitat (July 2011), issuance of this LOA also completes consultation for polar bears, Pacific walrus, and polar bear critical habitat pursuant to section 7 of the Endangered Species Act (ESA) of 1973, as amended. This LOA also serves as an "Incidental Take Statement" (ITS), which is required by the ESA in order for incidental take to be authorized.

The following statement should be included in the body of the LOA for the incidental take statement (as applicable for species/critical habitat present):

In the Programmatic Biological Opinion for Polar Bears, Pacific Walrus, and Polar Bear Critical Habitat on Beaufort Sea Incidental Take Regulations (July 2011), the Service determined the total incidental take anticipated as a result of the issuance of the Regulations is not likely to result in jeopardy to the polar bear or Pacific walrus, and will not adversely modify polar bear critical habitat. In order for an incidental take statement (ITS) to be provided: (1) the proposed activity must provide the required information, as described in the §18.124 of the Regulations, (2) the LOA includes mitigation measures appropriate for the specific activity and location, as described in §18.128 of the Regulations, and (3) that the incidental take for the specific activity will be consistent with the negligible impact finding for the total take allowed under the regulations.

We (MMM) have determined that the proposed action meet these three requirements. Therefore, issuance of this LOA also completes ESA requirements for authorization of incidental take of the polar bear. Compliance with the terms and conditions of the above LOA insures that the LOA holder is also in compliance with the ESA.

Documentation of Take
A requirement of each LOA is to provide observational data of polar bears throughout the project and a complete report of all observations at the conclusion of the project. This final report will be provided to the MMM. This report meets the tracking and reporting requirements relative to the documentation of take as required by the MMPA and the ESA.

Appendix 3. Large Oil Spill Analysis

From: Marine Mammals: Incidental Take During Specified Activities (Final Rule; sent to FFWFO 06/10/2011)

Oil Spill Assessment of Risks of Potential Impacts to Polar Bears from a Large Oil Spill in the Beaufort Sea

Potential adverse impacts to polar bears and Pacific walruses from a large oil spill as a result of industrial activities in the Beaufort Sea are a major concern. As part of the incidental take regulatory process the Service evaluates potential impacts of oil spills within the regulation area, even though the MMPA does not authorize the incidental take of marine mammals as the result of illegal actions, such as oil spills. Moreover any event that results in a lethal outcome to a marine mammal is not authorized under this rule.

In this section, we assess qualitatively the likelihood polar bears may be oiled by a large oil spill. We considered: 1) the probability of a large oil spill occurring in the Beaufort Sea; 2) the probability of that oil spill impacting nearshore coastal polar bear habitat; 3) the probability of polar bears being in the area and coming into contact with that large oil spill; and 4) the number of polar bears that could potentially be impacted by the spill. The majority of the information in this evaluation is qualitative; however, it is clear that the probability of all of these events occurring sequentially in a manner that impacts polar bears in the Beaufort Sea is low.

The analysis was based on polar bear distribution and habitat use using four sources of information that when combined, allowed the Service to make conclusions on the risk of oil spills to polar bears. This information included: 1) the description of existing offshore oil and gas production facilities and focused on information pertinent to an oil spill originating from

those facilities; 2) the Bureau of Ocean Energy Management, Regulation and Enforcement (BOEMRE) Oil-Spill Risk Analysis (OSRA) for the Beaufort Sea Outer Continental Shelf (OCS), which allowed us to qualitatively analyze the risk to polar bears and their habitat, from a marine oil spill; 3) the most recent polar bear risk assessment from the previous ITRs; and 4) polar bear distribution information from Service-supported polar bear aerial coastal surveys from 2000 to present. When taken separately this information tells only a part of the story, but with this assessment we combine pertinent information from these multiple sources and create a qualitative assessment of the potential impacts to polar bears from a large oil spill.

There is increasing interest in developing offshore oil and gas reserves in the U.S. Beaufort and Chukchi seas, where the estimate of recoverable oil is up to approximately 19 billion barrels (BOEMRE 2010a). Development of offshore production facilities with supporting pipelines increases the potential for large offshore spills. The probability of a large oil spill from an offshore oil and gas facility and the risk to polar bears is a scenario that has been considered in previous regulations (71 FR 43926). With the limited background information available regarding the effects of large oil spills on polar bears in the marine Arctic environment, the impact of a large oil spill is uncertain. As far as is known, polar bears have not been affected by oil spilled as a result of North Slope industrial activities to date.

As previously noted, walruses are rare in the Beaufort Sea. Therefore, they are unlikely to encounter oil spills there, and were not considered in this analysis. Only polar bears were considered for this analysis. In order to effectively evaluate how a large oil spill may affect polar bears, we considered the following factors in developing our oil spill assessment for polar bears:

1. the origin (location) of a large spill;
2. the volume of a spill;
3. oil viscosity;
4. accessibility to spill site;
5. spill trajectory;
6. time of year;
7. weather conditions (i.e., wind, temperature, precipitation);
8. environmental conditions (i.e., presence and thickness of ice);
9. number, age, and sex of polar bears that are (or likely to be) affected;
10. degree of contact;
11. importance of affected habitat; and
12. mitigation measures to prevent bears from encountering spilled oil.

The oil-spill scenario for this analysis considers the potential impacts from large oil spills resulting from oil production at the four developments described above. We define large oil spills as greater than or equal to 1,000 barrels. Estimating a large oil-spill occurrence is accomplished by examining a wide variety of probabilities. Uncertainty exists regarding the location, number, and size of a large oil spill and the wind, ice, and current conditions at the time of a spill, but we have made every effort to identify the most likely spill scenarios and sources of risk to polar bears.

In order to analyze oil spill impacts to polar bears from the offshore sites, we incorporated both quantitative and anecdotal information. The quantitative assessment of oil spill risk for the current request for incidental take regulations considered: (1) conditional oil spill probabilities

from offshore production sites, reflected primarily in BOEMRE's OSRA; and (2) oil spill trajectory models, and their relation to a polar bear distribution model. Conditional probabilities analysis assumes that a large spill has occurred and that no clean up takes place. The probability of a spill occurring would be different for each site depending upon oil type, depth, oil flow rates, etc. The analysis included information from the BOEMRE OSRA in regards to polar bear ERAs and LSs, reviewed previous risk assessment information of polar bears in prior ITRs, and analyzed polar bear distribution using the Service's coastal survey data for 2000 to present.

BOEMRE Oil Spill Risk Analysis

> Because the BOEMRE OSRA provides the most current and rigorous treatment of potential oil spills in the Beaufort Sea, our analysis of potential oil spill impacts applied the BOEMRE's most recent OSRA (MMS 2008a) to help analyze potential impacts of a large oil spill originating in the OCS to polar bears. The OSRA is a computer model that analyzes how and where large offshore spills will likely move (Smith et al. 1982). To estimate the likely trajectory of large oil spills, the OSRA model used information about the physical environment, including data on wind, sea ice, and currents. As a conditional model the OSRA is a hypothetical analysis of an oil spill. It is important to note that the OSRA assumes that a spill has occurred; it does not analyze the likelihood of an oil spill event.

The BOEMRE OSRA model was developed for the Federal offshore waters and does not include analysis of oil spills in the State of Alaska – controlled, nearshore waters. Northstar, Oooguruk, Nikaitchuq, and the Endicott/Liberty complex are located in nearshore, state waters. Northstar has one Federal well and Liberty is a Federal reservoir developed from state lands. Although the OSRA can not calculate trajectories of oil spills originating from specific locations in the nearshore area, it can be used to help examine how habitat may be affected by a spill should one originate in the OCS. We can then compare the location of the affected habitat to habitat use by bears.

Large Spill Size and Source Assumptions

> As stated in Appendix A of the Arctic Multi-sale DEIS (MMS 2008b), large spills are those spills of 1,000 barrels (bbl) or more and are assumed to persist on the water long enough to allow a trajectory analysis. Persistence depends upon weather, weight of oil, success of clean up, etc. The model predicted where the oil trajectory would go if the oil persisted as a slick at a particular time of year. Spills smaller than 1000 bbl would not be expected to persist on the water long enough to warrant a trajectory analysis. For this reason, we only analyzed the effects of a large oil spill. Although no large spills from oil and gas activities have occurred on the Alaska OCS to date, the large spill-size assumptions used by BOEMRE were based on the reported spills from oil exploration and production in the Gulf of Mexico and Pacific OCS regions. BOEMRE used the median spill size in the Gulf of Mexico and Pacific OCS from 1985-1999 as the likely large spill size for analysis purposes. The median size of a large crude oil spill from a pipeline from 1985-1999 on the U.S. OCS was 4,600 bbl, and the average was 6,700 bbl (Anderson and LaBelle 2000). The median large spill size for a platform on the OCS over the entire record from 1964-1999 is 1,500 bbl, and the average is 3,300 bbl (Anderson and LaBelle 2000).

In addition, in their analysis the BOEMRE estimated that large spills are more likely to occur during development and production than during exploration in the Arctic (MMS 2008a). Furthermore, the OSRA estimated that the statistical mean number of large spills is less than one over the 20 year life of past, present and reasonably foreseeable developments in the Beaufort Sea (MMS 2008, Table 4.3.2-1). Our oil spill assessment during a five-year regulatory period was predicated on the same assumptions.

BOEMRE still considers large oil spill estimates for the DEIS of the Beaufort Sea and Chukchi Sea Planning Areas to be valid despite Deepwater Horizon oil spill event in the summer of 2010. The specifics of the Deepwater Horizon incident are still under investigation. However, geologic and other conditions in the Arctic OCS are substantially different from those in the Gulf of Mexico, including much shallower well depth and the resulting lower pressures, such that BOEMRE currently does not believe that the Deepwater horizon incident serves as a predicate for the likelihood or magnitude of a very large oil spill event in the Beaufort Sea. Currently,

BOEMRE is working on a very large spill estimates for the Arctic OCS in regards to new methodology developed for, "Notice to Lessees (NTL) 2010-06." However, considering the low number of exploratory wells that have occurred in the Beaufort Sea OCS (31 wells since 1982 [BOEMRE 2010b]), the low rate of exploratory drilling blowouts per well drilled, and the low rate of well control incidents that spill fluids, it is reasonable to conclude that the chance of a large spill occurring during OCS exploration drilling in the Beaufort is very small. In addition, it is important to note that Industry does not plan to conduct drilling operations at more than three exploration sites in the Beaufort Sea OCS for the duration of the 5-year regulatory period.

Between 1971 and 2007, OCS operators have produced almost 15 billion barrels (Bbbl) of oil in the U.S. During this period, there were 2,645 spills that totaled approximately 164,100 barrels spilled (equal to 0.001 percent of barrels produced), or about 1 bbl spilled for every 91,400 bbl produced. Between 1993 and 2007, the most recent 15-year period analyzed, almost 7.5 Bbbl of oil were produced. During this period, there were 651 spills that totaled approximately 47,800 bbl spilled (equal to 0.0006 percent of barrels produced), or approximately 1 bbl spilled for every 156,900 bbl produced. These numbers will be updated once the government adopts a final determination of the volume from the Deepwater Horizon.

Within the duration of the previous ITRs, two large onshore terrestrial oil spills occurred as a result of pipeline failures. In the spring of 2006, approximately 6,200 barrels of crude oil spilled from a corroded pipeline operated by BP Exploration (Alaska). The spill impacted approximately 2 acres (8,100 square meters). In November 2009, a spill of approximately 1,150 barrels occurred from a "common line" carrying oil, water, and natural gas operated by BP

occurred as well, impacting approximately 8,400 square feet (780 square meters). Neither spill was known to impact polar bears, in part due to the locations: both sites were within or near industrial facilities not frequented by bears; and timing: polar bears are not typically observed in the affected areas during the time of the spills and subsequent clean-up.

Trajectory Estimates of a Large Offshore Oil Spill

Although it is reasonable to conclude that the chance of one or more large spills occurring during the period of these regulations on the Alaskan OCS from production activities is low, for analysis purposes, we assume that a large spill does occur in order to evaluate potential impacts to polar bears. The BOEMRE OSRA model analyzes the likely paths of over two million simulated oil spills in relation to the shoreline and biological, physical, and socio-cultural resource areas specific to the Beaufort Sea, which are generically called environmental resource areas (ERAs) or land segments (LSs). The chance that a large oil spill will contact a specific ERA of concern within a given time of travel from a certain location (launch area or pipeline segment) is termed a *conditional probability*. Conditional probabilities assume that no clean up activities take place, and that there are no efforts to contain the spill. We used the BOEMRE OSRA analysis from the Arctic Multi-sale DEIS to estimate the conditional probabilities of a large spill contacting sensitive ERAs pertinent to polar bears.

Oil-Spill Persistence

How long an oil spill persists on water or on the shoreline can vary, depending upon the size of the oil spill, the environmental conditions at the time of the spill, and the substrate of the shoreline. In its large oil spill analysis, BOEMRE assumed 1,500-bbl and 4,600-bbl spills could last up to 30 days on the water as a coherent slick based on oil weathering properties, and dispersal data specific to North Slope crude oils. Therefore, we assumed that winter spills (October-June) could last up to 180 days as a coherent slick (i.e., if a coherent slick were to freeze into ice over winter, it would melt out as a slick in spring).

> We used three BOEMRE launch areas (LAs), LA 8, LA 10, LA 12 and three pipeline segments (PLs), PL 10, PL 11, and PL 12 from Appendix A of the Arctic Multi-sale DEIS (Map A.1-4) to represent the oil spills moving from hypothetical offshore areas. These LAs and PLs were selected because of their close proximity to current offshore facilities.

Oil-Spill-Trajectory Model Assumptions

For purposes of its oil spill trajectory simulation, BOEMRE made the following assumptions:

- All spills occur instantaneously;
- Large oil spills occur in the hypothetical launch areas or along the hypothetical pipeline segments noted above;
- Large spills do not weather for purposes of trajectory analysis. Weathering is calculated separately;
- The model does not simulate cleanup scenarios. The oil spill trajectories move as though no oil spill response action is taken; and
- Large oil spills stop when they contact the mainland coastline.

Analysis of the Conditional Probability Results

As noted above, the chance that a large oil spill will contact a specific ERA of concern within a given time of travel from a certain location (LA or PL) assuming a large spill occurs and that no clean up takes place is termed a *conditional probability*. From the DEIS, Appendix A, we chose ERAs and Land Segments (LSs) to represent areas of concern pertinent to polar bears (MMS 2008a). Those ERAs and LSs, and the conditional probabilities that a large oil spill originating from the launch areas or pipelines chosen are presented in Table 1. From Table 1 we noted the highest chance of contact and the range of chances of contact that could occur should a large spill occur from launch areas or pipeline segments.

Launch Area (Pipeline Segment)	Season of Spill (Duration of Spill)	ERA 55	ERA 92	ERA 93	ERA 94	ERA 95	ERA 96	ERA 100	LS 85	LS 97	LS 102	LS 107	LS 138	LS 144	LS 145
LA 08 (PL 10)	Summer (60 days)	5 (3)	5(8)	*(2)	*(*)	*(*)	1(3)	*(1)	2(1)	1(2)	*(*)	*(*)	*(1)	54(34)	*(*)
	Winter (180 days)	1(1)	2(3)	*(*)	*(*)	*(*)	*(1)	*(*)	2(4)	*(1)	*(*)	*(*)	1(2)	39(29)	*(1)
LA10 (PL 10)	Summer (60 days)	3(3)	11(8)	2(2)	*(*)	*(*)	4(3)	1(1)	1(1)	5(2)	*(*)	*(*)	2(1)	33(34)	*(*)
	Winter (180 days)	1(1)	2(3)	*(*)	*(*)	*(*)	1(1)	*(*)	3(4)	2(1)	*(*)	*(*)	2(2)	29(29)	1(1)
LA 12 (PL 11)	Summer (60 days)	*(2)	12(12)	7(3)	2(1)	1(*)	13(6)	3(2)	*(*)	7(6)	1(1)	1 (1)	9(3)	33(29)	1(*)
	Winter (180 days)	1(1)	11(8)	1(*)	1(*)	*(*)	12(2)	1(*)	3(3)	4(4)	*(*)	*(*)	3(2)	31(28)	2(1)
LA 12 (PL 12)	Summer (60 days)	*(*)	12(9)	7(7)	2(3)	1(1)	13(12)	3(5)	*(*)	7(5)	1(2)	1(3)	9(11)	33(32)	1(1)

Launch Area (Pipeline Segment)	Season of Spill (Duration of Spill)	ERA 55	ERA 92	ERA 93	ERA 94	ERA 95	ERA 96	ERA 100	LS 85	LS 97	LS 102	LS 107	LS 138	LS 144	LS 145
LA 08 (PL 10)	Summer (60 days)	5 (3)	5(8)	*(2)	*(*)	*(*)	1(3)	*(1)	2(1)	1(2)	*(*)	*(*)	*(1)	54(34)	*(*)
	Winter (180 days)	1(1)	2(3)	*(*)	*(*)	*(*)	*(1)	*(*)	2(4)	*(1)	*(*)	*(*)	1(2)	39(29)	*(1)
LA10 (PL 10)	Summer (60 days)	3(3)	11(8)	2(2)	*(*)	*(*)	4(3)	1(1)	1(1)	5(2)	*(*)	*(*)	2(1)	33(34)	*(*)
	Winter (180 days)	1(1)	2(3)	*(*)	*(*)	*(*)	1(1)	*(*)	3(4)	2(1)	*(*)	*(*)	2(2)	29(29)	1(1)
LA 12 (PL 11)	Summer (60 days)	*(2)	12(12)	7(3)	2(1)	1(*)	13(6)	3(2)	*(*)	7(6)	1(1)	1 (1)	9(3)	33(29)	1(*)
	Winter (180 days)	1(1)	11(8)	1(*)	1(*)	*(*)	12(2)	1(*)	3(3)	4(4)	*(*)	*(*)	3(2)	31(28)	2(1)
LA 12 (PL 12)	Summer (60 days)	*(*)	12(9)	7(7)	2(3)	1(1)	13(12)	3(5)	*(*)	7(5)	1(2)	1(3)	9(11)	33(32)	1(1)

Definitions of ERAs and LSs, from Tables A.1-13, A.1-20, and A.1-22 (MMS, 2008)

ERA 55: Point Barrow, Plover Islands (Aug – Nov)

ERA 92: Thetis, Jones, Cottle and Return Islands, West Dock (Jan-Dec)

ERA 93: Cross and No Name Island (Aug-Nov)

ERA 94: Maguire Islands, Flaxman Island, Barrier Islands (Jan-Dec)

ERA 95: Arey and Barter Islands and Bernard Spit(Aug-Nov)
ERA 96: Midway, Cross and Bartlett Islands (May-October)
ERA 100: Jago and Tapkaurak Spits (May-October)
Seasonal LS 85: Barrow, Browerville, Elson Lagoon (August-November)
LS 97: Beechey Point, Bertoncini, Bodfish, Cottle and, Jones Islands, Milne Point, Simpson Lagoon
LS 102: Flaxman Island, Maguire Islands, North Star Island, Point Hopson, Point Sweeney, Point Thomson, Staines River
LS 107: Bernard Harbor, Jago Lagoon, Kaktovik, Kaktovik Lagoon
Grouped LS 138: Arctic National Wildlife Refuge (Jan-Dec)
Grouped LS 144: United States Beaufort Coast (Jan-Dec)
Grouped LS 145: Canada Beaufort Coast (Jan-Dec)

Table 1. Conditional oil spill probabilities (percent) in regards to Environmental Resource Areas and Land Segments for LAs and PLs offshore of four oil and gas industry sites. Values in parentheses are for pipeline segments. * = Less than one-half percent.

Polar bears are most vulnerable to a large oil spill during the open water period when bears form aggregations on shore. In the Beaufort Sea these aggregations often form in the fall near subsistence-harvested bowhead whale carcasses. Specific aggregation areas include Point Barrow, Cross Island, and Kaktovik. In recent years, more than 60 polar bears have been observed feeding on whale carcasses just outside of Kaktovik, and in the autumn of 2002, NSB and Service biologists documented more than 100 polar bears in and around Barrow. In order for significant impacts to polar bears to occur, 1) a large oil spill would have to occur, 2) oil would have to contact an area where polar bears aggregate, and 3) the aggregation of polar bears would have to occur at same time as the spill. The risk of all three of these events occurring simultaneously is extremely low.

We identified polar bear aggregations in environmental resource areas and non-grouped land segments (ERA 55, 93, 95, 96, 100; LS 85, 107). Assuming a spill occurs during summer or winter the OSRA estimates the chance of contacting these aggregations is 13 percent or less (Table 1). The OSRA estimates LA12 has the highest chance of a large spill contacting ERA 96 (Midway, Cross, and Bartlett islands). Some polar bears will aggregate at these islands during August-October (three months). If a large oil spill occurred and contacted those aggregation sites outside of that timeframe of use by polar bears, potential impacts to polar bears would be reduced.

Coastal areas provide important denning habitat for polar bears, such as the Arctic National Wildlife Refuge (ANWR) and nearshore barrier islands exhibiting relief (containing tundra habitat) (Amstrup 1993, Amstrup and Gardner 1994, Durner et al. 2006, USFWS unpubl. data). Considering that 65 percent of confirmed terrestrial dens found in Alaska from 1981–2005 were on

coastal or island bluffs (Durner et al. 2006), oiling of such habitats could have negative effects on polar bears, although the specific nature and ramifications of such effects are unknown.

Assuming a large oil spill occurs, and extrapolating the OSRA estimates to tundra relief barrier islands (ERA 92, 93, and 94, LS 97 and 102); these areas have up to a 12 percent chance of a large spill contacting them (range: less than 0.5 percent to 12 percent) from LA12 (Table 1). The OSRA estimates suggest that there was an 11 percent chance that oil would contact the coastline of the ANWR (LS 138). The Kaktovik area (ERA 95 and 100, LS 107) has up to a 5 percent chance of spill contact, assuming spills occur during the summer season and contact the coastline within 60 days. The chance of a spill contacting the coast near Barrow (ERA 55, LS 85) would be as high as 5 percent (Table 1).

All barrier islands are important resting and travel corridors for polar bears; larger barrier islands that contain tundra relief are also important denning habitat. Tundra-bearing barrier islands within the geographic region and near oil field development are the Jones Island group of Pingok, Bertoncini, Bodfish, Cottle, Howe, Foggy, Tigvariak, and Flaxman islands. In addition, Cross Island has gravel relief and polar bears have denned on it. The Jones Island group is located in ERA 92 and LS 97. If a spill were to originate from a LA 8 pipeline segment during the summer months, the probability that this spill would contact these land segments could be as great as 8 percent.. The probability that a spill from LA10 would contact the Jones Island group would range from one percent to as high as 11 percent. Likewise, for LA 12, PL 11 and the LA 12, PL 12 the range would be from 4 percent to as high as 12 percent and from 3 percent to as high as 12 percent, respectively.

Risk Assessment from Prior Incidental Take Regulations (ITRs)

In previous ITRs, we used a risk assessment method that considered oil spill probability estimates for two sites (Northstar and Liberty), oil spill trajectory models, and a polar bear distribution model based on location of satellite-collared females during September and October (68 FR 66744 and 71 FR 43926). To support the analysis for this action, we reviewed the previous analysis and used the data to compare the potential effects of a large oil spill in a nearshore production facility (less than 5 miles), such as Liberty, and a facility located further offshore, such as Northstar (greater than 5 miles). Although Liberty was originally designed as an offshore production island, it is currently being developed as a production facility connected to the mainland by a causeway using ultra-extended reach technology to drill directionally into the oil prospect. Even though the risk assessment of 2006 did not specifically model spills from the Oooguruk or Nikaitchuq sites, we believed it was reasonable to assume that the analysis for Liberty, and indirectly Northstar, adequately reflected the potential impacts likely to occur from an oil spill at either of these additional locations due to the similarity in the nearshore locations.

Methodology of Prior Risk Assessment

The first step in the risk assessment analysis was to examine oil spill probabilities at offshore production sites for the summer (July-October) and winter (November-June) seasons based on information developed for the original Northstar and Liberty EISs. We assumed that one large spill occurred during the five-year period covered by the regulations. A detailed description of the

methodology can be found at 71 FR 43926. The second step in the risk assessment was to estimate the number of polar bears that could be impacted by a large spill. All modeled polar bear grid cell locations that were intersected by one or more cells of a rasterized spillet path (a modeled group of hundreds of oil particles forming a trajectory and pushed by winds and currents and impeded by ice) were considered 'oiled' by a spill. For purposes of the analysis, if a bear contacted oil, it was assumed to be a lethal contact. This involved estimating the distribution of bears that could be in the area and overlapping polar bear distributions and seasonal aggregations with oil spill trajectories. The trajectories previously calculated for Northstar and Liberty sites were used. The trajectories for Northstar and Liberty were provided by the BOEMRE and reported in Amstrup et al. (2006). BOEMRE estimated probable sizes of oil spills from a pinhole leak to a rupture in the transportation pipeline. These spill sizes ranged from a minimum of 125 to a catastrophic release event of 5,912 barrels. Researchers set the size of the modeled spill at the scenario of 5,912 barrels, caused by a pinhole or small leak for 60 days under ice without detection.

The second component incorporated polar bear densities overlapped with the oil spill trajectories. To accomplish this, in 2004, USGS completed an analysis investigating the potential effects of hypothetical oil spills on polar bears. Movement and distribution information was derived from radio and satellite relocations of collared adult females. Density estimates were used to determine the distribution of polar bears in the Beaufort Sea. Researchers then created a grid system centered over the Northstar production island and the Liberty site to estimate the number of bears expected to occur within each 1 km^2 grid cell. Each of the simulated oil spills were overlaid with the polar bear distribution grid. Finally, the likelihood of occurrence of bears oiled during the duration of the 5-year incidental take regulations was estimated. This was calculated by multiplying the number of

polar bears oiled by the spill by the percentage of time bears were at risk for each period of the year.

In summary, the maximum numbers of bears potentially oiled by a 5,912 barrel spill during September open water seasons from Northstar was 27, and the maximum from Liberty was 23, assuming a large oil spill occurred and no clean up or mitigation measures take place. Potentially oiled bears ranged up to 74 polar bears and up to 55 polar bears in October mixed ice conditions for Northstar and Liberty, respectively. Median number of bears oiled by the 5,912 barrel spill from the Northstar simulation site in September and October were 3 and 11 bears, respectively. Median numbers of bears oiled from the Liberty simulation site for September and October were 1 and 3 bears, respectively. Variation occurred among oil spill scenarios and was the result of differences in oil spill trajectories among those scenarios and not the result of variation in the estimated bear densities. For example, in October, 75 percent of trajectories from the 5,912 barrel spilled oil affected 20 or fewer polar bears from spills originating at the Northstar simulation site; and 9 or fewer bears from spills originating at the Liberty simulation site.

When calculating the probability that a 5,912 bbl spill would oil 5 or more bears during the annual fall period, we found that oil spills and trajectories were more likely to affect small numbers of bears (less than 5 bears) than larger numbers of bears. Thus, for Northstar, the chance of a 5,912 bbl oil spill that affected (resulting in mortality) of 5 or more bears was 1.0-3.4 percent; for 10 or more bears was 0.7-2.3 percent; and for 20 or more bears was 0.2-0.8 percent. For Liberty, the probability of a spill that will cause a mortality of 5 or more bears was 0.3-7.4 percent; for 10 or more bears, 0.1-0.4 percent; and for 20 or more bears, 0.1-0.2 percent.

Discussion of Prior Risk Assessment

The location of Industry sites within the marine environment is important when analyzing the potential for polar bears to contact a large oil spill. Simulations from the prior risk assessment suggested that bears have a higher probability of being oiled from facilities located further offshore, such as Northstar. Northstar Island is nearer the active ice zone and in deeper water than Endicott/Liberty, Oooguruk, and Nikaitchuq, areas where higher bear densities were calculated. Furthermore, Northstar is not sheltered by barrier islands. By comparison through modeling, the land fast ice inside the shelter of the barrier islands appeared to dramatically restrict the extent of most oil spills in comparison to Northstar, which lies outside the barrier islands and in deeper water. However, it should be noted that while oil spreads more in deep water and breaks up faster in deeper waters where wind and wave action are higher, oil persists longer in shallow waters and along the shore.

Based on the simulations, a nearshore island production site (less than 5 miles) would potentially involve less risk of polar bears being oiled than a facility located further offshore (greater than 5 miles). For any spill event, seasonality of habitat use by bears will be an important variable in accessing risk to polar bears. During the fall season when a portion of the SBS bear population uses terrestrial sites for aggregations and barrier islands for travel corridors, spill events from nearshore industrial facilities (less that 5 miles offshore) may pose more chance of exposing bears to oil due to its persistence in the nearshore environment. Conversely, during ice-covered and

summer seasons industry facilities located further offshore (greater than 5 miles) may increase the chance of bears being exposed to oil as the bears will be associated with the ice habitat.

Discussion of Polar Bear Aerial Coastal Surveys for Current Analysis

The Service has an ongoing project to monitor polar bear distribution and numbers along the Beaufort Sea coastline during the fall season. These aerial surveys were conducted between 2000 and 2009. From 2000 to 2005, the Service investigated the relationship between sea ice conditions, food availability, and the fall distribution of polar bears in terrestrial habitats of the SBS via weekly aerial surveys. Aerial surveys were conducted weekly during September and October along the SBS coastline and barrier islands between Barrow and the Canadian border to determine polar bear density during the peak use of terrestrial habitat by bears. The Service observed that the number of bears on land increased when sea-ice retreated farthest from the shore. The distribution of bears also appeared to be influenced by the availability of subsistence-harvested bowhead whale carcasses and the density of ringed seals in offshore waters.

Between 2000 and 2005, the maximum density estimate of bears observed during any single survey was 8.6 bears/100 km or 122 bears total. Across all years (2000 to 2005) and survey dates between mid-September and the end of October, an average of 4 bears/100 km (57 bears total) were observed. The Service estimated that a maximum of 8.0 percent and an average of 3.7 percent of the estimated 1,526 bears in the SBS population were observed on land during the late open-water and broken ice period. This period coincides with increased aggregations of bears in the nearshore at feeding sites and the peak observation period (August through October) of bears observed from

Industry as reported through their bear monitoring programs. This would likely be the period posing the greatest risk to the largest number of bears from an oil spill.

The number of bears observed per kilometer of survey flown was higher between Cape Halkett and Jago Spit (4 bears/100 km) than the area surveyed between Barrow and the Canadian border (3 bears/100 km) during the 2003–2005 surveys. The Service reported that this difference was largely driven by a major concentration of bears (69 percent of total bears onshore) at Barter Island (17.0 polar bears/100 km). In addition, annual surveys were also conducted in 2007, 2008, and 2009. The number of bears observed during weekly surveys ranged between 2 to 51, 2 to 78, and 7 to 75, respectively. The highest concentrations continued to be in the area of Barter Island and the community of Kaktovik. Using the above information, if a spill occurred during the fall open-water or broken ice period, up to 8 percent of the SBS population could potentially contact oil.

Conclusion of Risk Assessment

In summary, documented oil spill-related impacts in the marine environment to polar bears to date in the Beaufort Sea by the oil and gas Industry are minimal. To date, no large spills by Industry in the marine environment have occurred in Arctic Alaska. Nevertheless, the possibility of oil spills from Industry activities and the subsequent impacts on polar bears that contact oil remain a major concern.

There has been much discussion about effective techniques for containing, recovering, and cleaning up oil spills in Arctic marine environments, particularly the concern that effective oil spill clean-up

during poor weather and broken ice conditions has not been proven. Given this uncertainty, limiting the likelihood of a large oil spill becomes an even more important consideration. Industry oil spill contingency plans describe methodologies in place to prevent a spill from occurring. For example, all current offshore production facilities have spill containment systems in place at the well heads. In the event an oil discharge should occur, containment systems are designed to collect the oil before it contacts the environment.

With the limited background information available regarding oil spills in the Arctic environment, it is unknown what the outcome of such a spill event would be if one were to occur. Polar bears could encounter oil spills during the open-water and ice-covered seasons in offshore or onshore habitat. Although the majority of the SBS polar bear population spends a large amount of their time offshore on the pack ice, it is likely that some bears would encounter oil from a large spill that persisted for 30 days or more.

Although the extent of impacts from a large oil spill would depend on the size, location, and timing of spills relative to polar bear distributions and on the effectiveness of spill response and clean-up efforts, under some scenarios, population-level impacts could be expected. A large spill originating from a marine oil platform could have significant impacts on polar bears if an oil spill contacted an aggregation of polar bears. Likewise, a spill occurring during the broken ice period could significantly impact the SBS polar bear population in part because polar bears may be more active during this season.

In the event that an offshore oil spill contacted numerous bears, a potentially significant impact to the SBS population could result, initially to the percentage of the population directly contacted by oil, but impacts could likely affect a much larger portion of the population. This effect would be magnified in and around areas of polar bear aggregations. Bears could also be affected indirectly either by food contamination or by chronic lasting effects caused by exposure to oil. During the five year period of these regulations, however, the chance of a large spill occurring is extremely low.

While there is uncertainty in the analysis, certain vectors have to align for polar bears to be impacted by a large oil spill occurring in the marine environment. First, a large spill has to occur. Second, the large spill has to contact areas where bears may be located. Assuming a large spill occurs, BOEMRE's most recent OSRA estimated that there is as much as a 13 percent chance that a large spill from the analyzed sites (LAs 8, 10, 12, and PLs 10, 11, 12), would contact Cross Island (ERA 96) within 60 days during summer and as much as an 11 percent chance that it would contact Barter Island and/or the coast of the ANWR (ERA 95 and 100, LS 107 and 138). Similarly, there is as much as a 5 percent chance that an oil spill would contact the coast near Barrow (ERA 55, LS 85). Third, polar bears will have to be seasonally distributed within the affected region when the oil is present. Data from the polar bear coastal surveys suggested that while polar bears are not uniformly distributed, an average of 3.7 percent with maximum of 8 percent (sample size of 122 bears) of the estimated 1,526 bears in the SBS population were distributed along the Beaufort Sea coastline between the Alaska/Canada border and Barrow.

As a result of the information considered here, the Service concludes that the probability of an offshore spill from an offshore production facility in the next five years is low. Moreover, in the unlikely event of a large spill, the probability that spills would contact areas, or habitat important to bears appears low. Third, while individual bears could be affected by a spill, the potential for a population level effect would be minimal unless the spill contacted an aggregation of bears. Known polar bear aggregations tend to be seasonal during the late open-water and broken ice season, further minimizing the potential of a spill to impact bears. Therefore, we conclude that only small numbers of polar bears are likely to be affected by a large oil spill (greater than 1,000 bbl) in the Arctic waters with only a negligible impact to the SBS population.

Documented Impacts of the Oil and Gas Industry on Pacific Walruses and Polar Bears

In order to document potential impacts to polar bears and walruses, we analyzed potential effects that could have more than a negligible impact to both species. The effects analyzed included the loss or preclusion of habitat, lethal take, harassment, and oil spills.

Pacific Walrus

During the history of the incidental take regulations, the actual impacts from Industry activities on Pacific walruses, documented through monitoring, were minimal. From 1994 to 2004, Industry recorded nine sightings, involving a total of ten Pacific walruses, during the open-water season. From 2005 to 2009, an additional eight individual walruses were observed during Industry operations in the Beaufort Sea. In most cases, walruses appeared undisturbed by human

interactions; however, three sightings during the early 2000s involved potential disturbance to the walruses. Two of three sightings involved walruses hauling out on the armor of Northstar Island and one sighting occurred at the SDC on the McCovey prospect, where the walruses reacted to helicopter noise. With the additional sightings in the Beaufort Sea, walruses were observed during exploration (eight sightings; five during recent aerial surveys; 2009), development (three sightings), and production (six sightings) activities. There is no evidence that there were any physical effects or impacts to these individual walruses based on the interaction with Industry. We know of no other interactions that occurred between walrus and Industry during the duration of the incidental take program. Furthermore, there have been no other documented impacts to walruses from Industry.

Cumulative Impacts

Pacific walruses do not normally range into the Beaufort Sea, and documented interactions between oil and gas activities and walruses have been minimal. Industry activities identified by the petitioners are likely to result in some incremental cumulative effects to the small number of walruses exposed to these activities through the potential exclusion or avoidance of walruses from resting areas and disruption of associated biological behaviors. However, based on the habitat use patterns of walruses and their close association with seasonal pack ice, relatively small numbers of walruses are likely to be encountered during the open-water season when marine activities are expected to occur. Required monitoring and mitigation measures designed to minimize interactions between authorized projects and concentrations of resting or feeding walruses are also expected to limit the severity of any behavioral responses. As a population, hunting pressure, climate change,

and the expansion of commercial activities into walrus habitat all have potential to impact walruses. Combined, these factors are expected to present significant challenges to future walrus conservation and management efforts. Therefore, we conclude that exploration activities, especially as mitigated through the regulatory process, are not expected to add significantly to the cumulative impacts on the Pacific walrus population from past, present, and future activities that are reasonably likely to occur within the 5-year period covered by these regulations.

Polar Bear

Documented impacts on polar bears by the oil and gas Industry during the past 40 years appear to be minimal. Historically, polar bears spend a limited amount of time on land, coming ashore to feed, den, or move to other areas. With the changing of their distribution based on the changing ice environment, the Service anticipates that bears will remain on land longer. At times, fall storms deposit bears along the coastline where the bears remain until the ice returns. For this reason, polar bears have mainly been encountered at or near most coastal and offshore production facilities, or along the roads and causeways that link these facilities to the mainland. During those periods, the likelihood of interactions between polar bears and Industry activities increases. We have found that the polar bear interaction planning and training requirements set forth in these regulations and required through the LOA process have increased polar bear awareness and minimized the number of these encounters. LOA requirements have also increased our knowledge of polar bear activity in the developed areas.

No known lethal take associated with Industry has occurred during the period covered by incidental take regulations. Prior to issuance of regulations, lethal takes by Industry were rare. Since 1968, there have been two documented cases of lethal take of polar bears associated with oil and gas activities. In both instances, the lethal take was reported to be in defense of human life. In winter 1968–1969, an Industry employee shot and killed a polar bear. In 1990, a female polar bear was killed at a drill site on the west side of Camden Bay. In contrast, 33 polar bears were killed in the Canadian Northwest Territories from 1976 to 1986 due to encounters with Industry. Since the beginning of the incidental take program, which includes measures that minimize impacts to the species, no polar bears have been killed due to encounters associated with current Industry activities on the North Slope. For this reason, Industry has requested that these regulations cover only nonlethal, incidental take.

To date, most impacts to polar bears from industry operations have been the result of direct bear–human encounters, some of which have led to deterrence events. Monitoring efforts by Industry required under previous regulations for the incidental take of polar bears documented various types of interactions between polar bears and Industry. Between 2006 to 2009, a total of 73 LOAs have been issued to Industry, with an average of 18 LOAs annually. Not all Industry activities observe or interact with polar bears. Polar bear observations were recorded for 56 percent of the LOAs (41 of 73 LOAs).

From 2006 through 2009, an average of 306 polar bears was observed and reported per year. (range: 170 to 420 bears annually). During 2007, 7 companies observed 321 polar bears from 177 sightings. In 2008, 10 companies observed 313 polar bears from 186 sightings. In 2009, 420 polar

bears were observed during 245 sightings. In all 3 years, the highest number of bears observed was recorded in the fall season in August and September. In 2007, the highest number of bears was recorded in August, where 90 sightings totaling 148 bears were observed; in 2008, 87 sightings totaling 162 bears were recorded in August; while in 2009, 77 bear sightings were reported. Sightings of polar bears have increased from previous regulatory time periods due to a combination of variables. The high number of bear sightings for these years was most likely the result of an increased number of bears using the terrestrial habitat as a result of changes in sea ice habitat, multiple marine-based projects occurring near barrier islands (where multiple sightings were reported), as well as increased compliance and monitoring of Industry projects, especially during August and September, where some repeat sightings of individual bears and family groups occurred. This trend in observations is consistent with the hypothesis of increasing use of coastal habitats by polar bears during the summer months.

Industry activities that occur on or near the Beaufort Sea coast continue to have the greatest potential for encountering polar bears rather than Industry activities occurring inland. According to AOGA figures, the offshore facilities of Endicott, Liberty, Northstar, and Oooguruk accounted for 47 percent of all bear observations between 2005 and 2008 (182 of 390 sightings).

Intentional take of polar bears (through separate Service authorizations under sections 101(a)(4)(A), 109(h), and 112(c) of the MMPA) occurs on the North Slope as well. Intentional take is used as a mitigation measure to allow citizens conducting activities in polar bear habitat to take polar bears by harassment (nonlethal deterrence activities) for the protection of both human life and polar bears. The Service recognizes intentional take as an escalation of an incidental take, where

the purpose of the intentional take authorization is to "take" polar bears by non injurious deterrent activities prior to a bear-human encounter escalating to the use of deadly force against a polar bear. These MMPA specific authorizations have proven to be successful in preventing injury and death to humans and polar bears.

The Service provides guidance and training as to the appropriate harassment response necessary for polar bears. The largest operator on the North Slope, BPXA, has documented an increase in the total number of bear observations for their oil units since 2006 (39, 62, 96, and 205 bears for the years 2006, 2007, 2008, and 2009, respectively). However, the percentage of Level B deterrence events reported by BPXA has decreased from 64 percent in 2006 to 21 percent in 2009 of total observations. BPXA attributes this decrease to an increase in polar bear awareness and deterrence training of personnel. A similar trend appears in the slope-wide data presented by AOGA, which represents multiple operators. The percentage of Level B deterrence events has decreased from 39 percent of all reported polar bear sightings in 2005 to 23 percent in 2008. We currently have no indication that these encounters, which alter the behavior and movement of individual bears, have an effect on survival and recruitment in the SBS polar bear population.

Cumulative Impacts

Cumulative impacts of oil and gas activities are assessed, in part, through the information we gain in monitoring reports, which are required for each operator under the authorizations. Incidental take regulations have been in place in the Arctic oil and gas fields for the past 17 years. Information from these reports provides a history of past effects on polar bears from interactions with oil and

gas activities, including intentional take. Information on previous levels of impact are used to evaluate impacts from existing and future Industry activities and facilities. In addition, information used in our cumulative effects assessment includes: polar bear research leading to publications and data, such as polar bear population assessments by USGS; information from legislative actions, including the listing of the polar bear as a threatened species under the ESA in 2008; traditional knowledge of polar bear habitat use; anecdotal observations; and professional judgment.

While the number of LOAs being requested does not represent the potential for direct impact to polar bears, they do offer an index as to the effort and type of Industry work that is currently being conducted. LOA trend data also helps the Service track progress on various projects as they move through the stages of oil field development. An increase in slope-wide projects has the ability to expose more people to the Arctic and increase bear–human interactions.

The Polar Bear Status Review describes cumulative effects of oil and gas development on polar bears in Alaska (see pages 175 to 181 of the status review). This document can be found at http://www.regulations.gov; search for Docket No. FWS-R7-FHC-2010-0098. In addition, in 2003 the National Research Council published a description of the cumulative effects that oil and gas development would have on polar bears and seals in Alaska. They concluded the following:

(1) “Industrial activity in the marine waters of the Beaufort Sea has been limited and sporadic and likely has not caused serious cumulative effects to ringed seals or polar bears.”

(2) “Careful mitigation can help to reduce the effects of oil and gas development and their accumulation, especially if there is no major oil spill. However, the effects of full-scale industrial development off the North Slope would accumulate through the displacement of polar bears and ringed seals from their habitats, increased mortality, and decreased reproductive success.”

(3) “A major Beaufort Sea oil spill would have major effects on polar bears and ringed seals.”

(4) “Climatic warming at predicted rates in the Beaufort and Chukchi sea regions is likely to have serious consequences for ringed seals and polar bears, and those effects will accumulate with the effects of oil and gas activities in the region.”

(5) “Unless studies to address the potential accumulation of effects on North Slope polar bears or ringed seals are designed, funded, and conducted over long periods of time, it will be impossible to verify whether such effects occur, to measure them, or to explain their causes.”

A detailed description of climate change and its potential effects on polar bears, prepared by the Service, can be found in the “Polar Bear Status Review” (pages 72 to 108) at: http://www.regulations.gov; search for Docket No. FWS-R7-FHC-2010-0098. Additional detailed information by the USGS regarding the status of the SBS stock in relation to climate change, **projections of habitat and populations, and forecasts of range wide status** can be found at: http://www.usgs.gov/newsroom/special/polar_bears/. Climate change could alter polar bear habitat because seasonal changes, such as extended duration of open water, may preclude sea ice habitat and restrict some bears to coastal areas. Biological effects on the worldwide population of polar

bears are expected to include increased movements, changes in bear distributions, changes to the access and allocation of denning areas, and increased energy expenditure from open water swimming, and possible decreased fitness. Demographic effects that may occur due to climate change include changes in prey availability to polar bears, a potential reduction in the access to prey, and changes in seal productivity.

The Service anticipates negligible effects on polar bears due to Industry activity, even though there may be an increased use of terrestrial habitat in the fall period by polar bears on the coast of Alaska and an increased use of terrestrial habitat by denning bears in the same area. Polar bears are not residents of the oil fields, but use the habitat in a transitory nature, which limits potential impacts from Industry. Furthermore, no known Level A harassment or lethal takes on polar bears have occurred throughout the duration of the incidental take program, which was initiated in 1994. The last known Industry-caused death of a bear by Industry occurred in 1990. This documented information suggests that Industry will have no more than a negligible effect on polar bears for the 5-year regulatory period even though there may be more bears onshore. The Service also believes that required mitigation measures will be effective in minimizing any additional effects attributed to seasonal shifts in distributions of the increased use by bears of terrestrial habitats and denning polar bears during the 5-year timeframe of the regulations as has occurred in the past. It is likely that, due to potential seasonal changes in abundance and distribution of polar bears during the fall, more frequent encounters may occur and that Industry may have to implement mitigation measures more often, for example, increasing polar bear deterrence events. In addition, if additional polar bear den locations are detected within industrial activity areas, spatial and temporal mitigation

measures, including cessation of activities, may be instituted more frequently during the 5-year period of the rule.

The activities identified by Industry are likely to result in incremental cumulative effects to polar bears during the 5-year regulatory period. Based on Industry monitoring information, for example, deflection from travel routes along the coast appears to be a common occurrence, where bears move around coastal facilities rather than traveling through them. Incremental cumulative effects could also occur through the potential exclusion or temporary avoidance of polar bears from feeding, resting, or denning areas and disruption of associated biological behaviors. However, based on monitoring results acquired from past ITRs, the level of cumulative effects, including those of climate change, during the 5-year regulatory period would result in negligible effects on the bear population.

Monitoring results from Industry, analyzed by the Service, indicate that little to no short-term impacts on polar bears have resulted from oil and gas activities. We evaluated both subtle and acute impacts likely to occur from industrial activity and we determined that all direct and indirect effects, including cumulative effects, of industrial activities have not adversely affected the species through effects on rates of recruitment or survival. Based on past monitoring reports, the level of interaction between Industry and polar bears has been minimal. Additional information, such as subsistence harvest levels and incidental observations of polar bears near shore, provide evidence that these populations have not been adversely affected. For the next 5 years, we anticipate the level of oil and gas Industry interactions with polar bears will likely increase in response to more

bears on shore and more activity along the coast, however we do not anticipate significant impacts on bears to occur.