Shell Offshore Inc.
3601 C Street, Suite 1334
Anchorage, AK 99503

November 21, 2006

Mr. Craig Perham
LOA Coordinator
USFWS, Marine Mammals Management
1011 E. Tudor Road, MS-341
Anchorage, AK 99503

Dear Mr. Perham:

Shell Offshore Inc. (SOI) is submitting for your consideration an Addendum Petition for Promulgation of Regulations for Chukchi Sea Pacific walrus (Odobenus rosmarus divergens) and polar bear (Ursus maritimus), pursuant to Section 101 (a) (5) of the Marine Mammals Protection Act.

Should you have any questions or require more information, please call me at (907) 646-7112; email susan.childs@shell.com, or Greg Horner, project manager at (907) 339-5486; email greg.horner@asrcenergy.com.

Sincerely,
Shell Offshore Inc.

Susan Childs
Regulatory Coordinator, Alaska

15067-22.1.2.3.1/O6-237

Enclosure: Addendum Petition for Promulgation of Regulations Pursuant to Section 101 (a) (5) of the Marine Mammal Protection Act for the Chukchi Sea

cc w/enclosure:
Jeff Hall, MMS
Susan Childs, Shell
Greg Horner, AES-RTS

ADDENDUM PETITION FOR PROMULGATION OF REGULATIONS PURSUANT TO SECTION 101 (a) (5) OF THE MARINE MAMMAL PROTECTION ACT FOR THE CHUKCHI SEA

Pacific Walrus (*Odobenus rosmarus divergens*)

Polar Bear (*Ursus maritimus*)

November 2006

Prepared for:

Shell Offshore Inc.
3601 C Street, Suite 1334
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Prepared by:

ASRC Energy Services
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Regulatory & Technical Services

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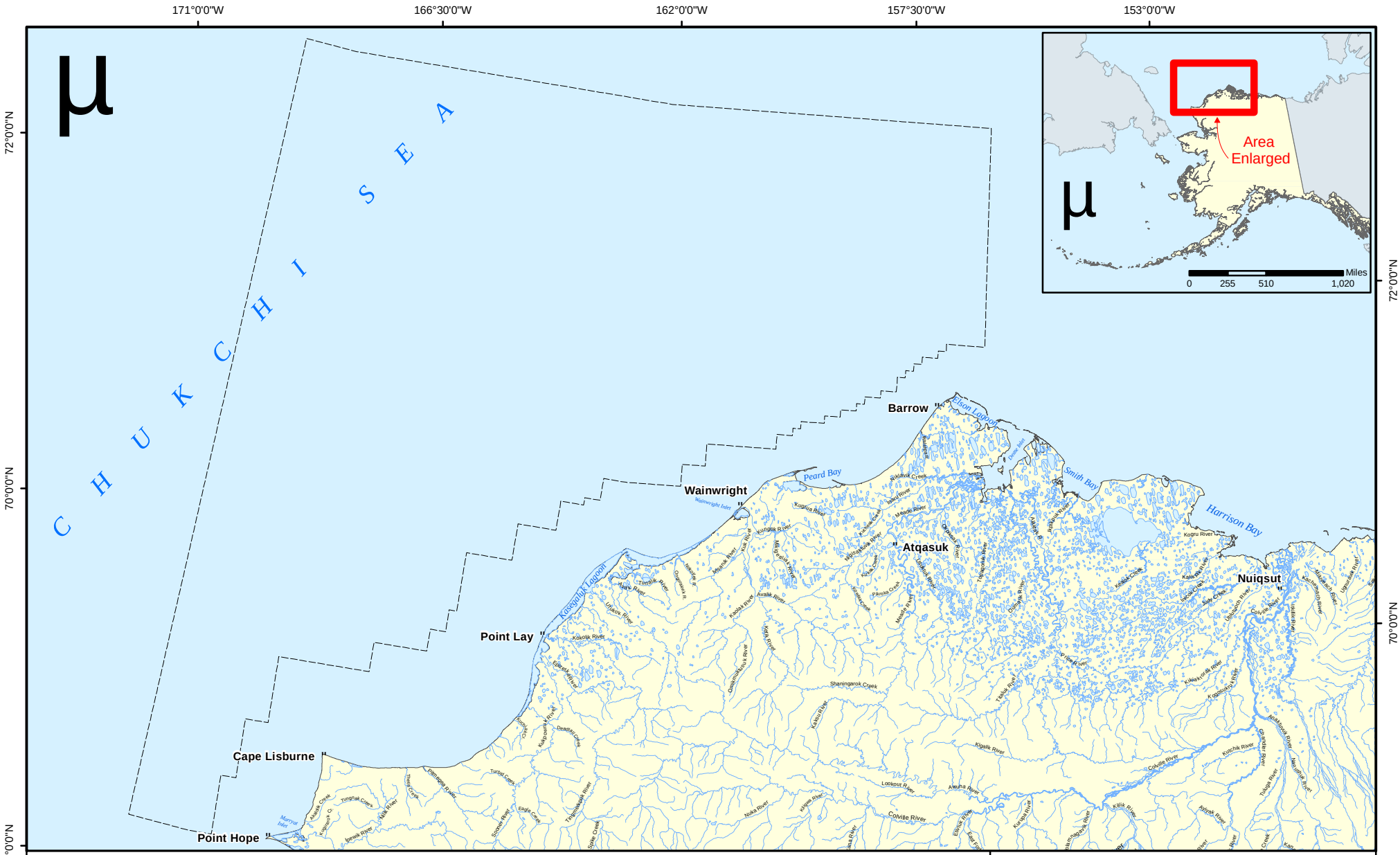
1.0 NATURE OF THE REQUEST

Shell Offshore Inc. (SOI) pursuant to Section 101 (a) (5) of the Marine Mammal Protection Act (MMPA), petitions the U.S. Fish and Wildlife Service (USFWS) to develop new regulations for taking of marine mammals incidental to oil and gas exploration and all associated activities in the Chukchi Sea for the period of five years beginning in January 2007 through 2011. The Mineral Management Services (MMS) proposes to offer for lease approximately 6,155 whole and partial blocks (about 34 million acres) in the Chukchi Sea identified as Oil and Gas Lease Sale 193 in the fall of 2007 (Figure 1-1). The propose sale excludes a 15- to 50-mile wide cooridor along the coast, the polynya or Spring Lead System. The geographic region of activity encompasses an area extending north from Point Barrow, on the east to Point Hope on the southwest. Water depths in the sale area vary from about 95 feet (ft) to approximately 262 ft. A small corner of the northeast corner deepens to approximately 9,800 ft.

Promulgation of the regulations sought would allow the incidental, but not intentional, "taking" of small numbers of Pacific walrus (*Odobenus rosmarus divergens*) and polar bears (*Ursus maritimus*) in the event that "takes" occur from oil and gas activities in the aforementioned area.

For purposes of this petition, SOI is requesting non-lethal incidental take during planned, legal activities. SOI does not anticipate that exploration activities will result in the taking of more than a small number of marine mammals. Furthermore, there would be no unmitigable adverse impact on the availability of polar bears and walruses for subsistence uses. Accordingly, this petition has been filed for the purpose of ensuring that there is no question that the activities described herein comply with the MMPA.

In 1976 the United States signed the International Agreement on the Conservation of Polar Bears (IACPB) as one of the five circumpolar countries (Canada, Norway, Denmark [Greenland], the former Soviet Union, and the United States). The IACPB seeks to protect ecosystems where polar bears live, restrict the taking of polar bears, and the commercial trade of polar bear parts. This request by SOI is consistent with conservation and management measures stated in the IACPB.



MMS Chukchi Sea Planning Boundary

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Figure 1-1: MMS Chukchi Sea Planning Area

SCALE: 0 25 50 100 Miles

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2.0 INFORMATION SUBMITTED IN RESPONSE TO THE REQUIREMENTS OF 50 C.F.R. § 18.27

The USFWS' regulations governing the issuance of regulations and authorization permitting incidental takes under certain circumstances are codified at 50 C.F.R. § 18.27. Section 18.27 sets out eight specific items that must be addressed in requests for rulemaking pursuant to Section 101 (a) (5) of the MMPA, 16 U.S.C. § 1371(a) (5). Information on the scope of work, duration, and the type of equipment SOI's proposed for their oil and gas exploration activities in the Chukchi Sea from 2007 to 2011 is provided in detail below. Other elements describing potential impacts of oil and gas exploration activities on marine mammals and their habitats are not presented at this time. Most of this information was provided earlier in the Alaska Oil and Gas Association petition to USFWS for the Beaufort and Chukchi Sea in 2006.

3.0 DESCRIPTION OF SPECIFIC ACTIVITIES

Scope of Petition

The scope of the petition includes open-water seismic surveys, site clearance, exploratory drilling and support activities and does not include any on-ice survey activity near Spring Lead Systems. Seismic surveys, site clearance, exploratory drilling and support activities, if Chukchi OCS lease tracts are offered, may occur during the next 5 years. The seismic surveys will occur prior to leasing Chukchi OCS waters, and on lease tracts anticipated to be offered in future lease sales, as early as 2007 (Chukchi Sea Sale 193).

Of the four principal forms of exploratory drilling structures currently in use or under development for Arctic exploration; artificial islands, bottom-founded structures, drillships, and semi-submersible vessels, SOI proposes to use two floating drillships; the Kulluk and Frontier Discoverer. Two ice management vessels per drilling unit and two support ships will also be used during the seismic and exploratory drilling phases of the project.

Although the level of support activities is speculative, supplies during the drilling season will be transported to the drill ships by helicopters, hovercraft, and supply vessels. Barges, and/or tankers might be used for OSRP plan support. During 1991 through 1996, an estimated 24 drilling support barge trips, and an unknown number of supply vessel trips or helicopter flights were made to Chukchi Sea drilling units. Proportionately with increased activities in the Chukchi, a large increase in the number of supply vessel, hovercraft, and/or barge trips would be expected during the timeframe of 2007-2011 for units drilling on tracts leased in Sale 193. It is estimated that one helicopter trip per drilling unit per day will be flown in support to exploratory drilling. One, to two icebreakers and two ice-strengthened support/supply boats are estimated as needed to support each drilling unit, and supply boat trips are estimated at one per drilling unit per week. Depending on ice conditions, two or more icebreaking vessels may be required to perform ice management tasks for the floating units.

Proposed Oil and Gas Activity

Based on SOI's success in acquiring Chukchi leases during 2007, SOI independently could drill up to 16 exploratory wells in the Chukchi Sea between 2007-2012. During 1988 in the Chukchi Sea, 350 blocks were leased as a result of OCS Lease Sale 109, and another 28 were issued as a result of OCS Lease Sale 126. To date, five exploratory wells have been completed. The final EIS for Lease Sale 109 estimated that 29 exploratory and 40 delineation wells will be drilled under the high-case assumption from 1991 through 1996, the period during which the last Chukchi Sea incidental take regulations were in effect.

The mean case assumed 16 exploratory and 23 delineation wells over the same period. As few as two or as many as seven drilling units were assumed could be working in any given year in the Chukchi Sea. These estimates included both floating and bottom-founded drilling units. Sale 126, the next oil and gas lease sale for the Chukchi Sea OCS planning area, (August 1991), estimated under the high case that 25 exploratory and 12 delineation wells would be drilled from 1992 through 1996. The mean case assumed industry would drill 23 exploratory and 11 delineation wells during the same period.

Seismic Geophysical Surveys

The exploratory activities discussed in the petition are currently being or have been conducted in Arctic waters (Beaufort and Chukchi Seas). Seismic surveys have been conducted in the Chukchi Sea as early as the mid-1960s, and were re-started in the Chukchi during the open water season of 2006. Five exploratory wells were drilled in the Chukchi Sea between 1989 and 1991.

Geophysical surveys can be divided into two classes: deep seismic and shallow hazard. Both kinds of surveys use a "reflective" method to acquire data. Both include an energy source that generates a seismic signal, hydrophones that receive the signal, and electronic equipment on board a seismic vessel that amplifies and records the signal. Energy sources used in deep seismic surveys release bursts of compressed air or water. Sound sources in shallow hazard surveys operate at lower energy levels and generate less acoustic pressure than deep seismic surveys.

Deep seismic surveys generally map deep strata beneath the surface of the earth (0.305 kilometers [km] to 6.1 km [0.2 to 3.7 miles (mi)] below ground level) in search of gas and oil-bearing rock formations. Shallow hazard surveys, also known as "site clearance" or "high resolution surveys" are conducted to gather information on near-surface hazards (up to 305 m [0.2 mi] below ground level), which could be encountered during drilling.

The proposed seismic program will consist of marine surveys only during the open-water season, which is variable. Marine seismic surveys are proposed only during the open-water season. In the southern Chukchi Sea, open water typically occurs between July and mid-November, and in the northern Chukchi Sea, open water occurs between August and October. Historically the open-water periods have not exceeded 90 days; floating ice and ice pack do not typically exit the northern Chukchi during the open water season.

Over the next five years, pre-lease survey activity (deep seismic) will occur in unleased portions of the Chukchi Sea, and potential on lease tracts offered in future lease sales. Pre-lease surveys will likely be concentrated in the proposed sale areas, as was done during 2006, during the open-water season. Past MMS estimates of the extent of shallow-hazard seismic surveys for Chukchi Lease Sale 109 (May 1988) was 7,979 trackline km over the life of the lease period for Sale 109. An additional 8,783 trackline km of a 3-D and deep penetration seismic data was estimated to occur after the initial exploratory drilling in the Lease Sale 109 area. The estimate for shallow-hazard surveys for Chukchi Sea Lease Sale 126 (August 1991) was 7,055 trackline km for the base case with an additional 10,329 trackline km of 3-D and deep penetration surveys. Although the trackline km estimates for Lease Sales 109 and 126 were not entirely independent, the amount of overlap was not calculated. The estimated total of shallow-hazard surveys for the Chukchi Sea for the life of Sale 126 was 15,034 trackline km, and 19,112 trackline km for 3-D and deep penetration seismic. As a barometer, SOI's Incidental Harassment Authorization (IHA) application for 2006 estimated SOI might acquire 5,556-11,112 trackline km during the open water season of 2006 alone. The actual trackline km are approximately 3,200 for 2006. If SOI acquires seismic data 3 of 5 open water seasons, the total would be approximately 10,000 trackline km.

Reflection Seismic Exploration

Deep seismic and shallow hazard surveys use the "reflection" method of data acquisition. Reflection seismic exploration is the process of gathering information about the subsurface of the earth by measuring acoustic (sound or seismic) waves, which are generated on or near the surface. Seismic exploration uses a controlled energy source to generate acoustic waves that travel through the earth (including sea ice and water, as well as subsea geologic formations), and then uses sensors to record the reflected energy transmitted back to the surface. When acoustic energy is generated, compression (p) and shear (s) waves form and travel in and on the earth. The compression and shear waves are affected by the geological formations of the earth as they travel in it and may be reflected, refracted, diffracted or transmitted when they reach a boundary represented by an acoustic impedance contrast.

The basic components of these survey types include an energy source (either acoustic or vibratory), which generates a seismic signal; hydrophones or geophones, which receive the reflected signal; and electronic equipment to amplify and record the signal. The number and placement of sensors, the energy sources, the spacing and placement of energy input locations, and the specific techniques of recording reflected energy are broadly grouped as "parameters" of a given exploration program.

In modern reflection seismology, many sensors are used to record each energy input event. The number of sensors used for each event varies widely according to the type of survey being conducted and the recording equipment available. Common numbers of groups of sensors are 240, 480, and 1040, and some new recording instruments may use as many as 4000 groups of sensors simultaneously. The sensors are normally placed in one or more long lines at specified intervals. In North America the common group placement intervals are multiples of 17 m (55 ft), 33.5 m (110 ft) and 67 m (220 ft).

Airgun and Watergun Seismic Data Collection

These techniques use compressed air or water in a cylinder at a pressure of about 2,000 pounds per square inch (psi). The air or water is vented through portals in the upper part of the cylinder creating a pressure wave- the seismic impulse. The intensity of the pressure wave is nearly proportional to the volume of the source array because all guns in the array are fired simultaneously. Reflections of this pressure wave from sub-surface layers are detected by a series of geophones or hydrophones.

Typically in summer for offshore seismic data collection, boats are used to pull an underwater array of air guns either followed by a set of sensor cables or past sensor cables that have been laid along the ocean floor.

High-Resolution Site-Clearance Surveys

During the open water season, high-resolution site-clearance surveys will be used prior to drilling test wells to obtain required permit information about proposed exploration and development sites. The surveys will locate and examine shallow geologic hazards, archeological features, and biological populations such as benthic communities. In addition, engineering data is gathered for placement of structures (e.g., proposed platform locations and pipeline routes).

High-resolution site-clearance surveys typically involve a vessel towing an acoustic source (airgun) about 25 m (82 ft) and a 600 m (1969 ft) streamer cable with a tail buoy. A 2D survey typically uses a single airgun, and a 3D survey uses an array of airguns. Operations are designed to be ultra-quiet and typical

surveys cover one OCS block at a time. Information will be collected on a 300 by 900 m (984 by 2953 ft) grid. Areas of suspected archeological resources are surveyed 50 m (164 ft) apart on the north-south lines. The time anticipated to survey each lease block is approximately 36 hours. Airgun volumes typically are 90-150 cubic inches (cu in) and the output of a 90–cu in airgun ranges from 229-233 decibel (dB) high-resolution re 1μPa at 1m. Airgun pressures typically are 2,000 psi and can be used up to 3,200 psi for higher signal strength to collect data from deep in the subsurface.

Depending on the environmental issues and analysis associated with an individual seismic survey or with multiple seismic surveys in the Chukchi Sea Planning Area, some of the mitigations measures described below may be selectively incorporated. These mitigation measures would function to provide further protection from the possibility for causing adverse environmental impacts in special situations.

- Aircraft shall be required to maintain a 1,000-foot minimum altitude within 0.5 miles of hauled-out Pacific walruses.

- Seismic-survey operators will notify MMS, National Marine Fisheries Service (NMFS), and USFWS in the event of any loss of cable, streamer, or other equipment that could pose a danger to marine mammals.

- Seismic survey plans will be modified to incorporate additional temporal or spatial separations to avoid significant additive and synergistic effects from simultaneous seismic-survey operations on marine mammals.

- Seismic cables and airgun arrays will not be towed in the vicinity of fragile biocenoses, unless MMS determines the proposed operations can be conducted without damage to the fragile

- Seismic-survey and associated support vessels shall observe a 0.5-mile (~800-meter [m]) safety radius around Pacific walrus groups hauled out onto land or ice.

- Marine mammal reports especially information concerning Pacific walruses, bowhead and gray whales will be provided to USFWS and NMFS respectively.

- A 160-dB vessel monitoring zone for bowhead and gray whales will be established and monitored in the Chukchi Sea during all seismic surveys.

Drillships and Support Vessels

Drillships operate only during the open-water season, and drifting ice can prevent their operation. Upon reaching the drill site, the vessel is secured over the location by deploying anchors on as many as ten to twelve mooring lines. The drill pipe is encased in a riser that compensates for the vertical wave motion. The blowout preventer (BOP) is typically located at the seabed in a hole dug below the ice-scour depth. BOP placement is an important safety feature enabling the drillship to shut down operations and get underway rapidly without exposing the well.

One or more ice management vessels (icebreakers) generally support drillships to ensure ice does not encroach on operations. A barge and tug typically accompany the vessels to provide a standby safety vessel, oil spill response capabilities, and refueling support. Most supplies (including fuel) necessary to complete drilling activities are stored on the drillship and support vessels. Helicopters based at existing shore facilities routinely transfer personnel and additional equipment. Flights to a drillship average one or two per day.

Kulluk

The Kulluk floating drilling unit was designed for extended-season drilling in Arctic waters of 18 to 185 m (59-607 ft) and can drill wells to depths of 6.1 km (20,000 ft) (Figure 3-1). The Kulluk is capable of withstanding ice forces encountered during breakup and freeze-up, and this capability permits it to operate during periods well beyond those of an ordinary Arctic-class drillship. The Kulluk can accommodate 104 people in 44 cabins.

The Kulluk's hull is made of modified high-tensile, low-temperature steel plates 3.8 centimeters (cm) (1.5 inches [in]) thick. All areas are double hulled to protect agast puncture. A compartmentalized space inboard of the hull plates provides further protection from flooding. The inwardly sloping hull has a maximum diameter of 81 m (266 ft) at the top and a minimum diameter of 60 m (197 ft) near the bottom. Below the main hull, the double bottom is 32 m (105 ft) in diameter, with a circumferential outer-hull ice shield 44 m (144 ft) in diameter. The hull is divided into eight radial and two circumferential bulkheads, and three decks.

Figure 3-1 Kulluk Floating Drilling Unit

Frontier Discoverer

The Frontier Discoverer (Discoverer), a turret moored ice class drillship, is 156.7 m (514 ft) in length with a maximum draft of 8.2 m (27 ft) and is anchored symmetrically using an eight point pattern (Figure 3-2). The unit is fitted with Sonat Offshore Drilling patented roller mooring system giving the unit the ability to maintain favorable heading without an interruption of the drilling operations. It is designed to operate in a maximum water depth of 1,000 ft. The Discoverer is capable of drilling to a maximum of 20,000 feet in depth. The fuel storage capacity is 272,874 gallons (gal). The Discoverer has 124 berths.

Figure 3-2 Drillship Frontier Discoverer

Ice Management Vessels

The Discoverer will be accompanied by up to two Arctic-class, foreign-flagged, ice management vessels: the M/V Vladimir Ignatjuk (Vladimir) and M/V Kapitan Dranitsyn (Kapitan) of the Murmansk Shipping Company fleet (Figures 3-3 and 3-4). Accompanying the ice management vessels are the support ships M/V Viking (Viking) of Viking Supply Ships and M/V Fennica-Nordica (Fennica) of Finnish Shipping Enterprise (Figures 3-5 and 3-6).

The Vladimir is 88 m (289 ft) in length with a maximum draft of 8.3 m (27 ft). Its maximum cruising speed is 25 knots when operating on all four 5600 hp diesel engines. The Vladimir has 34 berths (Figure 3-3).

The Kapitan is 132 m (433 ft) in length with a maximum draft of 8.5 m (28 ft). Its fuel capacity is 2,800 tons of IFO 30 for its main diesel engines. Its maximum cruising speed is 16 knots. The Kapitan has 102 berths (Figure 3-4).

Support Vessels

The Viking is 83.7 m (275 ft) in length and has a maximum draft of 28 ft. The Viking is powered by four engines has a maximum cruising speed of 12 knots. The Viking can accommodate up to 23 people (Figure 3-5).

The Fennica is 116 m (380 ft) in length and has a maximum draft of 8.4 m (27.56 ft). The Fennica has four engines with a maximum cruising speed is 16 knots. It is capable of berthing 82 people (Figure 3-6).

Figure 3-3 Ice Management Vessel M/V Vladimir Ignatjuk

Figure 3-4 Ice Management Vessel M/V Kapitan Dranitsyn

Figure 3-5 Support Vessel M/V Viking

Figure 3-6 Support Vessel M/V Fennica-Nordica

Rig Demobilization

The Kulluk and Frontier Discoverer will be demobilized each fall prior to the onset of pack ice formation and moved to a sheltered moorage in the Beaufort Sea near Prudhoe Bay. Ice management and support vessels will also over winter near Prudhoe Bay.

Abandonment and Closeout

The abandonment phase will be initiated if exploratory wells are not successful. In a typical situation, wells will be permanently plugged (with cement) and wellhead equipment removed. The seafloor site will be restored to some practicable, pre-exploration condition. Post abandonment surveys would be required to confirm that no debris remains following abandonment or those materials remains at the lease tract.

The casings for delineation wells can either be cut mechanically or with explosives during the process of well abandonment. If explosives were used protocols developed by MMS in 2001 would be followed. A relatively small, 16- to 20-kilogram (kg) charge in the well casing 5 m below the sea floor. Positioning the charge in this manner would dampen the explosion and restrict the shock and acoustic effects primarily to the area of water immediately above the well head.

Oil Spill Contingency Plan

The oil spill contingency plan for the drill ships, ice management, and support vessels will be provided to FWS after review and approval by MMS, and State of Alaska, Department of Environmental Conservation.

4.0 DATES AND DURATION AND GEOGRAPHIC REGION OF ACTIVITY

SOI seeks incidental take regulations for a period of five years (2007 to 2011) commencing upon July 1, 2007. The geographic region of activity encompasses an offshore area in the Chukchi Sea within and adjoining the boundary of proposed lease Sale 193 area north of Point Barrow in the east to Point Hope in the west.

Activities to be conducted will only occur during the open water period. Although the specific level of activity for the next five-year period cannot be fully known, anticipated operations have been outlined in the previous section. Activities over the next five-year period can be expected to involve offshore seismic activities to determine the presence of new hydrocarbon deposits, offshore exploratory drilling, to verify hydrocarbon accumulations, and cleanup activities from abandonment and closeout of exploration facilities.

The locations of these activities are assumed, for the purpose of this petition, are only for offshore tracts proposed to be leased by MMS in 2007, and waters adjacent to lease tracts during the period under consideration. Remediation and closeout activities at abandoned exploratory well sites could occur at up to 16 sites over a five year period at various locations within the leased tracts where activities have been previously conducted.

Because of the large number of variables influencing exploration activity, any predictions of the exact dates and locations of the operations that will take place over the next five years would be highly speculative. The specific dates and durations of the individual operations and their geographic locations will be provided to USFWS in detail when requests for Letters of Authorization (LOA) are submitted.

These data have been compiled from information supplied by SOI and companies under contract to SOI. These projections are also intended to encompass activities to be undertaken by companies not participating in this petition.

5.0 SPECIES, NUMBERS, AND TYPE OF TAKE

The MMPA defines "take" to mean "harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any marine mammal."(16 U.S.C. § 1362 [13]). SOI anticipates all takes to be non-lethal, incidental takes by harassment. While SOI does not anticipate any injury to or mortality of any marine mammal during the proposed activities, there is a slight possibility of a lethal take occurring. If a fatality or injury should occur, it would be incidental, accidental and non-intentional. Considerable effort will be made to avoid encounters that would risk either human or marine mammal lives. Takes, as defined by the MMPA, could result from encounters with humans, aircraft, ships and other vehicles, noise and vibration disturbances, contact with accidental oil spills or other wastes. A detailed discussion of noise and vibration activities is presented in Section 3C.

Pacific Walrus

Pacific walruses (*Odobenus rosmarus divergens)* are widely distributed in relatively high numbers in the Chukchi Sea within the proposed region of oil and gas activities described in this petition. In late summer, depending on the ice pack, walruses are found farther offshore with principal concentrations northwest of Barrow (Figure 5-1).

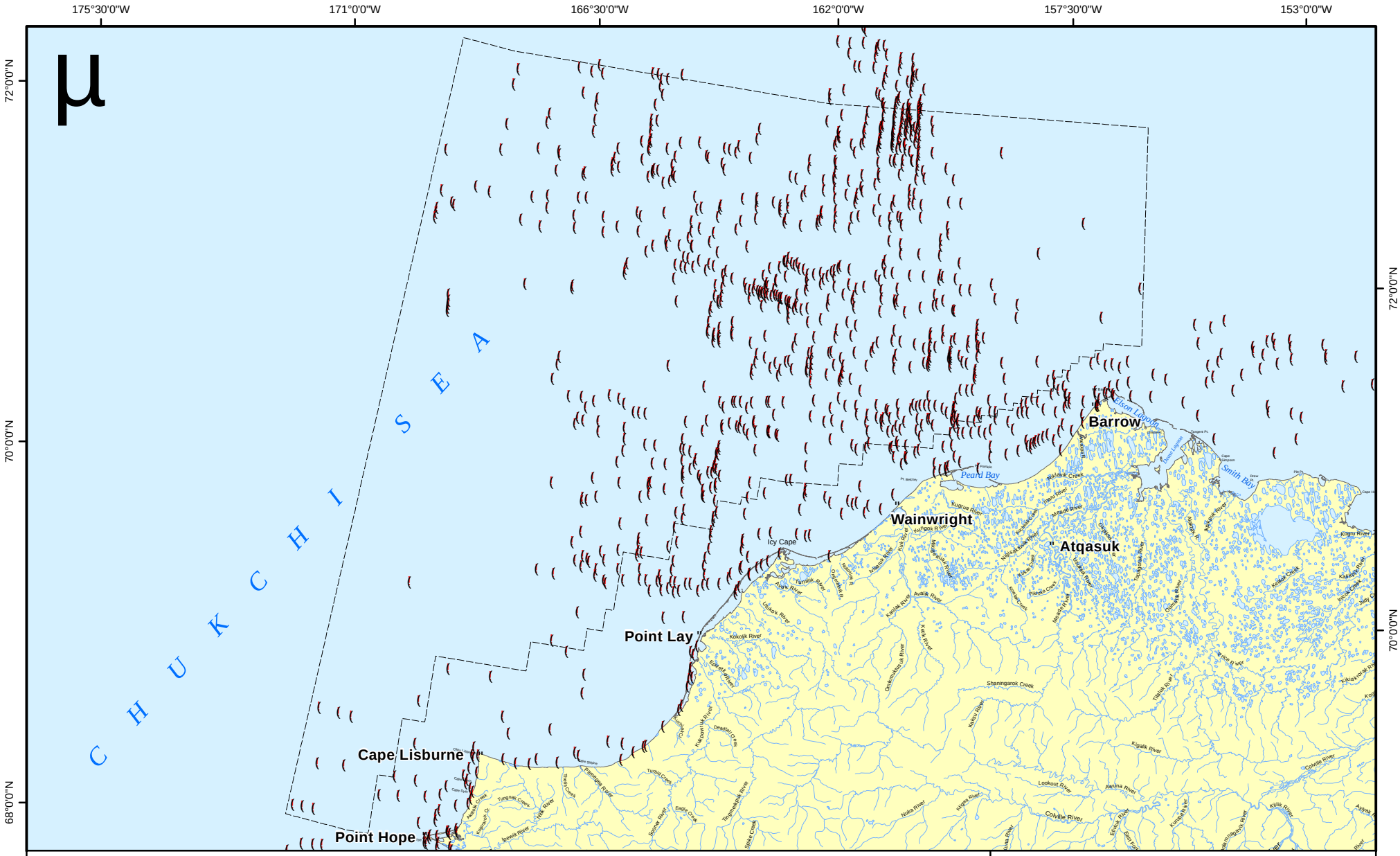
Oil and gas exploration activities do have the potential to disturb small numbers of walruses during the open-water season in the region of activity. Any impact is anticipated to result from disturbance by noise, vessel traffic and contact with accidental releases of oil or waste products. No walruses have been injured or encountered by industry activities on the North Slope, and there have been no lethal takes to date. Any takes are expected to be non-lethal, temporary, and have negligible impacts to the population.

Noise Disturbance

Walruses in the Chukchi Sea area could be potentially exposed to and subsequently disturbed by noise generated by oil and gas exploration. The potential to disturb walruses during the open water season will be greater in the Chukchi Sea than expected with similar activities in the Beaufort Sea. The response of walruses to sound sources may be either avoidance or tolerance.

Noise produced by routine vessel traffic could potentially disturb walruses. However, walrus densities are highest along the edge of the pack ice (Seas and Chapman 1988), and vessel traffic typically avoids these areas by operating in the open water. The reactions of walruses to vessel traffic are highly dependent on distance, vessel speed, and possibly smell (Richardson et al. 1995; Fay et al. 1984), as well as previous exposure to hunting (D.G. Roseneau, in Malme et al. 1989). Walruses in water appear to be less readily disturbed by vessels than walruses hauled out on land or ice (Fay et al. 1984). Thus, vessel activities are likely to impact at most a few walruses. In addition, barges and vessels associated with the oil and gas activities described here will typically avoid travel near large ice floes or land where walruses are found. Vessel noise from oil and gas activities is expected to have only a negligible short-term impact on individuals and no impact on the walrus population.
Icebreakers could unintentionally impact walruses at farther distances than routine vessel traffic (Fay et al. 1984). Walruses on ice have been observed to become alert and dive into the water when icebreakers

passed over 2 km (1.2 mi) away (Fay et al. 1984; Brueggeman et al. 1990; 1991; 1992). In addition, Brueggeman et al. (1990) suggest that walruses on ice floes may avoid icebreakers by 10 to 15 km (6.2 to 9.3 mi). The high density of walruses in the Chukchi Sea suggests that icebreakers may have some impact on the walrus population.



Data sources: NOAA Environmental Sensitivity Index; Mineral Management Services

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Figure 5-1: Walrus Sightings, 1979-1998

SCALE: 0 25 50 100 Miles

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Aircraft over flights may disturb walruses. However, most aircraft traffic is in nearshore areas, where there are typically few to no walruses. Reactions to aircraft vary with range, aircraft type, and flight pattern, as well as walrus age, sex, and group size. Adult females, calves, and immature walruses tend to be more sensitive to aircraft disturbance (Loughrey 1959; Salter 1979). Due to the low density and distribution of walruses in the proposed region of activity, any impact caused by aircraft traffic is expected to be limited to few individuals, if any, and have at most a negligible impact on the population.

Open-water seismic exploration produces underwater sounds, typically with air-gun arrays that may be audible tens of kilometers from the source (Richardson et al. 1995). Such exploration activities could potentially disturb walruses at varying ranges. Recent open-water exploration has been conducted in nearshore ice-free areas covered by this petition and has not encountered any walruses. It is highly unlikely that walruses will be present in these areas; and therefore, seismic exploration would have no more than a negligible impact on the population.

Contact with Oil or Waste Products

The impacts associated with an oil spill would depend on the location, size of the spill, environmental conditions, and success of clean up measures. The impacts of a major oil spill are not considered here. A small spill of a few gallons of oil or other petroleum products is possible during oil and gas exploration in the Chukchi Sea. Such a spill could result from normal day-to-day operations, e.g. an accidental release during refueling of a vessel. Due to current standard operating procedures during refueling, spill response vessels are typically positioned to respond immediately to any oil spill.

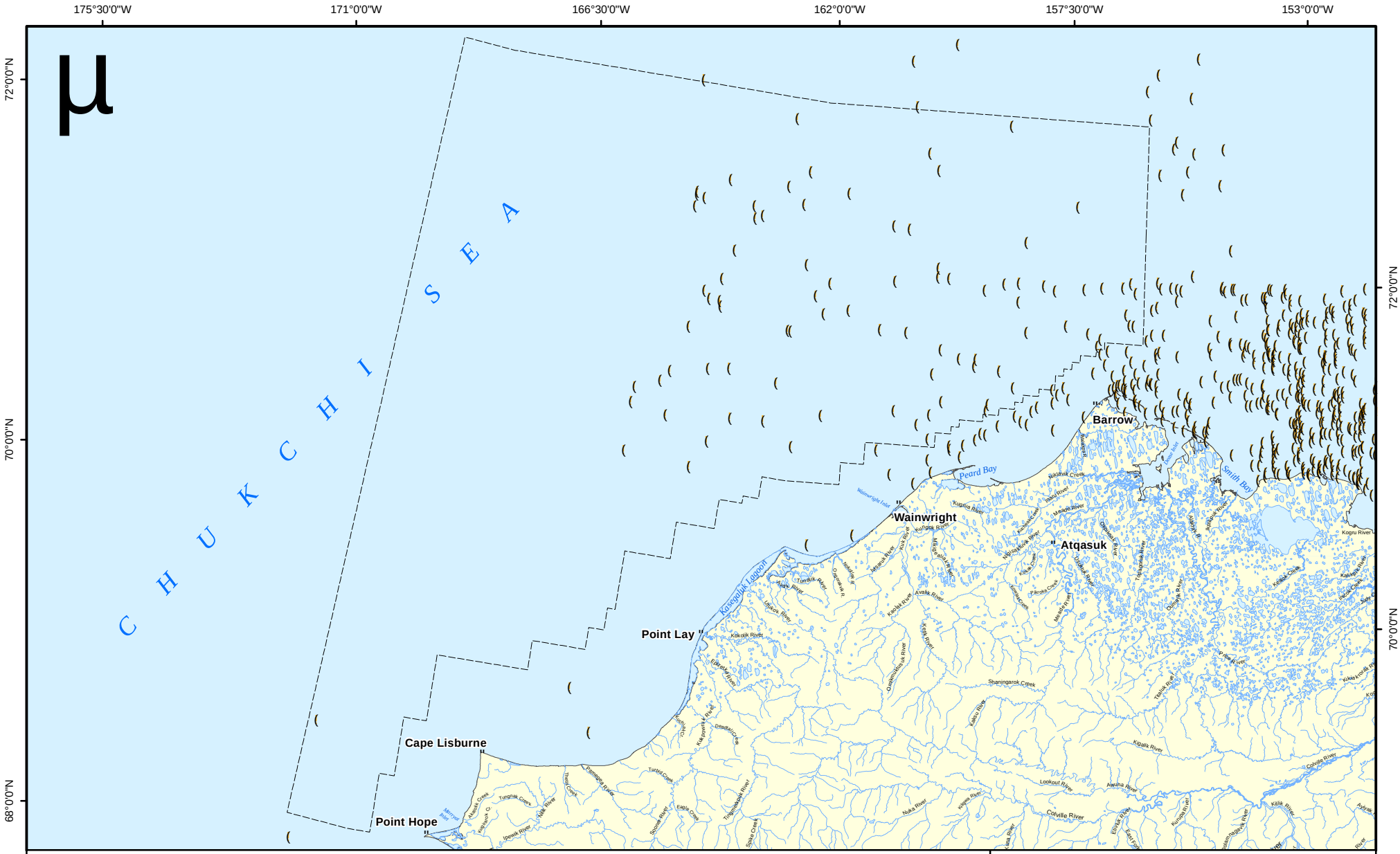
If a small spill occurred at exploration facilities or by vessel traffic, walruses could encounter the oil. Little or no contamination of benthic food organisms and bottom feeding habitats of walrus would be expected to occur, because of the small volume expected to reach offshore feeding areas. If a take did occur, it is very unlikely to be a lethal take because of the small amount of oil that would likely be involved. Thus, small oil spills would probably have minor short-term impact on individual walruses and no long-term impact on the walrus population.

Summary

Since walruses are found in relatively high numbers in the region of oil and gas exploration described in the petition, the probability is higher that the discussed activities, such as offshore drilling operations, seismic, and maintenance activities, could affect walruses.

Polar Bear

Polar bears (*Ursus maritimus) also* occur within the proposed region of oil and gas activities described in this petition (Figure 5-2). They may occur during summer in coastal areas of the Chukchi Sea; however, they typically prefer areas of offshore pack ice (Stirling 1988; Amstrup 1995). In late summer and fall, polar bears also occur in coastal areas near subsistence whaling activities. During the ice-covered season (October through April), polar bears occur in higher concentration throughout coastal and offshore areas of the Alaskan Beaufort Sea east of Point Barrow, including the land-fast ice (Amstrup 1995; NOAA) than west of Point Barrow including the Chukchi Sea. Detailed descriptions of walrus and polar bear distribution and movement patterns are included in Section 6.0.



(Polar Bear Sightings

MMS Chukchi Sea Planning Boundary

Data Sources: NOAA Environmental Sensitivity Index; Alaska Department of Fish and Game

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Figure 5-2: Polar Bear Distribution, 1979-2001

SCALE: 0 25 50 100 Miles

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Polar bear distribution is closely linked to the seasonal movement pattern of sea ice, which supports their primary prey, ringed seals (Amstrup and DeMaster 1988). During the open-water season, polar bears generally prefer areas of heavy offshore pack ice (Stirling 1988; Amstrup 1995). Polar bears occasionally occur along coastlines throughout the year, and also occasionally in areas of land fast ice during the ice-covered season. Female polar bears sometimes den at terrestrial sites along the mainland coast and barrier islands in Alaska (Gardner et al. 1998; Amstrup 2000). Since the late 1980s, polar bears have been observed in greater numbers near coastal areas during late summer and fall in the central Beaufort Sea (Schliebe et al. 2001). This recent observation of bear behavior may be related to the 30-year moratorium on polar bear hunting and the recent success of subsistence whale harvests resulting in a reliable, annual food source that bears are consistently using (Schliebe et al. 2001).

Thus, production facilities or industrial activities that are either offshore or along the coastline are most likely to encounter polar bears from fall to spring when ice is in the region of activity.

Open-Water Season

Noise Disturbance

Noise produced by oil and gas exploration, development, and production activities during the open-water season is unlikely to result in takes of polar bears. During unusual years, pack ice could move into the area of activity and small numbers of polar bears could be potentially affected by noise disturbance resulting in a take. Sources of noise include aircraft traffic, open-water seismic exploration, site clearance surveys, exploratory and delineation drilling, support vessels, and ice management vessels. It is unlikely that any of these activities will impact more than a few polar bears. Any impacts caused by these activities are expected to have short term, temporary impacts on the individual and no impact on the population.

Vessel Traffic

Vessel traffic, including ice-management, appears to have little impact on polar bears (Fay et al. 1984). Some bears walk, run, or swim away, but these reactions are brief and local, and other bears show no reaction or approach the vessels (Brueggeman et al. 1991). Vessel traffic could cause short-term behavioral disturbance only. During the open-water season, most polar bears remain offshore in the pack ice and are typically not present in the area of vessel traffic. Therefore, few if any bears should be disturbed by these activities. Moreover, vessels will change course to avoid disturbing bears whenever possible.

Aircraft Traffic

Repeated or extensive aircraft over flights could result in short-term behavioral disturbances to bears. However, reactions will vary among individuals and are not likely to be more than temporary and short-term to the individual. Pursuit or low-level over-flights will not occur by regularly scheduled or chartered air traffic. In addition, all pilots will be instructed to avoid flying over bears or otherwise making close approaches unless authorized to do so.

Seismic Exploration

It is highly unlikely that open-water seismic exploration activities or other geophysical surveys would cause more than temporary behavioral disturbance to polar bears. Polar bears normally swim with their heads above the surface, where underwater noises are weak or undetectable (Richardson et al. 1995).

Although polar bears are typically far offshore in the pack ice during summer and fall, open-water seismic exploration activities have encountered small numbers of polar bears in the central Beaufort Sea in late summer or more likely in the late fall as freeze up begins and the pack ice move nearshore.

Contact with Oil or Waste Products

Spills of petroleum products associated with exploration facilities are likely to be small (a few gallons or less) and would be cleaned up immediately. Contact with, or ingestion of oil could also potentially affect polar bears. Small oil spills are cleaned up immediately and should have little opportunity to affect polar bears. The probability of a large spill occurring is very small. However, if such a spill were to occur at an offshore oil facility, polar bears could come into contact with oil. The impact of a large spill would depend on the location and size of the spill, environmental factors, and the success of clean-up measures. Due to the low probability of a large spill combined with the solitary behavior and dispersed distribution of polar bears, SOI does not expect any or no more than a few takes of polar bears due to contact with or ingestion of oil during the five-year period of the proposed regulations.

Summary

Noise and vibration produced by oil and gas exploration including accidental oil or other hazardous wastes and the resulting clean-up operations could potentially disturb polar bears. These disturbances are expected to be primarily short-term and temporary behavioral reactions, and should have no more than a negligible impact on the population.

The possibility of unintentional lethal takes is very low; however, if lethal takes do occur, they are expected to have a negligible impact on the population. Alternative actions would be used to avoid or discourage lethal takes including direct intentional hazing conducted under a separate permit.

Current waste and fluid management practices mitigate the possibility of polar bears coming into contact with oil or waste products. Therefore, contacts with wastes and fluids are not expected to impact the polar bear population.

SOI conservatively estimates that no more than a small number of polar bears will be taken during the five-year period of the proposed regulations. These takes would be unintentional and non-lethal. However, it is possible that a few unintentional lethal takes could occur under low probability circumstances. For example, a scenario of an unintentional lethal take could be a road accident where a vehicle strikes and kills a polar bear. Overall, takes would have no more than a negligible impact on the polar bear population and no unmitigable impact on their availability to subsistence hunters.

6.0 STATUS, DISTRUBUTION AND SEASONAL DISTRIBUTION OF AFFECTED SPECIES OR STOCKS OF MARINE MAMMALS

The following species under the jurisdiction of the USFWS can be expected in the region of proposed activity: Pacific walrus and polar bear. These two species are discussed in this section and are the species for which general regulations governing incidental takes of small numbers of marine mammals are sought.

Pacific Walrus (*Odobenus rosmarus divergens*)

Population Status

Pacific walruses are found throughout Arctic waters, typically associated with the offshore pack ice (Dyke et al. 1999). The Pacific walrus stock is found throughout the northern Bering and Chukchi seas, and is not considered a "strategic stock" (Figure 5-1).

No reliable estimate for the size of the Alaska Pacific walrus stock is available (Angliss and Outlaw 2005 *In* MMS 2006). The USFWS in concert with U.S. Geological Survey (USGS) and Russian scientist from GiproRybFlot and ChukotTINRO, conducted a range-wide survey of the Pacific walrus population in March and April 2006. The primary goal was to estimate the walrus population across its spring range – ice covered continental shelf of the Bering Sea using aerial thermal imagery and photography. The final population estimate will be developed in late 2007.

Estimates of the pre-exploitation population of the Pacific walrus range from 200,000-400,000 animals (USDOC 2000a). Over the past 150 years, the population has been depleted by over-harvesting and then periodically allowed to recover (Fay et al. 1989). The Pacific walrus population was estimated at 201,039 animals (Gilbert et al. 1992 *In* MMS 2006). The most current minimum population estimate is 188,316 walruses (USDOC 2000a). This estimate is conservative, because a portion of the Chukchi Sea was not surveyed due to lack of ice.

Distribution and Seasonal Migration

Pacific walruses (*Odobenus rosmarus divergens)* range throughout the shallow continental shelf waters of the Bering and Chukchi seas, where their distribution is closely linked with the seasonal distribution of the pack ice. Walruses are generally found in waters with depths less than 200 m (656 ft) along the pack ice margins where ice concentrations are less than 80% (Fay 1982: Fay and Burns 1988 *In* MMS 2006).

Pacific walruses use 26 major haul out sites in Russia and five on the west coast of Alaska (Gilbert 1999). Of the five haul out sites used in Alaska, males mainly occupy Round Island and Cape Pierce during the summer (Hill 1992; Jefferson et al. 1993), the Punuk Islands are only used in late autumn (Fay and Kelly 1980), males use Cape Seniavin in the spring and autumn (Frost et al. 1982), and St. Matthew Island is seldom used.

In winter, Pacific walruses inhabit the pack ice of the Bering Sea. By May, as the ice pack loosens, adult females and dependent young move northward into the Chukchi Sea. In summer, walrus tend to concentrate in areas of unconsolidated pack ice within 100 km (62 mi) of the leading edge of the pack ice in the Chukchi Sea. By July, up to several thousand walruses can be found along the edge of the pack ice between Icy Cape and Point Barrow. Walruses will haul out to rest on land when suitable ice pack is not available preferring sites sheltered from wind and surf. Traditional haul out sites in the eastern Chukchi Sea include Cape Thompson, Cape Lisburne, and Icy Cape. Within the last 5 years, walruses have been reported hauling out in herds numbering in the thousands along the north coast of Chukota in the fall (C. Johnson per.commun. *In* MMS 2006). By August, depending on the ice pack, walruses are found farther offshore with principal concentrations northwest of Barrow. This area is the northeastern extent of the summer range of the walrus; few are found east in the Beaufort Sea. By September, the edge of the ice pack generally retreats to about 71° North latitude, although in some years it may retreat as far as 76° North latitude. In October, as the pack ice advances, large herds begin moving into the Bering Sea.

Feeding Ecology

The Pacific walrus mainly feeds on bivalve mollusks (clams) along the shallow continental shelf, typically at depths of 80 m (262 ft) or less (Fay 1982). Walruses feed on a variety of benthic invertebrates, such as: worms, snails, shrimp, and some slow-moving fish (Jefferson et al. 1993). However, some walruses have been reported to feed on seals and small whales (Jefferson et al. 1993), and even on seabirds (Gjertz 1990). They mainly feed between June and November when the young are growing and adult females are accumulating fat stores for the breeding season (Fay 1982).

Hauling out on moving ice provides significant advantages for foraging walruses, including proximity to varying food supplies, and relative freedom from disturbance when resting (Fay 1974). Since the walrus feeds on benthic invertebrates, which are slow to reproduce, this continually moving ice facilitates their feeding over a larger area without much effort.

The shallow Chukchi Sea and eastern Siberia Sea are the main feeding grounds for the bulk of the Pacific walrus population in the summer and autumn (Kochnev 2004 *In* MMS 2006). During the summer, the majority of sub adults, females, and calves move into the Chukchi Sea.

Reproduction

Walruses are long-lived animals with low reproduction rates. Male walruses reach sexual maturity between 5-7 years, but usually do not breed until age 15-16 (MMS 2006). Females reach sexual maturity at 4-9 years of age, and give birth to one calf every 2 or more years (Fay 1982). This reproductive rate is much lower than other pinnipeds; however, some walruses may live to age 35-40 and remain reproductively active until age 26 (Fay 1982; Born 2001).

Mating usually occurs between January and March. Implantation is delayed until June or July (Fay 1982). Gestation lasts 11 months (a total of 15 months after mating) and birth occurs between April and June during the annual northward migration. Calves weigh about 63 kg (139 lb) at birth and are usually weaned by age two (Fay 1982).

Pacific walruses (*Odobenus rosmarus divergens)* range throughout the shallow continental shelf waters of the Bering and Chukchi Seas, where their distribution is closely linked with the seasonal distribution of the pack ice. Walruses are generally found in waters with depths less than 200 m (656 ft) along the pack ice margins where ice concentrations are less than 80% (Fay 1982: Fay and Burns 1988 *In* MMS 2006).

Polar Bear (*Ursus maritimus*)

Population Status

Polar bears have a circumpolar distribution throughout the northern hemisphere (Amstrup et al. 1986) and occur in relatively low densities throughout most ice-covered areas (DeMaster and Stirling 1981). Polar bears are divided into six major populations and many sub-populations based on mark-and-recapture studies (Lentfer 1983), radio telemetry studies (Amstrup and Gardner 1994), and morphometrics (Manning 1971; Wilson 1976). Polar bears found in or around Alaska belong to either the Beaufort Sea (northern Alaska), or Chukchi/Bering Sea populations.

According to the USFWS, the status of polar bears worldwide is declining as a result of climate changes, loss of ice habitat, and unregulated hunting pressures (USDOI, FWS 2005 *In* MMS 2006). The global

population of polar bears is estimated at 21,500-25,000 animals (Lunn, Schliebe, and Born, 2002 *In* MMS 2006).

There is little reliable data on the population status of polar bears in the Bering/Chukchi Sea; an original estimate was derived by subtracting the total estimated Alaska polar bear population from the Beaufort Sea population, thus yielding an estimate of 1,200-3,200 animals (Amstrup 1995). In August 2000, a line transect survey was conducted in the eastern Chukchi Sea and western Beaufort to estimate polar bear density and to assess the logistical feasibility of using ship based aerial surveys to develop polar bear population estimates. The density of bears was estimated as one bear per 147 square kilometers (sq km) (Evans et al. 2003). Additional aerial surveys in late fall, using dedicated icebreakers, would be required to achieve the number of sightings, survey effort, coverage, and precision needed for more effective monitoring of population trends in the Chukchi Sea.

Currently, neither stock is listed as "depleted" under the MMPA. (USDOC 2000b, c). In February 2005, the USFWS was petitioned to list polar bear as a threatened species under ESA due to climate change and the melting of the sea ice habitat. In February 2006, the FWS determined the listing petition contained sufficient information indicating that listing polar bears as threatened may be warranted. The FWS is currently conducting a 12-month status review of the species to determine whether the listing is warranted (MMS 2006).

Polar bear populations are protected under the Marine Mammal Protection Act of 1972, as well as by the IACPB, ratified in 1976. Countries participating in the latter treaty include: Canada, Denmark, Norway, Russia (former USSR), and the USA. Article II of the agreement states, "Each contracting party …shall manage polar bear populations in accordance with sound conservation practices based on the best scientific data."

Distribution and Movement

Polar bears occur throughout most of the ice covered Arctic regions. They have been known to travel as far south as the Pribilof Islands and as far north as approximately 13 nautical miles (89° 46.5" N) from the Geographic North Pole (van Meurs and Splettstoesser 2003). The two most important factors influencing polar bear distribution in Alaska are sea ice and food availability. Polar bears migrate south with the advance and north with the retreat of sea ice each fall/winter and spring/summer, respectively. Seasonal distribution of polar bears is largely restricted by the southern edge of the pack ice. During winter, polar bears concentrate along the northern coastline for denning and feeding (Amstrup and Gardner 1994); then they retreat with the ice during the summer.

There are two polar bear stocks in Alaska: the Southern Beaufort Sea stock (SBS) and the Chukchi/Bering Sea stock (CBS), with considerable overlap between the two stocks in the western Beaufort /eastern Chukchi Seas (Amstrup et al. 2005 *In* MMS 2006).

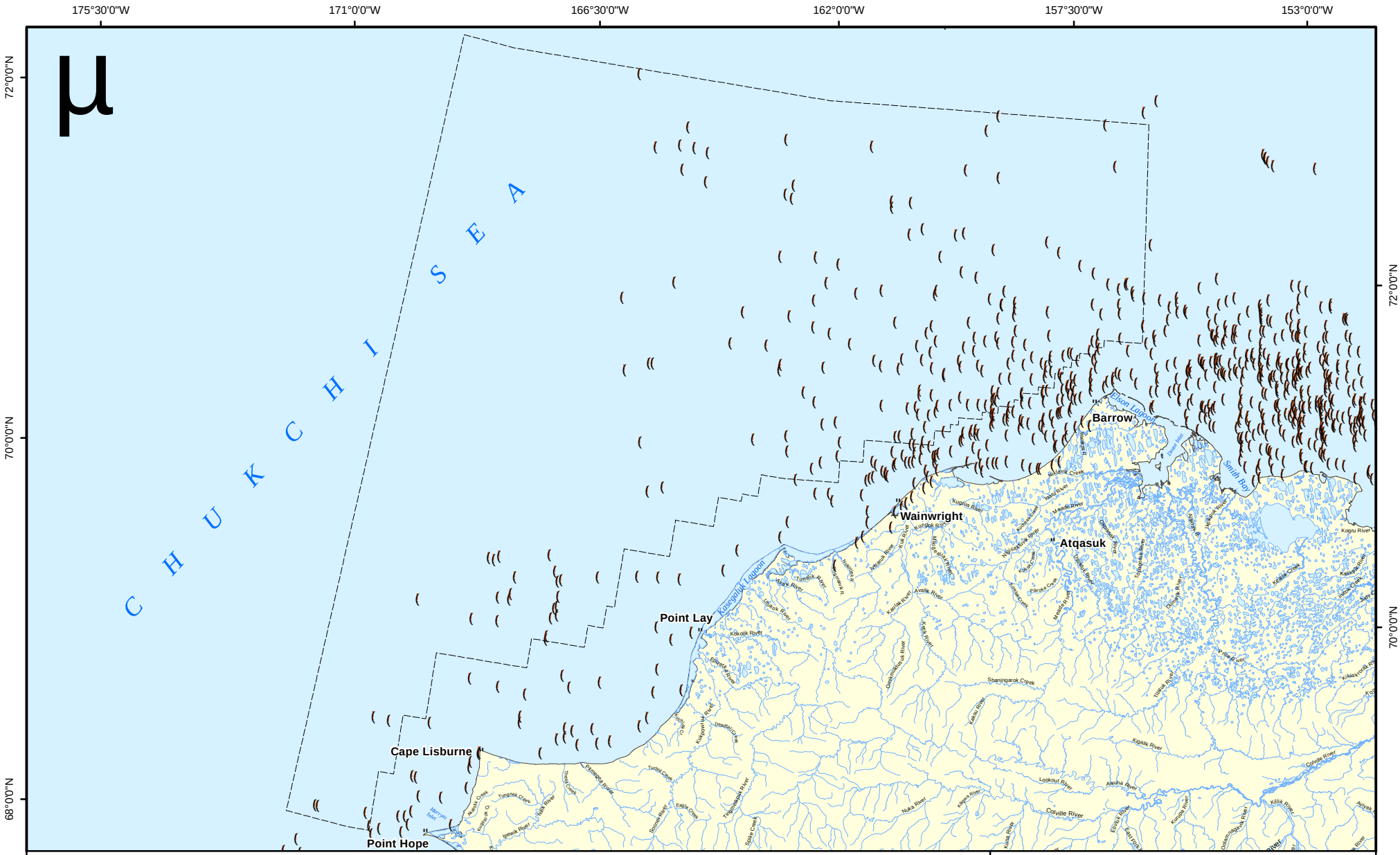
The SBS population ranges from the Baillie Islands, Canada west to Point Hope, Alaska and is subject to harvest from both countries. On an annual basis, more than 90% of the SBS population occurs between the Colville River, Alaska to Mackenzie Bay, Canada (Cronin et al. 2006 In MMS 2006). Similarly, more than 90% of the CBS population occurs west of Cape Lisburne (Cronin et al. 2006 *In* MMS 2006).

The CBS stock ranges from Point Barrow, Alaska west to the Eastern Siberian Sea. These two populations overlap between Point Hope and Point Barrow, Alaska near Point Lay (Amstrup 1995 *In* MMS 2006).

Polar bear distribution is strongly tied to sea ice dynamics (Garner et al. 1990; Amstrup 1995; Amstrup et al. 2000). Although polar bears in the Chukchi and southern Beaufort Seas generally move with the pack ice as it advances in winter and recedes in summer, the specific factors that determine their distribution, movement, and denning on the ice are not completely understood. Satellite telemetry from radio-collared females show a higher percentage of polar bears in the Chukchi Sea area dens on sea ice than on land (Figure 5-2). Despite observed and hypothetical risks, production of cubs from dens at sea was not significantly different than that from dens on land (Amstrup and Gardner 1994) and sea ice denning has obviously been maintained as a successful reproductive strategy in the Beaufort and Chukchi Sea area.

Feeding Ecology

Polar bears usually forage in areas where there are high concentrations of ringed seals (*Phoca hispida*) and bearded seals (*Erignathus barbatus*; Larsen 1985; Stirling and McEwan 1975) as illustrated in Figure 6-1. This includes areas of land-fast ice, as well as moving pack ice. Polar bears are opportunistic feeders and feed on a variety of foods and carcasses including beluga whales, Arctic cod, geese and their eggs, walruses, bowhead whales, and reindeer (Smith 1985; Jefferson et al. 1993; Smith and Hill 1996; Derocher et al.).



Seal Sightings

MMS Chukchi Sea Planning Boundary

Data Sources: NOAA Environmental Sensitivity Index; Alaska Department of Fish and Game

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SHELL EXPLORATION & PRODUCTION CO.

Figure 6-1: Seal Distribution, 1979-2001

SCALE: 0 25 50 100 Miles

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Polar bears usually forage where there are high concentrations of ringed seals, as these are their primary prey (Stirling and McEwan 1975; Larsen 1985 *In* MMS 2006). Bearded seals, walruses, and beluga whales are also taken opportunistically (Amstrup and DeMaster 1988 *In* MMS 2006). They often consume only the blubber of seals, and abandon the remaining meat and carcass, which is then consumed by other animals (Stirling and McEwan 1975). Ringed seal blubber contains most of the energy content: 67% for yearlings and 75% for adults (Stirling and McEwan 1975). Data from Øritsland et al. (1981) and Hurst et al. (1982), suggest that an entire one-year-old seal would provide the energy requirements of a polar bear for 3.7 days, while the blubber alone would provide energy requirements for 2.7 days (Stirling and McEwan 1975).

Polar bears prefer shallow-water areas possibly reflecting a preference for ringed seals as well as the higher productivity in these areas (Durner et al. 2004 *In* MMS 2006). In the spring, polar bears in the Beaufort Sea prefer regions with high ice concentrations. In summer, Beaufort Sea polar bears select habitats with a high proportion of old sea ice in waters greater than 350 m (1,148 ft) deep, which places them outside the areas of greatest prey abundance. The distribution of seals and the habitat selection patterns by polar bears in the Beaufort Sea suggests that most polar bears do not feed extensively during the summer.

During the winter, polar bears prefer the lead system at the shear zone between the shore fast ice and the active offshore ice. The narrow zone of moving ice parallels the coastline and creates openings used by seals.

Habitat

The polar bear's preferred habitat is the annual ice over the continental shelf and inter-island archipelagos that encircle the polar basin (Derocher, Lunn, and Sterling 2004 *In* MMS 2006). Polar bears and ringed seals depend on sea ice for their life functions. Research has indicated the total sea extent has declined over the last few decades especially near shore areas and in the amount of multiyear ice in the polar basin (Parkinson and Cavalieri 2002; Comiso 2002 (a)(b) *In* MMS 2006). Polynyas or open water areas surrounded by ice are another important habitat type that is extremely important to polar bears (Stirling 1997 *In* MMS 2006). Polynyas are often the sites of marine mammal and bird concentrations.

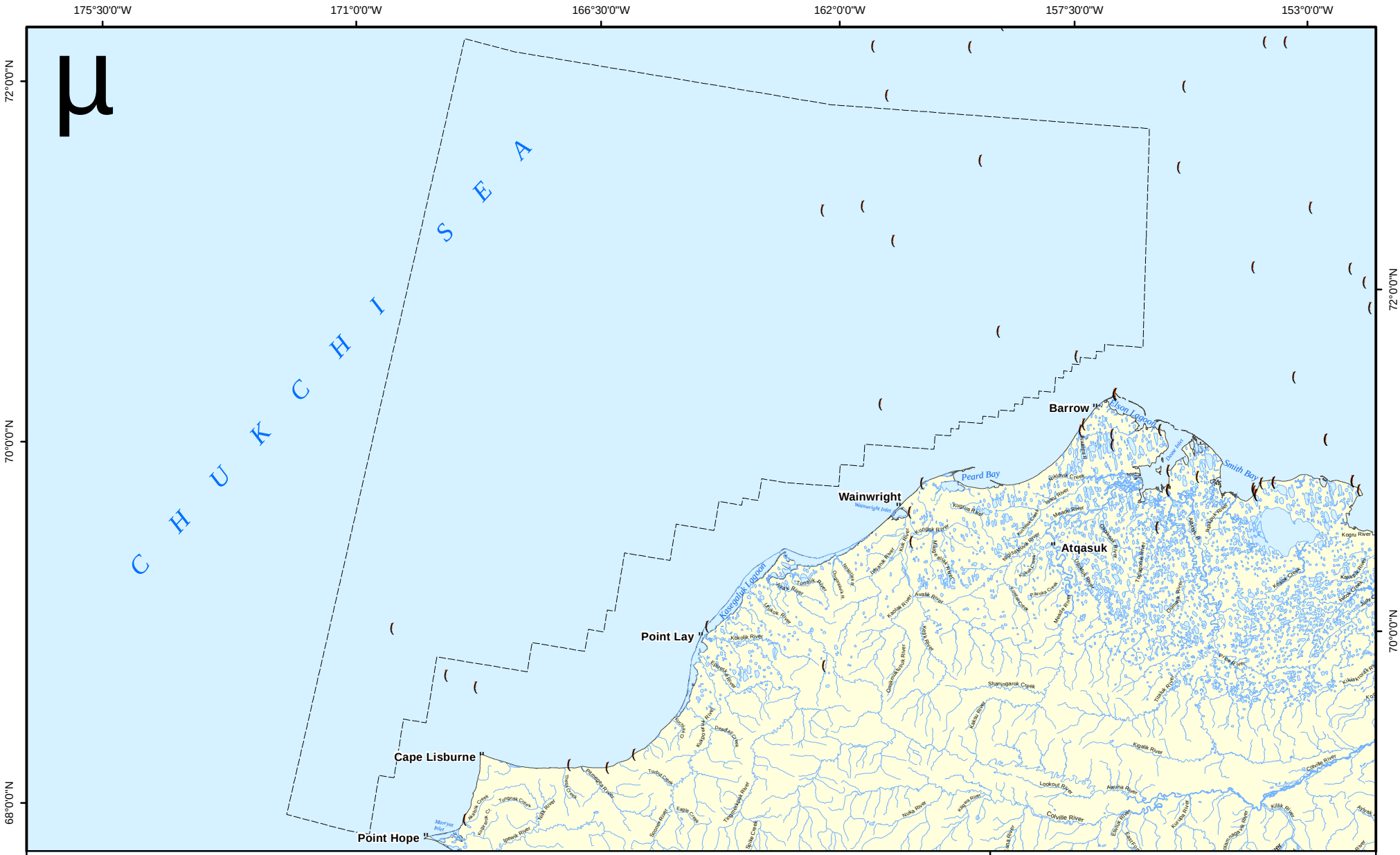
Reproduction

Females give birth to 1 to 3 cubs an average of every 3.6 years (Jefferson et al. 1993; Lentfer et al. 1980). Cubs remain with their mothers for 1.4 to 3.4 years (Derocher et al. 1993b; Ramsay and Stirling 1988). Mating occurs from April to June followed by a delayed implantation during September to December. Females give birth usually the following December or January (Harington 1968; Jefferson et al. 1993). In general, females 6 years of age or older successfully wean more young than younger bears; however, females as young as 4 years old can produce offspring (Ramsay and Stirling 1988). An examination of reproductive rates of polar bears indicated that only 5% of four-year-old females had cubs, whereas 50% of five year-old females had cubs (Ramsay and Stirling 1988). Females that were over 20 years had a very high rate of cub loss or did not successfully reproduce. The maximum reproductive age reported for Alaskan polar bears is 18 years (Amstrup and DeMaster 1988).

Denning

Female polar bears usually enter maternity dens from late October through early November. These dens are excavated in accumulations of snow on land in coastal areas, on stable parts of offshore pack ice, or on land-fast ice (Figure 6-2).

In the Beaufort and Chukchi Sea, polar bears den on the pack ice and on land (Amstrup and Gardner 1994). Amstrup and Gardner (1994) reported that during 1982 to 1991 a higher proportion of polar bears denned on the offshore pack ice (53%) than in terrestrial locations (47%). Pack ice is a mobile denning platform, and den sites can drift up to 1,000 km (621 mi) during winter (Amstrup 2000). Cub production between female bears using the two substrates was not significantly different (Amstrup and Gardner 1994). Of the 28 females that had dens on pack ice, 16 produced 26 cubs (0.93 cubs/den), whereas 21 of the 31 females that denned on land produced 33 cubs (1.1/cubs den) (Amstrup and Gardner 1994).



Historical Bear Dens

MMS Chukchi Sea Planning Boundary

Data Sources: NOAA Environmental Sensitivity Index; Alaska Department of Fish and Game

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Figure 6-2: Polar Bear Den Locations, 1957-2000

SCALE: 0 25 50 100 Miles

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7.0 ANTICIPATED IMPACT ON SPECIES OR STOCKS

This element of the petition is not addressed in this addendum.

8.0 ANTICIPATED IMPACT ON SUBSISTENCE

Information on subsistence harvest of polar bears and Pacific walruses for Chukchi Sea communities is provided in this section; however, the impact of the activities was not addressed in this addendum due the complexity of the issues and the lack of sufficient information.

Pacific Walrus (Odobenus rosmarus divergens)

The Pacific walrus is an important subsistence species for Alaska Native hunters. Walruses are harvested by several Native communities including Barrow, Wainwright, Point Lay, Cape Lisburne and Point Hope. The number of walruses harvested annually has varied over the years, with recent harvest levels much lower than historic highs. Base on harvest data from Alaska and Chukota in years 2001-2005, mean harvest mortality levels are estimated at 5,458 animals per year (USDOI, FWS 2006 *In* MMS 2006).

Polar Bear (Ursus maritimus)

Historically, polar bears have been killed for subsistence, handicrafts and recreation. Based on skins shipped from Alaska, an average of 120 polar bears was taken annually by natives between 1925 and 1953. Trophy hunting from aircraft was initiated in the 1950's, and as a result, the annual harvest rate by natives and sport hunters more than doubled to an average of 260 polar bears each year between 1961-1972 (Amstrup et al. 1986; Schliebe et al.1995). The MMPA exempted only native Alaskans from the prohibition on taking and allowed a harvest of all marine mammals for subsistence purposes. After 1972, the annual subsistence harvest of polar bears ranged from 29-181 between 1973 and 1984 each year (Amstrup et al. 1986). Over the past decade (1990-2001), the total number of harvested polar bears has ranged between 38-123 animals each year. Since 1972, the ban on commercial sale of polar bear hides drastically diminished the intensity of the harvest. Harvest from the Chukchi/Bering seas stock accounted for 68% (mean =75) of the annual Alaska kill during this period (USFWS 2004). The number of unreported kills since 1980 to the present is thought to be negligible. The pursuit of polar bears continues to play an important role in Inupiat communities where they utilize parts of the bears to make traditional handicrafts and clothing (Nelson 1981).

8.1 Subsistence Harvests by Community

Barrow

Barrow is the economic, transportation and administrative center for the North Slope Borough. Located on the Chukchi Sea coast, Barrow is the northernmost community in the United States. The majority of the annual subsistence harvest by edible pounds for Barrow is composed of caribou and bowhead whales (22 percent and 39 percent, respectively; USDOI 2001). Walruses comprise approximately 9 percent of the annual harvest (by edible pounds), and polar bear accounts for approximately 2.2 percent of the annual subsistence harvest (by edible pounds) for Barrow (USDOI 2001).

Walrus

Walruses are a very important cultural and subsistence resource comprising the third most important species by weight of harvestable meat (Residents of Barrow, as cited in S.R. Braund and Assocs. and UAA, ISER, 1993). Barrow residents hunt walruses from boats. The timing and seasonality of hunting greatly depends on ice conditions. Most walrus hunting occurs from June through September, west of Barrow southwestward to Peard Bay. From August to September walrus can be hunted at local haul outs with the focal area from Milliktagvik north to Point Franklin. Hunting peaks in August, when the land fast ice breaks up and hunters can access the walruses by boat as they migrate north on the retreating pack ice (USDOI 1990). The average annual walrus harvest for Barrow from 2000 to 2004 was 31.8 animals (Table 8-1).

Polar Bear

Barrow residents hunt polar bears on the sea ice or along leads from October to June. In 1989, 2.2% of the total subsistence harvest (by edible pounds) for Barrow was composed of polar bears (USDOI 2001). The polar bear harvest for Barrow from 2000-2004 averaged 15.6 animals /year (Table 2). Barrow often has the highest number of polar bear takes on the North Slope. Polar bear are hunted in the same general vicinity as the walrus hunt.

Wainwright

Wainwright is located on the coastline of the Chukchi Sea about 72 miles southwest of Barrow. It is the third largest village on the North Slope, with a population of 584 people. The people of Wainwright are Inupiat Eskimos who rely on subsistence hunting based primarily on whales and caribou.

Walrus

Wainwright residents hunt in the Chukchi Sea for walrus from June through August at the southern edge of the retreating pack ice for food and ivory use. Wainwright hunters are extremely successful and have consistently harvested more walruses than any other subsistence community on the North Slope averaging 62.2 animals/year for the last five years, 2000-2004 (Table 8-1).

Polar Bear

Polar bear hunting occurs primarily in the fall and winter around Icy Cape, at the headland from Point Belcher to Point Franklin, and at Seahorse Island. Compared to Barrow, Wainwright has the second highest take of polar bear on the North Slope. The annual polar bear harvest for Wainwright averaged 4.4 bears from 2000 - 2004 (Table 8-2).

Point Lay

Point Lay is located on the Chukchi Sea Coast, protected from the open ocean by the Kasugaluk Lagoon and is 152 miles southwest of Barrow. The deeply indented shoreline prevents effective bowhead whaling and the village has never fully participated in the whaling culture. The village's traditional hunt of beluga whales is similar to the bowhead whaling culture in other North Slope villages.

Walrus

Point Lay residents hunt walrus from June to August along the entire length of Kasegaluk Lagoon, south of Icy Cape, and as far as 20 miles offshore. Point Lay residents for the last five years, 2000-2004, have only averaged 6.2 walrus taken/year. Generally Point Lay residents' hunt less often than thee nearby communities of Point Hope and Wainwright; also USFWS officials suggest that tagging may be under-reported (Table 8-1).

Polar Bear

Polar bear are hunted from September to April along the coast and rarely more than 2 miles offshore. Only two polar bears have been tagged and reported from Point Lay from 2000 to 2004 for an average animal/year of 0.4. Compared to polar bears tagged in Wainwright (4.4 animals/year) and Point Hope (7.8 animals/year) this number is noticeably low and believed to be under-reported (Table 8-2).

Point Hope

Point Hope is located near the end of a triangular spit which juts 15 miles into the Chukchi Sea about 248 miles southwest of Barrow. This peninsula is one of the longest continually inhabited areas in North America. Some of the earliest residents came to the peninsula for bowhead whaling some 2,000 years ago after crossing the Siberian land bridge.

Walrus

Point Hope residents harvest walrus from May to July along the southern shore of the point from Point Hope to Akoviknak Lagoon. Point Hope annual take/year averages to 11 animals for the years of 2000 to 2004. Point Hope resident's reporting and hunting success is nearly double of Pont Lay. (Table 8-1).

Polar Bear

Point Hope residents hunt polar bear primarily from January to April and occasionally from October to January in the area south of the point and as far out as 10 miles from shore. Polar Bear takes in the Chukchi Sea area are reported as takes in defense of life or property or for their fur compared to subsistence. Point Hope harvested 7.8 polar bears for the last five years (2000-20004) with a Chukchi Sea region high of 12 in 2001 (Table 8-2).

Table 8-1
Native Subsistence Walrus Harvest Estimates by Year and Village

	Calendar Year					
Village	**88-99 [a]**	**2000**	**2001**	**2002**	**2003**	**2004**
Barrow	228	19	36	39	51	14
Wainwright	508	36	93	118	29	35
Point Lay	31	6	3	10	10	2
Point Hope	36	6	2	15	12	20
Total [b]	803	67	134	182	102	71

[a] Data based on seasonal-year (30 June – 1 July)
[b] Totals are not corrected for walruses struck and lost
USFWS 2004 data

Table 8-2
Estimates of Alaska Subsistence Harvest for Polar Bear by Year and Village

	Calendar Year					
Village	**88-99**	**2000**	**2001**	**2002**	**2003**	**2004**
Barrow	215	12	16	26	21	3
Wainwright	74	3	9	4	4	2
Point Lay	18	1	0	1	0	0
Point Hope	132	5	12	8	9	5
Total	439	21	37	39	34	10

USFWS 2004 data

9.0 ANTICIPATED IMPACT ON HABITAT

This element of the petition was previously addressed by in the AOGA's petition and the rule promulgation for the Beaufort Sea was published in the Federal Register on July 25, 2003 (Volume 68, Number 143).

10.0 ANTICIPATED IMPACT OF THE LOSS OR MODIFICATION OF THE HABITAT

This element of the petition was previously addressed in the AOGA's petition and the rule promulgation for the Beaufort Sea was published in the Federal Register on July 25, 2003 (Volume 68, Number 143).

11.0 AVAILABILITY AND FEASIBILITY OF EQUIPMENT AND METHODS WITH LEAST IMPACT TO RESOURCES

This element of the petition was previously addressed in the AOGA's petition and the rule promulgation for the Beaufort Sea was published in the Federal Register on July 25, 2003 (Volume 68, Number 143).

12.0 MONITORING AND REPORTING

This element of the petition was previously addressed in the AOGA's petition and the rule promulgation for the Beaufort Sea was published in the Federal Register on July 25, 2003 (Volume 68, Number 143).

13.0 COORDINATION OF RESEARCH EFFORTS

This element of the petition was previously addressed in the AOGA's petition and the rule promulgation for the Beaufort Sea was published in the Federal Register on July 25, 2003 (Volume 68, Number 143).