United States Department of the Interior

U.S. FISH AND WILDLIFE SERVICE
Northern Alaska Field Office
101 12th Avenue, Room 110
Fairbanks, Alaska 99701
February 2, 2022

Tracy Riker
Director, Fleet Installations and Environment
Department of the Navy
1562 Mitscher Avenue, Suite 250
Norfolk, VA 23551-2487

Re: Endangered Species Act
Section 7 Consultation for
Polar Bears

Dear Ms. Riker:

Thank you for requesting consultation pursuant to section 7 of the Endangered Species Act of 1973, as amended (ESA), regarding the proposed 2022 ICEX exercise in Arctic Alaska. The U.S. Fish & Wildlife Service (Service) has reviewed the proposed action to determine if it would adversely affect listed species or designated critical habitat under our jurisdiction. Three species listed as threatened under the ESA may occur in the action area: spectacled eiders (*Somateria fischeri*), Alaska-breeding Steller's eiders (*Polysticta stelleri*), and polar bears (*Ursus maritimus*). The Action Area is also located within all three units of designated critical habitat for the polar bear (i.e., Terrestrial Denning, Barrier Island, and Sea Ice).

THE PROPOSED ACTION

The Navy proposes to conduct submarine training and testing activities, which include establishment of a tracking range and temporary ice camp, and conducting research in an Arctic environment (Figure 1). The Proposed Action would also evaluate emerging technologies and assess capabilities in the Arctic environment and gather data on Arctic environmental conditions. The vast majority of submarine training and testing would occur near the ice camp; however, some submarine training and testing may occur throughout the deep Arctic Ocean basin near the North Pole, within the Navy Activity Study Area (Figure 1).

The Proposed Action, including construction and demobilization of an ice camp, would occur over approximately a six-week period from February through April (considered winter through early spring) 2022. Submarine training and testing and research activities, when occurring, would occur over approximately four weeks during the six-week period.

Ice Camp
Reconnaissance flights to identify a suitable location for the ice camp would occur over an area of approximately 113,927 square kilometers (km^2); the ice camp would be no more than 1.6 km in diameter (approximately 2 km^2 in area). During the 2022 ICEX exercise, the ice camp would

consist of a command hut, dining tent, sleeping quarters, an outhouse, a powerhouse, a runway (and a back-up runway for use in case of emergency), and a helipad (Figure 2). The number of structures/tents would range from 15 to 20, each typically 2 to 6 meters (m) by 6 to 10 m in size. Some tents may be octagon shaped and approximately 6 m in diameter. Berthing tents would contain bunk beds, a heating unit, and a circulation fan. Support equipment for the ice camp includes snowmobiles, gas powered augers and saws (for boring holes through the ice), two reverse osmosis units, and diesel generators.

All ice camp materials, fuel, and food would be transported from Prudhoe Bay, Alaska, and delivered by air-drop from military transport aircraft (e.g., C-17 and C-130), or by landing at the ice camp runway (e.g., small twin-engine aircraft and military or commercial helicopters). Aircraft would be used to transport personnel and equipment from the ice camp to Prudhoe Bay; up to nine round trips could occur daily during ice camp build-up and demobilization, and one to three round trips could occur daily during ice camp operation. At the completion of ICEX events, the ice camp would be demobilized, and all personnel and materials would be removed from the ice floe. All shelters, solid waste, hazardous waste, and sanitary waste would be removed and disposed of in accordance with applicable laws and regulations.

A portable tracking range for submarine training and testing would be installed in the vicinity of the camp; hydrophones, located on the ice and extending to approximately 30 m below the ice, would be deployed. Hydrophones are approximately 11.8 centimeters (cm) in length and have 610 m in associated cables; nothing associated with the tracking range would extend more than 30 m below the ice. The associated cable is Kevlar reinforced and has a long-life polyurethane jacket for durability. The hydrophones would be deployed by drilling holes in the ice and lowering the cable down into the water column.

Most freshwater for drinking and cooking would be produced by reverse osmosis through desalination. However, the camp may also utilize mining and melting of multi-year ice. The operation of a reverse osmosis system results in “reject water,” or water that is of higher salinity (approximately three times the salinity) than the initial seawater input. This reject water would also be discharged at the camp via a single drain (corrugated pipe placed through a hole in the ice) collocated with the portable system. The average reject water production is expected to be 144 gallons per day. This amount is based on the unit not being operated continuously due to downtime associated with system maintenance and adjustments for flow rate. The maximum reject water production would be approximately 576 gallons per day. The extreme conditions of the ice camp would influence both the system’s efficiency and ability to operate, which is why the output from the system would be variable. Assuming continuous operation (24 hours per day) for the 4 weeks of camp operations (excluding a week each for construction and demobilization), a maximum total discharge of reject water from the ice camp would be 8,064 gallons.

Freshwater would only be made available in the camp’s dining facility. This water would be available for limited food preparation, dishwashing, and human consumption. Additionally, a hygiene station would be available at the ice camp for hand washing. The hygiene station would be located in the dining facility and consist of a gravity fed container, which would provide water for hand sanitizing and/or face washing if needed. The hygiene station would utilize the

same drain as the kitchen sink for grey water discharge. No shower facilities would be available at the camp.

Dishwashing and a hygiene station would use biodegradable, chlorine-, and phosphate-free detergent that meets the Environmental Protection Agency's Safer Choice standards (U.S. Environmental Protection Agency 2015). Prior to use, dishwashing water would be heated using an on-demand propane water heater. Wastewater generated during food preparation and dishwashing would be discharged to the Beaufort Sea via a single drain in the camp's dining facility. The drain would consist of a corrugated pipe, wrapped in electric heat tape to prevent the pipe from freezing, which would be placed through a hole drilled/melted into the ice. The drain would utilize a removable metal screen to capture solid debris (i.e., food particles) in the wastewater prior to discharge. The metal screen would have a mesh size of no greater than 0.16 cm. Solids captured in the screen would be disposed of via the camp's solid waste containers and brought back to Prudhoe Bay, Alaska, for disposal. Freeze-dried, camping style meals would be the primary form of meals, supplemented with fresh fruit, energy bars, etc. The camp would have an average discharge rate of 100 gallons per day, with a maximum discharge rate of 155 gallons per day during the two weeks of peak camp operations.

Graywater and reverse osmosis reject water discharges would occur only during camp operation. Neither graywater nor reverse osmosis reject water would be discharged during construction of the ice camp. Additionally, reverse osmosis units would not be used until the camp is fully functional. The camp would be fully functional within five days of initial cargo flights dropping off equipment.

Sanitary/human waste generated at the camp would be collected in zero-discharge sanitary facilities (e.g., barrels lined with a plastic bag), would be collected and containerized, then flown back to Prudhoe Bay, Alaska, for disposal at appropriate facilities. In addition to the main ice camp, two smaller, adjacent berthing areas are proposed. These areas (used for expeditionary forces) would leverage the facilities provided by the main camp (e.g., sanitary facilities) while verifying these groups could function independently if necessary. All materials from these adjacent areas would be removed from the ice upon completion of the activities.

Prudhoe Bay

During the Proposed Action, flights to and from Prudhoe Bay would utilize the public airport to Deadhorse, Alaska. From there, up to nine round trips could occur daily during ice camp build-up and demobilization; one to three round trips could occur daily during ice camp operations. All flights would leave from Deadhorse Airport and fly directly to the ice camp. When exercise torpedoes (i.e., non-explosive) are retrieved from the water column following submarine training and testing, they would be transported to and be processed at Prudhoe Bay. Exercise torpedoes would then be prepared for transport in accordance with existing Navy policies.

Submarine Training and Testing and Torpedo Exercises

Submarine activities associated with ICEX events are classified, but generally entail safety maneuvers and active sonar use. These maneuvers and sonar use are similar to submarine activities conducted in other undersea environments; they would be conducted in the Arctic during the proposed exercise to test their performance in a cold environment. Submarine training

and testing would involve active acoustic transmissions, which have the potential to harass marine mammals. Details about torpedoes and torpedo firing are classified, and descriptions can be provided to authorized individuals upon request.

Research Activities
Personnel and equipment proficiency testing and multiple research and development activities would also be conducted during ICEX. Each type of activity scheduled for ICEX has been reviewed and placed into one of seven general categories of actions; these categories of actions are described further below. Due to the uncertainty of extreme cold, some scheduled activities may not be conducted. All researcher personnel traveling to the ice camp would be berthed at the facilities.

Platform Descriptions
Typical platforms used for ice camp logistics and to support proposed research activities include on-ice vehicles (e.g., snowmobiles), aircraft, unmanned vehicles (both aerial and underwater), and passive devices (e.g., acoustic receivers).

On-Ice Vehicles
Snowmobiles would be used to transport personnel and equipment on the ice. Additionally, snowmobiles would support research activities that require data collection from multiple locations, with some at a distance from the ice camp. Four to six snowmobiles would be used during ICEX. Two types of snowmobiles are typically used at the ice camp. Heavyweight snowmobiles have a single steering track and a very large drive track; these machines would be used to pull sleds and sledges to move equipment around camp. Lightweight snowmobiles with dual steering tracks would transport personnel.

In addition to the typical snowmobiles, two types of all-terrain tracked vehicles, one equipped with four wheels and one equipped with six or eight wheels, that can be used in open water (referenced herein as all-terrain tracked vehicle) may be air-dropped to support runway construction and expeditionary forces. The all-terrain tracked vehicle has a low ground pressure of 1.6 pounds per square inch and is used in sensitive habitats. The all-terrain tracked vehicle is capable of traversing in all terrains (Ontario Drive and Gear Ltd. 2017). Expeditionary forces may use an all-terrain tracked vehicle. The all-terrain tracked vehicles have a load capacity of up to 1,200 pounds, depending on the model. They are capable of floating in open water if necessary. All-terrain tracked vehicles have two engine types typically gasoline engine or diesel. Both engines are approximately 30 horsepower (Ontario Drive and Gear Ltd. 2017). The all-terrain tracked vehicle would be used to transport expeditionary forces to and from the main camp.

Aircraft
Various fixed-wing and rotary-wing (i.e., helicopters) aircraft may be used during ICEX (Figure 3). Shelters, personnel, and equipment would be transported to and from the ice camp via these aircraft. Up to nine round trips may be conducted each day during ice camp build-up and demobilization; one to three round trips may occur during ice camp operations. These aircraft would also support many of the research activities.

In addition, military aircraft may be used depending on their availability. Examples of military aircraft that may be used include C-130, V-22 and C-17 transport aircraft (as well as the LC-130, which is a modified C-130 suited to land on the ice) and CH-47 Chinook heavy-lift helicopters (Figures 3 and 4). These aircraft are much larger than the small, fixed-wing aircraft typically used (up to 53 m in length for the C-17 compared to 8 and 24 m in length for a Cessna 185 and Casa, respectively) and would allow for more efficient (i.e., fewer trips) transport of supplies. Equipment and material may be dropped by parachute from these military aircraft. The LC-130 would conduct up to four round trip flights to the ice camp over the course of the Proposed Action; these are included within the maximum number of daily flights to the ice camp. The V-22 would only land and take off from the ice camp one time.

The V-22 Osprey has several modes of operation, which include a vertical take-off, similar to a helicopter as well as a traditional take off similar to other fixed-wing aircraft. The V-22 generates a large amount of heat from its engines. However, due to the low ambient temperature of the Arctic, ice thickness required supporting aircraft and re-freezing of the ice, temporary melting of the runway may occur and re-freeze after the aircraft has departed the ice. The aircraft would not be allowed to alter the runway enough to make it inoperable for the remainder of the aircraft operations which would need to occur.

Unmanned Vehicles and Systems

Unmanned underwater vehicles would either maneuver autonomously, or may be tethered to a command center (Figure 5). Unmanned underwater vehicles are typically slow moving (less than 5 knots), and range in size from approximately 52 cm in length and width to 493 cm in length and 53 cm in diameter. Some unmanned underwater vehicles would use active acoustic sources. Additionally, some unmanned underwater vehicles would have *de minimis* acoustic sources used and deployed throughout ICEX. *De minimis* sources have the following parameters: low source levels, narrow beams, downward directed transmission, short pulse lengths, frequencies above (outside) known marine mammal hearing ranges, or some combination of these factors (Department of the Navy 2013).

In addition to unmanned underwater vehicles, various unmanned aerial systems are proposed for testing. Systems used may be either fixed-wing (Figure 6) or rotary-wing (Figure 7). Fixed-wing systems vary in their wingspans, up to approximately 305 cm, and fly at speeds of about 80 knots. Rotary-wing systems are typically smaller, approximately 51 cm in length and width, and fly at speeds of about 30 knots.

Scientific Devices

Various passive and active acoustic devices would be used for data collection, including a vertical array and buoys.

Passive Devices

A vertical line array would be deployed through the ice to measure ambient underwater noise and sound propagation through Arctic waters. A tow body consisting of plate weights suspended from a line would be deployed through the ice to disturb the fine-scale ocean “staircase” structure at 200-300 m. A line array of oceanographic sensors would measure any noticeable difference in the ambient area from the deployment of this tow body line. This array would

contain a series of acoustic recorders located at depths from the surface to 200 m. Other various scientific devices (typically less than 1 m in diameter) would be deployed throughout ICEX, including four EMATTS (mobile acoustic sources) which would transmit in specific patterns within the mixed arctic water layer, for the vertical line array to receive. EMATTS, which are approximately 36 inches in length and 5 inches in diameter, would scuttle and would not be retrieved. To support submarine self-tracking, an acoustic buoy would be deployed and would emit a homing signal so that the submarines can determine their location relative to the ice camp. This buoy would be retrieved at the completion of the exercise. The remaining devices would be deployed as part of the research activities and would collect data on the under-ice topography and environmental conditions (Figure 8).

Active Acoustic Devices
Information regarding the majority of the active acoustics associated with the ICEX Program is classified. One active ice profiler would be deployed under the ice and map the ice. Acoustic parameters for active sources described above can be found in Table 2-2.

Minimization Measures
In collaboration with the Service's office of Marine Mammals Management (MMM), the Navy has proactively agreed to implement Best Management Practices (BMPs) to reduce potential impacts of the proposed exercise on polar bears (Appendix A).

In addition, the Navy would implement the following Standard Operating Procedures and Mitigation Measures to further reduce potential impacts of the proposed exercise on polar bears (Navy 2021):

Standard Operating Procedures
The Navy states the following procedures would be implemented:

- "The location for any air-dropped equipment and material would be visually surveyed prior to release of the equipment/material to ensure the landing zone is clear. Equipment and materials would not be released if any animal is observed within the landing zone.
- Air drop bundles would be packed within a plywood structure with honeycomb insulation to protect the material from damage.
- Spill response kits/material would be on-site prior to the air-drop of any hazardous material (e.g., fuel)."

Mitigation Measures
In addition to the standard operating procedures above, the Navy states the following mitigation measures would be implemented to reduce or avoid potential impact or harm to polar bears. Only mitigation measures related to polar bears are included.

- All material (e.g., shelters, unused food, excess fuel) and wastes (e.g., solid waste, hazardous waste) would be removed from the ice floe upon completion of ICEX.
- Dish soap would be selected from the U.S. Environmental Protection Agency's "Safer Choice" list.
- All cooking and food consumption would occur within designated facilities to minimize attraction of nearby animals.
- Passengers on all on-ice vehicles would observe for marine and terrestrial animals; any

marine or terrestrial animal observed on the ice would be avoided by 100 m. On-ice vehicles would not be used to follow any animal, with the exception of actively deterring polar bears if the situation requires.
- Personnel operating on-ice vehicles would avoid areas of deep snow drifts near pressure ridges, which are preferred areas for subnivean dens.
- Aircraft will raise altitude above 1,500 feet if a polar bear is sighted provided it is operationally safe to do so (Navy email 12/17/21).

Finally, the Navy applied for a letter of authorization (LOA) to non-lethally deter polar bears from the camp location, Navy personnel completed MMM polar bear deterrence training during the week of 1/10/22, and MMM issued LOA 22-INT-01 to the Navy on 2/2/2022 (MMM *pers comm*).

ACTION AREA

The vast majority of submarine training and testing would occur near the ice camp, however, some submarine training and testing may occur throughout the deep Arctic Ocean basin near the North Pole, within the Navy Activity Study Area (Figure 1). The proposed ice camp would be located within a small section of the larger Study Area (See ice camp study area on Figure 1). Prior to the set-up of the ice camp, reconnaissance flights would be conducted to locate suitable ice conditions required for the location of the ice camp. The ice camp would be established approximately 100–200 nautical miles (nm) north of Prudhoe Bay, Alaska and the exact location cannot be identified ahead of time as required conditions (e.g., ice cover) cannot be forecasted until exercises commence.

EFFECTS OF THE ACTION ON LISTED SPECIES

This section includes an analysis of the effects of the Proposed Action on listed species. Effects of the Action are all consequences to listed species or critical habitat that are caused by the proposed Action, including the consequences of other activities that are caused by the Proposed Action. A consequence is caused by the Proposed Action if it would not occur but for the Proposed Action and it is reasonably certain to occur. Effects of the Action may occur later in time and may include consequences occurring outside the immediate area involved in the Action.

Project effects on listed eiders

The Service listed the spectacled eider as threatened on May 10, 1993 (58 FR 27474) and the Alaska-breeding population of the Steller's eider as threatened on June 11, 1997 (62 FR 31748). Spectacled and Steller's eiders can occur on tundra wetlands near Deadhorse, Alaska, and in nearshore waters included in the Action Area between May and September, although they occur at low densities and Steller's eiders are particularly rare. Direct effects are those that occur when there is an immediate effect on listed species or habitat (e.g., disturbance resulting in nest abandonment). However, because the proposed exercise would be limited to winter, when listed eiders are absent from all portions of the Action Area, direct effects to listed eiders from the proposed exercise would not occur.

Polar Bears

The Service listed the polar bear as a threatened species under the ESA on May 15, 2008 (73 FR 28212). Polar bears in the Chukchi Sea (CS) and Southern Beaufort Sea (SBS) subpopulations (Figure 9) may occasionally pass through or den throughout the Action Area, although they occur at low density, are most abundant in nearshore shallow-water areas, and areas where currents and ocean upwelling increase marine productivity and serve to keep sea ice cover from becoming too consolidated in winter (Stirling and Smith 1975; Stirling et al. 1981; Amstrup and DeMaster 1988; Stirling 1990; Stirling and Øritsland 1995; Amstrup et al. 2000). Durner et al. (2004; and Durner et al. 2009) found that polar bears in the Arctic Basin prefer sea-ice concentrations (i.e., percent of ocean surface area covered by ice) greater than 50 percent, and located over continental shelf water, which in Alaska is at depths of 300 m (984 ft) or less. With the exception of the flight corridor, the majority of the Action Area (including the Ice Camp Study Area), would occur beyond the 300 m depth contour (Figures 1 and 10). Therefore, the majority of the Action Area would be beyond the zone where polar bears occur at comparatively higher density, and accordingly, encounters with polar bears are expected to be rare.

Moreover, during three separate ICEX exercises since 2014, polar bears have only been encountered near the camp once, when an adult and two juvenile bears approached a parked aircraft during a period when no personnel were present at the camp (Navy *pers comm*). Additionally, during daily flights to the camp over a 4-6 week period, polar bears have only been observed from aircraft 1-3 times during previous exercises (Navy *pers comm*).

Despite their relative scarcity in the Action Area, in the rare event transient polar bears encounter the Navy's activities, they would be subject to disturbance from human presence and equipment noise (including passive and active acoustic devices) and/or aircraft operations. However, we expect disturbance to transient (non-denning) bears would be minor (i.e., limited to changes in behavior that would not be biologically significant) and temporary because bears would be able to respond to human presence or disturbance by departing the area. Furthermore, measures in MMM's BMP package (including management of attractants, bear avoidance and detection protocols, and 1,500 ft minimum flight altitudes; Appendix A), would minimize potential impacts in the rare event a transient polar bear is encountered. Given the very low density of transient polar bears and minor, temporary nature of disturbance from the proposed activities, we would not anticipate impacts of disturbance to non-denning polar bears would have the potential to result in injury or death of a bear. Therefore, we conclude disturbance to non-denning polar bears would be insignificant.

It is possible transient swimming polar bears could conceivably encounter underwater acoustic sources. However, due to the low density of polar bears and nearly complete sea ice coverage in the Action Area during winter, we anticipate encounters between underwater Navy acoustic devices and swimming polar bears would be extremely unlikely (i.e., discountable). Furthermore, because polar bears are typically surface swimmers, and their heads are rarely underwater, Navy acoustic sources would likely be weak or undetectable to polar bears (Greene and Richardson 1988; Richardson et al. 1995). Therefore, we expect disturbance from underwater acoustic sources on transient swimming polar bears would be discountable.

Although the potential exists for polar bears to encounter contamination from small spills, given the very low density of polar bears in the Action Area, and spill prevention and response measures identified in the Navy's Standard Operating Procedures, the probability of impacts from contaminant spills on polar bears would be extremely unlikely and therefore, are considered discountable.

Similarly, we expect the Navy's attractant and waste management protocols, as well as deterrence measures, would prevent transient polar bears from encountering or ingesting human food or other camp wastes. However, polar bears are curious, and have been observed investigating unfamiliar objects and smells (Stirling 1988), which has led to polar bears ingesting trash and hazardous materials. If polar bears discarded equipment (e.g., expended buoys), or other trash they may investigate and ingest small pieces. If a polar bear does ingest expended materials, the bear would likely excrete the material without detrimental effects (Lunn and Stirling 1985). Given the Navy's commitment to remove wastes and hence the small amount of expended materials that may remain, coupled with the very low density of polar bears in the Action Area, the probability of a bear encountering and ingesting expended material, and experiencing detrimental effects, is extremely small and therefore is considered to be discountable.

In addition to transient animals, female polar bears may den in the Action Area at low density. We do not anticipate underwater acoustic sources would disturb denning bears. However, in the unlikely event a den is encountered by surface activities, denning polar bears would be susceptible to disturbance. For example, disturbance could potentially cause females to abandon dens before cubs are able to survive. Available data indicate polar bears den at low density on sea-ice in the action area (Fischbach et al. 2007). While very unlikely, it is possible Navy personnel could encounter ice-denning bears during the ICEX exercise.

The current status and trend of the CS subpopulation are unknown, however the most recent estimate of the CS subpopulation is approximately 2,900 bears (Regehr et al. 2018). The most recent estimate of the SBS subpopulation is approximately 907 bears (90% CI: 606-1212; Bromaghin et al. 2015). Bromaghin et al. (2015) also estimated roughly 35% (SD = 3.8) of the SBS subpopulation is of adult females. Because current demographic data on the CS subpopulation are unavailable, for the purposes of this evaluation, we assume it is reasonable to apply the estimated proportion of adult females in the SBS subpopulation to the CS subpopulation (i.e., the CS subpopulation is also roughly 35% female). Based on this information, the number of ice-denning bears in each subpopulation was estimated using the following calculations. First, we estimated the number of adult females (NAF) in each subpopulation:

907 SBS bears × 0.35 = 317.5 adult females
2,900 CS bears × 0.35 = 1,015 adult females

Regehr et al. (2010) provided estimates of breeding probability for adult females in the SBS subpopulation. This includes two components, 1) the probability of a female without cubs breeding and producing a litter, and 2) the probability of a female that has lost her cubs but rebreeds in a given year. Regehr et al. (2010) reported estimates of these parameters of P_{breedO} =

0.44 (90 percent CI: 0.33–0.56) and P_{breed1} = 0.10 (90 percent CI: 0.02–0.38), respectively. Based on these estimates, we then we calculated the number of adult females that would be predicted to breed (N_{breed}) in a given year, again assuming the best available reproductive data for SBS bears can also be reasonably applied to CS bears.

$(NAF \times P_{breedO}) + (NAF \times P_{breedO} \times P_{breedI}) = N_{breed}$
(317.5 SBS bears × 0.437) + (317.5 SBS bears × 0.437 × 0.104) = 153.2 SBS bears
(1,015 CS bears × 0.437) + (1,015 CS bears × 0.437 × 0.104) = 489.68 CS bears

Based on collar data from SBS bears from 2007 to 2013, Olson et al. (2017) found that 44.8 percent of adult females denned on sea ice versus land[1] (P_{ice} = 0.45). The most recent estimates of the proportion of ice-denning females in the CS subpopulation is 10% in the Chukchi Sea (Rode et al. 2015). Therefore, we estimated the number of ice-denning females in each subpopulation (N_{ice}) as follows:

$N_{breed} \times P_{ice} = N_{ice}$
153.2 SBS bears × 0.45 = 68.94 SBS ice dens
489.68 CS bears × 0.10 = 48.97 CS ice dens

Combining estimates for the two subpopulations, we estimate an annual total of approximately 118 ice-denning bears within Chukchi and Beaufort seas. The Navy's Action Area covers roughly 2,753,390 km^2 (Navy *pers comm*) and represents a subset of the Chukchi and Beaufort seas. However, if we assume all 118 ice-based dens were located within the Navy's Action Area, which is a conservative assumption that likely overestimates the number of dens within the Action Area, we would then estimate an annual density of approximately 0.000042 ice-denning bears/km^2. This estimate, even based on a "worst case scenario," estimates the density of ice-denning bears within the Navy's 2022 Action Area would be extremely low. Accordingly, although the Navy's Action Area is large, because 1) most of the Navy's activities would be concentrated within the smaller Ice Camp Study Area (Figure 1), 2) activities in the larger Study Area would be dispersed and cumulatively represent a comparatively small proportion of the entire Action Area, 3) the density of ice-based polar bear dens in the Action Area is extremely low, 4) the Navy's Mitigation Measures and MMM's BMPs, include denning habitat avoidance measures (i.e., avoidance of pressure ridges capable of forming drifts suitable for denning); the probability of the Navy's activities encountering an ice denning bear would be extremely low.

Nonetheless, in the extremely unlikely event an ice-denning polar bear was encountered, additional measures included in MMM's BMPs, such as 1-mile exclusion zones for any detected den and associated reporting requirements, further serve to avoid and minimize potential impacts.

In addition to ice-denning bears, polar bears may also den in terrestrial potions of the Action Area (i.e., on barrier islands within the flight corridor or in the coastal zone near Deadhorse.

[1] This estimate assumes that den data obtained from VHF and satellite radio collars are representative of the entire SBS subpopulation, and not just those in the area where bears are available to be captured and collared.

However, the probability of terrestrial dens occurring within the Navy's relatively narrow flight corridor is low. Furthermore, we would expect any bears that den in terrestrial habitat near Deadhorse, or on barrier islands on the approach path to Deadhorse Airport would be habituated to disturbance from existing levels of aircraft traffic associated with this high-use airport. Finally, the Navy's minimization measure and MMM's BMP requiring a minimum 1,500 ft flight altitude when operationally possible, serves to further avoid and minimize potential impacts of disturbance to terrestrially denning bears within the Action Area.

In summary, we expect collective effects of the proposed action on polar bears would be insignificant and/or discountable because: 1) the density of polar bears in the Action Area is low, and the majority of the Action Area (including the Ice Camp Study Area), would occur beyond the 300 m depth contour; where it is unlikely the proposed exercise would encounter a polar bear, 2) in the unlikely event a transient bear was encountered, behavioral effects would be minor, temporary, and not injurious), 3) disturbance from underwater acoustic sources on denning- or transient swimming polar bears would be discountable, 4) given spill prevention/response and waste management protocols in place, effects to polar bears from contaminant spills or contact with camp waste would be extremely unlikely (i.e., discountable), 5) the density of ice-based polar bear dens in the Action Area is extremely low, such that the probability of encountering an ice-denning bear would be extremely unlikely and, 6) the Navy's Minimization Measures and MMM's BMP package, including management of attractants, bear avoidance and detection protocols, 1,500 ft minimum flight altitudes, denning habitat avoidance and exclusion zones for any detected den, further serve to avoid and minimize potential impacts in the unlikely event transient or denning polar bears are encountered.

Project effects to polar bear critical habitat

On October 29, 2009, the Service proposed critical habitat for polar bears (74 FR 56058) and a final rule designating critical habitat was issued on December 7, 2010 (75 FR 76086). In designating critical habitat, the Service identified the physical or biological features (PBFs) essential to the conservation of the polar bear:

1) Sea-ice habitat used for feeding, breeding, denning, and movement, which is further defined as sea-ice over waters 300 m 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 riverbanks, with suitable macrohabitat characteristics. Suitable macrohabitat characteristics are:
    a) Steep, stable slopes (range 15.5–50.0 degrees), with heights ranging from 1.3 to 34 m, 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, including 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 of these islands.

Unit 1, Sea Ice Habitat

With the exception of the flight corridor, the majority of the Action Area (including the Ice Camp Study Area), would occur beyond the 300 m depth contour (Figures 1 and 10). Therefore, there would be very little spatial overlap between the Navy's activities and designated sea ice critical habitat. Furthermore, because the Navy's activities within the area of overlap would be limited to aircraft overflights, impacts to the physical features of designated sea ice critical habitat would be discountable.

Unit 2, Terrestrial Denning Habitat

Overlap between the proposed Action and designated terrestrial denning habitat would be limited to the southern flight corridor and area surrounding the airport at Deadhorse, Alaska (Figure 1). Again, because the Navy's activities within the area of overlap would be limited to aircraft overflights, impacts to the physical features of terrestrial denning habitat would be discountable. Denning polar bears occupying terrestrial denning habitat could be subject to disturbance from Navy aircraft and these activities could conceivably preclude or disrupt denning. However, aircraft presence over terrestrial denning habitat would be transitory, of short duration, and limited to the vicinity of the Deadhorse Airport, an area with high levels of existing aircraft disturbance. Furthermore, the Navy's minimization measure and MMM's BMP requiring a minimum 1,500 ft flight altitude would minimize potential disturbance to polar bears occupying designated terrestrial denning habitat. Finally, the potentially affected area is an extremely small proportion of available terrestrial denning habitat (approximately 14,652 km^2). Therefore, we expect disturbance within this unit would be temporary and limited to a small geographic area, such that the value of terrestrial denning habitat for the survival and recover of polar bears would not be appreciably reduced.

Unit 3, Barrier Island Habitat

The proposed Action, particularly the flight corridor between Deadhorse and the Ice Camp Study Area, would have minor overlap with barrier island critical habitat in nearshore waters of the Beaufort Sea near Prudhoe Bay (Figure 1). Transient or denning polar bears occupying barrier island critical habitat could be subject to disturbance from Navy aircraft and these activities could conceivably impact barrier island habitat by precluding denning, refuge from human disturbance, and/or movements along the coast. However, we note that 1) aircraft presence in proximity to barrier islands would be transitory and of short duration, 2) the Navy's minimization measure and MMM's BMP requiring a minimum 1,500 ft flight altitude would minimize potential disturbance, and 3) the potentially affected area is an extremely small proportion of available barrier island critical habitat (approximately 10,575 km^2). Therefore, we expect disturbance within this unit would be temporary and limited to a small geographic area, such that the value of barrier island critical habitat as a refuge from disturbance would not be appreciably reduced.

CONCLUSION

Because the proposed Action would take place when listed eiders are absent from the Action Area, effects to listed eiders would not occur. Additionally, although the proposed activities could temporarily disturb transient or denning polar bears or expose them to contaminants, because: 1) the density of polar bears in the Action Area is low and the majority of the Action Area (including the Ice Camp Study Area), would occur beyond the zone where polar bears are likely to occur, 2) behavioral effects of disturbance would be temporary and would not reach the scale where take would occur, 3) effects of underwater acoustic disturbance would be discountable, 4) spill prevention/response and waste management protocols would be in place, 5) the density of ice-based polar bear dens in the Action Area is extremely low and, 6) the Navy's Minimization Measures and MMM's BMP package would avoid and minimize potential impacts in the unlikely event transient or denning polar bears are encountered; effects of the proposed action on polar bears would be insignificant and/or discountable. Finally, effects to designated polar bear critical habitat would be insignificant. Therefore, the Service concludes the Proposed Action is not likely to adversely affect spectacled or Alaska-breeding Steller's eiders, polar bears, or designated polar bear critical habitat. Thank you for the opportunity to comment on this project. If you need further assistance, please contact Kaithryn Ott at (Kaithryn_Ott@fws.gov).

Sincerely,

KAITHRYN OTT

Digitally signed by KAITHRYN OTT
Date: 2022.02.02 13:08:02 -09'00'

Kaithryn Ott
Lead Section 7 Biologist

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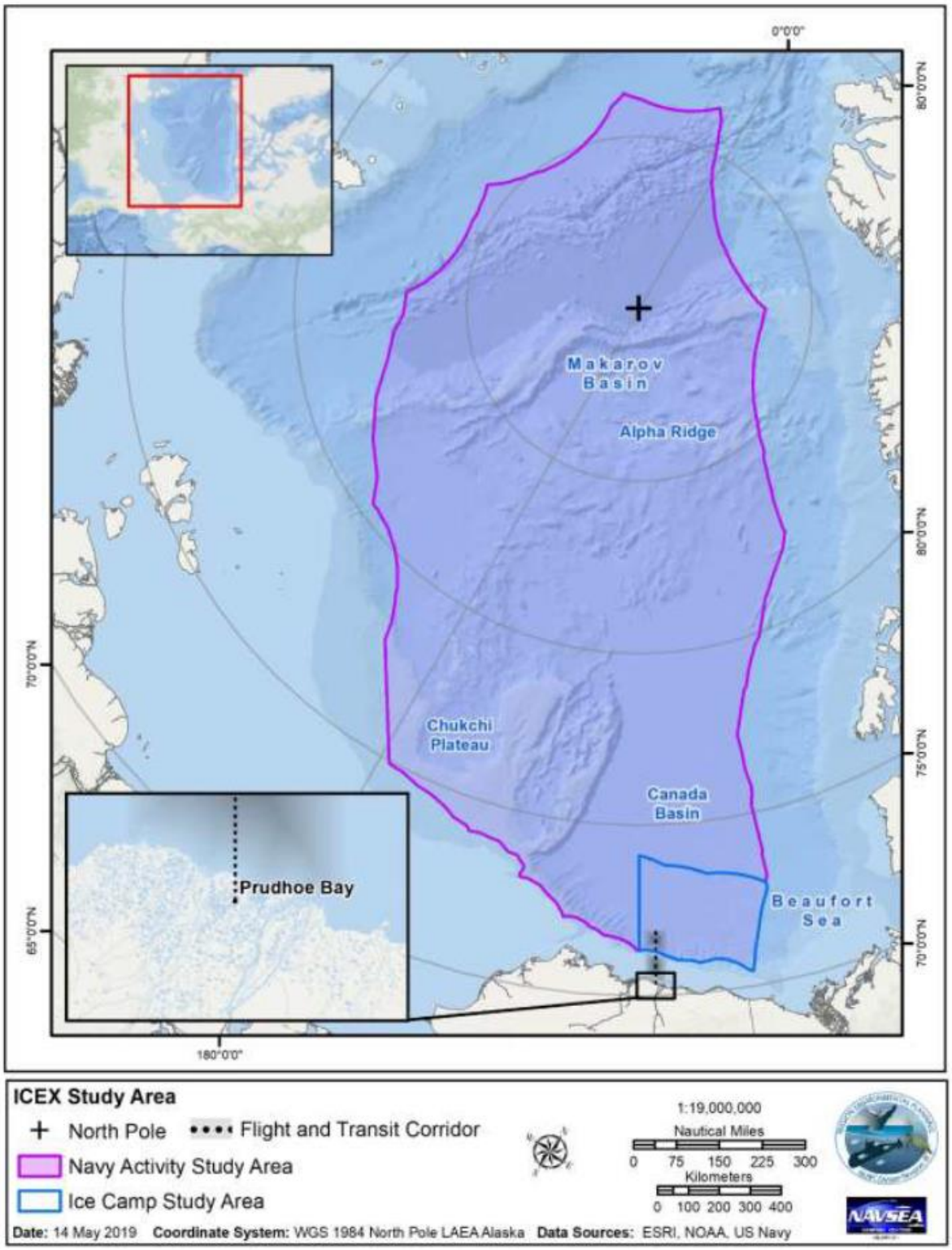

Figure 1. The Navy's proposed 2022 ICEX submarine training and testing area (Navy Activity Study Area) and ice camp (Ice Camp Study Area), in the deep Arctic Ocean basin near the North Pole. The proposed ice camp would be located within a small section of the larger Study Area. The ice camp would be established approximately 100–200 nautical miles (nm) north of Prudhoe Bay, Alaska.

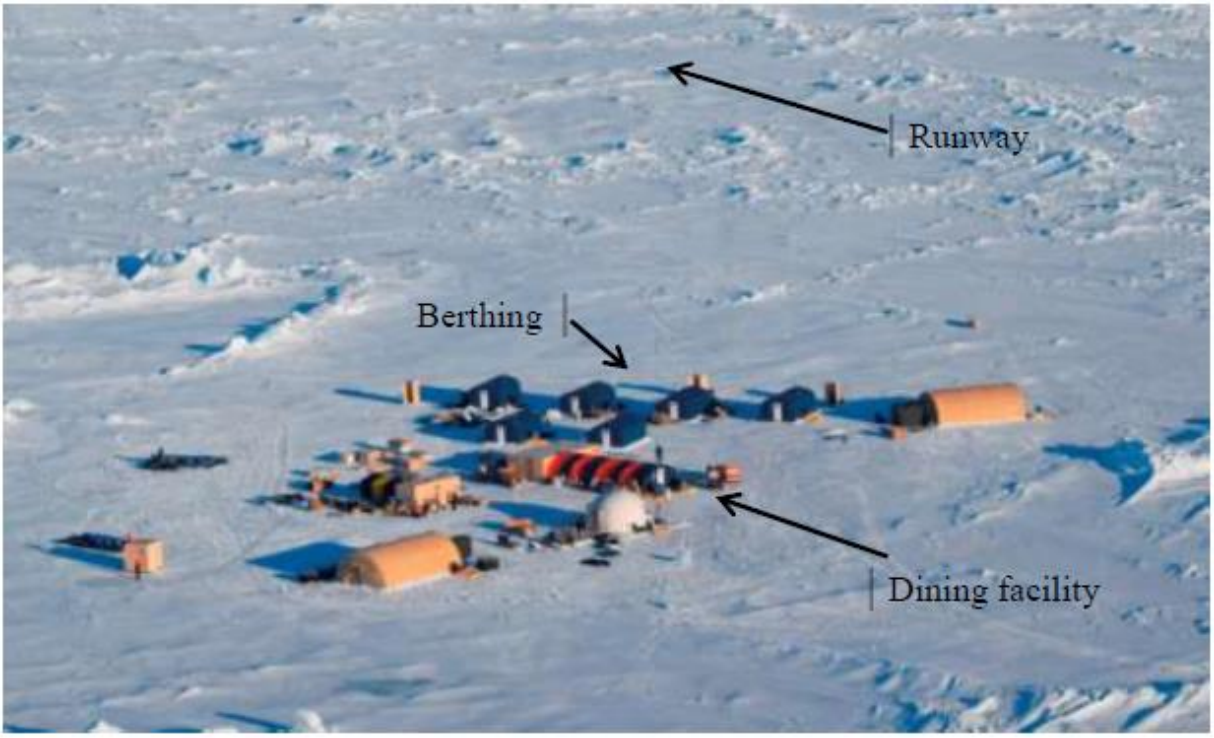

Figure 2. Example the Navy's proposed Ice Camp


Figure 3. Typical aircraft the Navy would employ during 2022 ICEX.

Figure 4. Examples of military fixed-wing aircraft (left panel; C-130) and rotary-wing aircraft (right panel; CH-47) that may be used during 2022 ICEX.

Figure 5. Examples of unmanned underwater vehicles that would be deployed during 2022 ICEX.

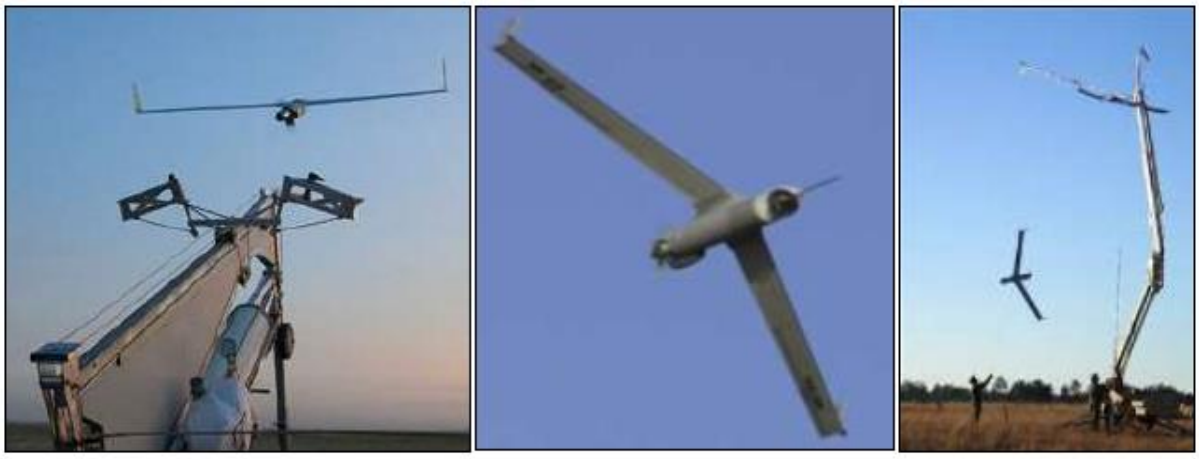

Figure 6. Examples of fixed-wing unmanned aerial systems that would be used during 2022 ICEX.

Figure 7. Examples of rotary-wing unmanned aerial systems that would be used during 2022 ICEX.

Figure 8. Examples of passive acoustic devices/buoys that would be deployed during 2022 ICEX.

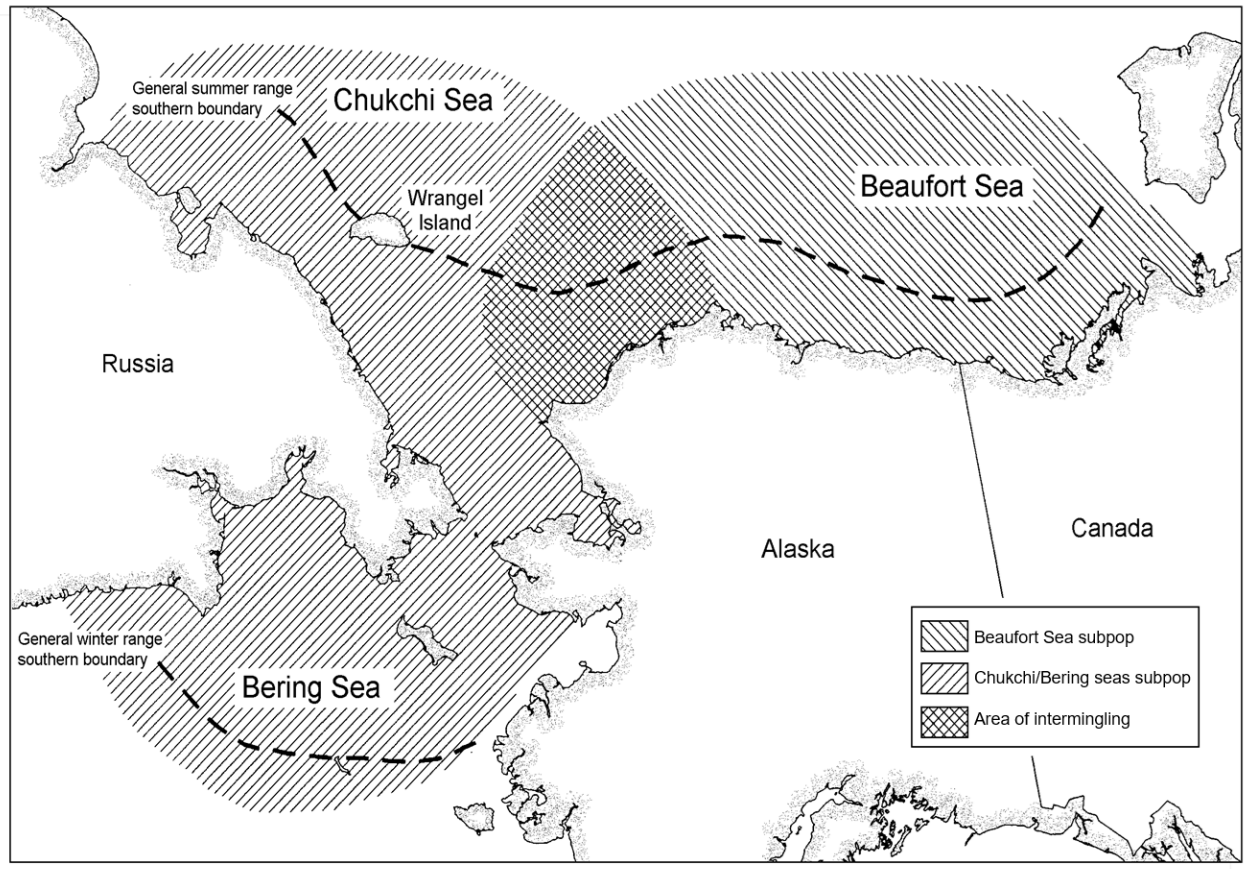

Figure 9. Range of polar bear subpopulations in Alaska. The Navy's proposed exercise would take place within the range of the Chukchi Sea and Southern Beaufort Sea subpopulations.

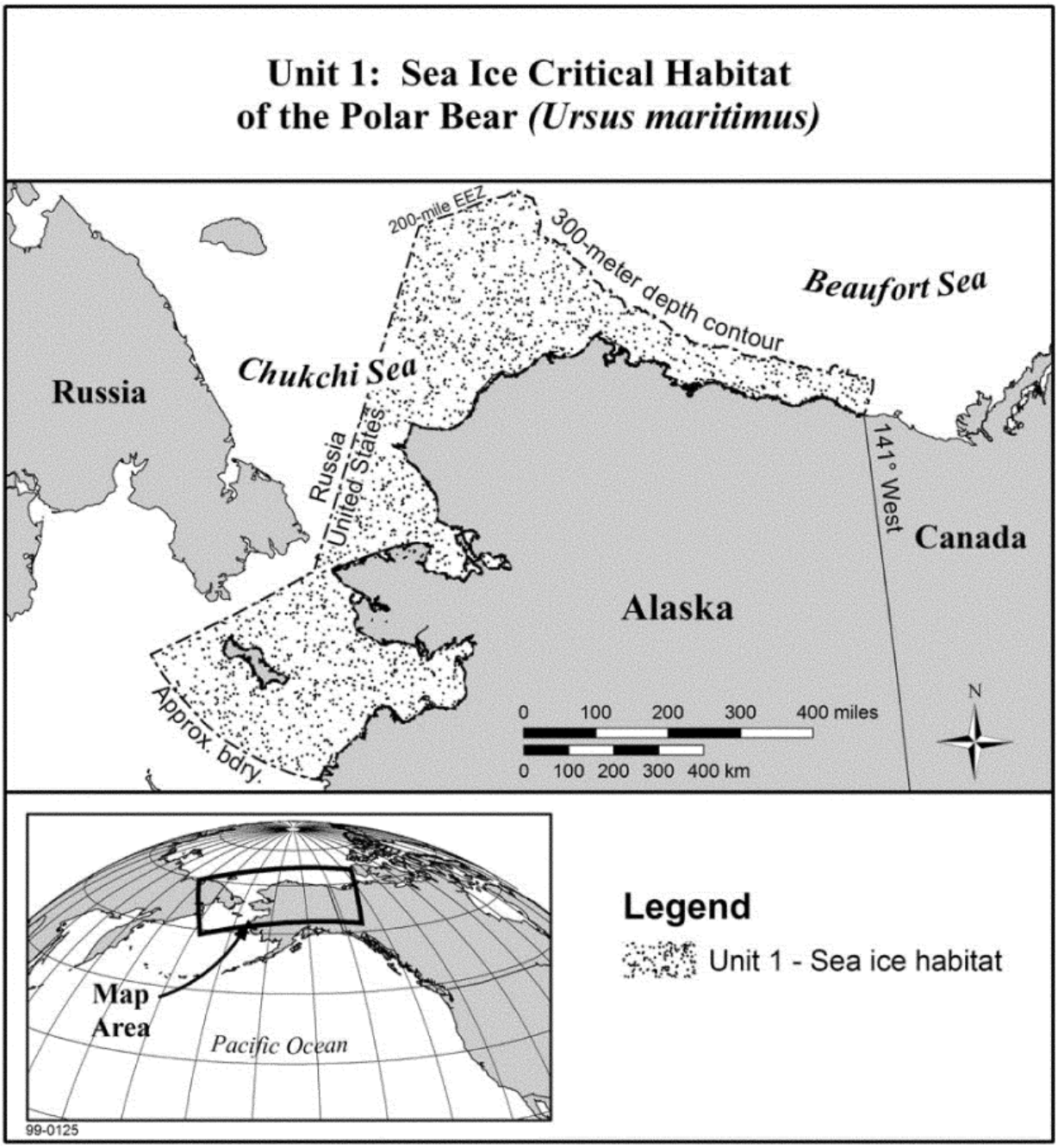

Figure 10. Designated sea ice critical habitat for polar bears, which extends to the 300 m depth contour in the Chukchi and Beaufort seas.

Best management practices to minimize impacts to polar bears

USFWS Marine Mammals Management

Polar bears are protected under the Marine Mammal Protection Act (MMPA) and were listed as a threatened species under the Endangered Species Act (ESA) in 2008. The MMPA and ESA both prohibit the "take" of polar bears with limited exceptions, such as for authorized incidental take and when necessary for human safety. Take includes disturbing, injuring, and killing polar bears.

Polar bears use sea ice, marine waters and terrestrial areas in northern and northwestern Alaska for resting, feeding, denning, and seasonal movements. They are most likely to be encountered within 25 miles of the coastline, especially along barrier islands during July-October. Polar bears may also be encountered farther inland, especially females during the denning period (November-April). Be aware that polar bears also occur within human settlements such as villages, camps, and work areas.

This document lists best management practices the Service recommends to minimize the risk of human activities causing adverse impacts to polar bears, as well as polar bear encounter guidelines and reporting procedures. Following as many relevant measures as possible through the development and implementation of a polar bear avoidance and encounter plan will help protect both human and bear safety. Adherence to measures does not, however, absolve personnel of responsibility if they take (harass, harm, capture, or kill) a polar bear in violation of the Marine Mammal Protection Act. If you have questions about any best management practices or how they might be implemented in specific scenarios, please contact USFWS Marine Mammals Management (MMM) at FW7_AK_Marine_Mammals@fws.gov or 907-786-3844.

Contents

Best practices for avoiding polar bear encounters and impacts to bears

Project siting and timing

- Avoid siting projects in polar bear high-use areas to the maximum extent practicable. High-use areas include all land within 2 km (1.2 miles) of the Chukchi and Beaufort Sea coasts. Polar bears are most likely to be encountered along coastal movement corridors along the Beaufort Sea coast between July and October. Polar bears may congregate near coastal communities in September and October when remains of subsistence-harvested whales are present. If coastal siting is unavoidable, maintain an open transit corridor for bears that is free of human presence and activity to help avoid conflict.
- Avoid establishing infrastructure in or near polar bear denning habitat (see USGS habitat maps: https://alaska.usgs.gov/data/polarBear/denHabitat/polarBear_denHabitat_allACP) and avoid undertaking activities in or near polar bear denning habitat between November and April.
- Be vigilant for sows with cubs during the den emergence period (March – May) in inland as well as coastal areas.
- Polar bears typically rest during day and become more active during dusk, night, or dawn. Plan activities with this in mind.

Den detection and avoidance

- Aerial infrared (AIR) surveys can locate polar bear dens that can then be avoided between November and April to prevent disturbance to denning bears. Anyone planning industrial operations or other activities involving large human presence or equipment between November and April and within 25 miles of the Bering, Chukchi, or Beaufort coasts (outside of communities) should contact Marine Mammals Management to determine if completing one or more AIR surveys is necessary to lower the risk of impacts to denning bears.
- Avoid any activities within one mile of known polar bears dens, including dens encountered in the course of activities. Locations of known polar bear dens can be obtained from MMM. Report any observed polar bear dens to the MMM Regulatory Program at FW7_MMM_Reports@fws.gov as soon as possible and within 24 hours of discovery. Should occupied dens be identified within one mile of activities, cease work in the immediate area and immediately contact MMM for guidance before proceeding with activities. The Service will evaluate these instances on a case-by-case basis and determine the appropriate action.
- During transit off of ice roads and established tundra travel routes, personnel in potential denning areas should constantly be on the lookout for signs of denning (e.g., piles of snow from den excavation, tracks) between November and April. Use vehicle-based forward looking infrared cameras to scan for dens when possible. Personnel should avoid crossing topographic features suitable for denning, such as riverbanks and along bluffs.

Avoiding impacts to sows and cubs after den emergence

- If a sow and cubs of the year are seen, cease operations within a 1.6 km (1 mi) exclusion zone and notify the Service at 1-800-362-5148 and FW7_MMM_Reports@fws.gov. Any operations in between the sow/cubs and the shoreline must be notified, and the bears must be provided a clear and unimpeded path to the sea ice through coordination with bear monitors.

Attractants management

- Be aware that garbage, food, deliberate feeding, animal carcasses, chemicals, petroleum products, sewage, and grey water can attract polar bears. Polar bears are curious and may also be attracted to novel or unfamiliar items (e.g., plastic objects, snowmachines)
- Incinerate garbage and food waste at work sites as frequently as possible. Locate incinerators outside of living areas. If incineration is not an option, store wastes as described below and remove them from site (e.g., fly them out) as frequently as possible.
- Store attractants in a manner that minimizes odors and prevents access by bears. Use bear-resistant storage containers and waste receptacles. Containers should be approved and certified by the Interagency Grizzly Bear Committee as "bear-resistant" (see information at http://www.igbconline.org/html/bear-resistant-products). Always store food away from living quarters.
- Maintain clean work areas and/or camps.
- Clean any fuel spills or spills/leaks of other chemicals or toxic materials properly and immediately, even if they are small.
- When travelling, avoid carrying strongly scented attractants or store them in air-tight containers to minimize odor transmission, and consume food in enclosed and secure areas whenever possible.

Bear avoidance, detection, and deterrence protocols

- Establish specific protocols to minimize the risk of encounters and maximize human and animal safety if an encounter does occur. These should include such measures as:
    - regular on-site safety discussions
    - using the buddy system for activities away from buildings or outside fences
    - being vigilant, traveling in groups, and making noise to avoid surprise encounters
    - using bear detection tools/methods including human monitors or "bear guards", physical barriers, trip wire systems, alarms, and/or motion detectors/cameras
    - establishing a notification system/communication plan (e.g., using radio, blow horns, or sirens) to alert workers of a polar bear in the area and contact outside help if needed (e.g., by satellite phone)
    - designating safe area(s) to gather if a bear approaches work areas

  Additional precautions should be taken on barrier islands, in river drainages, along bluff habitat or ice leads/polynyas, near whale or other marine mammal carcasses, or in the vicinity of fresh tracks. For example, prior to landing/docking on barrier islands or other coastal areas, survey the area to ensure polar bears are not present.
- Prepare bear deterrence plans to implement if a polar bear approaches and must be hazed to protect workers and property. The Service has issued Polar Bear Deterrence Guidelines (link to notice: https://www.federalregister.gov/documents/2010/10/06/2010-

25044/marine-mammal-protection-act-deterrence-guidelines) that describe passive and preventative deterrence measures that do not require advance training. These include tools such as loud acoustic devices, air horns, electric fencing, or using a vehicle or boat to block an approaching bear. Bear spray is another effective preventative deterrence tool for individuals informed in its proper use. Use of more advanced deterrence methods, such projectiles from a firearm (e.g., pepper balls, cracker shells, bean bags, rubber bullets) requires appropriate specialized training, and the Service may provide a Letter of Authorization for Intentional Harassment for projects intending to use advanced deterrence. Contact MMM for additional information on the Service's Bear Safety and Bear Deterrence Specialist training and intentional harassment authorization.
    - If deterrence plans include use of a firearm by a Service-approved bear deterrence specialist, make sure plans identify how rounds will be handled to prevent mixing of lethal and less-lethal rounds.
- If working near a North Slope Borough community, reach out to the North Slope Borough Department of Wildlife Management (phone: (907) 852-0350) for information on recent polar bear activity in the area to inform avoidance plans.

Information and measures in the Polar Bear Encounter Guidelines section of this document should be incorporated into encounter and deterrence protocols

Personnel training materials and procedures

- Ensure all personnel working in polar bear habitat receive appropriate safety training, including education on site-specific protocols. Depending on individual duties and activities, this may include Bear Safety Training from the Service or the Alaska Department of Fish and Game.
- Any personnel that may need to deter an approaching polar bear should receive training in use of deterrents, including hands-on practice. Training from the Service or Service-approved trainers is critical for individuals planning to use advanced hazing tools (e.g., projectiles from a firearm or approaches with vehicle).
- Share or publicly post materials on bear safety and encounter protocols at work sites.
- Complete on-site polar bear safety drills.

Industrial infrastructure: site design and snow and lighting management

- For industrial infrastructure, ensure good visibility in all work site locations though facility layout and lighting. All personnel areas, including entrances, should be illuminated during working hours. Waste-management areas and pedestrian traffic areas should be particularly well-lit.
- Exterior doors should open outward, and there should be windows in or near exterior doors so personnel can look for polar bears before exiting a building, and. To limit risk of bears entering buildings, use oval-shaped versus handle-type knobs on exterior doors. Prevent snow from piling up below windows if it could allow a bear to climb and enter the building

through the window. Grates on windows (in compliance with fire codes) are recommended to limit potential entry by bears.

- Take measures to prevent snow drifts from forming around elevated structures (including roads and pads), as they may obstruct visibility or attract bears as denning habitat. Prevailing wind directions and resulting drift should be considered when placing barriers or storing materials. Establish protocols to remove accumulated snow from infrastructure, as needed, and consider placement of snow berms to increase visibility.
- Minimize the potential for polar bear concealment. Arrange any objects outdoors in a way that reduces or eliminates spaces where a polar bear could be concealed. Where practicable, install skirting under elevated buildings, cap off stored pipes, block culverts in the winter, surround equipment storage areas with fencing, and place of gates or other barriers on stairwells.
- Avoid creating corners and areas where bears may feel trapped or workers may become trapped by a bear.
- Minimize outdoor storage and rearrangement of outdoor objects, which may attract curious polar bears.
- If work and camp activities are co-located (e.g., on a pad) ensure living quarters are centrally located.
- Use electric or other fences that exclude bears from work and living areas, but recognize that fences are not fail-safe and awareness within or outside fences is necessary.
- If full illumination of a work site is not possible, monitoring by a bear guard using infrared night-vision cameras or binoculars may be sufficient to detect approaching bears. Contact MMM if you are considering infrared night-vision monitoring.

Remote field camp safety practices

- Minimize and prevent access to attractants. Store food, garbage, and other attractants in a manner that minimizes odors and prevents access by bears. Do not allow any bears to receive a food reward in a camp. Use containers approved and certified by the Interagency Grizzly Bear Committee as "bear-resistant" to store food, garbage, and other attractants (see attractant section above).
- Use an electric fence or alarm system as additional campsite protection.
- Avoid camping or lingering in bear high-use areas such as river drainages, coastal bluffs and barrier islands, or along ice leads/polynyas. Do not camp within one mile of river drainages with steep banks and bluffs during denning season (November-April).
- Along the Beaufort and Chukchi coasts, locate overnight camps inland. Based on known patterns of land use by polar bears, camping just a mile or two inland will dramatically decrease the chance a camp will be in the path of a polar bear. Be aware, however, that camping inland or along the coast can result in an encounter with a brown bear, so take bear conflict-avoidance precautions regardless of camping location.

Watercraft operations

- Be especially vigilant for swimming bears when vessels are underway. If one or more swimming bears are encountered, allow it to continue unhindered. Never approach, herd, chase, or attempt to lure a swimming bear.
- Reduce speed and avoid sudden changes in travel direction when visibility is low.

Aircraft operations (including unmanned systems/drones):

- Pilots of all aircraft types (fixed wing, helicopters, and drones) should fly at the maximum distance possible from concentrations of polar bears. Aircraft should maintain an altitude of 1500 ft (457 m) above ground level when operationally possible. Under no circumstances, other than an emergency, should aircraft operate at an altitude lower than 1500 ft within 0.5 mi (805 m) of polar bears observed on ice or land.
- When weather conditions do not allow a 1500 ft flying altitude, such as during severe storms or when cloud cover is low, aircraft may be operated below this altitude. However, when lower flight is necessary, the operator should avoid areas of known concentrations of polar bears and should take precautions to avoid flying directly over or within 0.5 miles (805 m) of these areas. Operators should stay aware of bear congregation sites near their work areas through communication with the Service and regional and local bodies (e.g., the North Slope Borough Department of Wildlife Management, community councils). Note that Barter Island and Cross Island are consistent bear concentration areas.
- Aircraft should avoid performing any evasive and sudden maneuvers, especially when traveling at lower altitudes. Avoid circling, turning, or hovering aircraft within 0.5 mi (805 m) of polar bears or in known polar bear concentration areas.
- If a polar bear is spotted within a landing zone or work area while an aircraft is in flight, aircraft operators should travel away from the site, and if flying at a lower altitude, slowly increase altitude to 1500 ft (or a level that is safest and viable given current traveling conditions). Do not land aircraft within 0.5 mile of a polar bear.
- If a polar bear is observed while an aircraft is grounded, personnel should board the aircraft and leave the area. The pilot should also avoid flying over the polar bear.
- Do not operate aircraft in such a way as to separate individual members of a group of polar bears from each other.

Polar bear encounter guidelines

The general strategy for minimizing human-bear conflicts is to: 1) be prepared; 2) avoid encounters; and 3) know how to respond if an encounter occurs. Preparation and avoidance measures—which include avoiding high-use areas, minimizing attractants, developing a human-bear safety plan, preventing surprise encounters, carrying deterrents and practicing using them—are all described above. Guidelines for encounters are listed in this section. These encounter guidelines are based on up-to-date, expert assessment of polar bear incidents and practices that minimize negative outcomes.

Note that polar bears react differently to human presence depending on a variety of biological and environmental factors, as well as their previous experience with humans. Hungry (skinny) bears can be particularly dangerous.

If a polar bear is encountered:

- Prepare deterrent(s). Do not run from or approach polar bears. If the bear is unaware of human presence, allow it to continue what it was doing before it was encountered. Move to safe shelter (e.g. vehicle or building) if available, and wait until it is safe to proceed.

- Group up. If no safe shelter is available, group up with others and stand positioned to allow for safe deployment of deterrents (e.g. firearm, pistol launcher, bear spray) – until the bear leaves.

- Observe bear behavior. Polar bears that stop what they are doing to turn their head or sniff the air in your direction have likely become aware of your presence. These animals may exhibit various behaviors:

  - C*urious* polar bears typically move slowly, stopping frequently to sniff the air, moving their heads around to catch a scent, or holding their heads high with ears forward. They may also stand up.
  - *A threatened or agitated* polar bear may huff, snap its jaws together, stare at you (or the object of threat) and lower its head to below shoulder level, pressing its ears back and swaying from side to side.
  - A *predatory* bear may sneak up on an object it considers prey. It may also approach in a straight line at constant speed without exhibiting curious or threatened behavior.

If a polar bear approaches you or your camp:

- Defend your group/camp. Any bear that approaches within range of your deterrents should be deterred. Stand your ground; do not run. Defend your group or camp, increasing the intensity of your deterrence efforts as necessary. Start with the least aggressive options, such as using noisemakers, yelling or clapping, or deploying air horns. Recent work has found bear spray to be an effective deterrent against polar bears, even under high wind scenarios. With wise use of deterrents, your group may be able to de-escalate the incident by keeping bears from making contact with site items, and by eventually increasing distance between you and the bear. Be aware that lethal take of polar bears is permissible if such taking is imminently necessary in defense of human life. Defense of life kills must be reported to the Service within 48 hours.

- If bear makes physical contact, fight back. If deterrence/lethal efforts have failed and a polar bear attacks (makes physical contact), **do not "play dead"**. Fight back using any deterrents available, aiming fists or objects at the bear's nose and face.

If defense of life becomes necessary:

- Defense of life kills are only allowed in self-defense or to save the life of a person in immediate danger. All defense-of-life kills of polar bears must be reported to the Service within 48 hours. Report to USFWS Marine Mammals Management (email FW7_MMM_Reports@fws.gov and/or call 1-800-362-5148). Events in the Arctic National Wildlife Refuge may alternatively be reported by calling the Arctic National Wildlife Refuge Manager at 1-800-362-4546 or by calling (907) 883-9409 and speaking to a law enforcement officer. If you send an email or leave a message, provide your name, contact info, and location so you can be reached to provide additional information about the incident.
- You will be required to document the circumstances leading up to, and immediately surrounding, the death of the bear, including documentation of the preventative methods you used to de-escalate the conflict in advance of killing the bear.
- The shooter may be required to transfer the carcass (including hide and skull) to a law enforcement officer or designated local representative. The shooter is responsible for the carcass once the bear is killed (it cannot be abandoned).
- The shooter may not keep any parts of the animal unless authorized by the US Fish and Wildlife Service.

Reporting

The Service requests that any polar bears sighted during activities are reported to FW7_MMM_Reports@fws.gov. Reports are mandatory if polar bears are harassed or harmed in an incident, and all sighting reports are helpful. Any injury or death of a bear related to human activities must be reported as soon as possible and no later than 48 hours after occurrence, as described in the defense of life section above. Please include as much of the following information as possible in reports:

- Date, time, and location of the polar bear observation
- Number of individual polar bears by sex and age, if possible
- Observer name and contact information
- Weather, visibility, and ice conditions at the time of the polar bear observation
- Estimated closest point of approach for the polar bear from personnel and facilities/equipment
- Project activity at time of the polar bear observation and possible attractants if present
- Polar bear behavior
- Description of the encounter with the polar bear. A full written description, including the duration of encounter and all actions taken to minimize harassment or harm to the bear, is required when a human-bear interaction occurs.
- In cases involving aircraft or vessels:
    a. Aircraft or vessel heading
    b. Aircraft or vessel speed
    c. Aircraft altitude
    d. Initial behaviors of the polar bear before responding to the aircraft or vessel

e. A description of any apparent reactions from the polar bear to the aircraft or vessel

- If injured, distressed, or dead polar bears are observed that not associated with project activities (e.g., found outside the project area, previously wounded polar bears, or carcasses), please report this information to the Service as soon as possible at 1-800-362-5148 and FW7_MMM_Reports@fws.gov. The following website has instructions for reporting found polar bear remains: https://www.fws.gov/alaska/pages/marine-mammals/polar-bear/carcass-found. Photographs, video, location information, or any other available documentation is very helpful for all reports.