

encounter, which could result in unintentional harassment, lethal take, or intentional hazing (under separate permit) of the bear.

Most bears seen near production facilities are transients, and only a small fraction of those observed closely approach the facilities. Currently, there is no evidence that unequivocally states that noise associated with Industry facilities disturbs or does not disturb polar bears. In fact, bears have commonly approached industrial sites in the Canadian Beaufort Sea. In addition, a few bears will approach facilities, particularly on artificial or natural islands, such as Endicott and West Dock in Prudhoe Bay, even though garbage and other attractants are carefully managed.

B. Mobile Sources—In the southern Beaufort Sea, during the open-water season, polar bears spend the majority of their lives on the pack ice, which limits the chances of impacts on polar bears from Industry activities. Although polar bears have been documented in open water, miles from the ice edge or ice floes, this is a relatively rare occurrence. In the open-water season, Industry activities are generally limited to vessel-based exploration activities, such as ocean-bottom cable (OBC) and shallow hazards surveys.

C. Vessel Traffic—Vessel traffic would most likely result in short-term behavioral disturbance only. During the open-water season, most polar bears remain offshore in the pack ice and are not typically present in the area of vessel traffic.

D. Aircraft Traffic—Routine aircraft traffic should have little to no effect on polar bears. However, extensive or repeated overflights of fixed-wing aircraft or helicopters could disturb polar bears throughout the year. Behavioral reactions of non-denning polar bears should be limited to short-term changes in behavior and would have no long-term impact on individuals and no impacts on the polar bear population. Mitigation measures are routinely implemented to reduce the likelihood that bears are disturbed by aircraft. Noise and vibrations produced by extensive aircraft overflights could also disturb denning bears during the ice-covered season, potentially causing them to abandon their dens or depart their dens prematurely.

E. Seismic Exploration—It is unlikely that seismic exploration activities or other geophysical surveys during the open-water season would result in 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. Although polar bears are typically associated with the pack ice during summer and fall, open-water seismic exploration activities can encounter polar bears in the central Beaufort Sea in late summer or fall.

Noise and vibrations produced by oil and gas exploration and production activities during the ice-covered season could potentially result in impacts on polar bears. During this time of year, denning female bears as well as mobile, non-denning bears could be exposed to and affected differently by potential impacts from oil and gas activities. Disturbances to denning females, either on land or on ice, are of particular concern. As part of the LOA application for seismic surveys during denning season, Industry provides us with the proposed seismic survey routes. To minimize the likelihood of disturbance to denning females, we evaluate these routes along with information about known polar bear dens, historic denning sites, and probable denning habitat.

A standard condition of LOAs requires Industry to maintain a 1-mile buffer between survey activities and known denning sites. In addition, we may require Industry to avoid denning habitat until bears have left their dens. To further reduce the potential for disturbance to denning females, we have conducted research, in cooperation with Industry, to enable us to accurately detect active polar bear dens. We have evaluated the use of remote sensing techniques, such as Forward Looking Infrared (FLIR) imagery and the use of scent-trained dogs to locate dens. In addition, Industry has sponsored cooperative research evaluating noise and vibration propagation through substrates and the received levels of noise and vibration in polar bear dens.

Depending upon the circumstances, bears can be either repelled from or attracted to sounds, smells, or sights associated with Industry activities including seismic exploration. The LOA process requires the applicant to develop a polar bear interaction plan for each operation. These plans outline the steps the applicant will take, such as garbage disposal procedures, to minimize impacts to polar bears by reducing the attraction of Industry activities to polar bears. Interaction plans also outline the chain of command for responding to a polar bear sighting. In addition to interaction plans, Industry personnel participate in polar bear interaction training while on site. The result of these polar bear interaction plans and training allows personnel on site to detect bears and respond appropriately. Most often, this response involves deterring the bear

from the site. Without such plans and training, the undesirable outcome of lethal takes of bears in defense of human life could occur.

Although very unlikely, it is possible that on-ice vehicle traffic related to seismic exploration could physically run-over an unidentified polar bear den. Known dens around the oilfield are monitored by USFWS and Industry. The oil and gas industry communicates with the USFWS to determine the location of their activities relative to known dens. General LOA provisions require Industry operations to avoid known polar bear dens by 1-mile. There is the possibility that an unknown den may be encountered during Industry activities. If a previously unknown den is identified, communication between Industry and the USFWS and the implementation of mitigation measures help ensure that disturbance is minimized.

2. Physical Obstructions

There is little chance that Industry facilities would act as physical barriers to movements of polar bears. Most facilities are located onshore where polar bears are only occasionally found. The offshore and coastal facilities are most likely to be approached by polar bears. The Endicott Causeway and West Dock facilities have the greatest potential to act as barriers to movements of polar bears because they extend continuously from the coastline to the offshore facility. Yet, because polar bears appear to have little or no fear of man-made structures and can easily climb and cross gravel roads and causeways, bears have frequently been observed crossing existing roads and causeways in the Prudhoe Bay oilfields. Offshore production facilities, such as Northstar, may be approached by polar bears, but due to their layout (*i.e.*, continuous sheet pile walls around the perimeter) the bears may not gain access to the facility itself. This situation may present a small scale, local obstruction to the bears' movement, but also minimizes the likelihood of human/bear encounters.

3. Human/Polar Bear Encounters

Encounters with humans can result in the harassment or (rarely) the death of polar bears. Unlike most mammals, polar bears typically do not fear humans and are extremely curious. Polar bears are most likely to encounter humans during the ice-covered season, when both humans and bears are found on the land-fast ice and adjacent coastline. Polar bears can also come in contact with humans along the coast or on islands, particularly near locations