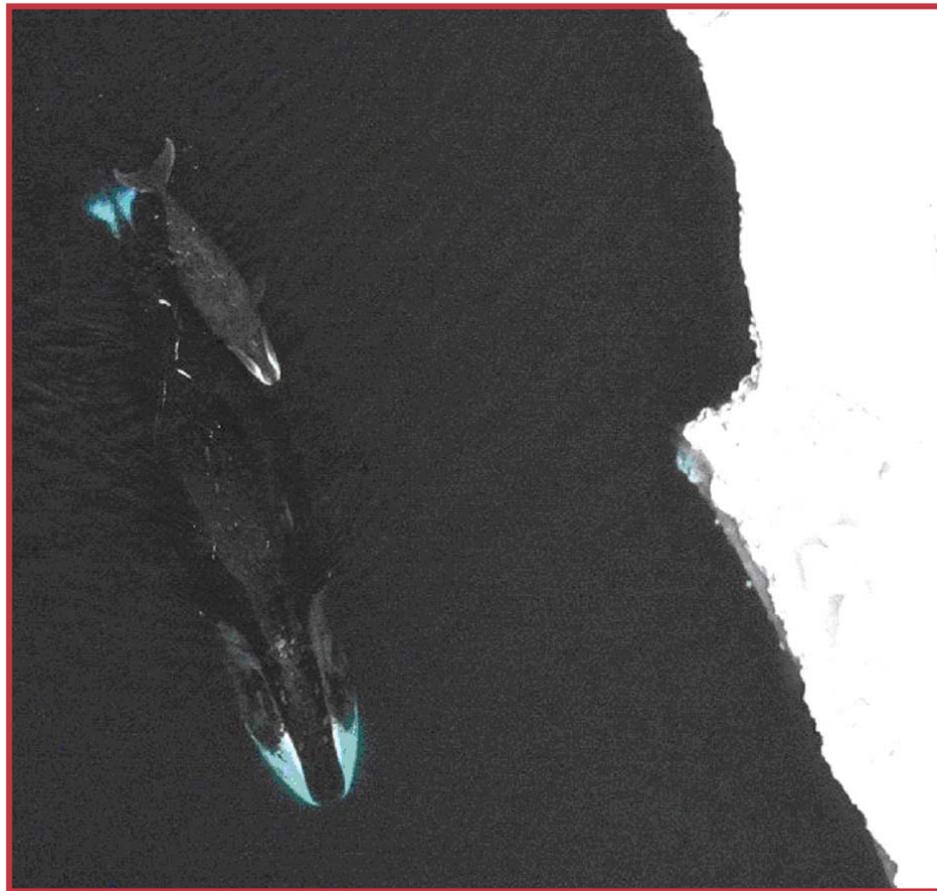


Fish and Wildlife of Alaska's North Slope

BOWHEAD WHALES

Bowhead whales (*Balaena mysticetus* or *abviq*) in the Bering, Chukchi, and Beaufort seas are protected under the federal Marine Mammal Protection Act and are listed as endangered under the Endangered Species Act. These large baleen whales can reach lengths of 60 feet and can weigh up to 80 tons. The bowhead is unique among mammals in its longevity — evidence suggests that some individuals live over a hundred years and perhaps more. Reproduction is slow, with animals beginning to breed at about age 20 and calves being produced only every three to four years.



Photograph of a bowhead whale mother with her calf (Balaena mysticetus or abviq) taken on 30 May 2003 near Barrow, Alaska. Courtesy of North Slope Borough. Photo: Bill Koski, LGL, Ltd. Canada.

The Bering-Chukchi-Beaufort population of bowhead whales is estimated by a combined visual and acoustic census conducted during the spring migration (mid-April to mid-June) past Barrow, Alaska. A census conducted in 1993 showed the estimated population at about 8,200 animals, while a census in 2001 showed the estimated population at 10,500. The population is believed to be increasing at a rate of about 3.4 percent per year despite an annual subsistence harvest and ongoing industrial activity along the migration routes.



Nuiqsut resident sharing muktuk at a whale harvest celebration. Muktuk is the thick outer skin of the whale. It has tender-crisp texture and has been reported to taste like fresh coconut or hazelnut.

In spring and fall, a portion of the bowhead population migrates past the oilfields of the North Slope to and from the Mackenzie River delta of Canada's Northwest Territories. During spring migration, whales are farther offshore, north of the oilfields, because that is where the leads in the ice are located. In fall, however, migrating whales can be less than 20 miles from shore. The spring and fall bowhead whale migrations are subject to important subsistence hunts by the local Inupiat people. The spring subsistence hunt occurs from March to June, with participation by people from eight villages located from St.

Lawrence Island to Barrow. The fall hunt occurs mainly in October and November, with participation by people from Barrow, Nuiqsut, and Kaktovik.

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Potential Impacts of North Slope Development

With regard to bowhead whales, the principal issue associated with routine oil-industry operations is the effect of underwater noise and disturbance. The potential impacts could include possible hearing damage, displacement of the animals from important habitat, and direct and indirect effects on the success of subsistence hunting of bowheads. In addition, a large oil spill could result in injuries or mortality of bowheads. Over the years, ConocoPhillips has cooperated with industry partners and federal resource agencies to study and evaluate operations with regard to these potential impacts. At BP's Northstar development, numerous monitoring programs are conducted in cooperation with the U.S. Fish and Wildlife Service.

Hearing Damage

Evidence from dolphins, beluga whales, and seals indicates that marine mammals can suffer at least temporary hearing impairment when exposed to strong underwater sounds. The strongest underwater sounds associated with oil industry activity occur during seismic exploration when airguns create sound pulses that are used to map geological features. An airgun forces a burst of compressed air into the ocean in a bubble that



A seismic vessel like the ones used in the Beaufort Sea.

expands and contracts, creating a reverberating sound. Sound levels can be 170 to 180 decibels at approximately 3,000 feet from the source. Mammal ears can tolerate higher levels of pulsed sounds than of continuous sound. The limited data for belugas and seals indicate that those mammals would need to be within a few hundred feet of an airgun array to incur even mild hearing impairment.

To reduce noise stress on whales, ConocoPhillips has stationed full-time marine mammal observers on the vessels used in our offshore seismic exploration. When observers sight marine mammals in designated safety zones, airgun operations are temporarily suspended. As a

further precaution, it is now general practice to slowly ramp up the energy output and noise level of the airgun array at the beginning of seismic operations in the Alaskan Beaufort Sea. This practice gives nearby whales the opportunity to move away before potentially damaging noise levels are reached.

ConocoPhillips does not typically conduct seismic activities during the fall whale migration. Aerial surveys of whales done before and during offshore seismic activities have shown that bowhead whales avoid geophysical boats with active airgun arrays. Because of this avoidance and the ramp-up procedure at the onset of airgun operations, bowheads generally are not exposed to sound levels that are potentially damaging to their hearing.

Displacement

During the fall migration, bowheads migrate west from the Canadian Beaufort Sea and pass along the coast in the area of oilfield operations. As the whales traverse the region, they may encounter industry activities linked to offshore geophysical exploration, exploration drilling, and production.

During the falls of 1996 through 1998, ConocoPhillips and industry partners studied whale reactions to seismic exploration conducted in the nearshore waters of the Alaskan Beaufort Sea. The distribution of bowheads migrating past the seismic boat was markedly different when the airguns were firing at intervals of 8 to 20 seconds as compared with extended periods when the airguns were silent. Almost all migrating bowheads avoided the area within 12 miles of the seismic vessel when it was actively firing airguns. These results corroborated reports by Inupiat hunters who had observed that migrating bowheads remain farther away from active seismic vessels.

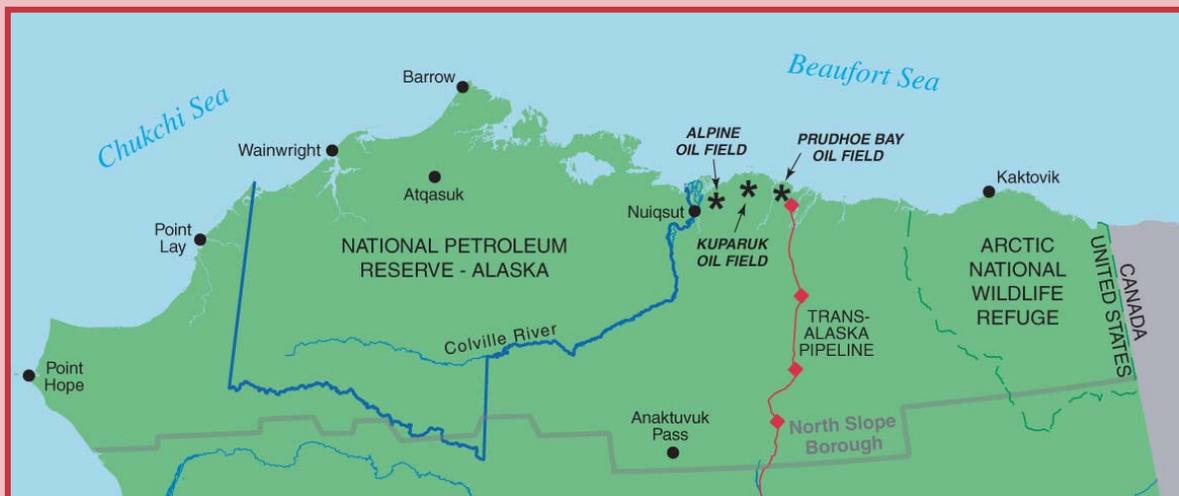
From the mid-1980s to the early 1990s, ConocoPhillips and other operators drilled several exploration wells in northern Alaska waters. While these efforts were ongoing, ConocoPhillips scientists, in cooperation with federal resource agencies, studied the effects of drillships and their support vessels on migrating bowheads. The results of these programs were similar to those reported from seismic operations. In general, fall migrating bowhead whales maintained a distance of about five to six miles from active exploratory drilling operations.

Localized displacement of bowheads migrating past industrial sites along the central coast of the Alaskan Beaufort Sea probably does not pose any problems for individual animals. However, offshore diversion of migrating whales by seismic vessels operating in nearshore waters could, in the absence of mitigation, affect hunting success by Inupiat whalers. Evidence from the seismic monitoring studies indicates that the number of migrating whales in the operating area returns to normal within 12 to 24 hours after the airguns stop firing. If the noise source is far enough upstream of the hunt, migrating whales may divert around the noise but resume normal migration routes before they reach the hunting areas.

The effects of other shipping traffic from tugs, barges, and icebreakers are not well documented in studies, but ship noise — especially from icebreakers — can deflect and disturb whales at considerable distances. Research has documented potential distances up to 20 miles from operating seismic vessels, with clear displacement at 12 miles.

Mitigation Techniques

During the past several years, when working offshore, ConocoPhillips has used the results of whale research to redesign its project schedules and operation plans to avoid or minimize impacts on the fall and spring whale migration. In the fall, most migrating whales move through the Beaufort Sea by the end of October. Whales migrating in the spring usually don't occur near the oilfields until March. Since most aspects of seismic and exploration drilling activities are conducted in winter, schedules can be modified to avoid significant interactions with the fall and spring migrations.



For Additional Information, Contact:

Environmental Studies Program
ConocoPhillips Alaska, Inc.
P.O. Box 100360
Anchorage, Alaska 99510-0360
Telephone (907) 276-1215

April 2005