

Alaska Eskimo Whaling & the International Whaling Commission

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Along the Alaskan Arctic coast, ice begins forming in September and October and grows in thickness through the winter. During this period, drifting ice including multi-year "pack" driven by wind and currents, collides with shorefast ice, forming pressure ridges. Often, in waters less than 30 m deep, large pressure ridges are "grounded" on the sea floor. The stability of the shorefast ice depends on grounded pressure ridge systems on its seaward edge. Periodically, sea currents and wind push the pack ice offshore, creating a flaw zone between the shorefast and pack ice. In this flaw zone, leads (channels) and polynyas (discrete areas of open water) develop. Bowheads use this zone in the spring to migrate from the Bering Sea to summering grounds mainly in the eastern Beaufort Sea off Canada.

The Western Thule people, ancestors of modern Eskimo whalers of northern Alaska, were among the first people to study the bowhead migration along the Arctic coast. These early whalers obviously knew a great deal about bowhead migratory behavior and had identified the areas where landform and ice conditions allowed the best access to whales for hunting: Point Barrow, Cape Krusenstern, and Point Hope (Bockstoce 1976). By around 1000 A.D. they had developed effective whaling equipment and actively hunted bowheads. Charles D. Brower, a shore-based "Yankee" whaler at Barrow, produced some of the first written descriptions of the bowhead migration at Barrow in his autobiography (Brower 1942).

Foote (1964) was the first to count migrating bowhead whales at Point Hope (on the east central Chukchi Sea coast) from 1960 to 1962. Foote did not view his counts as population estimates, recognizing that he missed many whales. His highest count was during the 1962 season, when he saw 177 whales.

In 1972, the International Whaling Commission (IWC) expressed concern about the absence of data on the size of the Bering Sea bowhead population and details of the Eskimo subsistence hunt. The IWC requested information on population abundance, magnitude and trend of the subsistence catch, and number of whales struck but lost (Tillman 1980).

The first field effort aimed at estimating the size of the population was initiated by the Marine Mammal Division (now called NMML, the National Marine Mammal Laboratory) of the National Marine Fisheries Service, National Oceanic and Atmospheric Administration (NMFS, NOAA) in the spring of 1976 near Point Barrow (Braham and Krogman 1977; Marquette 1977). The 1976 fieldwork was considered "reconnaissance". The researchers recognized that considerable knowledge of the sea ice and arctic "survival" skills were necessary to conduct an effective ice-based census. During this first season they quartered with an Eskimo whaling crew captained by James Matumeak, to gain knowledge and experience.

The counting effort was intermittent due to frequent closures of the lead. A lead is "closed" when the water in the channel freezes over or when pack ice pushes up against the shorefast ice. In 1976 the lead closed between 19-25 April and essentially remained closed from 25-30 April. The lead was also closed on 1, 6, 13, and 22nd of May. Krogman (1980) reported an estimate of 796 bowhead whales passing the observation site during the sampling period based on the 1976 data. This estimate only reflected the number of whales counted, corrected for times during the sampling period when observers were unable to count whales due to environmental conditions. It was viewed as a population index rather than as an estimate of population size since it did not account for whales that did not pass during the sampling period, passed too far offshore to be seen, or passed within viewing range but were missed by the observers.

A U.S. report to the IWC in 1976 indicated significant increases in number of bowheads harvested annually, number of Eskimo whaling crews, and number of bowheads struck and lost since 1969 (Marquette 1977). The U.S. reported 91 strikes in 1976 (Tillman 1980). The IWC strongly urged the U.S. to take action to reduce strikes (IWC 1977).

During the 1977 season, U.S. scientists conducted a preliminary census near Point Barrow from 25 April to 2 June, near Point Hope from 18 April to 28 May and at Cape Lisburne from 5 to 17 May (Braham et al., 1984; Rugh and Cabbage 1980). They still considered the counting effort as reconnaissance to determine the best methods and locations for a census. Observers used a single observation site near Point Barrow and counted 327 whales. This count resulted in an index estimate of 715 bowheads (Krogman 1980). Other crews counted a total of 185 whales near Point Hope and 49 near Cape Lisburne.

Based on results of the 1977 counts and reported high numbers (111) of strikes, the IWC imposed a moratorium on Eskimo whaling. The report of the Scientific Committee concluded that "any taking of bowhead whales could adversely affect the stock and contribute to preventing its eventual recovery, if in fact such recovery is still possible" (IWC 1978). However, at a special December meeting of the IWC, the U.S. negotiated a small harvest quota in recognition of the subsistence and cultural needs of Eskimos and committed itself to a substantial research effort to learn more about the status of the Bering Sea stock.

In 1978 whales were counted near Cape Lisburne and Point Barrow. Counts from 2 April to 7 June at Cape Lisburne totaled 280 bowheads, with peak counts from 18 to 22 April and from 3 to 9 May. At Cape Lisburne, high winds and poor weather greatly compromised the census effort (Rugh and Cabbage 1980). Primarily due to its severe weather conditions, Cape Lisburne was abandoned as a suitable census location after the 1978 season.

The 1978 census effort near Point Barrow was much more successful. Near Point Barrow, bowheads typically swim parallel to the lead edge in a northeasterly direction (Carroll and Smithhisler 1980; Gentleman and Zeh 1987). Ice conditions force the migratory path to be closer to land at Point Barrow than perhaps anywhere else on the migration route (Braham et al. 1984). Thus, ice conditions and the bowheads' migratory behavior facilitate the ice-based census there.

All ice-based bowhead census efforts after 1978 were conducted near Point Barrow, and the basic field methods for the visual census established there in 1978 were used through 1985. NMML scientists conducted the work from 1978 to 1980. In 1981, the Alaska Eskimo Whaling Commission (AEWC) conducted the census under contract to NMML. From 1982 on, the North Slope Borough conducted it.

Acoustic census studies of migrating bowheads were initiated in the spring of 1978 (Braham et al. 1979) and have continued since then with varying levels of effort and emphasis (e.g. Clark and Johnson 1984; Cummings et al. 1983; Cummings and Holliday 1985; Clark et al. 1986a,b; Clark and Ellison 1988, 1989). The original premise for these studies was that visual observations would be improved by information on the general proximities of and directions to vocalizing whales. Later, after several years of intensive analyses of the data giving locations where whales were heard, it became clear that acoustics did not just augment visual observations, but was in fact an independent method for recording numbers, positions, and movements of whales.

The acceptance of acoustic techniques in partnership with traditional visual census methods led to changes in visual census and population estimation procedures after 1983. In 1984-86 and 1988, combined visual and acoustic censuses were conducted. In 1987, the Point Barrow fieldwork in the spring was restricted to the collection data on bowhead behavior during the migration. The 1987 studies were designed to provide information that might be used in refining population estimation methods.