

Spitsbergen Bowhead Stock: A Short Review

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Introduction

The bowhead whale, *Balaena mysticetus*, had a nearly circumpolar distribution, historically, in the higher latitudes of the Northern Hemisphere. Five geographically separate stocks are recognized by the International Whaling Commission (IWC) (1978), primarily on the basis of arguments presented at its 1977 annual meeting in an unpublished report¹. These stocks are: 1) The Spitsbergen stock, estimated at 25,000 in 1679; 2) the Davis Strait stock, estimated at 6,000 before commercial exploitation; 3) the Hudson Bay stock, estimated at 700 prior to commercial hunting; 4) the Bering Sea stock, estimated at 18,000 in 1850; and 5) the Sea of Okhotsk stock, estimated at 6,500 before commercial exploitation (all from IWC, 1978).

The purpose of this paper is to summarize briefly the history of exploitation, the historical distribution, and the current status of the Spitsbergen stock. It is based on a review of literature.

Aboriginal Exploitation

This, the largest bowhead whale population, was the first to be exposed to European commercial hunting. The extent to which the Spitsbergen stock was hunted by aboriginal peoples is difficult to determine. Vibe's (1967) account of the development and movement of Eskimo cultures in Greenland, from which the following discussion is derived, indicates that the first immigration to north Greenland occurred in approximately 2500-2000 B.C. Both the Independence people, who were musk-ox hunters, and the Sarqaaq people, who

were reindeer hunters, inhabited north Greenland off and on until about 500 B.C. The Dorset people, reindeer hunters, came about 100 B.C. and disappeared around 500 A.D. I know of no evidence that any of these people hunted whales, and almost certainly they did not hunt them off northeastern Greenland, where animals from the Spitsbergen stock would have been involved.

The Whaling (or Thule) Culture was established in northwestern Greenland between 900 and 1200 A.D. Some of these people immigrated to northeastern Greenland at least as early as 1480, when a skin boat carrying Eskimo whale hunters arrived from the northwest at Pearyland (Knuth, 1967). Whalebone and baleen lashings were recovered in an archaeological site at Pearyland, and the latter were radiocarbon dated as 470 ± 100 years old. Perhaps it was in the 15th century, then, that the Spitsbergen stock of bowheads first experienced the sting of primitive whaling weapons off northeastern Greenland. In the 15th and 16th centuries the Angmagssalik Eskimos (Inugsuk) of southeastern Greenland probably pushed northward, eventually meeting and merging with the Thule people to create what Vibe called the "Northeast Greenland Mixed Culture," which seems to have depended heavily on reindeer. That this culture exploited bowhead whales is suggested by the discovery of whale bones in a midden searched by Scoresby (1823) and another examined by Vibe (1967).

European whalers in the Greenland Sea reported several instances in which captured whales had stone harpoon heads or lance tips imbedded in their carcasses (Gray, 1935). Unaware of the

existence of Eskimos in northeastern Greenland, they interpreted such finds as evidence that bowheads immigrated into this area from Davis Strait or the Chukchi Sea. However, subsequent archaeological discoveries have demonstrated beyond reasonable doubt that these implements were fashioned and wielded by local Eskimos. Gray suggested that the decline and eventual extinction of this Stone Age civilization after 1823 may have been due, at least in part, to the drastic reduction in the bowhead whale population caused by commercial whaling. By 1870 the Northeast Greenland Mixed Culture appears to have vanished utterly (Gray, 1935), and the modern, rejuvenated settlement at Scoresbysund was not established until 1925 (Vibe, 1967).

Available information is too sparse to judge whether the early aboriginal inhabitants of northeastern Greenland had a significant impact on the Spitsbergen bowhead stock. However, the marginal nature of subsistence life in this unforgiving land suggests that Eskimo habitation was sporadic, and what whaling that did occur was probably local in impact and primitive in methodology. Eskimo residents of Scoresbysund are not known ever to have taken up the pursuit of large whales, although they do kill narwhals, *Monodon monoceros*, and white whales, *Delphinapterus leucas*, occasionally (Kapel, 1977), and they rely heavily on seals for subsistence (Kapel, 1975).

Tomilin (1957) referred to whale hunting along the Murman coast of Russia as early as the 9th century, but did not indicate, except by inference, that bowheads were among the exploited species. He did assert, with unfortunately little documentation, that hunters from the northern coasts of Russia sailed to Spitsbergen long before the island's "discovery" by Barents in 1596, to hunt whales, presumably including bowheads, and pinnipeds.

Commercial Exploitation, Whale Distribution, and Stock Identity

The history of the intensive European fishery that flourished around Spitsbergen and off east Greenland between 1610 and 1910 has been reviewed by

¹Mitchell, E. D. 1977. Initial population size of bowhead whale (*Balaena mysticetus*) stocks: cumulative catch estimates. Unpubl. manuscript submitted to IWC Scientific Committee, Canberra, Australia, June 1977, as SC/29/Doc. 33.

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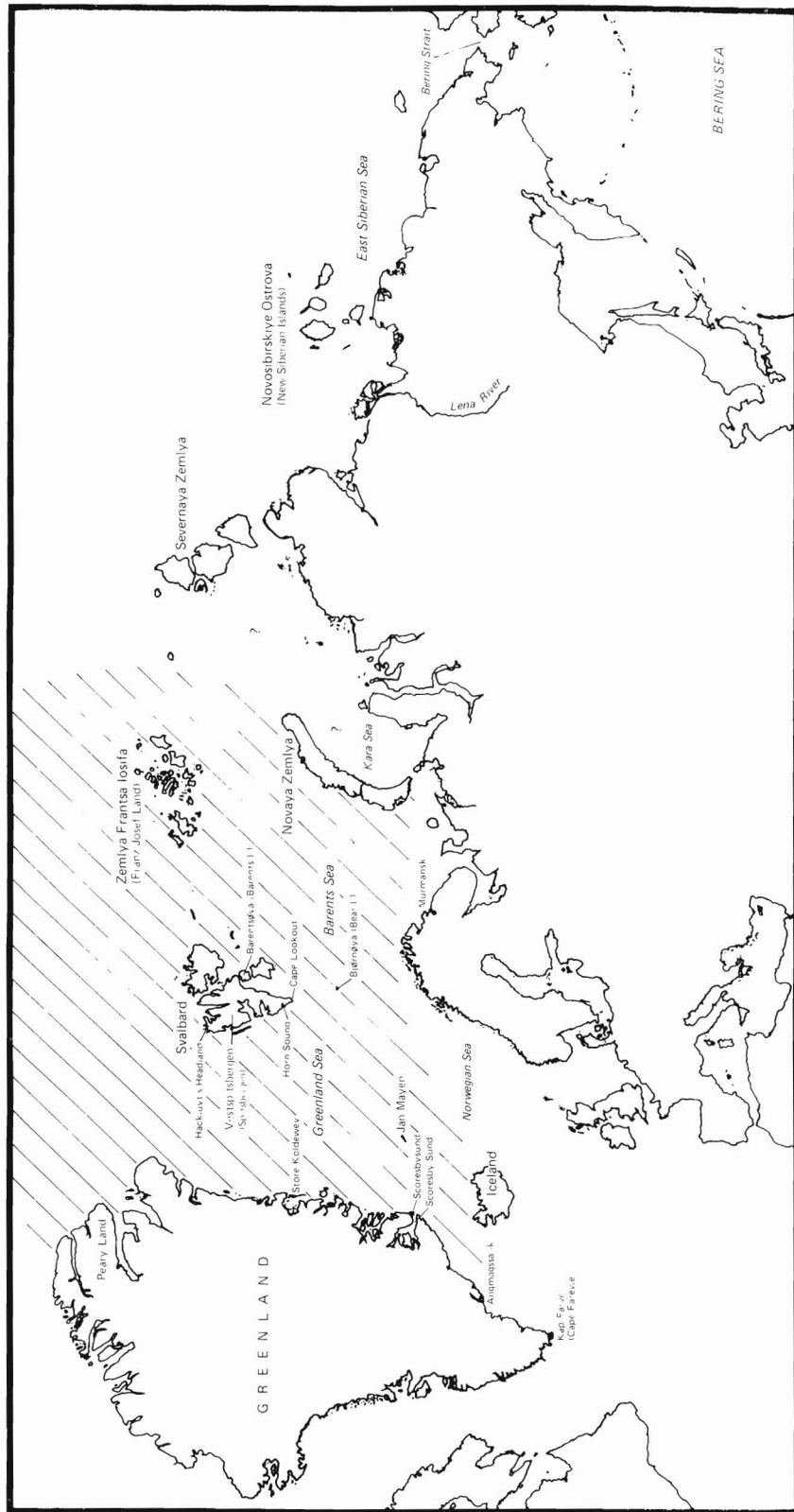


Figure 1.—Approximate historical range (hatched) of the Spitsbergen stock of bowhead whales, with place names mentioned in text.

many authors (e.g., Scoresby, 1820; Eschricht and Reinhardt, 1866; Southwell, 1898; Jenkins, 1921; Lubbock, 1937; Tomilin, 1957; and Jong, 1978). Though tens of thousands of whales were captured in those areas during this period, major questions about the Spitsbergen stock remain unresolved.

For instance, Scoresby (1820) observed that identifiable substocks, what he called "tribes," of whales occupied different grounds in summer and migrated southward in the fall by different routes. He mentioned differences in head shape and body proportions that, by his estimation, could have taxonomic significance. Eschricht and Reinhardt (1866) managed to attribute most of the differences pointed out by Scoresby to age and sex segregation within the whale population, but they were less able to dismiss the observations of Zorgdrager, "a Dutchman of great experience." Zorgdrager (1720) suggested that "west-ice whales," those killed between Spitsbergen and Greenland, were different from "south-ice whales," those killed south of Spitsbergen. "South-ice whales" had thinner, softer, yellow blubber; they appeared to come from the east and return to the east during the exceptional years when they appeared at all near Spitsbergen; and they were relatively naive and approachable compared with "west-ice whales." Eschricht and Reinhardt (1866) allowed that these characteristics could constitute evidence of geographic, but not necessarily systematic, separation. But Zorgdrager also had claimed that "south-ice whales" had a "more even" back than "west-ice whales," and this they found more difficult to reconcile with the single-species concept. The problem of variability within what is now called the Spitsbergen stock is beyond resolution; it is also beside the point as long as the population remains near extinction. There may be interesting parallels between this and the "ingutuk" problem in northern Alaska (Braham et al., 1980).

There are different opinions about how far eastward bowheads from the Spitsbergen stock wander(ed) (Fig. 1). Eschricht and Reinhardt (1866) were

doubtful of the species' occurrence as far east as Novaya Zemlya, and Ruud (1937) stated that bowheads are generally absent between Novaya Zemlya and Bering Strait. Tomilin (1957) evaluated these claims in light of old Russian literature and judged them to be in need of qualification. While some of his sources are not particularly convincing with respect to species identification, enough of them are offered to leave little doubt that bowheads occur(ed), at least sporadically, as far east as Novaya Zemlya and possibly even to the Kara Sea. Tomilin's argument was strengthened in May 1963 when a bowhead was sighted off Novaya Zemlya (at lat. 73°50'N, long. 49°20'E) by Norwegian small whale hunters (Jonsgård, 1964) and again, in May 1973, when an adult and calf were seen swimming northeastward at lat. 74°40'N, long. 52°20'E (Benjaminson et al., 1976). Given Zorgdrager's (1720) conviction (see above) that "south-ice whales" came to Spitsbergen from the east, it is reasonable to suppose there was (and may still be) either an eastern stock of bowheads in the Barents and Kara Seas or a part of the Spitsbergen stock which spent at least part of some years in these waters.

Another unanswered question is the winter whereabouts of Spitsbergen bowheads. Since virtually all hunting occurred in spring, summer, or fall, there are, to my knowledge, no published winter observations of bowheads between east Greenland and the East Siberian Sea. Southwell (1898), without giving evidence, stated that bowheads winter east of Greenland at about lat. 65°N; Gray (1931) referred to "their supposed winter quarters, between Iceland and Cape Farewell." Eschricht and Reinhardt (1866) claimed "we know that it [the bowhead] sometimes repairs to the north coast of Iceland" but gave no supporting evidence. Saemundsson (1939) asserted that "no records as to its occurrence in Icelandic waters are at hand," though he admitted that in exceptional ice-years the bowhead probably did come close to the island's northwest coast. Scoresby (1820) knew of "some rare instances" of large whales being seen early in the

season along the ice edge extending from Point Lookout (Spitsbergen) to Bear Island, which suggests wintering in the Norwegian or Barents Sea. Gray (1931) noted that there is open water "north of Siberia" in winter, and implied that some bowheads, in some years at least, overwinter(ed) there.

The best that can be said is that the population probably remains close to the southern boundary of winter ice and moves northward as the ice cover recedes and disintegrates in spring. Robert Gray (1889), an experienced whaler, explained: "... the area inhabited by the *Mysticetus* might be represented by a band of variable breadth running parallel to the edge of the ice, the animal being most usually present where the temperature of the water is just above the freezing point."

The bowhead's distribution in northeast Atlantic waters from spring through autumn is relatively well mapped. In 1634 Dutch sailors wintering on Jan Mayen first noticed bowheads passing the island on 27 March, and whales were seen daily "in larger or smaller numbers" until the end of April (Southwell, 1898). Saemundsson (1939) reported a sighting at the ice edge 40 miles off the northwest coast of Iceland in spring 1879. According to Southwell, the whales were next seen off western Spitsbergen in mid-May, being found north and west of there throughout the summer.

Gray (1936) summarized Scoresby's reflections on the principal whaling grounds and seasons. In April whales were caught in open water, outside the ice, within view of Hackluyt's Headland at about lat. 80°N. (According to Gray (1931), some autumn whaling took place there, too.) By the end of April this episode would end, as the whales, many accompanied by calves, dispersed into the ice. Hunting resumed in May and lasted through June or July between lat. 78° and 80°N, when whales were found "among the ice; in bays or 'bights' in its margin; among the broken or 'pack' ice; among the unbroken ice or 'floes' and often between the two kinds of ice." During May, Spitsbergen was often in sight from where the whales were caught.

Scoresby (1823) noted that before 1814 most whaling was done between lat. 76° and 80°N and at lat. 79°N within "thirty or forty leagues" of Spitsbergen. After 1814, however, the hunting was so poor in these areas that new grounds had to be found. Scoresby and others began thereafter to work the ice between lat. 71° and 74°N, close to the Greenland coast. Southwell (1898) described what he called the "south fishing ground" as between lat. 72° and 75°N at about long. 13°W, off east Greenland, and it was "fished" mainly between mid-June and early August. Apparently it was this "south fishing ground" that Vibe (1967) had in mind when he asserted: "The main summer feeding ground of the Greenland Whale off Northeast Greenland seems to be the continental slope between 200 and 1000 m."

An additional whaling ground was called the "'southward' fishing station" (Scoresby quoted by Gray, 1936). It was in open water or "bay ice" to the south of Spitsbergen at about lat. 76°N (with Horn Sound and Cape Lookout sometimes in sight). This may be where Zorgdrager's "south-ice whales" were found.

Gray (1936), like Eschricht and Reinhardt (1866), dismissed Scoresby's concerns about variability among bowheads by concluding that "differences between the whales caught at the different fishings seem to have been merely a matter of age and sex." The whales caught in ice between lat. 78° and 80°N were presumably immature; those killed in April at lat. 80°N, "breeding females"; those taken at lat. 76°N from April to July, adult males; and those found in summer ice off east Greenland, mostly males.

Historical Status

There is little point in recounting details of the Spitsbergen stock's decline to commercial extinction. The average number of whales taken per voyage by each Peterhead vessel was 16.8 in the period 1800-09; it declined steadily thereafter to 1.7 between 1850 and 1859 (Gray, 1929). The total fleet caught 85 whales in the Greenland Sea in the period 1880-89, but only 38 between

1890 and 1899 and 28 in 1900-09. Gray (1929) reflected: “. . . in the 'eighties we seldom saw more than one or two at a time and seldom more than a dozen or two in a voyage. In 1890 only six were seen by all the ships, and in 1898 not a single one.” The continued pursuit of bowheads east of Greenland in these waning years of the fishery was “subsidized” by the walruses, polar bears, harp and hooded seals, bottlenose whales, narwhals, and musk oxen that could, if nothing more, at least cut the losses of an unsuccessful voyage (see Lubbock, 1937).

Reasons for Decline and Failure to Recover

For more than half a century now the Spitsbergen stock has enjoyed virtually complete immunity from hunting. Only four animals are known to have been taken since 1911, and those were killed by Norwegians in 1932 (Table 1). If the population were still viable at the turn of the century, there is reason to think some recovery in numbers would have been achieved. However, there is no evidence whatsoever to suggest that the population has increased. There is, on the contrary, reason to fear that the Spitsbergen stock was below a critical level when its exploitation ceased and that it has either stabilized at a relic number or is in the process of declining to extinction.

There are several lines of argument to account for the Spitsbergen stock's apparently drastic decline. Some are less plausible than others. James Lamont (1861), a walrus hunting yachtsman, observed that by the middle of the 19th century the whales had “entirely deserted” the vicinity of Spitsbergen. He believed the “principal reason to be that the seas around Spitsbergen have become *too shallow* for them.” Vibe (1967) constructed a different ecological explanation, to wit, that “special conditions of currents, drift-ice, and production in the Arctic seas were the deciding factors in its [the bowhead's] mass occurrence in different places at different times.” He assumed that instability of the whale's habitat made its survival tenuous enough without whaling and that whaling simply hastened an

Table 1.—Twentieth century records of bowhead whales east of Cape Farewell.

Date	Number	Nature of evidence	Location	Source
1900-09	28	Killed	Off east Greenland	Gray, 1929
1910	5	Killed	Between lat. 78°N, long. 1°W and lat. 79°N, long. 1°E.	Lubbock, 1937:450
1911	1	Killed	Svalbard	Jonsgård, 1977:424
1917	1	Sighted	In ice off east Greenland between lat. 64° and 65°N	Ruud, 1937
Summer 1932	4	Killed	At the ice edge north of Spitsbergen	Ruud, 1937; and see Jonsgård, 1964
1940	1	Sighted	Mouth of Scoresby Sound, east Greenland	Vibe, 1967
August 1953	2	Sighted	In drift ice at lat. 76°N 40 mi. east of Store Koldewey, east Greenland	Vibe, 1967
August 20, 1958	1	Sighted	Off northwest Spitsbergen at lat. 79°48'N, long. 10°07'E	Christiansen, 1962
May 23, 1963	1	Sighted	West of Novaya Zemlya at lat. 73°50'N, long. 49°20'E	Jonsgård, 1964
June 1964	1	Sighted	Mouth of Scoresby Sound, east Greenland	Vibe, 1967
May 29, 1973	2 (adult & young)	Sighted	West of Novaya Zemlya at lat. 74°40'N, long. 52°20'E	Benjaminsen et al., 1976
August 1974	1	Stranded parts recovered	Mistakodden at the east side of Spitsbergen	Larsen, 1976
April 23, 1979	2	Sighted	Off northeast Greenland at lat. 80°45'N, long. 05°33'E	Anonymous, In press
Aug. 2, 1979	2	Sighted (Identification unconfirmed)	Off SE Greenland at approx. lat 61°05'N, long. 42°10'W	Jonsgård, 1980 ¹
May 21 and 25, 1980	1	Sighted	Off Finnmark, North Norway, at approx. lat. 71°00'N, long. 28°51'E	Jonsgård, 1980 ¹

¹See text footnote 2.

ebbing cycle for the species in the eastern North Atlantic.

Sergeant (1978) suggested that recovery of bowheads in Canada's eastern Arctic could be retarded by killer whale, *Orcinus orca*, predation. Since killer whales are common enough in the subarctic eastern North Atlantic to have been themselves the object of commercial exploitation in the 20th century (Jonsgård and Lyshoel, 1970), their role in preventing the Spitsbergen stock's recovery cannot be entirely discounted.

Gray (1889) suggested that competition for food between bowheads and blue whales, *Balaenoptera musculus*, (and possibly in this case including other balaenopterids) was an important factor in preventing the former's recovery. As he put it, “. . . the struggle all along has been one of a slow swimmer with long whalebone plates *versus* a swift and active animal with short plates, with this qualification, however, that *Mysticetus* has become specialized to inhabit those parts of the feeding-grounds covered by ice, its congener [sic] to occupy rather the open ocean. The prolonged prosecution of the

Whale fishery, and the consequent reduction in numbers of the Greenland Whale, has favoured a corresponding increase in the abundance of the Blue Whale, at the same time permitting its intrusion upon the habitat of *Mysticetus*, and hence its frequent appearance amongst the ice, where for weeks the ships now search vainly for the Greenland Right Whale.” Since blue whales were themselves heavily exploited in the eastern North Atlantic after 1890 (Jonsgård, 1977), the bowhead should have had a timely opportunity to regain its niche. Sergeant (1978) considered Gray's competition “hypothesis” and found it difficult to accept, “unless the ice-covered area was so poor in plankton that the bowhead had to move out to the edges, and then, surely competition would always have occurred and the niches become well defined.”

However susceptible to ecological instabilities, predation, or interspecies competition the bowhead may be, its demise was most likely a direct result of overhunting. The whalers spared neither males nor females, young nor old. Gray (1929) referred to the “waste-

ful method of carrying on the fishing" that involved the frequent capture of very young whales. This practice became common in the late 18th century and continued to the end of the fishery. Southwell (1898) observed that "Females accompanied by suckers are now rarely met with, and it follows that they must either have a secure hiding-place . . . or that reproduction has for many years been greatly arrested, or has almost ceased."

Present Status

Published 20th century records of bowheads in the Spitsbergen stock area are listed in Table 1. As Jonsgård (1964) inferred, the paucity of bowhead sightings in the present century cannot be attributed solely to a lack of observer effort. Norwegian small whale hunters (looking for minke, *Balaenoptera acutorostrata*; bottlenose, *Hyperodon ampullatus*; pilot, *Globiocephala malaena*; and killer whales) have been working in the vicinity of Spitsbergen since at least 1949 (see Jonsgård, 1977). Some of these vessels have carried observers from the Institute of Marine Research (Bergen), whose presence on board probably improves the chance of a sighting's being noted and reported.

I have not attempted to correlate small whale hunting vessel cruise tracks and schedules with those of the earlier bowhead whaling vessels. Reports by Christensen (1972, 1974) and Benjaminsen et al. (1976) gave details of Norwegian small whale research cruises during recent years near Spitsbergen and east Greenland. It may be possible to plot and compare Norwegian searching effort with historically profitable bowhead whaling areas (by season) in order to document changes in whale abundance or distribution. If modern Norwegian small whale hunters have in fact been searching (in appropriate seasons) areas where bowheads once were common, then the lack of more incidental sightings takes on greater meaning. However, if their timing or routes have been out of phase with those of the early bowhead whalers, then it is possible that more whales survive than is generally assumed.

Jonsgård² is not sanguine about the existence of a viable stock in the Spitsbergen-Barents Sea area. He suggests that the few whales seen there since World War II may be strays from other stocks.

In any case, the IWC Scientific Committee's conclusion—that "the stock is now at a very low level" (IWC, 1978)—seems a fair assessment until new information becomes available to argue otherwise.

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