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Notes on the present status of the polar bear (*Ursus maritimus*) in Ungava Bay and northern Labrador
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Abstract

The present status of the polar bear (*Ursus maritimus*) in the Ungava Bay—northern Labrador area (Polar Bear Management Zone B) is assessed on the basis of limited, available data. These data include historical sources, harvest records, and incomplete current research.

From aerial spring denning surveys and Inuit reports there appear to be three possible denning areas: 1) northern Labrador, 2) Akpatok island, 3) western Ungava. However, the concentration of maternity dens and productivity in these areas appear to be low.

Twelve polar bears were tagged. One bear tagged on the Labrador coast was recaptured in Ungava Bay.

Several summer aerial surveys carried out since 1970, mainly over Akpatok Island, and other observations have indicated that the bears retreat to the islands and mainland in late July—early August after the sea-ice has melted, and remain on land until freeze-up in November.

Historically these polar bears have been hunted by the Inuit as well as by traders, hunters—trappers, whalers, sealers, and settlers. Most of the 30 to 50 bears now taken each year are killed along the Labrador coast on Killinek and Akpatok islands, and in western Ungava north of Payne Bay. Hunting is restricted to Inuit in Quebec and Northwest Territories, but the season is closed in Newfoundland. The main incentive for polar bear hunting is the price obtained for the hide.

Because Ungava Bay and northern Labrador may have few polar bears and low productivity, harvesting should be carefully managed.

An expanded research program is required to establish base-line information on the discreteness and size of the population, seasonal movements, denning, feeding, and summer sanctuary areas, and the age structure of the bears being harvested.

Introduction

The polar bear (*Ursus maritimus*) is circumpolar in its distribution, but occurs in several semi-discrete groups or sub-populations. Although the range limits of most of these sub-populations are not precisely defined, several years of tagging and recapture data show only limited movements of individual bears between the groups. For a general review of polar bear biology, research, and management in Canada, see Stirling and Jonkel (1972).

The polar bears in the region of Ungava Bay and Labrador were thought to form a discrete sub-population, approximating the area delineated as Management Zone B by the Federal—Provincial Polar Bear Technical Committee (Figure 1).

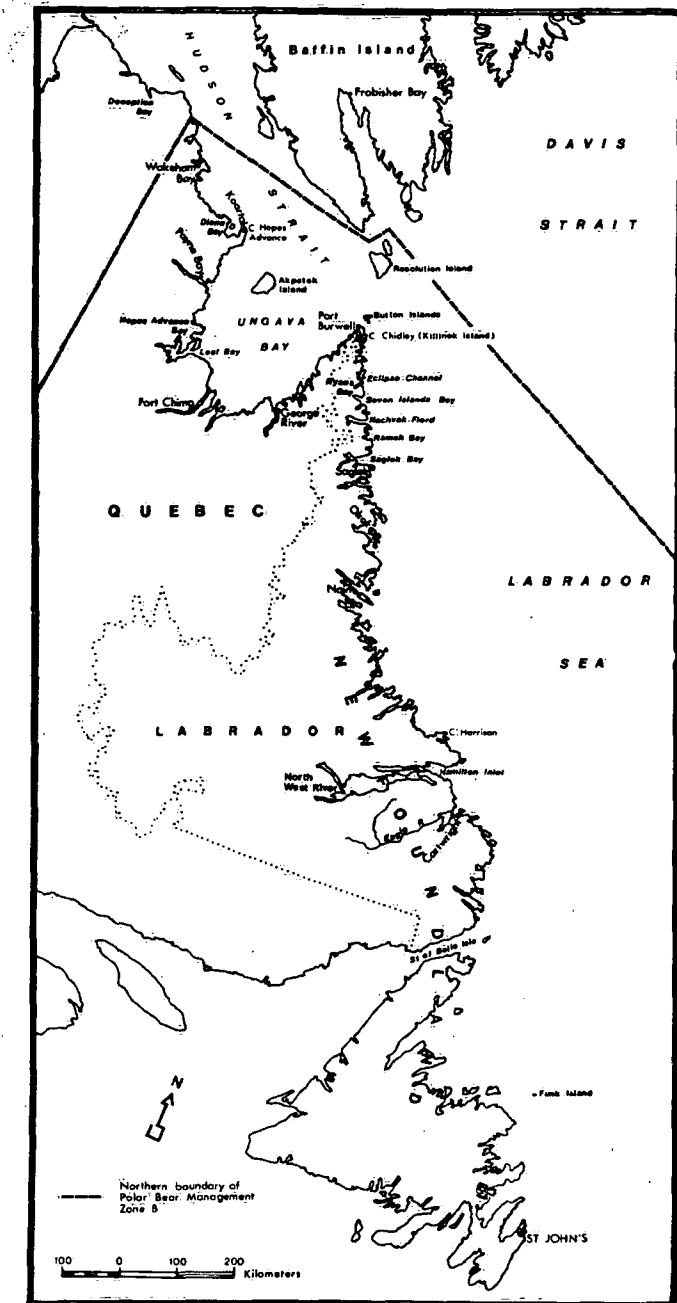


Figure 1
Location map: Ungava Bay—Labrador—Newfoundland

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The objective of this Progress Note is to summarize the state of knowledge about this sub-population, using the scattered data available from historical sources, harvest records, and research completed to date, and to indicate what research is needed to ensure the best course of management.

Materials and methods

Denning surveys

Spring denning surveys by the Canadian Wildlife Service (CWS), Newfoundland Wildlife Branch (NWB), and Quebec Wildlife Service (QWS) were carried out from 23 to 29 March 1973 and 15 to 31 March 1974.

We determined the timing of the surveys by comparing the dates of emergence of denning females at other latitudes. In the more southerly areas of Manitoba and Ontario, bears begin to leave their dens at the end of February, with a peak of emergence in early March; in the Western and High Arctic, they leave in late March and early April. Potential denning areas along much of the Ungava Bay—northern Labrador coastline and adjacent islands were searched using mainly fixed-wing aircraft with some additional helicopter support. We followed the coastline and floe edge at 90 m and 160 kmph searching for tracks of females and newborn young, and when possible, back-tracked the trails in the hope of locating the den. Additional information was gathered from the Inuit of Port Burwell, George River, Fort Chimo, Payne Bay, and Koartak, and from native polar bear kill and historical records.

Tagging programs

For determination of population size, discreteness, and seasonal movements, it is essential to tag individual polar bears and recover tags at a later date, either through recapture of the bear or by return of the tag from a native hunter. The methods used are described by Jonkel (1967), Lentfer (1968), and Larsen (1971).

From 9 to 19 August 1971, a camp was established on Akpatok Island to capture polar bears with foot snares and tag them. We used helicopters during polar bear tagging programs on Akpatok Island from 8 to 13 August 1974, and on the Labrador coast from 21 to 26 May 1974 and from 21 to 23 May 1975 based at Saglek, Labrador.

Summer aerial surveys

Since 1970, several summer aerial surveys of Akpatok Island (mainly CWS programs with some QWS co-operation) have been carried out (Table 1). The survey of 16 August 1970 also covered the Button and Resolution islands.

Provincial game records and miscellaneous sources

Quebec and Newfoundland provincial game reports, and records from the Institute of Marine Research, Bergen, Norway, were reviewed for past harvest data. We reviewed observations incidental to other wildlife studies, records from local interviews, recent and historical literature, and ice records for any data relevant to this summary.

Pre-molar teeth were removed for age determination from polar bear skulls collected from native hunters, from bears

immobilized for tagging, and from bears killed in self-defence by Norwegian sealers.

Results and discussion

Denning and productivity

Only a few data on maternity dens were obtained from the spring surveys and no females with newborn cubs were seen. The surveys may have been too late, since the taking of a female with newborn cubs on the Labrador coast on 25 March 1970 indicates that emergence from the dens may be earlier than was previously suspected. The surveys were also hampered by unfavourable weather conditions, which made the observation of tracks difficult.

Even from the data recorded it was apparent that the concentration of maternity dens in the region of Ungava Bay and northern Labrador was low, especially when compared to areas such as Southampton Island (Harington, 1968), north-eastern Manitoba (Jonkel *et al.*, 1972; Cross, 1975), and north-western Ontario (Kolenosky, 1974 and 1975). Consequently, annual productivity was probably also low.

Despite their paucity the new data from these surveys, combined with Inuit reports, suggest three possible denning areas, as follows.

1) *Northern Labrador, north of Nachvak Fiord.* A possible maternity den, tracks of a female with young, and a temporary den were observed on 28 March 1973 in Seven Islands Bay. George River Inuit reported an unoccupied den and tracks of a female and young in the same area on 10 March 1974, and they had taken a female and two cubs in the Eclipse Sound area in March 1970. Further south, in May 1974, tracks of females with young were observed in the Ramah Bay—Bear's Gut area.

2) *Akpatok Island.* We saw no bears or dens. Records of tracks of females and young from the ravines suggest that the island may be a maternity denning area. Tuck (1954) observed in July-August a den containing polar bear hair, which the natives thought had been used as a winter den. We suspect that females with young may return to maternity denning areas in summer and utilize them as summer sanctuaries, which also suggests that Akpatok Island is used for maternity denning.

3) *Western Ungava.* A temporary den occupied in February 1973 by a female and two yearlings north of Baie de Rozière; 65–70 km north of Payne Bay, was reported by Payne Bay Inuit. Temporary dens and tracks of females and young were also reported by Koartak Inuit in the area south of the Eider Islands and south-east of Cape Hopes Advance. In December 1973 a female with a yearling was killed in southern Diana Bay. In November 1972 a female and two cubs, one year of age or older, were shot by Inuit while heading inland 16 km north of Payne Bay.

Tagging and recaptures

In 30 trap-nights no bears were captured on Akpatok Island in August 1971. Bears were present on the island, but not in the immediate vicinity of the traps.

In May 1974 one polar bear, a sub-adult male, was seen and tagged near Saglek, Labrador. In August 1974, 22 bears were seen and 10 were captured on Akpatok Island. The

Table 1

Number of polar bears counted on summer aerial surveys of Akpatok Island, 1970–75

Date	Obs. total	Est. total	Obs.		Observers
			Cubs	Yearlings	
16 Aug. 1970	10	20		4	Russell
23 Aug. 1971	22	30-40		1	Kiliaan Russell
19 July 1972	0	0			Nettleship
8-13 Aug. 1974	22	22	3	5	Knudsen Le Henaff
9 Aug. 1975	14	35			Juniper

single tagged bear from Labrador was also captured, thereby confirming suspected movements between the two areas. This same tagged bear was then killed 32 km northeast of Payne Bay by Inuit hunters in September 1974. In May 1975, only one bear, a sub-adult female, was seen and captured in Bigelow Bay, east of Nachvak Fiord, northern Labrador. With more time, tagging, and recoveries of tagged bears, the discreteness of this sub-population will become clearer. Future tagging planned for southeastern Baffin Island and the western portion of Hudson Strait should also help to resolve this question.

Summer surveys and records

The last remnants of the sea ice in Hudson Strait and Ungava Bay melt by late July to early August (Atmospheric Environment, 1966–1972). Thus, polar bears are forced to retreat to islands or the mainland until freeze-up in the following November. On 28 July 1927 a polar bear was killed on an ice pan drifting in Hudson Strait about 80 km north-east of Akpatok Island (Hudson Strait Expedition, 1928). Since polar bears are easier to see, particularly from the air, on land areas during summer, more data are available from casual observations and from aerial surveys than from other sources.

Once the bears are on land, their activity is minimal. To keep cool, they dig temporary dens in snowbanks that persist in ravines and along water courses. Some feeding on vegetation occurs. Their behaviour and food habits are probably quite similar to those of polar bears that spend the summer on the islands of James Bay (Russell, 1975; Knudsen, 1973). No earth dens such as those found in Manitoba or Ontario (Jonkel *et al.*, 1972) have been recorded, but their construction may be precluded by the rocky nature of the area and the lack of soil to any significant depth.

Polar bears have been reported on the Button and Killinek islands (Gross, 1935; Leechman, 1946). In 1959, a female with two cubs was seen 12 km west of the head of Ryans Bay in Labrador (O. Løken, pers. comm.). In the western Ungava area a family group was seen heading inland north of Hopes Advance Bay in July 1972 (G. Philotas, pers. comm.). Further west, several bears were observed during August–September 1962 around Asbestos Hill, about 60 km

inland from Deception Bay, west of Wakeham Bay (K. Steele, pers. comm.).

Most information is available from Akpatok Island. Turner (1894), on the basis of information from the Inuit of Fort Chimo, reported that Akpatok Island and the vicinity of Cape Chidley were infested with polar bears. The Oxford University Expedition in August and September 1931 found that polar bears were exceptionally numerous for such a small area (Davis, 1932). Bears including cubs were observed throughout the island, but mainly on the plateau, and holes or trenches were found dug under the brow of a slope for shelter (Davis, 1936). The nature of the substrate, whether snow or ground materials, was not mentioned. Tuck (1954), during his seven-week stay on the island, frequently saw tracks of females with young but no bears were seen until July 29, after the pack-ice had disappeared. Currie (1968) visited Akpatok Island in 1963 and concluded that although bears were numerous on the island, they were only occasional visitors along the Ungava coast. Little other information, except for scanty kill records, is available until 1970, when CWS and QWS conducted a series of co-operative aerial surveys. From the results (Table 1) it is apparent that the island is an important summer sanctuary, but that the number of bears is quite variable. Archaeologists working on the island in mid-July 1974 reported seeing no polar bears during a two-week stay (P. Plumet, pers. comm.).

The bears presumably remain on land until freeze-up begins in mid-November with the development of land-fast ice along the coast. By the end of November to early December, pack-ice moves southeastward through Hudson Strait and accumulates in Ungava Bay and Hudson Strait.

Past harvest from Zone B

Historically, the polar bears of the Ungava Bay and Labrador region have been taken by the Inuit of the area and by non-natives, including whalers, sealers, settlers, and local people, but as far as we are aware there are no reliable records of numbers. Cabot (Markham, 1893) in July 1497 apparently encountered large numbers of white bears catching fish on the island of Newfoundland. Cartier (Stephens, 1890) in July 1534 reported bears going to Funk Island, off the east coast of Newfoundland, and feeding on the birds in the water. At that time Funk Island was populated with the flightless Great Auks. After leaving the island, one bear was killed whilst swimming towards the mainland. As late as the 1770's Cartwright (Townsend, 1911) reported large numbers of white bears in July and August fishing for salmon in the Eagle River and nearby White Bear River to the west of the present settlement of Cartwright. Well-defined bear paths in the area and the remains of partially eaten salmon apparently attested to the abundance of bears. In July 1778, 32 white bears plus three black bears were observed in one day feeding on salmon in the Eagle River. Six, or possibly seven, white bears were killed and only the lack of ammunition prevented further slaughter. Only one skin was taken. Cartwright, who was a trader as well as a hunter-trapper, was more concerned about the quantities of furs and meat that could be procured and in the sport of hunting rather than in the conservation of the species. Consequently most polar bears were pursued

when observed. During the time between 1769 and 1778 that Cartwright spent in southern Labrador, at least eight polar bears in addition to the six or seven taken at Eagle River were killed and many others were shot at and wounded. The total known kill included the taking of four females with young and six additional cubs. Although Cartwright spent six winters in the area, he saw little evidence of polar bears, and speculated that most bears were at the floe edge hunting seals, though some bears went inland. In summer the bears competed with the people for duck eggs on the coastal islands.

Low (1929) reported that in the winter of 1894 white bears were seen in the vicinity of Northwest River at the head of Hamilton Inlet and that a few specimens had been taken nearby. Grenfell (1913) reported that every year a number of polar bears landed along the coast between St. John's and Cape Chidley and, immediately thereafter, started to head northward. An occasional stray bear was reported by Okak Inuit, but most of the bears were thought to have retreated further north (Hutton, 1912). In the past few decades bears have been sighted every few years along the Newfoundland coast and during this time about 20 bears have been killed along the northern Newfoundland and Labrador coasts, mainly between Saglek Fiord and Cape Harrison (letters from T. Baird and F. Lyall to C.R. Harington, 1965). During winter 1967-68, three bears, considered to be an average annual take, were killed in the Nain area (letter from F. Bruemmer to C. Jonkel, 1968).

Since the late 19th century Akpatok Island has been a good hunting ground for walrus, seal, and bear for the Fort Chimo, Leaf Bay, Payne Bay, and Koartak Inuit. In recent years, the polar bear hunting has been carried out mainly by Payne Bay Inuit, whose harvest from the island has varied from a known high of 27 bears in 1965 to zero in some years (CWS Polar Bear Questionnaires, 1965-66).

Only since January 1972, when Quebec introduced a tagging system for polar bear hides, has there been a reasonably reliable record of the harvest. Table 2 gives the known number of polar bears killed in Zone B for the last four game management years (1 July to 30 June).

Most of the kills were located along the Labrador coast, on Killinek and Akpatok islands, and western Ungava north of Payne Bay, although occasionally kills were made outside this area (Figure 2a). One bear was killed 16 km south of George River in September 1971 and an adult male bear was killed 160 km south of Fort Chimo in August 1969. Four bears (two males and two females), which had drifted south with heavy pack-ice, were killed when they came ashore on the island of Newfoundland in March 1973. Occurrences so far south in recent times have been rare (Figure 2b).

The apparent lack of large numbers of bears in Labrador today may not necessarily be the result of over-killing, but of long-term climatic changes which affect the southerly drift of the pack-ice during the spring. Under ameliorating climatic conditions, vast quantities of floe-ice are released from the polar pack-ice and drift southward (in this case with the Labrador current). Vibe (1967) termed such ice-floe movements as *pulsation stages* and documented the transport of polar bears from east Greenland to south-western Greenland (an area outside the normal range of east Greenland polar bears)

Table 2
Known numbers of polar bears killed in Zone B, 1 July 1971 to 30 June 1975, based on records from CWS, QWS, Hudson's Bay Company, and Inuit Co-op files.

Settlement	Known polar bear kill			
	1971-72	1972-73	1973-74	1974-75
Port Burwell	4	10	8	5
George River	2	7	4	6†
Fort Chimo		1	5*	5*†
Leaf Bay		0	1	0†
Payne Bay		7	9†	24†
Koartak	2	1	4	1†
Wakeham Bay	5	14	6	0†
Newfoundland		6	0	0
Norwegian sealers	2	2	0	1
Total	15	48	37	42
Cubs/yearlings shipped to zoos			1	

*Hides sealed in Fort Chimo, but most likely bears killed by Payne Bay, Koartak or George River hunters.

†Taken on Akpatok.

‡Number of hides that entered the fur market, 1 July 1974-30 June 1975. Some of these bears may have been killed during 1973-74.

during such pulsations. It is possible that during past pulsation phases polar bears could have been transported on ice-floes by the Labrador current to areas south of their normal range in the eastern Canadian Arctic.

Figure 3 illustrates the age structure of polar bears killed and captured in Ungava Bay and northern Labrador, from which we were able to obtain specimens from 1971 to 1975. Although the sample is inadequate for describing the age structure, it shows that individuals of most age classes are represented in the population. The ages of three dead bears of unknown sex were 2, 3, and 15 years. The average ages of the pooled samples of killed and captured adult males and females, four years of age and older, were $9.4 \pm$ and $9.1 \pm$ respectively, which are comparable to results obtained from the population of the Western Arctic (Stirling, 1974).

Table 3 summarizes the recorded observations of polar bears and numbers shot by Norwegian sealers off the Labrador coast (T. Øritsland, pers. comm.). (The ages of the four bears killed in 1971 and 1973 are included in Figure 3).

Tables 2 and 3 indicate that 30 to 50 bears are taken each year from Zone B. On the basis of preliminary analyses of our unpublished data, it appears that a healthy polar bear population can probably sustain an annual harvest of 5 to 7%. Thus, for example, if we assumed that an annual harvest of 30 bears represented 7% of the population, the minimum size of the population would have to be 428 or, on the basis of the recorded kill of 48 bears in 1972-73, a maximum population of 685 to sustain that level of harvest annually. The data available to date, which admittedly are incomplete, do not suggest a polar bear population that approaches this number in the area currently delineated as Zone B.

However, it appears from Figure 3 that the longevity of males and females in this population is similar to that of

Figure 2a
Location of polar bear captures and known kills, 1971-74, in Ungava Bay-northern Labrador

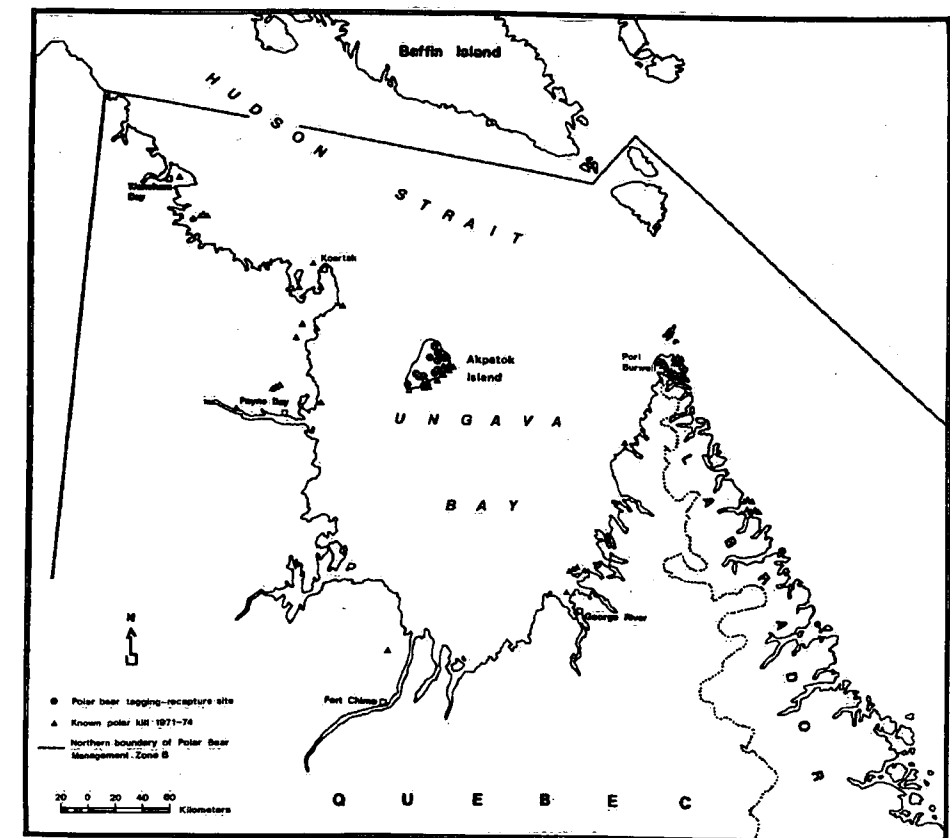
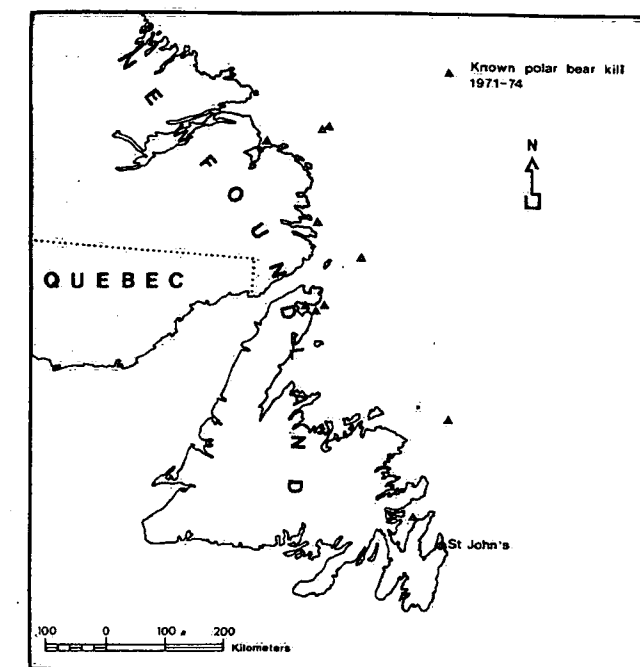


Figure 2b
Location of polar bear captures and known kills, 1971-74, in southern Labrador-Newfoundland



polar bears in other populations which do not appear to be over-harvested (Stirling, 1974). If in fact this population is not being over-harvested as was previously feared, there are two possible explanations for the apparently low numbers: (a) that the area currently delineated as Zone B does not contain the whole sub-population from which the harvest is taken, or (b), that if the population is contained within Zone B, it is larger than we have suspected.

Present management

The Ungava Bay-Labrador area falls within the jurisdictions of Quebec, Northwest Territories, and Newfoundland. Since the end of 1970, Newfoundland (including Labrador) has had a closed season on polar bears, and NWT has had a strict quota system since 1967 which allows eight bears to be taken in the Killinek Island area by Port Burwell Inuit. Quebec has no such regulations; a quota of 12 bears is tentatively proposed for the area, but an unlimited kill is permitted at present. Norwegian sealers through the Norwegian Declaration attached to the Agreement on the Conservation of Polar Bears (1973) are allowed to take, in self-defence only, a maximum of five bears during sealing operations on the front ice east of Labrador. Until recently, the Polar Bear Technical Committee which meets annually to assess current biological data and to recommend sound management practices has advocated a zero kill for the Ungava Bay-Labrador area on the grounds that little is known about the sub-population.

The lack of a quota system in Québec has provided no restraints on the number of bears killed. During years when bears are more plentiful, more bears are killed. For example, in the winter of 1972-73 Payne Bay hunters killed seven bears, while during the winter of 1973-74 they killed none.

Until recently, no restrictions were placed on the season, age, and sex of animals killed in Quebec. The hides of small bears have little economic value, so that dispatch of the young results in the loss of a potentially valuable animal. In June 1975 an Order in Council established a summer closed season from 1 June to 30 September, and specifically provided protection for bears in their dens, females with cubs, and cubs under one year of age. The problem is now one of communication and enforcement.

As in other areas, the main incentive for polar bear hunting is the high price for hides, which peaked at \$3,600 for one untanned skin in 1973 (Smith and Jonkel, 1975). Usually, only the skin is taken from the bear. Few people eat the meat, and there are very few dog teams to feed because of increased utilization of oversnow machines in recent years. Although the people of Koartak rely to a certain extent on polar bears as a fresh meat source and hunt them throughout the winter, they were hard-pressed to take four bears during the winter of 1973-74.

The traditional hunting areas of Inuit hunters cross jurisdictional boundaries, which the Inuit do not recognize. For example, Quebec Inuit traditionally hunt on the Labrador coast and on islands which are part of the NWT. Akpatok Island is a known summer sanctuary for polar bears and its use as such was threatened by summer hunting prior to the recent change in regulations. In 1973 all nine bears seen on the island by Inuit hunters during the summer were killed.

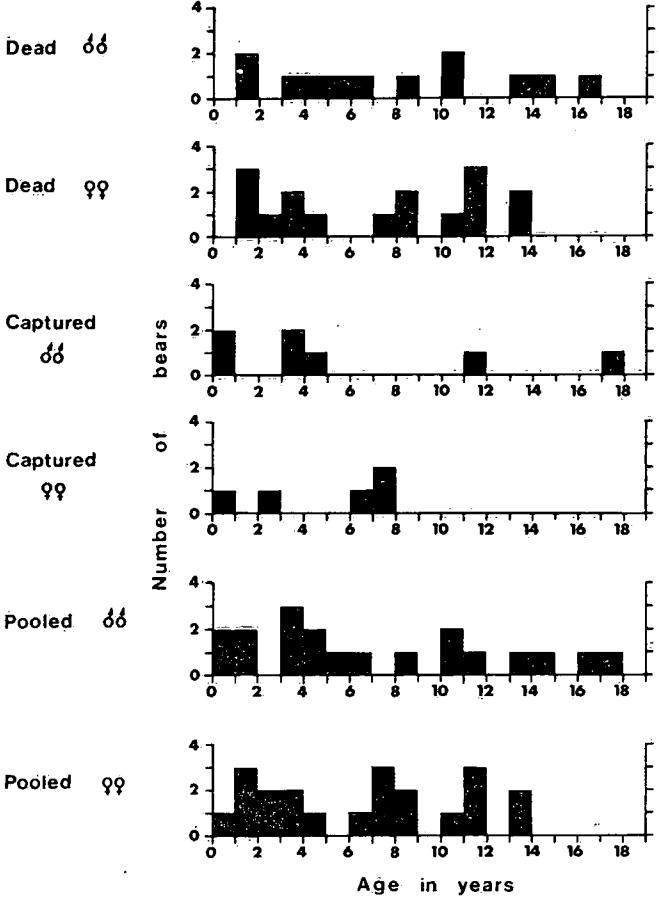


Figure 3
Age structure of polar bears killed and captured in Ungava Bay and Labrador, 1971-74

The 27 bears killed on Akpatok Island in 1965 may have been a similar case.

Sound management practices are needed if the Ungava Bay and northern Labrador area is to maintain a viable polar bear population. From the data available at present, it appears to be an area of low bear numbers and productivity, and can probably withstand sustained hunting pressure only at a reduced level. Further threats to the bear population may be imposed by possible hydro development in the Ungava watershed and increased shipping along the Labrador coast and through Hudson Strait.

Future requirements

An expanded research program, co-ordinated between all the agencies involved, is required to establish base-line information on: the size of the population; seasonal movements; geographic boundaries of the population; denning, feeding, and summer sanctuary areas; and an accurate age structure of the population that is being harvested. The data presented here should provide a basis on which to plan the necessary field work with a maximum of efficiency.

Table 3
Recorded observations of polar bears and numbers shot by Norwegian sealers off the coast of Newfoundland-Labrador, 1964-1975 (from T. Øritsland, Institute of Marine Research, Bergen, Norway).

Year	Polar bears seen	Polar bears shot
1964	1	0
1965	0	0
1966	no record	
1967	0	0
1968	no record	
1969	4	1
1970	0	0
1971	2	2
1972	0	0
1973	2	2
1974	2	0
1975	4	1

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