

## PANEL 3: POLAR BEAR STUDIES

# Norwegian Polar Bear Hunt, Management and Research

THOR LARSEN

*University of Oslo, Institute of Marine Biology A, Frederiksgt. 3, Oslo 1.*

### SUMMARY

More than 8,000 polar bears have been killed in Svalbard (Spitsbergen) since 1945. New hunting regulations were enforced on 1 September 1970. Long term ecological and physiological polar bear investigations started in 1964. Of 103 bears marked, there have been reported 33 kills and 2 resightings. Various observations suggest a common Norwegian-Russian polar bear population in the Barents sea. An evaluation of various estimates suggest a total world population of polar bears close to 20,000 animals.

### NORWEGIAN POLAR BEAR HARVEST

The Norwegian catching of sea mammals has traditions dating from 1795. Catching grounds range from the Kara sea in the east to the Newfoundland region in the west. The polar bear (*Ursus maritimus*) has been hunted in Greenland, Svalbard (Spitsbergen) and Jan Mayen, as well as in the pack ice of the Greenland sea and the Barents sea. Hunting is performed by the following main categories: 1. winter trappers, 2. weather station crews, 3. sealing vessels, 4. summer sport hunters (Arctic safaris), 5. expeditions, miners and others.

The polar bear harvest was of little economic importance prior to 1900. The total catch has varied from year to year, depending upon the number of vessels and hunters involved, weather and ice conditions, and skin and blubber prices. Between 1945 and 1969 the total Norwegian polar bear catch was 7807 animals, with an annual average of 312 bears. The average for the last 5 year period was 299 bears. The catch for the 1969-1970 season is estimated close to 500 animals, which is the highest take since 1950. Prior to the late 'fifties, the sealing fleet accounted for the majority of the take, and in particular the ships operating in the Barents sea and around Svalbard. The sealing in those waters has decreased, but better prices for polar bear hides have simultaneously encouraged the commercial polar bear winter harvest by trappers and by weather station crews, who together now account for about 75% of the take.

This commercial hunt deserves some attention. Some areas in Svalbard, such as Hopen and Halvmaneöya islands and Hornsund and Tjuvfjorden fjords are particularly famous polar bear hunting grounds. The typical trapping team consisted of two men, operating from a small trappers' station with between a dozen and half a hundred set guns. Some bears have also been taken free-roaming or with the aid of a 'signal', which is a primitive alarm system connected to the cabin. There have been about one to three trappers teams operating in Svalbard each winter for the last two decades, except in the winter 1969/70, when there were 6 teams trapping bears.

Until 1970, the following major laws regulated the Norwegian polar bear harvest:

the use of poison and steel traps was prohibited;

Kong Karls Land and adjacent waters were a polar bear sanctuary;

the catching of live bears was generally prohibited, but permits could be given on applications from approved zoos or for scientific purposes;

trophy hunters operating from vessels (Arctic safaris) were limited to one bear per hunter, and could not kill cubs or yearlings or females with cubs or yearlings;

bears could not be taken with the aid of motorized vehicles or aircraft.

As better protection of the polar bear was required, new hunting regulations were introduced on 1 September 1970, summarized below:

polar bear hunting in Svalbard and Jan Mayen and by Norwegians in any territory requires a permit, issued on the basis of a quota system;

Kong Karls Land and adjacent waters are a polar bear sanctuary;

trapping devices as set guns, snares, steel traps and the use of poison are prohibited;

rifles must be at least 6.5 mm calibre, with a minimum energy of 200 kJ at a distance of 100 m;

cubs and yearlings and females with cubs and yearlings are protected;

polar bears must not be caught alive;

the use of motorized vehicles and boats is prohibited, except when necessary in the performance of legal hunting; the use of aircraft is prohibited. (This means that bears can be pursued and hunted with the aid of vehicles and boats by hunters who hold a permit).

Dispensations from these regulations can be granted for scientific and other purposes. Licence fees, stamping of hides and skulls, submission of reports by hunters and other requirements may be introduced if found necessary.

In essence, the new regulations control the polar bear harvest through an annual quota, which for the 1970-1971 season has been set at 300 bears. It has been allocated as follows: 1. winter trappers: 100 bears; 2. weather station crews: 40 bears; 3. sealing vessels: 60 bears; 4. summer sport hunters (Arctic safaris): 40 bears; 5. expeditions, miners and others: 60 bears. The Governor (Sysselmann) of Svalbard, who is in charge of issuing the permits for categories 1, 2 and 5, has issued a licence for one bear per man on the weather stations, except on Hopen, where the four men of the station have been allowed four bears each. The winter trappers were allowed ten bears each, except for one trapper wintering alone in Hornsund, who got twenty, and another on Halvmåneøya, who got sixteen. Most likely, weather station crews and other professional bear hunters will take about 100 bears this season. Hunting success by the other categories is expected to be high, because motorized vehicles now are permitted.

One cannot expect a selective polar bear harvest in Svalbard, for example directed towards old males. Only the trophy hunters, operating from icegoing vessels in summer, are in the position to sail in pack ice areas where bears are abundant enough for some degree of selection during the normal ten day cruise.

## **NORWEGIAN BEAR RESEARCH**

The Directorate of Fisheries has collected polar bear harvest statistics from 1924 onwards. But prior to 1964, Norwegian polar bear research was only occasional.

Dr. Odd Lönö, who wintered for the fourth time in Svalbard in 1964-1965, collected specimens and made observations from his bear hunts in Tjuvfjorden Edgeöya. He has published polar bear harvest statistics which are accurate between 1885 and 1906, and from 1924 onwards. He has also presented new information on polar bear breeding biology, age and sex structures, denning habits, mortality and food habits, as well as on other topics (7).

In 1964, a long term polar bear project in Svalbard was launched as a cooperative enterprise between the University of Oslo and the Norsk Polarinstitut. The program consists of a physiological part, headed by cand. real. Nils Are Öritsland, Zoophysiological Institute, University of Oslo, and an ecological part, headed by the present author. Field work in Svalbard started in 1966, with monthly aerial surveys over the eastern pack ice between March and October for the purpose of bear counts and ice observations. The same summer, an attempt was made to catch and mark polar bears from icegoing vessels, and 4 were captured and marked in a 5 days effective survey (3). The aerial survey programme was repeated in 1967, and bears were captured from a chartered sealer in the eastern pack ice in July and August. During 20 effective days, 105 bears were spotted, of which 51 were captured and 2 more were killed during capture. Another marking expedition in 1968 spotted 48 bears during 12 effective days in August. 32 were captured and marked. None were killed (5). The 1968 summer expedition was followed by a one year long expedition to Tjuvfjorden, from September 1968 to August 1969. Participants were Mr. Öritsland and the author, plus two assistants. Polar bears were trapped in foot snares, or taken free-roaming. Den surveys received a high priority in the spring of 1969, when Edgeöya and Barentsöya were carefully searched for dens or signs of denning (4). Physiological studies, with special reference to polar bears temperature regulation, were made by Mr. Öritsland on bears kept in captivity in the station.

## **PRELIMINARY APPRAISAL OF THE INVESTIGATIONS INTO POLAR BEAR ECOLOGY**

Many scientists have claimed that polar bears all belong to one single population, and some even describe migration patterns of such a population (9). But polar bear marking programs carried out by the U.S.A., Canada and Norway, show that polar bears do not migrate very far (2, 5, 6). Of the 33 recoveries and 2 resightings made of bears marked in Svalbard (up to November 1970) only one was killed in Nanortalik, SW Greenland, less than 2 years after it had been marked. All the others were taken in the Svalbard area.

Track observations made from aircraft in 1966 and 1967 and on the ground during the 1968-1969 winter expedition, revealed a southwestward migration of bears from the Barents sea to Hopen, Edgeöya, Barentsöya and the west coast of Spitsbergen in late fall and winter. Bears tend to follow the shorelines and the winter ice edge, and are less frequent inland or on the frozen fjords. In late winter and early spring, the bears migrate back into the Barents sea. This migration pattern is confirmed by recoveries of bears marked in Svalbard (5). Parovshchikov (8) describes an analogous migration pattern in the eastern Barents sea and the Franz Josef Land and Novaya Zemlya areas.

He states that there is a connection between the polar bears in Svalbard and those in the western Soviet Arctic. Vibe (13) has shown that polar bear abundance is correlated with seal occurrence and ice conditions. He states that ocean currents and pack ice drift are important factors in determining polar bear abundance and migration. The southwestern ice drift in the Barents sea favors a migration of bears from Russian territories to Svalbard. It is reasonable to regard Svalbard, Franz Josef Land, Novaya Zemlya and the pack ice between those archipelagos as one geographical unit, and the range of a single polar bear population.

The eastern regions of Svalbard have been assumed to be important denning areas for polar bears. The Norwegian delegation to the Fairbanks polar bear conference in 1965 thus estimated about 500 polar bears to den on the archipelago each winter. Dr. Lönö has also described eastern Svalbard as an important denning area. But over a 20-year period, he reports less than two dozen dens, with a maximum of 6 in 1948 (7). Only a few dens were registered on Kong Karls Land during the aerial survey programme. It must be remembered, however, that polar bear dens may be difficult to locate from the air. The low number of dens found in 1969 is also noticeable (4). It is therefore questionable if Svalbard is an important denning area after all.

The 33 recoveries of 103 marked bears made so far (2 in 1967, 9 in 1968, 6 in 1969 and 16 in 1970) may indicate a heavy harvest pressure on the polar bear population in the Svalbard area in recent years. A selective catch among those marked is however possible, due to a high hunting effort along some important migration routes. One bear marked on Kap Lee on Edgeöya and 3 marked in Tjuvfjorden were recovered in the same localities one year after they had been marked (5). It is possible that individual bears follow the same migration pattern from one year to another.

Hopen is the only place in Svalbard where the hunting effort may be assumed to have been about the same for the last two decades. The 4 men on the weather station have taken the majority of their bears with set guns, until the latter were outlawed in 1970. The crews' experience has been about the same from year to year. Short time fluctuations in the harvest can be correlated with varying amounts of ice around the island (7). But the ice conditions cannot explain an increasing catch from 1957 to 1965—from 18 to 93 bears per season. The USSR prohibited polar bear hunting in the Soviet Arctic in 1956. If there is a common Norwegian-Russian polar bear population as previously suggested, Hopen may have had more bears to catch on in the subsequent 1957-65 period. The harvest increase can also be explained by a possible higher hunting effort due to increasing hide prices (from 450 n.kr. in 1957 to 750 n.kr. in 1965). But the harvest has stabilized with an average of 80 bears per season since 1965, while skin prices have increased by over four times in the same period. The prices should have encouraged an increased hunting effort, in particular when the weather station crews for several years have been aware of the proposed set gun ban now enforced, which has restricted their commercial bear hunt.

Various attempts have been made to estimate the world's total polar bear population, and numbers estimated range from 19,000 (10) to 5,000 (11). More recent world estimates have been presented by Harington (1), who suggests 10,000 animals, and by Uspenski and Shilnikov (12) who present a figure of between 10,000 and 15,000 bears. The variation between the many estimates, and the lack of evaluation of the various methods and their bias, limits the value of those estimates. Probably the best figure is obtained by summarizing

the estimates made within limited regions of the Arctic. They are as follow: Alaska, 1959: 2, 500 (10); Canada, 1968: 6, 000 (1); USSR, 1968: 5, 000-7, 000 (12). So far, reliable data have not been presented from Greenland or Svalbard. But from 1966 onwards, bears have been counted from aircraft and ships in Svalbard, and attempts have been made to evaluate some of the limiting factors. Data revealed an expected difference between air and ship counts, with a higher success from ships. Counting success depends very much upon light, weather and ice conditions, observers' experience and the distance from the bears. Observers' color sense is an important factor in polar bear counts. When spotting bears from aircraft, observation probability decreases sharply with increasing speed and altitude. A careful and preliminary estimate suggest about 3, 000 bears in the Svalbard area. The harvest data from Greenland suggest a population of at least 1, 000 bears in that region. Totalling all the figures, we arrive at an estimated overall world population of between 17, 500 and 19, 500 polar bears. It may be argued that some bears cross national borders, and hence may be counted twice. On the other hand, the majority of the estimates have been made from the air and, since air counts are very inaccurate, the figures should be regarded as minimum estimates only. It is reasonable therefore to suggest that the world population of polar bears is close to 20, 000 animals.

#### **FUTURE RESEARCH NEEDS**

At present, collected serum, hemoglobin and milk are being analyzed by electrophoresis, in an effort to state the discreteness of the Svalbard polar bear population. The results will be compared with craniometric studies. Polar bear skulls collected in Svalbard since 1964 are aged by tooth sectioning and skull characteristics in an attempt to get more information about the hunting pressure over the last few years.

Additional den surveys on Edgeöya, Barentsöya, Kong Karls Land and Nordaustlandet are necessary, in order to evaluate the importance of Svalbard as a denning area for polar bears. If there is a common Norwegian-Russian polar bear stock as suggested, it is possible that the majority of the females den in Russian territory.

We cannot expect polar bears marked in Svalbard to be recovered in the Soviet arctic, because of their polar bear hunting prohibition. Marking and sampling in the western Soviet Arctic is necessary in order to solve many of the questions mentioned in this paper.

#### **REFERENCES**

1. HARINGTON, C. R. 1968. *Canadian Wildlife Serv. Report. Series 5*, pp. 1-30.
2. JONKEL, C. 1969. *Canadian Wildlife Serv. Progr. Notes 13*, pp. 1-10.
3. LARSEN, T. 1967. *Polar Rec.* **13**, 86, pp. 589-593.
4. ———. 1970. *Norsk Polarinst, Arbok 1969*, pp. 94-99.
5. ———. 1971. *J. Wildl. Mgmt.* In press.
6. LENTFER, J. W. 1970. Mimeographed Report to the Second Working Meeting of Polar Bear Specialists. pp. 1-31.

7. LÖNÖ, O. 1970. *Norsk Polarinstitutt Skrifter* **149**, pp. 1-103.
8. PAROVSHCHIKOV, V. J. 1964. *Acta Soc. zool. Bohemoslov* **XXVIII**, **2**, pp. 167-177.
9. PEDERSEN, A. 1945. *Der Eisbär. Verbreitung und Lebensweise*. E. Bruun & Co., Copenhagen. pp. 1-166.
10. SCOTT, R. F., KENYON, K. W., BUCKLEY, J. L. & OLSSON, S. T. 1959. *Trans. N.A. Wildl. Conf.* **24**, pp. 366-374.
11. USPENSKI, S. M. 1965. *Moskovskoe ovo ispytatelei prirody. Biulleten 1965. otd. biologicheskii.* **70**, **2**, pp. 18-24.
12. USPENSKI, S. M. & SHILNIKOV, V. I. 1969. in *The Polar Bear and its Conservation in the Soviet Arctic*. Hydrometeorological Publishing House, Leningrad, pp. 89-102.
13. VIBE, C. 1967. *Meddelelser om Grönland*, **170**, **5**, pp. 1-227.