

THE BROWN BEAR IN SWEDEN — DISTRIBUTION, ABUNDANCE, AND MANAGEMENT

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Abstract: Between 1913 and 1942, the brown bear (*Ursus arctos*) was totally protected on state land in Sweden. The resultant increase in the population allowed a shooting season to be established in 1943 in 2 areas, in central and northern Sweden. Official shooting statistics show that the annual harvest of bears decreased sharply after 1971 even though the population was believed to be increasing. To resolve the status of the brown bear, a nationwide survey embodying questionnaires and some field work was carried out in 1975-76. Reports from Lapp villages, local affiliates of the Swedish Sportsmen's Association, large lumber companies, and the Swedish Forest Service were used to determine the nationwide distribution of the species and to estimate the maximum and minimum numbers of bears for each area that reported. Survey results indicate that the present brown bear population numbers 400-600 individuals widely but very unevenly distributed in northern and central Sweden, with marked concentrations in the northern parts of Jämtland and in wooded and low mountain areas in central Norrbotten. As a result of the survey, it is suggested that the open season be abolished and that a license system be established for better adjustment of the harvest to the true distribution of the species.

The brown bear was originally found throughout Sweden but by the end of the 19th century, it had been exterminated from the southern portion of the country. Some suspected that the brown bear was also decreasing farther north, and in the 1880s it was suggested in Parliament that the bounty for shooting brown bears should no longer be paid by the government. Bounties were discontinued in 1893, but brown bear populations apparently continued to decline. To halt the decline, the government put the brown bear under protection on state land in 1913 (Lönnberg 1929). The population then increased to the point that it was considered necessary to reintroduce hunting. Open seasons have been held since 1943, with brown bears being hunted in September and/or October in 2 areas in central and northern Sweden. Juveniles and females with juveniles are protected year-round.

Official statistics suggest that some 20-30 brown bears have been shot annually since 1943. The smallest number, 9 bears, was harvested in 1949; the highest, 41, in 1966. There is no obvious trend except that during the last 6 years, the figures show a pronounced decrease. Bears shot in 1971 numbered 20, followed in the next 5 years by 15, 12, 11, 8, and 7. There is no equivalent decrease anywhere else in the series. This decline runs counter to public opinion, which holds that the populations is increasing. To resolve this question, a survey of the population was carried out in 1975-76.

Methods and Materials

A basic premise was that the survey should comprise the entire Swedish population of brown bears. Because it would be impossible to make a field survey, a questionnaire with some very limited field investigations was utilized.

The questionnaire was based on the assumption that people who engaged in outdoor activities had some idea of the brown bear distribution and abundance in their particular areas. Questionnaires were therefore distributed to the Lapp villages, to local organizations of the Swedish Sportsmen's Association, and to the forest districts of the largest forestry companies, including the Swedish Forest Service. A map was attached to each questionnaire.

The questionnaires were distributed in April and May 1975. First and second reminders to those who had not answered were sent out in July and September/October, respectively. Information about the survey was published in some newspapers and periodicals and was presented on local radio and television programs.

Questionnaires were sent to 876 sportsmen, and first-time responses were received from 167 (19 percent). After the 2 reminders, responses totaled 449 and 607 (51 and 69 percent), respectively. Response rates for the 53 Lapp villages were 13, 21, and 35 (25, 40, and 66 percent). The response rate for the forestry companies was more difficult to establish because some companies distributed the material to their own forest districts, which then delivered the reports. Other companies gathered information centrally and submitted a single report. A total of 752 reports were received, which means that about two-thirds of those consulted responded.

Field work covered areas where reports were either contradictory or entirely lacking. This work was carried out by helicopter during 6 days in early May of 1975 and 1976, when the ground was still covered with snow but when it was reasonably certain that most bears had left their dens.

Work on the reports started with the transformation of all information to a system for computer treatment. However, it soon became obvious that this method was too simplified and would lose many details given in the reports. The method was abandoned and the material was treated manually. Distribution of the brown bear was determined by county, partly because the county is an important administrative unit. Below county level, a geographic subdivision was chosen, primarily conforming to the main river valleys, which are often boundaries, for example, of Lapp villages.

All reports from a given area were compared with reference to information about distribution and abundance of brown bears. For each area a minimum and a maximum estimate was made of the total number of bears. Discrepancies between individual reports were evaluated according to the reliability of the informant and the extent of agreement among informants. This procedure resulted in a narrative description of each area, with discussion as far as the details permitted. This description was transferred to maps, 1 for each county and another for the entire area of distribution.

RESULTS AND DISCUSSION

Brown bears are distributed over a large but not continuous area in central and northern Sweden (Fig. 1). The distribution is very uneven. Marked concentrations are found in the northern parts of the county of Jämtland and in central parts of the county of Norrbotten. The area includes the upper part of the coniferous zone and the lower part of the alpine zone. Movements towards higher elevations are common in summertime. Early in the summer, bear distribution is supposed to be influenced by movements of migrating domestic reindeer (*Rangifer tarandus*) herds and especially by the calving grounds. Later in summer and in autumn, rich crops of berries (mainly *Empetrum* spp.) apparently attract bears. Extensive movements are also known to

occur in the conifer forest, in 1 case even as far as out to the archipelago of the Gulf of Bothnia. Such movements usually occur in early spring and are assumed to be related to lack of adequate food within the normal range (Haglund 1968).

The survey material was used to interpret the present status of the brown bear population. Total numbers of brown bears are estimated to be between 400 and 600. This estimate represents an increase from the figure of 370 bears in a survey from 1966 (Haglund 1968). The results agree with the general opinion of those who returned questionnaires; of 297 reports from areas with brown bears, 159 mentioned an increasing population and 29 reported decreasing numbers.

During the past decade, development of the bear population has not been uniform. In the county of Norrbotten — where hunting is allowed in 1 area — the population seems to be increasing at such a rate that it has doubled in about 25 years. In the county of Västerbotten — where no hunting is allowed — the population is obviously decreasing. The population in the mid-1970s is about one-third the size it was at the beginning of the 1940s. There are also areas where the reports indicate a fairly stable population.

There are discrepancies between the distribution of brown bears and the areas where hunting is allowed (Fig. 1). This situation creates problems of different kinds. For example, some Lapp villages have applied for specific licenses to shoot brown bears because of excessive damage to reindeer farming, whereas in areas where brown bears are only occasional visitors, a 2-month season limits their chances of reestablishment. To overcome these disadvantages, it was recently suggested that the open season be abolished. A well-designed license system should then make it possible to adjust the harvest to the true distribution of the population.

LITERATURE CITED

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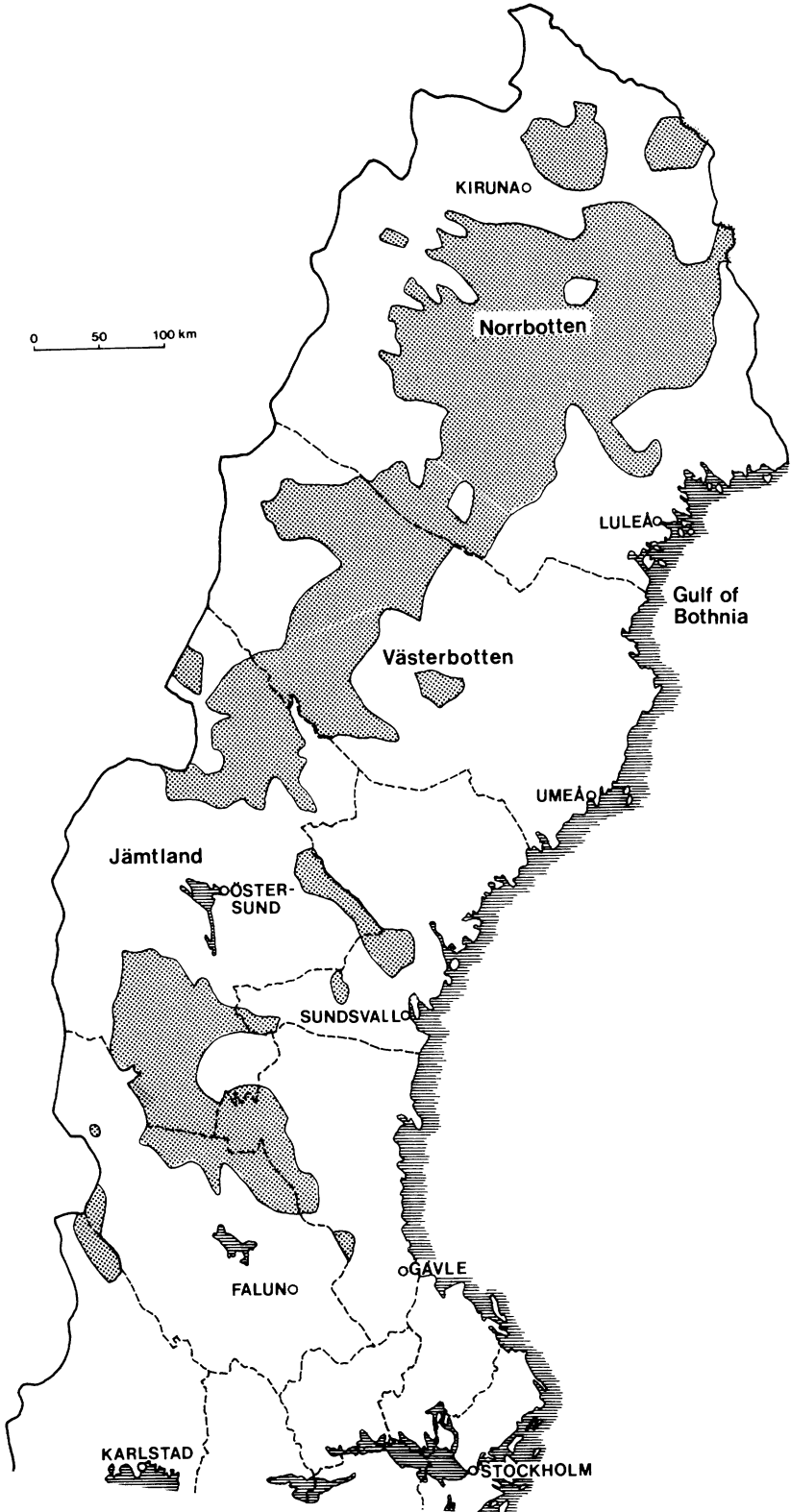


Fig. 1. Distribution of the brown bear in Sweden, 1975-76.