

**PANEL 1: THE ECOLOGY, POPULATION CHARACTERISTICS,  
MOVEMENTS AND NATURAL HISTORY OF BEARS**

**The Brown Bear (*Ursus arctos*) in Europe:  
decline, present distribution, biology and  
ecology**

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**INTRODUCTION**

Due to commitments in Africa I was unable to accept the invitation to attend the Symposium in November 1970 and to contribute a paper on the brown bear (*Ursus arctos*) in Europe. Later, I was again asked to write such a paper for the Symposium Proceedings. In doing so, I have had the privilege of previously reading and commenting on Ian McTaggart Cowan's paper, published in this volume, on the status and conservation of the *Ursidae* of the World, before preparing my own contribution, but even so it has been impossible to avoid some slight overlapping of subject matter.

**PAST DISTRIBUTION**

In the past the range of the brown bear covered almost the entire coniferous, mixed and deciduous forest zones of Europe. Probably the subalpine birch forests of Scandinavia, Finland and the Urals were included in its past range as nowadays. Although the brown bear seasonally visits the tundras and arctic heaths above the timberline for feeding purposes, it has never in Europe been a true inhabitant of treeless habitats. This feature seems to distinguish it ecologically from the conspecific North American grizzly (cf. Cowan in this volume).

**HISTORY OF DECLINE**

The history of local extinctions of the brown bear in Europe is geographically and chronologically as follows:

Denmark: Extinct probably already about 5000 years ago.

Great Britain: Became probably extinct in the 10th century and had certainly vanished by the beginning of the 11th century. It is uncertain whether it has ever existed in Ireland.

Eastern Germany (Silesia): Extinct in 1770.

Western Germany (Bavaria): Extinct in 1836.

Switzerland: Extinct in 1904. Occasional visitor, observed in 1914.

French Alps: Extinct in 1937.

## PRESENT DISTRIBUTION

Although the brown bear has thus disappeared from the greater part of its range west of the USSR, it still occurs in most European countries. The destruction of forests and heavy hunting pressure have obliged it to retreat to forest-clad mountains in various parts of Europe, where the populations are isolated. There are at least 13 and probably as many as 19 or 20 insular brown bear populations in Europe. Several of these pockets hold very small populations, the future of which is far from being bright. The main populations live in the USSR, Romania and Yugoslavia.

Information about the size of the European populations varies in accuracy. Therefore, the following data are only indicative.

In Spain the brown bear is to be found as two isolated populations, one in the Cantabrian Mountains, west of the Pyrenees, and the second in the Pyrenees. According to Couturier (1954) there were about 40 animals in the Cantabrians and about 60 in the Spanish Pyrenees. However, the latter population is connected to the French one in the same mountains. There are about 70 brown bears in the French Pyrenees and that is all that remains of the species in France.

In Italy the brown bear still exists in two areas, the Abruzzo National Park in the Apennines and between Adamello and Brenta in the Dolomites. In 1922 there were only 30 or so brown bears in the Abruzzo National Park, which was established the following year. In 1935 more than 200 animals were reported from the area, a figure repeated by Couturier in 1954 for the whole of Italy. This estimate was probably much too high, for in 1964 the population in the Abruzzo National Park was found to be only about 60 bears (Curry-Lindahl 1964).<sup>1</sup> In 1971, Mr Franco Zunino and Dr. Stephen Herrero worked in this National Park and estimated the population there at 70-100 brown bears (Herrero *in litt.*).

Of the large European carnivores—the bear, the wolf and the lynx—only the bear has survived in the Alps with about 8-10 animals in the Italian Dolomites. (However, the lynx has recently been reintroduced in Switzerland.)

In Yugoslavia, brown bears live in isolated mountains of both the northern and southern parts of the country. Couturier (1954) estimated the population at more than 700, a number that 16 years later seems to have increased considerably: about 2000 (Isakovic 1970). Also in Albania there are 'numerous' brown bears (Hainard 1961), but no figures are available.

In Greece the population was estimated at about 115 individuals in the 1950's (Couturier 1954), but this seems to be too low, because in Macedonia alone there were about 400 bears in 1959 (Hainard 1961) and, in addition, there is also a population in the Pindus Range of northern Greece (Curry-Lindahl 1964). From Bulgaria about 1,300 brown bears were reported by Couturier (1954). Romania has a fairly sizable population. According to Professor Valeriu Puscaru (verbal comm. 1971) there are more than 3,000 bears, chiefly living in the Carpathians.

In Hungary there were three to six brown bears in the 1950's (Couturier 1954),

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<sup>1</sup> The IUCN Mission to the Park in the same year accepted a figure of about 100 for the Abruzzi as a whole, based mainly on sightings by forest guards—Ed.

but recent information is lacking. From Czechoslovakia the same author reports 70 to 80 bears and from Poland only about six. These figures were probably too low, because at present there are about 230 bears in the Tatra National Parks alone, located in the northern Carpathians of both Czechoslovakia and Poland (Curry-Lindahl & Harroy in press). In fact, the brown bear is distributed almost throughout the Carpathians.

Hence, the Balkan and Carpathian populations at the present time consist of at least 5, 230 bears if only figures of the 1960's for Yugoslavia, Romania, Czechoslovakia and Poland are included. If data of the 1950's for Greece and Bulgaria are added, there are altogether about 7, 000 animals in the region.

In Scandinavia there are between 25 and 50 brown bears in Norway (Myrberget 1969) and about 300 in Sweden (Curry-Lindahl 1970); some estimates in 1968 reached a total of about 400 (Haglund 1968) but this figure is somewhat uncertain. In Finland the population seems to be larger than in Scandinavia (cf. Pulliainen 1971) judging from the number of bears shot annually in the former country. However, recently (1971) the conservation journal Suomen Luonto stated that the number of bears in Finland has been established at 150.

Obviously it is in the USSR that the bulk of the European brown bear population is to be found. In the Baltic countries the bear now appears only in Esthonia. In southern USSR it occurs as far west and south as White Russia along the Oka River; to Rjazan near Moscow, and farther east in Mordow and Mari to the Urals. Thus it occurs farther south in western USSR than in the east (Curry-Lindahl 1964). Cowan (this volume) summarizes the data from various parts of the USSR territory. The total population in the European part seems to be about 10, 000-11, 000 animals.

The grand total of European brown bear populations therefore seems to be approximately 17, 700-18, 000 animals. This is about 8, 000 animals less than the estimated North American brown bear population (Cowan, this volume).

#### **THE BROWN BEAR IN SWEDEN AS AN EXAMPLE OF RETREAT AND EXPANSION DURING 370 YEARS.**

The oldest records of the brown bear in Sweden date back about 8, 000 years.

Fig. 1 shows the decrease of the brown bear in Sweden, indicated by the southern boundaries of its range in each century from 1600 onwards. It is unknown when, before historical times, the species became exterminated in the southernmost provinces but there are subfossil records from deposits contemporary with human presence.

Between 1800 and 1900 the brown bear decreased tremendously, retreating from Southern Sweden to the northern parts of the country. By 1900 it was, except for two minor enclaves in Central Sweden, almost entirely restricted to Swedish Lapland.

During the first decades of the 20th century the brown bear decreased further. The remaining populations were forced upwards into the mountainous regions of Swedish Lapland, where they found refuge in remote valleys. When the species was near extinction in 1925 it became totally protected. As a result of the protection, a certain stabilization of the population seems to have followed locally in the upper Vindel Valley of southern Swedish Lapland and in the mountains of Lule Lappmark of northern Swedish Lapland.

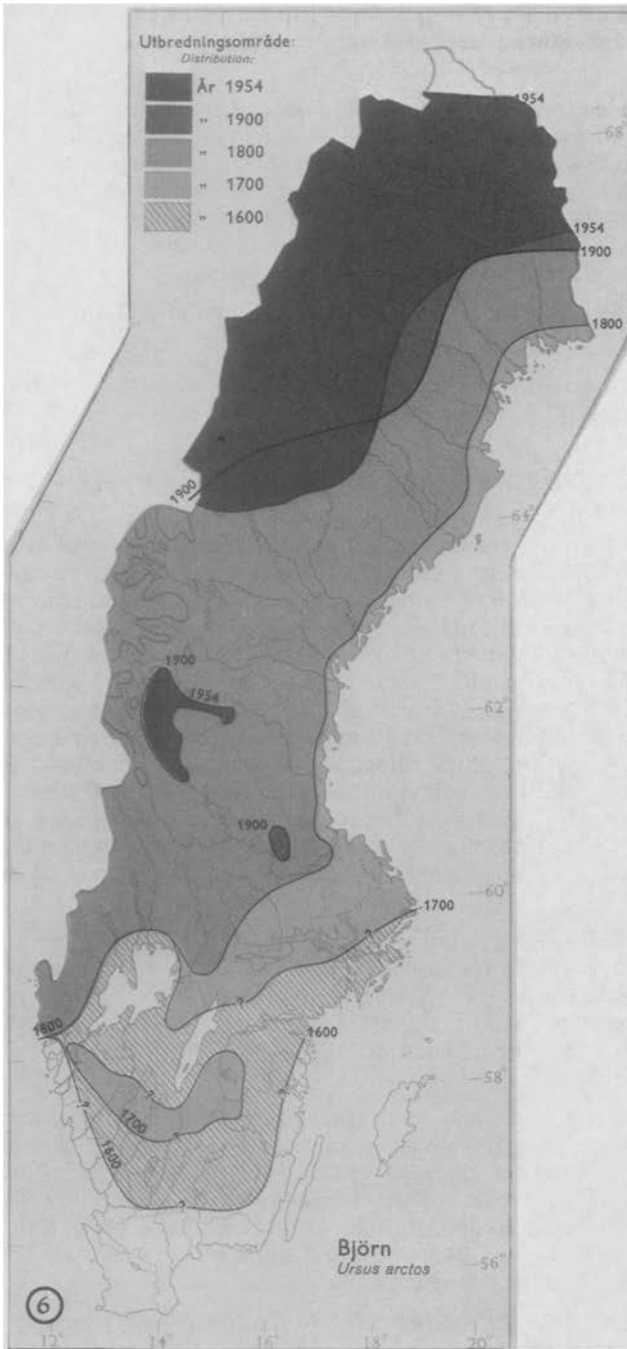


Fig. 1 Breeding distribution of the brown bear (*Ursus arctos* L.) in Sweden 1600-1954. After Curry-Lindahl (1957).

Simultaneously the isolated southern populations in central Sweden increased and spread southwards and eastwards, recolonizing ancient areas as indicated by the map.

In 1943 a two months annual open season was introduced in Sweden. It has continued ever since and in some provinces it has even been extended in time. The hunting pressure on bears living in the upper valleys of Swedish Lapland, where they had been left in peace for 18 years, led to a gradual evacuation of these areas and the reappearance of bears in the lower coniferous forests, where they more easily found shelter and food. Some bears were recorded as far eastwards as Niemisel and Boden near the Baltic coast.

In 1957 a census of the brown bear in Sweden gave a figure of 252 animals.

### **BIOLOGY AND ECOLOGY**

Only a few features in the biology and ecology of the brown bear in Europe will be commented upon here.

All over its European range the brown bear is an inhabitant of forests, although it makes visits above the timberline in spring to feed on carrion (in northern Europe particularly the carcasses of reindeer *Rangifer tarandus* which have succumbed during the winter) and in late summer and autumn to feed on berries. The optimal habitats of the bear are coniferous, mixed and deciduous forests, with a rich under-vegetation of various vascular plants and whether located in lowlands or in mountains. Scandinavian subalpine birch forests in some valleys with favourable edaphic conditions and sun exposure, are characterized by a luxurious vegetation, which offers the bear optimal habitats. Also the birchwood steppes close to the southern Ural Mountains in the USSR seem to be appreciated by bears as a biotope. However, in Europe most bears are found in the coniferous forests despite the fact that deciduous woods seem more suitable for them. This is probably due to the fact that man has occupied deciduous forests more intensively than he has coniferous ones.

If left in peace, the brown bear will stay within a certain large territory; if often disturbed, it may roam over tremendous areas. Usually it lives alone, although the females remain with their young up to a year and a half. During the summer it is chiefly active during the afternoons and the evenings. When it has scented or heard something unusual, it takes a bipedal position in order to facilitate vision and scent.

Just before or just after the first snow has fallen in the autumn, the brown bear retreats to a den, which has been prepared in advance. The den is in a natural cave, a dug cavity in the earth of a slope, an anthill (of *Formica rufa*), under a fallen tree, under low overhanging branches, between or under larger roots and under overhanging rocks. The den is lined with branches of spruce, moss, grass, leaves or bark, which form a bed, but there are also dens without lining. The same den can be used during several years.

There is doubtless a small drop of temperature in the brown bear during hibernation, although it does not prevent a winter sleeping bear from becoming immediately active when disturbed. Lobachev (1951) in the USSR found that respiration and heart beat slowed down and that body temperature falls to 29-34°C. Folk (in this volume) gives support to previously recorded minima of 31-37.9°C in the case of the black bear (*Ursus americanus*); for the North American brown bear or grizzly (*U. arctos horridilis*) he mentions a drop in

heart rate during dormancy similar to that recorded by him for the black bear, namely from 40 to about 10 beats per minute. Changes of this order certainly seem remarkably pronounced in relation to the observed alertness of hibernating European brown bears if disturbed.

The European brown bear is omnivorous, but feeds chiefly on plants. In summer it eats mostly grass, herbs, fruit, berries and roots. In the Scandinavian mountains it is especially fond of the great angelica (*Angelica archangelica*) and alpine lettuce (*Lactuca alpina*). The brown bear also relishes ants, honey, beeswax, insect larvae, small rodents, fish and carrion. Only exceptionally do brown bears acquire a taste for fresh meat and attack larger mammals such as moose *Alces alces*, reindeer, red deer *Cervus elaphus* and livestock.

The reproduction of the brown bear in Europe usually has the following pattern. The species is promiscuous. Copulation takes place in May-June. Up to 16 copulations have been observed during the same day. The rutting period of females is 10-30 days and the gestation period 6-7 months with delayed implantation. The 1-3, seldom 4, cubs are born in the den in December-January. Their eyes open after 4-5 weeks and they are regularly suckled up to June-July, sometimes August, and irregularly as late as up to an age of one and a half years. Usually the female has cubs every second year. Sexual maturity is reached at an age of 2½-4 years, females normally when 2 years old, males when 3 years old. Maximum longevity in captivity is 47 years (Skansen Zoological Garden, Stockholm).

## THE BROWN BEAR, LIVESTOCK AND MAN

The European brown bear is not dangerous to man unless it is attacked and wounded or its young are threatened or believed to be so. Hence, it does not share the reputation for aggressiveness of the brown bears of Hokkaido and the grizzlies of North America.

Although the brown bear lives in many areas where there are livestock grazing extensively in the same habitats, it does not normally kill domestic animals. There are observations of brown bears feeding on meadows where cattle were grazing without any reactions from either the bear or the herbivores. A sizable bear population haunts the Caucasus Mountains—often in the middle of the sheep-breeding regions—apparently without coming into conflict with human interests. In one place in the Caucasus shepherds pointed out to me a cave in a mountain-side where a bear was resting; neither the sheep grazing all around nor the shepherds seemed unduly concerned. In Swedish Lapland domestic reindeer and bears meet frequently. The former are normally undisturbed when a bear is in the vicinity, but when the reindeer females are giving birth or are accompanied by newborn calves, they are alert to the presence of bears. In Swedish Lapland some bears—apparently the same individuals and perhaps their offspring—regularly every spring visit areas where reindeer females give birth. Many calves are stillborn or succumb just after birth, so this may be the prime reason for the bear's interest during a season when vegetable food on which the bear likes to feed is almost non-existent.

Also elsewhere in Europe bears in some areas in late winter or early spring are forced to feed on carrion or live mammals. In such cases sheep and other domestic animals may fall victim to them, but in general such cases are quite exceptional.

## CONSERVATION

The brown bear is not endangered by extinction in Europe, but its range is shrinking due to habitat alterations. Hunting pressure has ceased and the species is at present totally or seasonally protected in most countries. In many areas it is showing a gradual adaptation to cultivated habitats. It is certainly able to live side by side with man without causing serious conflicts.

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