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Original/Review Articles

Experiences in the Protection of the Large Predators in Finland

Erkki Pulliainen

During the nineteenth century, the large predators of Finland — wolf, bear, lynx, and wolverine — were exterminated in the southern and western regions of the country. There were almost no lynx by the late 1950s, but a protection order issued in 1968 has resulted in a steady increase in their number, to about 300 by 1980. There was a breeding population of wolverines until the late 1960s, but in the 1970s, most were killed by snowmobiles, and only 10-30 are now thought to inhabit the frontiers between Finland and the USSR, and Finland and Norway. Bears, in the 1970s, tended to immigrate into Finland from the east; currently, the population is about 300. Since 1980, the wolf population has also expanded because of movements from the east and, in Finland, their current total is about 100. However, movement from other countries cannot be used as a long-term solution to maintaining and increasing the numbers of large predators in Finland, since predator populations in these countries cannot be expected to expand sufficiently to compel large-scale migrations. Rather, the maintenance of stable predator populations in Finland must depend on their adaptation to relatively settled areas and acceptance by local populations. The wolf and lynx have shown considerable adaptation; the wolverine and bear have not. Also, hostile attitudes toward predators like wolves, based largely on fairy tales and overblown news items, must continue to change, and change rapidly, if these animals are to be preserved.

The history of the large predators — the wolf, the bear, the lynx and the wolverine — in Finland has been very typical of the trend in western Europe. At the beginning of the 19th century, the ranges of these animals covered all those parts of the country where they could live under natural conditions. During the course of that century, and especially during its last three decades, however, they were exterminated in the southern and western parts of the country. During the 20th century the western edges of the large predator populations of eastern Europe have sometimes extended to the eastern and northern parts of Finland. During the past eight decades, the number of wolves within Finnish territory has varied between less than ten and more than one hundred, those of the lynx between none and about 300, those of the wolverine between ten and several hundreds, and those of the bear between about 150 and more than 500.

The purpose of this paper is to describe factors contributing to the populations of the large predators in Finland and adjacent areas and to relate experiences connected with attempts to protect these large carnivores.

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We have a unique system in Finland for following changes in large-predator populations. Since 1968 the daily patrols of the Finnish Border Patrol Establishment have recorded every crossing of the frontier by large predators and estimated or calculated the numbers of these mammals in the areas under their surveillance three times a year. This observation line is 2,574 km long, and data are now available for a period of over twelve years.

Tracks of the large predators are easy to observe and identify in the snow. In the northernmost parts of Finland the snow disappears in late May or early June and may appear by the end of September, or more normally in October, while in the southeast it may last only three or four months, a difference which must be kept in mind when assessing the crossing data, although tracks can still be identified in snowless conditions in sandy, wet or muddy ground, for instance. It is also worth noting that the members of the Border Patrol Establishment are instructed in the identification of the large-predator tracks in their preliminary training.

While the data collected by the Border Patrol Establishment enable us to follow the movements and numbers of the large predators in the frontier regions, a network of observers also exists which reports on the occurrence of the large predators in the interior of the country.

Population Status

Lynx

It is possible that there were no lynx at all in Finland in the late 1950s, and the species was placed under a protection order in 1968. The nucleus for a new population was received through immigration both from the USSR via the southeastern border and from Sweden in the west, around the Gulf of Bothnia. In the 1970s movements of lynx were clearly greatest on the southeastern frontier and decreased to the north, and the numbers of lynx were also greatest in the south and lowest in the north. This is only natural, for the lynx belongs to the European faunal type, the main distribution area of which is located in central Europe. In fact, the lynx has hardly ever been abundant in the north of Finland.

The lynx is still protected over the whole country, but the Ministry of Agriculture and Forestry may grant special licenses for killing them. Some 10-20 lynx are normally killed each year and a few more die of natural causes. The number of lynx in Finland has increased fairly steadily since the 1960s, and they have come to their old territories again throughout the southern half of Finland. In the reindeer husbandry area of northern Finland, however, their number has continued to be very low, and the reindeer owners have announced only a few cases of their stock being killed by lynx.

Wolverine

The wolverine belongs to the north-Siberian faunal type, the main distribution area of which lies in the subarctic and the northern part of the taiga. At its greatest extent, this distribution area reached as far south as Poland in northern central Europe. The wolverine population in Finland has always been densest in northern Lapland, which is nowadays the reindeer husbandry area. There was still a breeding population of wolverines in that area in the late 1960s, but during the following decade most of them were killed by snowmobiles. The present range of the wolverine extends to Finnish Northern Karelia in the south, but the home ranges of the individuals identified along the eastern frontier lie mainly in the Soviet Union.

Usually the total numbers of crossings of the frontier by the large predators express rather well the trend in the population in question, but here, as with all statistics, some exceptions occur. An exceptionally strong peak was recorded in the total number of crossings of the frontier by wolverines in 1979, the bulk of these crossings being recorded in Suomussalmi, eastern central Finland. A detailed study revealed the reason for this exceptional occurrence: A large number of wild forest reindeer had died just on the frontier beyond the Finnish reindeer fence, and wolverines had gathered to utilize the carcasses available, moving across the frontier line in both directions many times a day. The wolverines mainly kill semi-domestic reindeer, the great majority of kills taking place in late winter.

Bear

In contrast to the wolf, wolverine and lynx, the bear, being a heavy animal, leaves detectable tracks or signs of its presence on the soil, ground vegetation, fences, etc., in summertime, so that the crossing data permit us to calculate immigration-emigration rates as well as other movements.

Finland received a net immigration of bears from the east, especially from Soviet Karelia, in the 1970s. Pronounced expansion into eastern Finland has also led to a further invasion into the interior of the country. In some cases it has been possible to follow the movements of a bear in southern Finland from place to place. Naturally any appearance of bears in the settled areas of the country is usually given prominence in the local newspapers. The emigrating bears at the edge of the population are mainly males.

Bears have been especially mobile in Northern Karelia, due not to exceptionally high numbers, but to the cultivation of oats for cattle fodder just on the Finnish side of the frontier, as they prefer to eat this cereal, and cross the frontier every night to visit the oat fields. There may be as many as five bears at a time in one small field. Naturally this represents a financial loss to the farmer. At the same time as showing an increase in movement within their traditional range in the late 1970s, the bears also expanded their range to the south, as seen from the increase in the numbers of bears in the vicinity of the frontier in Kainuu and Northern Karelia, in particular, but less so in Lapland. Finland also has some bears in common with Norway, but very few with Sweden.

The bears eat both vegetable matter (berries, other succulent parts of plants, and soft grain) and also carcasses, and sometimes succeed in killing livestock and ungulates. Moose particularly are vulnerable in late winter, as also are semi-domestic reindeer when they are in very poor condition. The reindeer owners believe that bears kill a lot of semi-domestic reindeer, especially calves, but there is relatively little evidence for this.

Wolf

Since 1950 Finland has received two expansions of the wolf population from the east, in both cases from Soviet Karelia into Finnish Northern Karelia and Kainuu. These expansions have been due to two notable increases in the population in this Soviet territory. The first expansion was recorded in 1959-1963, 1961 being the peak year. In the latter half of the 1960s there were relatively few wolves in Soviet Karelia and less than 20 in Finland.

In 1971-1976 an increase in wolf populations was recorded in the southern, central and northern parts of Soviet Karelia, the highest density being found in the southern part. Danilov and others who have studied wolves in Soviet Karelia em-

phasize the tripling of the Karelian wolf population from 1966-1969 to 1973-1976. The highest densities were recorded in the areas adjacent to Finnish Northern Karelia and Kuhmo and in the southeastern corner, east of Lake Onega, while there were still very few wolves in the northeastern part of Soviet Karelia.

Of the 4,656 crossings of the frontier by wolves recorded by the Finnish Border Patrol Establishment in the years 1968-1979, 4,640 (99.66%) took place on the frontier between Finland and the USSR, 14 on the Norwegian border, and 2 on the Swedish border. There was a steep increase in the total number of crossings from 1974 to 1977 and a subsequent decrease to 1979, which was still continuing during the first half of 1980. These crossing data and other observations indicate that 1977 may represent the peak year for this expansion of wolves from the east.

The most reliable results on the numbers of wolves are naturally obtained on the first of January, when there is snow on the ground throughout the country, and these show the majority of the wolves to have occurred in the vicinity of the frontier between Finland and the USSR, the numbers varying between 6 and 24 in 1969-1975, but increasing thereafter from 1976 to 1978. The total figure reported for 1st January 1978 was somewhere between 77 and 89, but one and two years later it was again smaller. The largest packs in the vicinity of the frontier during both expansions consisted of approximately ten individuals.

There have also been wolves, from one to four individuals in a group, on the move in the interior of the country, using certain specific migration routes. Observations of such individuals have been made in western and southern Finland since 1970, and even recent wanderers are found to use the old migration routes. Such wandering wolves may be estimated from the total information available to have amounted to some 30 individuals altogether in January 1980.

The sexing of 154 wolves killed or found dead in Finland in 1969-1980 showed 64.3% to be males, a disparity which is statistically highly significant. There was, however, an even sex ratio in Finnish Northern Karelia when this area lay near or within the breeding territory of the wolf.

The abundance of wolves in Soviet Karelia since the Second World War is in many respects a consequence of human impact. An intensive program of clear-cutting in the vast areas of coniferous forest in Soviet Karelia was commenced in the late 1940s, and the conifers were replaced with deciduous trees, which offered food for the moose populations and enabled these animals to increase markedly. After the war, Finland ceded large areas of Karelia to the USSR and most of this land remained neglected. Fields and meadows returned to forest and again provided very suitable environments for moose and other game. In the 1950s reindeer husbandry was discontinued in Soviet Karelia, and the semi-domestic reindeer returned to a wild state, while the wild forest reindeer were no longer hunted. Thus there was an abundance of food for the wolves, which could use the forest roads and the trails of ungulates, when moving from one place to another. The wolf population was therefore allowed to expand to the north, where it had earlier been absent.

The increase in the wolf population in Soviet Karelia in the 1970s was a rapid one, probably similar to that which took place in the 1950s. In the former case the population tripled in less than a decade. This was due to the improved food situation and the reduced control during the years when small numbers of wolves were recorded. In areas where there is no human impact on the wolf population, e.g., on Isle Royale, such sharp increases do not seem to occur. One very probable reason for this is the self-regulation mechanism which operates in a wolf population, i.e.,

the pressure of the alpha-pair on the other mature females of the pack is so great that they do not produce offspring. This has been verified in the wild and in captivity. But if the alpha-male is taken away, for instance, all the mature females give birth to pups. The alpha-pair, which is mainly responsible for taking care of the young, is most vulnerable of the adult wolves to the hunter, thus allowing the potential maximum productivity of the pack to be realized. The wolf populations of Soviet Karelia have been hunted continuously, although at varying intensities.

A saturated wolf population naturally disperses in directions where there are no barriers and suitable empty territories are available. In the case of Soviet Karelia the latter are to be found in Finland, which is a part of the former range of the species, for their territories are bordered by the sea in the northeast and east, and there is already a dense wolf population in the southeast and south. D.I. Bibikov estimates that the 300 wolves in Soviet Karelia in the early 1970s represented a density of 2.5 wolves per 1000 km². Since expansion can be considered as a sign of a saturated population and an expression of population pressure, recent observations on the increase in the Soviet Karelian wolf population and the commencement of a powerful expansion into Finnish Northern Karelia allow us to estimate that the saturation point for a wolf population under conditions such as those prevailing at present in Soviet Karelia must be roughly 5-7 wolves per 1000 km². Higher densities are reached in the wolf populations of the more southerly regions of the European part of the USSR, however.

The majority of the wolves which crossed into Finland from Soviet Karelia in 1959-1963 were killed, and expansion in Finland was thus blocked. Before and during that expansion it was found that most of the wandering wolves were males, but as the breeding population approached the frontier the excess of males decreased. The same trend in sex ratios has also been recorded during the recent expansion from Soviet Karelia into Finnish Northern Karelia, and a similar blocking of the expansion into Finland is in progress, for at least 104 wolves have been killed in Finland during the past three years. According to the official statistics, 151 wolves were killed in Soviet Karelia in 1978.

The wolf, bear and wolverine are protected in the majority of the southern half of Finland, where they occur either in low numbers or not at all. There is an open season for hunting the wolf in certain communes adjacent in Kainuu and Northern Karelia to the eastern frontier, and for the bear in the reindeer husbandry area, where the wolf and wolverine are unprotected throughout the year.

To sum up, there were about 100 wolves in Finland in January 1980, the great majority of which inhabited the southern half of the country; more than 300 bears, mainly inhabiting the eastern and northern areas; about 300 lynx, occurring mainly in southern and central Finland; and from 10 to 30 wolverines inhabiting the frontiers between Finland and the USSR, and Finland and Norway. If no radical changes take place in the hunting pressure on the bear and lynx, the future seems to be fairly bright for these predators, the former as an inhabitant of eastern and northern Finland and the latter in the southern half of the country. Prospects are rather more bleak for the wolverine and wolf, however. Naturally we have tried to analyze factors contributing to the populations of these large predators which involve the activities and attitudes of man.

Problems in Protection

One "easy" way to maintain populations of the large predators in Finland is to rely on continuous immigration from the neighboring countries. Since northern

Sweden and Norway have little to offer and the Soviet Union cannot continue to do so indefinitely, the future of the large predators in Finland cannot be built upon this eventuality. The Russians are now substantially reducing the numbers of their wolf populations, which will naturally lead to the end of the expansion. Finland has also received an immigration of bears from the east, and if these individuals really do originate from the vast clear-cut areas of Soviet territory, the end of that activity is also to be expected. The Russian authorities have recently emphasized that the densities of the wolverine populations of Northern Soviet Karelia and the Kola Peninsula are rather low, and thus no notable emigration into Finland is to be expected. There has similarly been no immigration or emigration of lynx to or from southern Finland, the fence located three kilometers away from the border on the Russian side probably serving to limit their movements.

In order to maintain our own large-predator populations without immigration from other areas we must have suitable habitats, enough food and a peaceful environment in which they can live.

Of the four large predators in Finland, the wolf and lynx have appeared to be adaptable to the settled areas of Finland. Lynx have been observed preying on dense hare populations in the surroundings of big cities, and wolves have also moved in the southern coastal area of Finland, where there are a lot of moose (more than 8 ind./1,000 ha) and also white-tailed deer, on introduction to the area. Here these adaptable animals are also faced with the dangers of the civilized world in the form of busy roads, however, and some ten wolves and several lynx are killed in traffic accidents each year in southern and central Finland.

In contrast, the wolverine and bear have shown little propensity for adaptation to the conditions prevailing in southern Finland nowadays. The wolverine is a very mobile animal, and is thus highly vulnerable to all kinds of intentional and unintentional disturbance by man. If not killed, individuals wandering in central Finland have soon returned to the eastern and northern forests. There is an abundance of food for the wolverine in eastern and northern Finland, where there is moose and semi-domestic reindeer, and in the east also wild forest reindeer, in addition to small game. The major problem is that the 200,000 semi-domestic reindeer are owned by private persons or associations. The carcasses of these ungulates are also utilized by bears, which now and then also succeed in killing some moose or reindeer. The main food items of the bear in Finland, however, are berries and other easily digestible parts of plants, which are usually available throughout the country. In the settled area of the country wandering bears have tended to move from one place to another fairly rapidly due to intentional and/or unintentional disturbance by man. It may be said that a bear sees a person more often than a person sees a bear.

The wolf, wolverine and bear should find suitable habitats and enough food in the northern and extreme eastern parts of Finland, and the lynx in the south. The insecurity factor in their lives is thus due mainly to man's hostile attitude toward them. Theoretically, a rational reason for this kind of attitude and aggressive behavior could be thought to lie in the danger caused by the large predators (a) to people's affluence, (b) to their physical health, or (c) to their mental health. Also, hunters may be too eager to hunt lynx, bears and wolves for their pelts or meat.

We do know that under certain conditions the wolf, wolverine, bear and lynx can all cause substantial economic losses to owners of livestock or reindeer.

By the middle of the 19th century man had almost exterminated the moose population in Finland, and the small-game populations had become badly depleted.

In the absence of ungulates, their most important natural prey, the wolves killed a lot of livestock, thus increasing the poverty of a simple agricultural society. It is no wonder that under such conditions the wolf got a bad image, which it still possesses, and which is maintained in certain expressions in our everyday language. When there is a failure in the crop of berries over vast areas, the bears do not succeed in collecting enough fat for overwintering and do not enter dormancy, but begin to wander, attacking livestock even in cowsheds in early winter. Such cases are particularly well documented in Siberia. In late winter, when the surface of the snow will stand the weight of a wolverine, but not a reindeer, a wolverine may kill a number of semi-domestic reindeer in one place, thus storing food for the future and simultaneously causing considerable losses to the reindeer owner. In the mountains of northern Scandinavia lynx have also been known to cause losses in reindeer herds under certain conditions.

The Finnish state has accepted the principle that if we are to possess and protect the large predators, any losses of livestock or semi-domestic reindeer caused by them should be reimbursed by the state. Nowadays the livestock losses are covered in full, and all known losses of reindeer are repaid at 150% of their value, thus also compensating for those cases which never come to light. We still have two major gaps in this compensation system, namely, the facts that the large numbers of deaths among dogs caused by wolves every year and losses caused by bears in oat fields are not subject to compensation.

The hostile attitude of man toward the large predators, especially the wolf, is not only motivated by economics, however. I recently suggested that in order to save the lives of some wolverines the state should repay for every loss of reindeer caused by this predator at a rate of 200%, but the reindeer owners immediately announced in the newspapers and other media that "this is not a matter of money."

Hardly anyone thinks that wolverines or lynx could be dangerous to man. Sometimes a mother bear has chased humans who have come between her and her cubs, but none of the difficulties existing in bear-human relationships in the Glacier and Yellowstone National Parks has occurred so far in Finland. People seem to be more afraid of wolves than of bears. They fear that wolves will eat their children and attack adults. They base their fear on fairy tales, stories, old wives' tales and the like. What, then, is the truth concerning attacks by wolves on people?

Wolf-like, nonrabid canids attacked more than a hundred persons in France between 1764 and 1767. The destruction of two huge animals put an end to the killings. One or more similar creatures killed 22 children in Finland in 1880-1881. In both cases it is possible that the canids in question were first generation dog-wolf crosses with hybrid vigor, as stated by Dr. C.H.D. Clarke of Ontario. Naturally rabid wolves can attack people, as a rabid human attacks other humans, but a nonrabid human often attacks other humans as well. Thus we cannot say that wolves never attack humans, but it happens so seldom that it is not relevant to take it into account in our family planning. And we must remember that I and many other researchers have lived in the same enclosure with wolves for years and suffered no harm from these animals.

Nevertheless, our fear of wolves persists. At least once per decade Finnish newspapers deal with the details of the events of 1880-1881 in southwestern Finland, increasing people's fears to a greater or lesser degree depending on the writer. When a wolf appears in the vicinity of a village after a long interval, the reaction of local people depends very much on the pronouncements of the so-called leaders of opinion

in the agricultural community. Typically, such a person could be a teacher, the police chief, a reporter on the local newspaper, a priest or a leading figure in the local farmers' party, and the motivation for promoting fear among people may be that the person in question has recently lost his dog, or merely hates wild animals such as wolves. Naturally these opinion leaders should be a very important target (as well as schoolchildren) when educating people to adopt a reasonable attitude toward wolves and other large predators.

Traditional habits and beliefs are very difficult to change. This holds true, especially, in the case of man's behavior toward the large predators. The image of a monster is very difficult to change. There are nevertheless a wealth of ecological considerations which support the protection of the large predators in an ecosystem. The general opinion in Finland is changing in favor of the large predators, but this change may be taking place too slowly.

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Pulliainen

Erfahrungen mit dem Schutz der grossen Raubtiere in Finland

Zusammenfassung

Während des 19. Jahrhunderts rottete man die grossen Raubtiere Finlands (Wolf, Bär, Luchs und Vielfrass) im Süden und Westen beinahe aus. In den späten

1950s haben es fast keine Luchse mehr gegeben, aber ein Schutzbefehl von 1968 hat einen stetigen Aufwuchs ihrer Zahlen, bis zum 300 in 1980, zur Folge gehabt. Bis zu den späten 1960s vermehrte sich der Vielfrass in Finland, aber die meisten sind von den Schneeaautos in den 1970s getötet worden. Jetzt wohnen vielleicht nur 10-30 dieser Art vom Raubtier auf den Grenzen zwischen Finland und die USSR, und Finland und Norwegen. Auch während der 1970s wanderten Bären aus dem Osten in Finland ein; ihre gegenwärtige Anzahl steht auf etwa 300. Seit 1980 fahren auch Wölfe aus dem Osten ins Land hinein; jetzt gibt es in Finland eine Wolfengruppe von etwa 100. Doch ist das Fortziehen von relativ kleinen Nummern aus anderen Ländern für die Erhaltung und Vermehrung der Zahl der grossen Raubtiere in Finland keine dauerende Lösung. Eher muss die Erhaltung einer beständigen Anzahl von der Anpassungsfähigkeit der Tiere und von dem Geduld der Einwohner abhängen. Der Wolf und der Luchs haben sich an der menschlichen Anwesenheit ziemlich gut angepasst; der Bär und der Vielfrass nicht. Wenn aber die böse, auf den alten Märchen und übertriebenen Nachrichten begründete Haltung gegen die Raubtiere (der Wolf im besonderen) nicht weiter und schneller mildert, steht die Zukunft aller dieser Tiere in Gefahr.

UFAW Publication List

The Universities Federation for Animal Welfare was established to examine animal welfare issues from a scientific and scholarly point of view. They have a number of excellent publications, the major and most recent ones being listed below. (All prices include postage and packaging — the US \$ price is approximate since airmail postage varies considerably.)

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The Care and Management of Farm Animals, 2nd Edition (249 pp.). Published by Bailliere Tindall (£9.50, \$30)

The Humane Killing of Animals, 3rd Edition (34 pp.). (£0.80, \$3)

Symposia Proceedings (The first nine held during 1968-1975 are not listed.)

1980 The Ecology and Control of Feral Cats (£2.50, \$6)

1979 The Humane Treatment of Food Animals in Transit (£0.90, \$3)

1978 The Welfare of Food Animals (£0.90, \$3)

1977 The Pharmaceutical Applications of Cell Culture Techniques (£0.90, \$3)

1976 The Welfare of Laboratory Animals: Legal, Scientific and Humane Requirements (£0.90, \$3)

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