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Management Plan for the Wolf Population in Finland

11b2005

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Ministry of Agriculture and Forestry 11b/2005

Name of publication:
Management Plan for the Wolf Population in Finland

Publisher:
Ministry of Agriculture and Forestry

Photographs:
Seppo Ronkainen, Ilpo Kojola

ISBN 952-453-270-0
ISSN 1238-2531

Graphic design: Z Design Oy Ab

Layout: Vammalan Kirjapaino Oy

Printer: Vammalan Kirjapaino Oy, 2006

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1. Introduction

1.1 Background

Finland had a relatively large wolf population until the 1880s. It was then that a systematic persecution of wolves began, eventually bringing wolves almost to extinction in Finland. Since then, however, the number of wolves has gradually grown and the wolf population in Finland has expanded considerably in recent years. The number of litters has developed quite favourably. In 2004, 16 litters were found in Finland, compared with four in 1996. In addition to these 16, there were another 4–5 litters on the Russian side of Finland's eastern border whose pups also wandered across to Finland from time to time. At the end of 2004, Finland's wolf population consisted of an estimated 185–200 individuals.

The wolf population in Finland is linked with that of Russia along the entire length of the border between the two countries. Thus it is possible to regard the Finnish wolf population as a fringe population of a large population of some 25,000–30,000 wolves.

During the past few years, the growth of the wolf population in Finland and the spread of wolves to new areas have highlighted the challenges of managing the wolf population. The last time the wolf population was this numerous in Finland was in the 19th century. There are strongly conflicting targets in the management of the wolf population. The inhabitants of sparsely populated areas, in particular, have expressed forceful demands that the population growth of large predators, wolves in particular, must be restricted and the number of individuals reduced by hunting. On the other hand, there are also a number of stakeholders in the nature sector in Finland that have demanded protection for large predators and, especially, improvements in the protection of wolves. The management of the wolf population undertaken by the Ministry of Agriculture and Forestry has tried to take all these highly conflicting aims and demands into account, and this has left its mark on Finland's policy with regard to wolves.

In Finland, the wolf is a game species and the responsibility for management and conservation of the wolf population belongs to the Finnish Ministry of Agriculture and Forestry. At the regional level, game management is the responsibility of the game management districts, which are the administrative units of Finnish game management, and also the regional administrative units of the statutory hunters' organization. Their position and duties are defined in the Hunting Act (615/1993). The Ministry of the Environment also acts as an authority in this sphere. It defines the status of any species that is threatened and thus it has considerable influence over the debate on wolves in Finland and internationally.

As a result of Finland's accession to the European Union, the wolf became a game species subject to very limited hunting due to the obligations to protect it. Outside the reindeer herding area in northern Finland, the wolf falls under Annex IV of Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (the Habitats Directive) which is binding on Finland and places the species under strict protection, subject to derogation only under certain very clearly specified conditions. People in the areas where wolves exist have found it difficult to adjust to this change brought by EU membership. Wolves occurring in the reindeer herding area fall under Annex V of the Habitats Directive, which allows more flexibility in the action by the authorities.

In 2000, action plans for the conservation of wolves, lynxes, wolverines and bears were prepared by the Council of Europe. Each plan set a target that Member States should prepare management plans for all large carnivores. The drafting of management plans for large carnivores is also connected with measures to be taken at the Ministry of Agriculture and Forestry in order to implement the initiatives on renewable natural resources and the countryside that are included in the Action Agenda of the Johannesburg Summit on sustainable development.

The Natural Resources Strategy of the Ministry of Agriculture and Forestry defines the aims for sustainable use of renewable natural resources and shared aims for all administrative sectors together with guidelines for each sector until 2010. Practical implementation of the Natural Resources Strategy is carried out primarily by each individual

sector with the help of various strategies and programmes. The strategy is also implemented through the operations and financial planning of the Ministry of Agriculture and Forestry and through steering of the administration under the Ministry of Agriculture and Forestry. The management plan for the wolf population is one part of the implementation of the Natural Resources Strategy carried out by the game management sector.

1.2 Preparation of the management plan

The Ministry of Agriculture and Forestry made preparations in 2002 for drafting the management plan for the wolf population by inviting statements from various bodies and starting to collect statistics and other background material. In order to base the management plan on extensive public hearings, the Ministry requested at the end of 2003 that the Institute for Rural Research and Training at the University of Helsinki should plan a research project with the aim of studying the socio-economic issues connected with management of the wolf population in Finland and thus prepare background information for the management plan. From the beginning of 2004, the University of Helsinki set out to implement a project to produce a proposal for a national management plan based on an extensive hearing procedure. Public hearing was also assigned particular value in a proposal connected with the Rural Policy Programme, according to which plans for the management of individual species of large predators in Finland should assign appropriate weight to views from the general public and the business sector, without risking the favourable conservation status of the populations of these species.

The project, entitled 'Criteria for the management of the wolf population in Finland', set out as the aim for its first stage to study people's views on wolves, policy on wolves, expectations and demands in each province. The target groups consisted particularly of people whose everyday lives are affected by the presence of wolves, and organizations and authorities that were involved in some way with conservation, the use of natural areas, or the relevant supervision. Another reason for the decision to use an extensive hearing procedure was the view that management of the wolf population is a sociological rather than a purely biological matter.

In the course of preparing the management plan, 30 public hearings were arranged in different locations in Finland. A total of 1,617 people attended them to share their views on management of the wolf population. In addition, 220 actors in various regional interest groups were sent a questionnaire concerning the management of the wolf population, and some 1,000 people were involved in preparing the responses. A similar process was also carried out with interest groups at the national level, this time with 14 respondents. Separate meetings were arranged with all parties defined as stakeholders with the aim of establishing cooperation. A total of 16 such meetings were held, with over 200 participants in all. A research report on this process, which lasted for months, and its main results was published in the publication series of the Institute for Rural Research and Training at the University of Helsinki. In addition to this, the project also collected together other research material based on random samples that had been produced during the past few years on the subject of Finnish people's attitudes to large carnivores and their expectations concerning trends in the populations of large carnivores.

On August 18, 2005, the Institute for Rural Research and Training at the University of Helsinki submitted to the Ministry of Agriculture and Forestry a draft for a management plan for the wolf population in Finland. After that, the Ministry of Agriculture and Forestry prepared a version based on the draft that was dated September 5, 2005, and this proposed management plan was widely circulated for comment, starting on September 9, 2005.

As a result, 61 comments were received. They all considered it important that the drafting of a management plan was based on international obligations, national characteristics and the hearing of local people, regional actors and national stakeholder groups, and taking their views into account. The bodies commenting on the plan generally felt that Part 1 of the draft plan was an excellent information package and very few comments, suggestions or clarifications were made concerning it. The attitude to the measures proposed in Part 2 of the draft management plan was also generally positive, and most measures were supported unconditionally. On the other hand, many proposals for amendments were also made to Part 2, particularly concerning the definition of 'favourable conservation status', population management areas, the population targets set for those areas, and derogations from the protec-

tion of the wolf. Furthermore, many of the comments from the population management area in western Finland expressed great reservations about the proposed development targets for the wolf population in the area.

The management plan has been completed by the Ministry of Agriculture and Forestry on the basis of the comments received. The remarks, suggestions and clarifications given in the comments have been taken into account in the management plan to the extent that they do not jeopardize the targets set in the management plan and its implementation. In finalising the management plan, the obligations of Recommendations 59 (1997) and 74 (1999) of the Standing Committee of the Convention on the Conservation of European Wildlife and Natural Habitats, the sustainable use principle of the World Conservation Union (IUCN) and the obligations of the Habitats Directive have all been taken into account so as to fulfil the international obligations placed on Finland concerning management of the wolf population.

1.3 Aims and measures in the management plan

The management plan for the wolf population in Finland is divided into two main parts. Part 1 sets the background for the Finnish Ministry of Agriculture and Forestry's policy concerning the wolf population. It describes the biology of the wolf and the status of the wolf population and compares the situation in Finland with international research where relevant. Part 1 also deals with topics such as national legislation, international obligations and forms of co-operation, the economic losses caused by wolves, the shared history of the wolf and man, previous aims of wolf population management, the nature of that management so far and sociological research into large carnivores. Further, Part 1 comprises research material drawn from the hearing procedure which is closely linked with the practical part of the plan, i.e. the actual management plan.

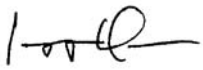
The practical management plan presents guidelines based on the biology of the wolf, on the one hand, but also on socio-economic facts that are considered important in this context on the other. Finland will apply all this in its continued systematic management of the wolf population and efforts to stabilize the wolf population as a permanent part of the Finnish wilderness and its wide diversity of wildlife.

The fundamental aim of management and conservation of the wolf population is to maintain a favourable conservation status for the wolf. This aim will be implemented through the combined effect of different measures. Measures are proposed for the management of regional wolf populations, the prevention of damage and a lowering of its costs, compensation for damage, the granting of derogations from the protection of wolves, monitoring the wolf population, research and how to develop it, the provision of training, advisory services and information, supervision of hunting, cooperation among the various parties involved and the division for the responsibility for population management. The measures to be taken will take into account economic, social and cultural requirements and regional and local characteristics.

The management plan for the wolf population in Finland included in this document describes the actions that the Finnish Ministry of Agriculture and Forestry will implement in managing the country's wolf population. Implementation of the plan will be monitored and the plan will be developed if the need arises.

Helsinki, December 19, 2005

Minister of Agriculture and Forestry
Juha Korkeaoja



Director General, Department of Fisheries and Game
Seppo Havu

PART 1. BACKGROUND

2. The biology of the wolf and the viability of the wolf population

2.1 Status and development of the wolf population in Finland

(Ilpo Kojola, Finnish Game and Fisheries Research Institute)

2.1.1 Background

The wolf has a larger range than other wild terrestrial mammals, even if it has been exterminated from much of North America and Western Europe. It is also a highly adaptable species, being found in all vegetation zones in the Northern Hemisphere (Mech & Boitani 2003b). Wolves breed well and have a potential for rapidly expanding into new areas.

Wolves form established pairs and generally reproduce every year. A wolf pack is usually a family unit made up of one pair (the so-called alpha pair) and its offspring. Other types of pack structure are known, but they are much more rare (Mech & Boitani 2003b).

The wolf feeds on a variety of other mammals that occur in its habitat. The main diet generally consists of large ungulates, in the boreal zone generally moose (Pulliainen 1965, Olsson et al. 1997, Gade-Jörgensen & Stagegaard 2000, Kojola et al. 2004a). In the reindeer herding area, the wolf's main prey is reindeer (Pulliainen 1965, 1985).

The conflict between wolf and man is caused largely by the wolf's tendency to kill livestock. One wolf causes several times the amount of livestock damage caused by a bear or lynx (Kojola 2005). Unlike the other large carnivores in Finland, the wolf will also kill domestic dogs for food. The wolf is also quite widely considered to be dangerous to humans, and about one in three Finns is afraid of wolves (Lumiaro 1997). In certain rare situations and circumstances, wolves are known to have attacked humans (Linnell et al. 2002).

2.1.2 Monitoring of population numbers

A rough outline of the population numbers and trends in the Finnish wolf population can be gathered from hunting statistics from the 1840s onward (Ermala 2003). Actual population monitoring has been carried out from 1968 onwards, when the Frontier Guard began to record wolves crossing the Finnish border, following an initiative from Professor Erkki Pulliainen. These records enable us to track changes in population density in the border region and to assess the migration of wolves into Finland (Pulliainen 1974, 1980, Pulliainen & Rautiainen 1999). The Frontier Guard districts have also produced estimated numbers for the area of their districts (Pulliainen & Rautiainen 1999).

Minimum population estimates made by the Finnish Game and Fisheries Research Institute (RKTL) are based on the observations recorded by a monitoring network for large carnivores made up of volunteers. Observations have been collected from 1978 onwards (Nyholm 1995). RKTL has improved the efficiency of its own information gathering by starting a research project in 1998, which has so far (since spring 2005) fitted 82 individual wolves with radio or satellite collars in a research area that covers southern Kainuu, North Karelia and North Savo. Studies on movements and habitat have produced information on the number of wolves in the main distribution range of wolves in Finland and considerably helped in interpretation of the observations recorded by the volunteer monitoring network.

The wolf population is organized in family packs, pairs and lone wolves that are usually young animals searching for a new territory and a partner. The family packs and pairs have their own territories and observations concerning them form clusters on the map, each of which represents a separate pack or pair. Lone wolves without specific territories account for 15–25% of the overall population.

From 1996 onwards, the RKTL has monitored the trend in the number of litters in Finland. The occurrence of a reproducing population and the number of yearly litters can be considered the most unambiguous descriptors of the status of the wolf population in Finland (Kojola 2003). The number of reproducing individuals, the so-called effective population size, has also been examined on the basis of the population's genetic structure (Aspi et al. 2006).

2.1.3 Variations in the wolf population in the 19th and 20th centuries

For a couple of decades in the 1850s and 1860s, wolves were killed at a rate of about 400 individuals a year (cf. Ermala 2003). Taking into account example calculations

of the so-called sustainable harvest rate (29–34%; Keith 1983, Fuller 1989, Smietana & Wajda 1997), it is possible that the wolf population in Finland during that period was more than 1,000 at its highest. There was a clear change in the period between the end of the 1870s and the mid-1890s, when the annual number of wolves killed fell from about 300–400 wolves a year to a few dozen (Teperi 1977, Ermala 2003).

In the last century, regular occurrences of wolves were limited to northern and eastern Finland (Pulliainen & Rautiainen 1999). Fluctuations in numbers were linked with population changes in northwest Russia, especially Karelia (Pulliainen 1965, 1974, 1980, 1985). The expansion of wolves into Finland from beyond the border with Russia was higher than average in, for instance, 1959–1963, 1975–1979 and 1982–1985 (Pulliainen 1985).

The Finnish Game and Fisheries Research Institute estimated that the wolf population had grown from 80 individuals to 300 between 1978 and 1984, but that it had fallen to about one hundred individuals in 1985–1987 (Nyholm 1996). The growth of the wolf population in 1978–1984 fits the time of the expansion that was observed in the early 1980s (cf. Pulliainen 1985, Pulliainen & Rautiainen 1999). The estimate of at least 300 wolves in 1984 seems very high, however, because the number of wolves killed in 1984–1986 (21, 15 and 12 individuals) remained at a fraction of the ecologically sustainable number. Considering the number of killed wolves recorded, the wolf population should have grown in 1984–1987, but in fact, the population declined by about one third during this time. With a view to the number of wolves killed in 1984–1986 and the simultaneous rapid decline in the population, it would seem that there were far fewer wolves in 1984 than estimated.

2.1.4 Trends in wolf numbers in recent years

The number of confirmed litters per year more than tripled in 1996–2004 (Figure 1). In 1996–1998, about five litters were recorded each year. In the early 21st century, the number of annual litters has risen from ten litters in 2000 to at least 16 litters in 2004 (Figure 1). Measured by the minimum number of litters recorded, the annual growth in the wolf population (λ) in 1996–2004 was an average of 1.17, i.e. 17%.

The distribution range of the breeding wolf population has expanded westward as population numbers are growing (Figure 1). In the 1990s, litters were found only in the Kainuu, North Karelia and Kymi game management districts, but in recent years, breeding wolves occur regularly also in the South and North Savo game management districts. Individual litters have been recorded even on the west coast of Finland (Pyhäjoki 2002 and Kristiinankaupunki 2004, see Figure 1) for the first time in over a hundred years (Kojola et al. 2005c).

At the end of 1999, the minimum number of wolves in Finland was estimated to be 98 (Kojola 2000b). The corresponding estimate for 2003 was 150 wolves (Kojola & Määttä 2004). At the end of 2004, there were at least 185–200 wolves (Kojola et al. 2005d). These estimates are based on the assumption that the approximate size of the wolf population can be derived by multiplying the number of family-based packs by ten (H. Sand et al., unpublished material). In estimating the wolf population in Finland, another thing that must be taken into account is that some of the packs with litters live on both sides of the border between Finland and Russia. The number of such packs has been multiplied by five.

In estimating wolf numbers in Finland, and taking research results on the population structure and average litter size in Finland into account, an estimate of the minimum number of wolves in Finland can also be derived by multiplying the number of litters with the average size of litters (Kojola et al. 2005a, 4,37, see the section on 'Reproduction') and by multiplying the resulting figure by 2.5, because the prey structure indicates that wolf pups account for about 40% of the wolf population in Finland (see the section on 'The structure of the Finnish wolf population'). The minimum of 16 litters recorded in 2004 thus give a result of 175 individuals. In addition to these, five litters were observed near Finland's border with Russia, and it is assumed that these litters were born on the Russian side of the border.

2.1.5 The structure of the Finnish wolf population

Family packs studied in eastern Finland in 1999–2004 consisted of an average of 7.0 individuals in the winter. The pack size is thus about the same as in the Scandinavian wolf population (6.7 on average; H. Sand, personal communication 2004) and bigger than in Poland or Italy (Ciucci & Boitani 1999, Jedrzejewski et al. 2000, Apollonio et al. 2004). One reason for this may be that the main prey species are smaller in the deciduous zone (cf. Mech & Boitani 2003a). In Fennoscandia, pack size is about the same as it is for wolves in Alaska, whose main source of food is moose (cf. Fuller et al. 2003). The

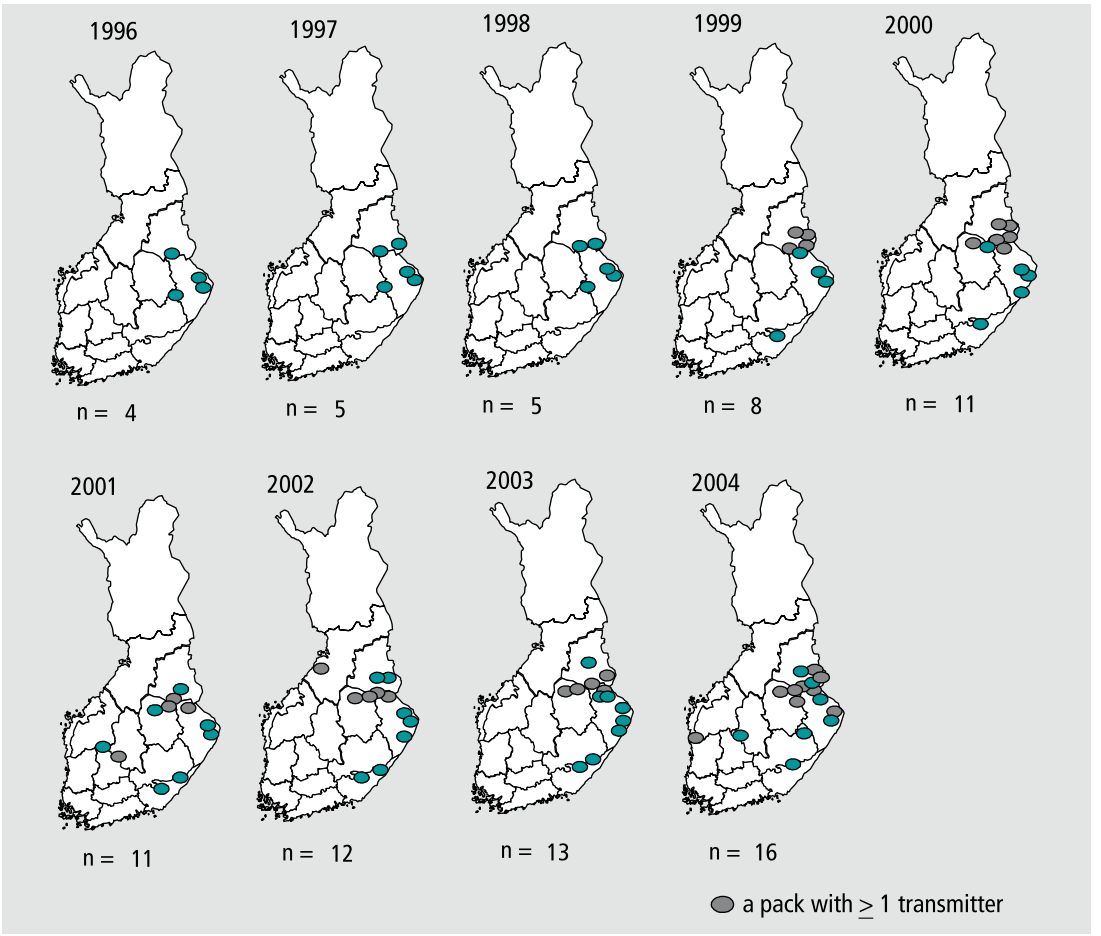


Figure 1. Wolf litters in 1996–2004 (Kojola et al. 2005b).

biggest family pack in the research area in eastern Finland consisted of 12 wolves, the smallest packs of three.

Pack size has a clear connection with pack history. In the winter following the birth of the first couple of litters, average pack size was 5.4 individuals (variation 4–7 wolves, n = 14). After subsequent litters, average pack size was 8.4 wolves (variation 3–12 wolves, n = 21).

The gender division of the Finnish wolf population has shifted from a majority of males to an even distribution between males and females. In 1969–1979, there were far more males than females among wolves killed (65.8%, n = 123 wolves, Pulliainen 1980), but in the data on wolves killed in 1996–2004, the percentage of males was 47.7% (n = 108 individuals, Kojola et al. 2005a).

The earlier dominance of males would indicate that there were more males than females among the wolves migrating from Russia. An analysis of the genetic structure of the Scandinavian wolf population based on old museum records also suggests that males would tend to move further than females (Flagstadt et al. 2003). However, results from wolves fitted with transmitters do not indicate any differences between males and females in terms of percentage of dispersing individuals or the distances they travel (Boyd & Pletcher 1999, Kojola at al. 2005b).

On the basis of the size of the Finnish wolf population, the average litter size and the data on the number of litters, it is possible to estimate that wolf pups account for about 40% of the Finnish wolf population. An extreme example of wolf reproduction in Finland is the situation after the 2000 breeding season in Kuhmo, where in three wolf packs (n = 35 wolves total) 57% of

the wolves were under one year of age. In North American wolf packs, the percentage of pups in the winter has varied between 29–67% depending on the area (Fuller et al. 2003). Of the wolves killed in Finland in 1996–2004, 42% were less than a year old (n = 72 wolves, whose ages were determined on the basis of dental samples at the Matson laboratory in Montana). One-year-olds accounted for 28% and wolves older than one year accounted for 30% (Kojola et al. 2005a). A comparison with the monitoring data on the Scandinavian wolf population (P. Wabakken, personal communication 2005) indicates that the age distributions in Finland and Scandinavia are similar. This distribution is characteristic of an expansive wolf population.

2.1.6 Reproduction, mortality and expansion of the wolf population

Reproduction

Female wolves usually have their first litter when they are about two years old. The data on Finnish wolves in the wild so far comprises eight females. Five of these had their first litter at the age of two and three had their first litter at the age of three.

The number of pups in a litter has been estimated early in the winter. The litters in the research area in eastern Finland had an average of 4.3 pups aged under one year (variation 1–8 pups, n = 27 litters). First litters had an average of 3.4 pups (n = 11) and subsequent litters 5.1 pups (n = 16) (Kojola et al. 2004a).

The first litters were the same size as in the Scandinavian wolf population (3.5; O. Liberg, personal communication 2005). Compared with the North American populations, the number of pups (4.3) in winter packs was higher than average, because only 21% of the research data (n = 14) presented by Fuller et al. (2003) had a higher number of pups than the packs in western Finland.

Mortality

In North American wolf populations (n = 9 studies on different populations), the annual mortality of adult wolves varied between 14–44% (Fuller et al. 2003). In North America, populations have fallen only if the mortality of adult wolves has been 40% or more (Fuller et al. 2003). In Finland, a minimum mortality rate for wolves fitted with transmitters can be calculated using the Kaplan-Meier estimate; this rate was 17.5 ± 6% (n = 40 wolves, Kojola et al. 2005b).

After the early stages of life, wolf mortality outside conservation areas is mainly caused by humans (Fuller et al. 2003). Research data collected by the Finnish Game and Fisheries Research Institute determines or estimates the cause of death for 25 wolves fitted with collars. Most of them (80%) were estimated to have been killed as a result of permitted hunting or other killing. The cause of death for the remaining individuals included traffic, illnesses or being killed by a moose or other wolves.

Expansion of the wolf population

Young wolves generally leave the territories were they were born in the research area in eastern Finland in April–May, at an age of about 11–12 months. Only a small minority remain in their original territory longer than this, and the estimated average age for leaving is 13.5 months (Kojola et al. 2005b). There is no significant difference between males and females in terms of the distance to the new territory (average 150 km, within a range of 35–445 km, n = 20 wolves). Most of the new territories are less than 100 km from the area where the wolves were born. Dispersal is fairly even in all directions (Figure 2). The wolves' movement is likely to be steered by the fact that young wolves try to avoid the territory of neighbouring packs (Kojola et al. 2005b).

For the dispersal of young wolves into new areas, research material suitable for comparison is available for North America. In North America, wolves generally leave their territory of origin later than they do in eastern Finland (cf. Kojola et al. 2005b), but in Minnesota in 1969–1989, for instance, young wolves also generally left their original packs as pups or one-year-olds (Gese & Mech 1991). One of the explanations for the early independence of young wolves in eastern Finland is probably that there are areas without wolf territories available in several directions around the cluster of wolf territories in the research area (see Wolff 1997).

The size of the distribution area of the wolf population in Finland grew from some 20,000 km^2 to about 100,000 km^2 (Figure 3) in 1996–2004. This means that the distribution area grew to five times its size in 1996 while the number of litters quadrupled. There is a linear relation between the distribution area of the wolf population and the number of litters (Figure 3).

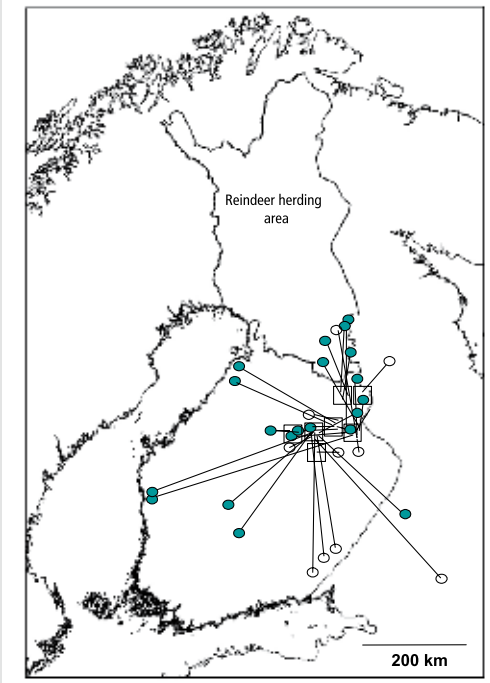


Figure 2. Dispersal of young wolves from their home territory. The dark symbols indicate the estimated location of the new territory (Kojola et al. 2005b).

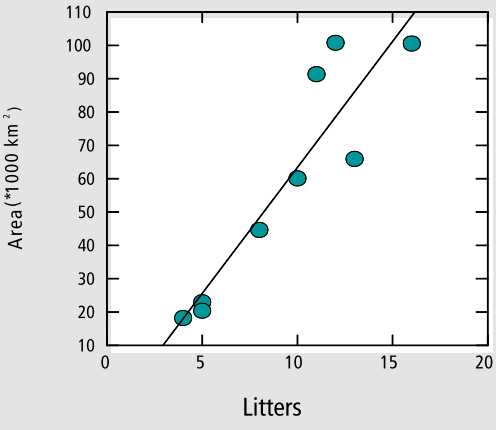


Figure 3. The relation between the number of annual litters and the distribution area of the wolf population in 1996-2004 (Kojola et al. 2005a).

2.1.7 Sources of food and populations of prey species

In Finland, the moose is the main source of food for the wolf (Pulliainen 1965, Gade-Jörgensen & Stagegaard 2000, Kojola et al. 2004a). In the research area in North Karelia, moose accounts for over 90% of the biomass used by wolves for nutrition (Gade-Jörgensen & Stagegaard 2000). In the Kainuu area, where there is wild forest reindeer, moose accounts for 75% and wild forest reindeer for 20% (Kojola et al. 2004a). The remaining 5% consists of smaller prey. On the whole, moose is not favoured over wild forest reindeer, because the percentages in the diet of wolves correspond fairly accurately with the biomass ratio of moose and wild forest reindeer in the area. The percentages of moose and wild forest reindeer show clear seasonal fluctuations. In January–March, the wolves' diet contains almost no wild forest reindeer, but in the autumn and early in the winter, it is their main prey (Kojola et al. 2004a).

In Finland, there are about 150,000 moose before the moose hunting season, and some 90,000–100,000 moose in the winter (V. Ruusila, personal communication 2005). There are moose throughout Finland, but in recent years densities have been highest in central Finland and in the coastal areas (Figure 4). Occurrences of white-tailed deer and roe deer are limited to the western and southern parts of Finland (Figure 4). It is estimated that there are some 35,000–40,000 white-tailed deer and some 15,000–20,000 roe deer (V. Ruusila, personal communication 2005). Wild forest reindeer occur in Kainuu and Suomenselkä (Figure 4). According to an airborne census performed in 2005, there are about 1,000 wild forest reindeer in Kainuu. This number has fallen rapidly in recent years. In 2003, there were about 1,000 wild forest reindeer in Suomenselkä, but it is assumed that the population has grown since then.

Humans have an impact on wolf populations both directly and indirectly, while forest management has had an impact on the food sources of the wolf's prey species, such as moose (Seip 1992, Heikkilä & Härkönen 1996, Rempel et al. 1997). On the other hand, the population density of moose in Finland remains below the level determined by food resources in any case (V. Ruusila, personal communication 2005).

The food situation of wolves can be roughly outlined by using the ungulate biomass index, which makes it possible to compare different areas (Keith 1983, Fuller 1989, Fuller et al. 2003). When the fact that the European moose is smaller than its North American counterpart is taken into account in the grounds for calculation

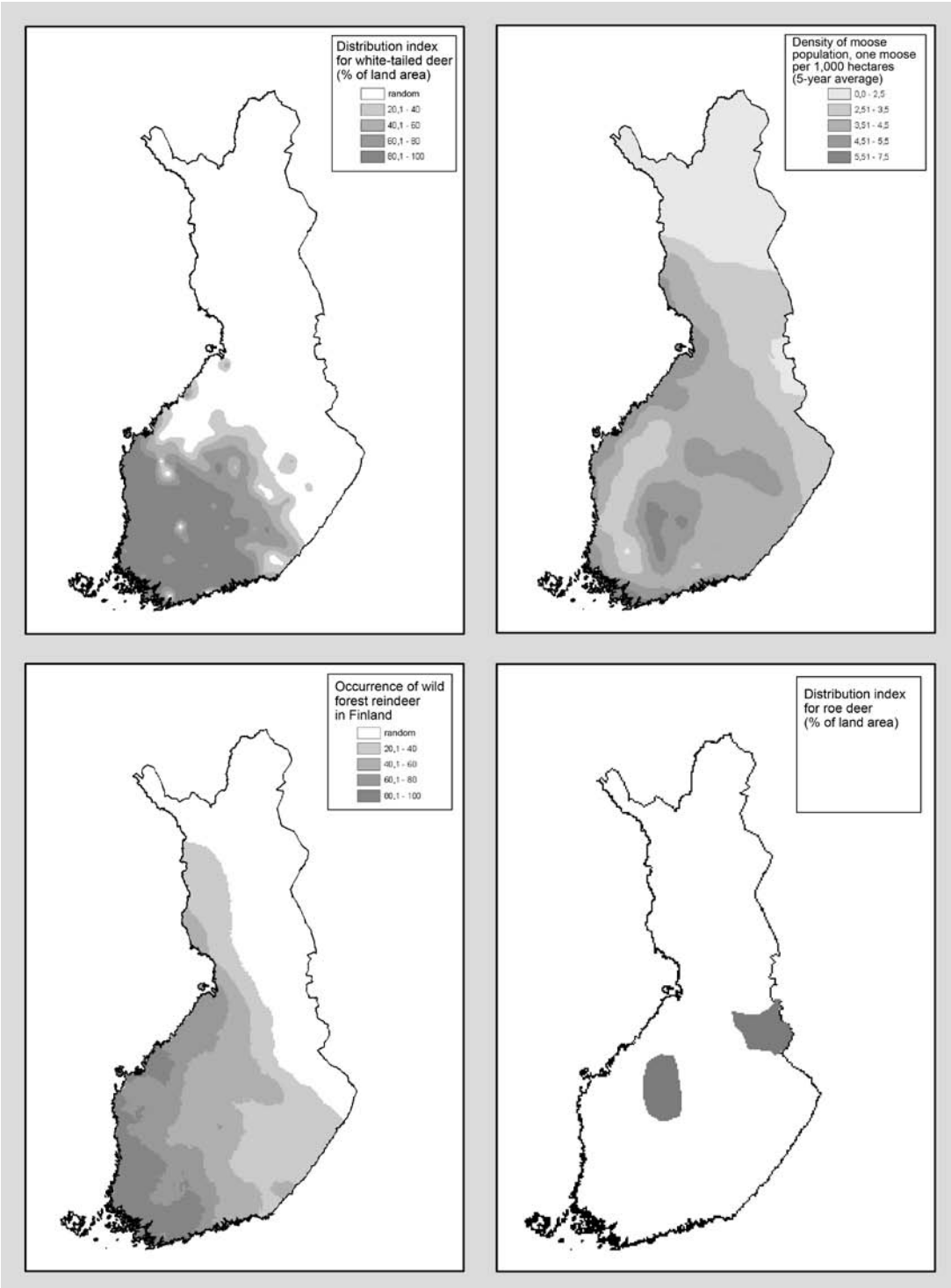


Figure 4. Distribution index for white-tailed deer (% of land area), density of moose population (individuals per 1,000 hectares, 5-year average), distribution index for roe deer (% of land area) and occurrence of wild forest reindeer in Finland (Ruusila & Kojola 2005, unpublished).

of the index, and the comparison figure for size is set at five instead of six as used by Keith (1983) and Fuller (1989), the index per wolf for the 20,000 km^2 area of eastern Finland is 470 (3.7 wolves and 350 moose per 1000 km^2; moose population data V. Ruusila/ Finnish Game and Fisheries Research Institute).

The index is higher than the average for North American research areas (271, within a range of 97–659; Fuller et al. 2003). The density of the moose population in Finland is about half that of the areas in Scandinavia where wolves occur and lower than in most areas in North America where moose occur (cf. Fuller et al 2003), but still seems to enable a relatively high rate of reproduction in a wolf population of the present size (see the section on 'Reproduction').

2.1.8 Habitats

In southernmost Finland, as in most of Europe, the habitat of the wolf consists of forests that are interspersed with habitation and road networks (cf. Linnell et al. 2000). In eastern Finland, wolves occur mainly in forested areas where there is a lower-than-average density of roads and human habitation (Kaartinen et al. 2005). Wolves are not selective about the age or density of trees in the area where they breed (Kaartinen et al. 2005). Radio positioning suggests that wolves living in established territories avoid human activity even when moving within their own territory (Kaartinen et al. 2005). In future, research on wolves' use of their territory will also be based on use of GPS transmitters, helping to provide a more comprehensive picture than we have now about wolf movements at night.

In its movements, the wolf population seems to avoid both habitation and roads (Kaartinen et al. 2005). The connection between sparsely inhabited areas and wolf observations produced by Finnish Game and Fisheries Research Institute monitoring of large carnivores is illustrated in Figure 5. Although wolves generally strive to avoid people, wolves are still observed near human habitation and even in people's yards. This would appear to have an effect on people's attitudes towards wolves.

2.2 Wolf populations in Finland's neighbouring areas

(Ilpo Kojola, Finnish Game and Fisheries Research Institute)

Over the last few decades, wolf numbers have grown and the area in Europe where wolves occur has expanded (Boitani 2003). The wolf has recently expanded to countries such as France and Germany (Boitani 2003). In Finland's neighbouring areas, wolf populations have both increased and decreased.

The present wolf population in Scandinavia originated with a litter born in 1983 (Wabakken et al. 2001). In 1991, the population that was descended from this one pair was supplemented with another male (Vila et al. 2003).

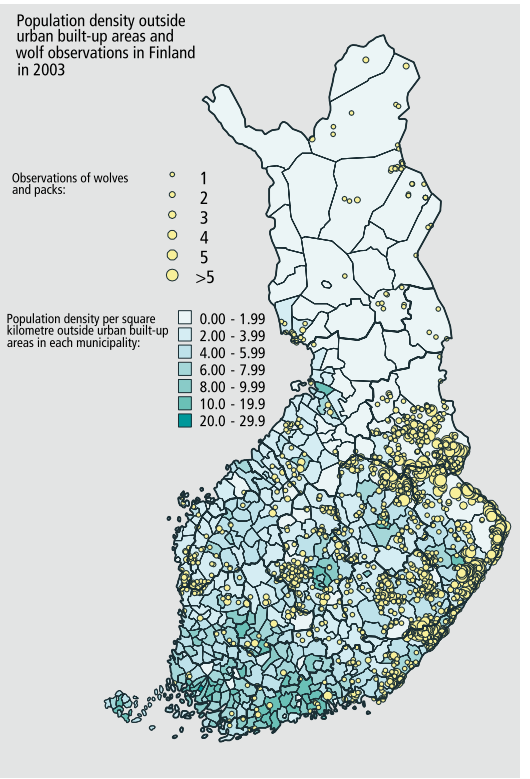


Figure 5. Population density outside urban built-up areas and wolf observations in Finland in 2003 (sources: Finnish Game and Fisheries Research Institute observations of large carnivores and municipal statistics).

All three founding members of this population derive from the Fenno-Russian wolf population, according to an analysis of genetic material (Vila et al. 2003). Other cases have subsequently been discovered, which also indicate that there is some kind of connection between the Scandinavian and the eastern wolf populations; for instance, a male wolf shot in Jämtland, Sweden, in winter 2004/2005 came from the Fenno-Russian wolf population while a female shot in eastern Lapland had been tagged in southern Norway (O. Liberg, personal communication 2005, P. Wabakken, personal communication 2005).

Some of the pairs in the Scandinavian wolf population are so closely related that their first litters are smaller than normal (Liberg et al. 2005). However, the Scandinavian wolf population has grown rapidly (see e.g. Aronson et al. 1999, 2004) since the average net increase in numbers has been 29% a year (Wabakken et al. 2001). At present, the Scandinavian wolf population consists of about 120–140 individuals (H. Sand, unpublished material).

In northwest Russia, the province of Karelia has been the main area of origin for wolves crossing into Finland (Pulliainen 1980, Pulliainen 1985, Pulliainen & Rautiainen 1999). Over the past twenty years, the wolf population of Russian Karelia has fallen to about half of what it was in the early 1980s (Danilov et al. 1998, Danilov 2003). There are some 300–350 wolves in Russian Karelia (P. Danilov, unpublished material), and south of the Gulf of Finland in Estonia, the number of wolves has fallen even more rapidly in recent years (Männil 2003).

2.3 Red List of threatened species

(Sauli Härkönen, University of Helsinki)

In the latest Red List of Finnish threatened species, published in 2001, the wolf is classified as Endangered (EN) (Rassi et al. 2001). The report states that on the basis of the number of breeding individuals (under 50), the wolf ought to be classified as Critically Endangered (CR). The classification determined on the basis of population size was reduced to EN, however, as the Finnish wolf population is supplemented by wolves from Russia.

Although the classification of a species as Endangered does not give the reasons for that status, the report nevertheless says that the main reason for wolves being endangered and the main risk factor for them is hunting. The report goes on to say that one of the important issues for the protection of endangered species is how to maintain a balance between the protection of large carnivores and hunting. The wolf, in particular, is considered so endangered that the population cannot support much decimation. In conclusion, it is stated that the aims for the protection of large carnivores should be examined and adjusted. In the case of the wolf, the report is based on the situation and population data for 1998. According to Kojola (1999), there were at least 95 wolves in Finland at the end of 1998, while at the end of 2004, there were at least 185–200 wolves in Finland (Kojola et al. 2005d).

According to the report, the new endangered status is not a proposal for action in the same way as a previously assigned Red List of threatened species. Furthermore, the probability of biological extinction does not always tell us enough about an individual species' need for protection or the ways in which it can be protected.

2.4 Viability of the wolf population

(Jouni Aspi, University of Oulu & Ilpo Kojola, Finnish Game and Fisheries Research Institute)

To put it simply, the continued existence of the wolf population in a specific geographic area only requires that the sum of reproduction and immigration is bigger than or at least as big as the sum of mortality and emigration. The main factor influencing this balance are the food resources available and the mortality caused by man (Fuller et al. 2003). In estimating a viable minimum population, it is fundamentally a question of estimating the risk of extinction for a specific period in the future. Key starting points include the minimum number of individuals required for preservation of the population and the minimum area required (Shaffer 1987, Soule 1987). The required minimum number of individuals is significantly influenced by birth rate and mortality, and also by immigration and emigration. Another key basis for evaluation is the genetic structure of the population, as a reduction in the genetic diversity undermines the general vitality and reproductive ability of individuals (Gilpin 1987). Inbreeding has been found to reduce the lifespan of individuals and the reproductive ability of females in wolf populations kept in captivity (Laikre & Ryman 1991). Mating between close relatives among wolves in the wild also tends to increase offspring mortality (Liberg et al. 2005).

Finland's wolf population is genetically diverse. Diversity is described by the observed heterozygosity found, and this was the same, 0.71, both for the research period 1996–1998 (n = 39 wolves) and 1999–2001 (n = 31 wolves) (Aspi et al. 2006; the age of the generation of wolves was used as the basis for the division into three-year periods). In the samples collected in 2002–2004 (n = 47), the observed heterozygosity was slightly lower than before (0.68). The values obtained were at the same level as those of eastern European or North American wolf populations (Wayne 1996, Lucchini et al. 2004). The observed heterozygosity is lower (0.59) in the Scandinavian wolf population, which is known to be inbred, and it is also lower in the isolated wolf populations in mountainous regions in Italy (0.44) and Spain (0.50).

The index describing the extent of inbreeding was slightly higher for the Finnish wolf population in the most recent research period (- 0.045 in 1996–1998; - 0.052 in 1999–2000 and 0.032 in 2002–2004), but it is still well below that of Italy (0.10) or Spain (0.17) (Lucchini et al. 2004). The index change observed in the Finnish data was not statistically significant, but it may indicate that inbreeding is on the increase (Aspi et al., unpublished material). One explanation could be that immigration of wolves has fallen as a result of the decrease in the wolf population in Russian Karelia.

Frankham et al. (2002) estimate that the negative effects of inbreeding can be avoided if the number of reproducing individuals is clearly over 50. The theoretical calculation referred to above examines the viability of independent populations. The wolf population in Finland is supplemented by individual wolves arriving from Russia, although there is no exact information on the number of these new arrivals. Observations based on genetic data (Aspi et al. 2006) and data on the development of the wolf population in Russian Karelia (Danilov et al. 1998) seem to indicate that the significance of immigration may have fallen.

The wolf population in Finland is linked with that of Russia along the entire length of the border between the two countries. According to Boitani (2003), it is possible to regard the Finnish wolf population as a fringe population of a large population of some 25,000–30,000 wolves. If it is assumed that the migration of wolves into Finland from outside will continue in the future, too, it can be estimated on the basis of the effective population size derived from genetic analysis, i.e. the number of breeding wolves (42.5; Aspi et al. 2006) and the previous population estimate (150; Kojola & Määttä 2004), that Finland should have 20 breeding pairs in order to ensure that the effective population size remains at over 50 (J. Aspi, unpublished material). This requires that the migration of wolves from populations in Russian Karelia into Finland remains unchanged. If the number of migrants falls from the present level, Finland would need over 25 breeding pairs of wolves.

Analyses of the viability of the wolf population have been criticized for not taking the flexibility typical of the species and the regional variations in habitat, e.g. in the population density of prey species, into account sufficiently (Boyce 1992, Fritts & Carbyn 1995). In 2004, the Finnish wolf population consisted of at least 16 pairs that had bred in Finland and five pairs whose territories extended onto both sides of the border between Finland and Russia (Kojola et al. 2005d). The increase in the population, its genetic diversity and its production of pups (some 40% pups in the winter population) all indicate that the wolf population has a great deal of potential to be viable.

3. Economic losses caused by the wolf population in Finland

3.1 Wolves as a cause of damage

(Ilpo Kojola, Finnish Game and Fisheries Research Institute)

Outside the reindeer herding area, the amount of damage done by wolves differs considerably between individual wolves, with 10–20% of the wolf population causing about 80% of the damage. These individual differences may arise from differences in the environment of the wolves in question and in individual tendencies. Linnell et al. (1999) emphasize in their overview of the literature that the number of opportunities on offer and the recurrence of such opportunities have an impact on the risk of damage to livestock caused by large carnivores and they also question the significance of individuality. However, the tendency of wolves in eastern Finland to kill domestic dogs showed striking differences between packs and the differences were unconnected with the number of dogs or the populations of prey species locally (Kojola et al. 2004c, but cf. also Kojola & Kuittinen 2002 concerning the possible impact of moose population density). On the other hand, material collected in Sweden showed a clear connection between the number of damage incidents per territory and the use of dogs (Karlsson & Thoresson 2002).

Damage by wolves to reindeer husbandry has traditionally occurred mainly in the reindeer herding districts along Finland's eastern border (Nieminen & Leppäluoto 1986). In recent years, there has been most damage in Kainuu. This is mainly due to the fact that independent young wolves from the family packs to the south of the reindeer herding area have dispersed into the area of the Kainuu reindeer herding districts (Figure 2).

3.2 Types of damage, amount of damage and location of damage

(Jukka Bisi, University of Helsinki)

Damage by wolves to reindeer makes up the biggest damage category in terms of individual animals. The number of reindeer killed by wolves has varied in recent years between less than 50 reindeer killed in 1995 and nearly 600 reindeer in 2002. In examining damage to reindeer, it is important to bear in mind that not all reindeer killed by carnivores are found.

Sheep are suitably sized prey for wolves, and the behaviour of sheep when threatened, i.e. gathering into herds and becoming paralysed with fear, makes them a particularly easy prey for wolves. Damage to sheep is the second biggest damage category. A certain amount of cattle also fall prey to wolves (Figure 6).

Wolves are occasionally seen in the yards of houses and certain individuals may, as a result of either starvation caused by sickness or learned behaviour, strive repeatedly to seek food in yards. Young wolves moving to new areas may also visit the yards of houses, apparently either in search of food or because of the dogs in the yard. In addition to this, there are numerous observations by locals of radio-tagged wolves visiting their yards, often yards where dogs are kept. Even if these visits do not cause any damage, they tend to give rise to fear locally and to demands that wolves that come

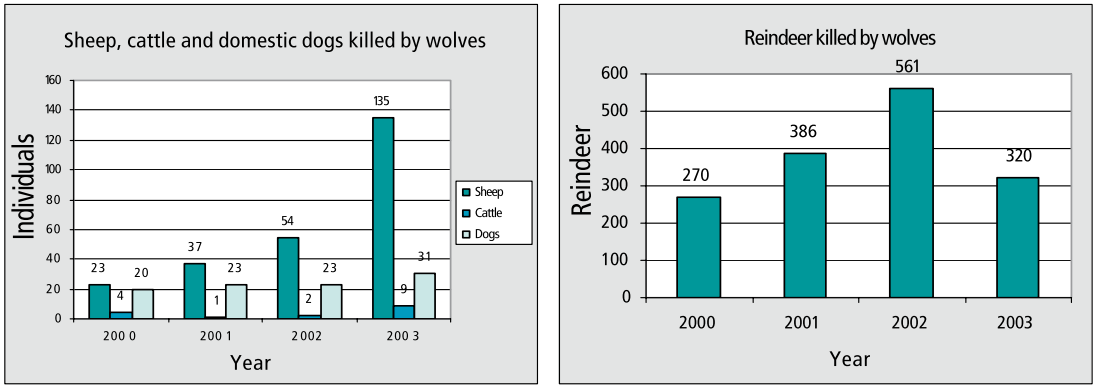


Figure 6. Damage caused by wolves that was reported to the authorities and compensation paid in Finland in 2000–2003 (Ministry of Agriculture and Forestry, unpublished).

too close to habitation should be eliminated (Bisi & Kurki 2005).

Attacks on dogs and loss of dogs are one of the biggest problems that undermine tolerance of the wolf population at the local level (Palviainen 2000). According to damage compensation statistics kept by the Ministry of Agriculture and Forestry, wolves have killed between 20–40 dogs a year on average in Finland over the past few years. A closer analysis of the damage to dogs in eastern Finland has shown that about half of the dogs were taken from their yard, while the rest of the damage took place in the context of hunting (Kojola & Kuittinen 2002).

It should be noted that not all dogs killed by wolves are entered in the official damage statistics, since not all dogs taken by wolves are found and not all these dogs are reported to the compensation system due to the deductible involved. Damage to dogs accounts for a considerable proportion of the cost for all damage done by wolves. For example, about half the damage that was compensated for in 2003 consisted of damage to dogs. There were 31 recorded incidents of such damage and their combined cost came to about EUR 38,000.

In recent years, damage by wolves to dogs has occurred in different parts of Finland. In 2003, the damage that took place in North Karelia and compensation for it raised the total sum of compensation and the total damage considerably, accounting for about half of all damage to domestic animals in Finland.

If we examine all the damage that has occurred over the past few years and the compensation paid, it is clear that most of the damage occurred in the areas with the highest wolf population density, i.e. North Karelia, southeast Finland and Kainuu. In North Karelia, the total sum of compensation paid in 2001–2004 came to about EUR 47,000, and the sums for southeast Finland and Kainuu came to over EUR 20,000. Compensation was also paid in Northern Savo and Ostrobothnia of over EUR 10,000. Elsewhere, damage was either limited to a few thousand euros, or just hundreds of euros. Appendices 1–3 give statistics on damage according to the territories of the Employment and Economic Development Centres (T&E Centres); the diagrams show incidents of damage by species and year, the category 'other' refers to damage other than animals being killed, e.g. veterinary care costs, chewed and broken GPS equipment for hunting dogs, etc.

It is difficult to predict the effect the population growth and expansion of wolves on the trend in damage, but the amount of damage appears to be linked with the size of the wolf population. Damage caused by wolves has grown with the increase in the wolf population, and in 2003, the wolf population was already causing more damage subject to compensation payments than all other large carnivores put together.

The volume of livestock farming also has an impact on the amount of damage. In 2004, there were about 21,500 working farms with livestock in Finland, and just over half of these, some 13,000 farms, grazed their animals outdoors. Of these farms, about 1,000 kept sheep (Figure 7), for which the risk of damage is the highest. Generally, the bigger sheep farms tend to lie in southwestern Finland or Pirkanmaa, but there is a fairly even distribution of sheep farms throughout Finland.

The presence of wolves has various kinds of effects on human activity, for instance on the keeping of dogs and other domestic animals, but also on how freely children can be permitted to move around outdoors. Although there are no recorded incidents of wolves attacking human beings in Finland for over 100 years, many people still refuse to consider wolves as harmless and are, in fact, afraid of wolves (Lumiaro 1997, Bisi & Kurki 2005). This should be seen against a background of stories and myths, but also a number of actual incidents of wolves killing children in the 19th century. Many Finnish municipalities provide transportation to school for children because of the occurrence of wolves in the area, which causes additional costs for these municipalities.

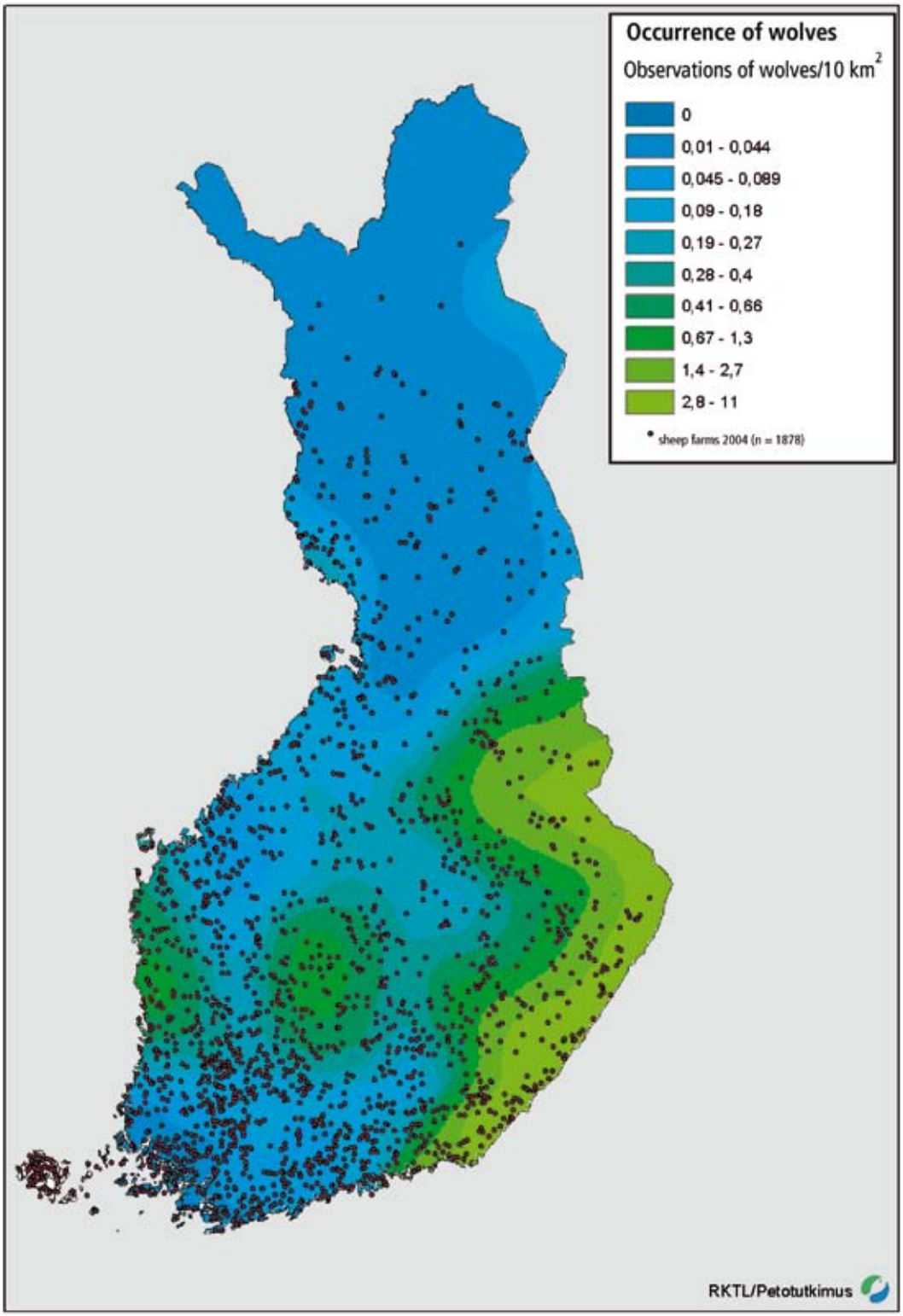


Figure 7. Sheep farms and the occurrence of wolves in Finland.

4. National legislation, international obligations and international cooperation

(Sauli Härkönen, University of Helsinki)

4.1 The position of the wolf in national legislation in Finland

4.1.1 Summary of changes of the position of the wolf in Finnish legislation from 1973 onward

The hunting legislation concerning wolves has been amended several times during the past 30 years. Table 1 shows a brief summary of the main content of the amended provisions.

4.1.2 Hunting legislation concerning the wolf currently in force

Wolves outside the reindeer herding area

In Finland, wolves outside the reindeer herding area are among the species listed in Annex IV of the Habitats Directive (Animal and plant species of Community interest in need of strict protection). This requires that measures are taken to establish a system of strict protection for the wolf in its natural range and a prohibition on all forms of deliberate capture or killing of specimens of this species in the wild. The Habitats Directive has been implemented in the Finnish hunting legislation by defining the wolf as a game species that is always protected outside the reindeer herding area (section 24(2) of the Hunting Decree).

It must be possible to make exceptions to this protected status under certain specific circumstances. Derogation is possible only for particular, justified reasons under the grounds for derogation given in Article 16 of the Habitats Directive. However, this requires that there is no satisfactory alternative and that the derogation is not detrimental to the maintenance of the population of the species concerned at a favourable conservation status in its natural range.

The grounds for derogation given in Article 16 of the Habitats Directive are:

a) in the interest of protecting wild fauna and flora and conserving natural habitats;
b) to prevent serious damage, in particular to crops, livestock, forests, fisheries and water and other types of property;
c) in the interests of public health and public safety, or for other imperative reasons of overriding public interest, including those of a social or economic nature and beneficial consequences of primary importance for the environment;
d) for the purpose of research and education, of repopulating and re-introducing these species and for the breeding operations necessary for these purposes, including the artificial propagation of plants;
e) to allow, under strictly supervised conditions, on a selective basis and to a limited extent, the taking or keeping of certain specimens of the species listed in Annex IV in limited numbers specified by the competent national authorities.

The above-mentioned provisions concerning derogations are set down in Section 28 of the Hunting Decree. Under this section, if no other satisfactory solution exists and the hunting does not endanger the maintenance of a favourable conservation status, exceptions to the general closed season for wolf as laid down in section 24 (2) may be made:

1) in order to conserve natural wild fauna or flora;
2) in order to prevent particularly significant damage to agriculture, forestry, fishing, animal husbandry or other property;
3) for compelling reasons of public health, general safety or other particularly important reasons in respect of public interest, including financial and social reasons, and when the exception yields benefits of primary importance for the environment; and
4) in carefully supervised circumstances selectively and to a restricted extent in order to take certain individual animals.

A hunting licence can be granted for the above purposes for the period between November 1 and March 31. Hunting licences are granted by the game management districts subject to restrictions set down separately by the Ministry of Agriculture and Forestry.

Table 1. Amendments to the hunting legislation concerning wolves from 1973 onward.

Act/Decree	Adopted on	In force	Content
749/1973	14.9.1973	14.9.–31.12.1977	Wolf protected throughout Finland with the exception of the reindeer herding area until the end of 1977.
1038/1975	31.12.1975	1.1.1976–	Bounty on wolves is abolished.
720/1977	7.10.1977	1.1.1978–31.12.1979	It is permitted to hunt wolf all year round in the reindeer herding area and in the municipalities of Kuhmo, Nurmes, Lieksa, Ilomantsi, Tuupovaara, Tohmajärvi, Värtsilä and Kitee between September 1 and March 31. Wolf otherwise protected.
1000/1979	21.12.1979	1.1.1980–31.12.1981	It is permitted to hunt wolf all year round in the reindeer herding area and in the municipalities of Kuhmo, Nurmes, Lieksa, Ilomantsi, Tuupovaara, Tohmajärvi, Värtsilä and Kitee between September 1 and March 31. Wolf otherwise protected.
1000/1981	23.12.1981	1.1.1982–31.12.1984	It is permitted to hunt wolf all year round in the reindeer herding area and in the municipalities of Kuhmo, Nurmes, Lieksa, Ilomantsi, Tuupovaara, Tohmajärvi, Värtsilä, Kitee, Kesälahti, Punkaharju, Uukuniemi, Saari, Parikkala, Rautjärvi, Ruokolahti, Imatra, Joutseno, Taipalsaari, Nuijamaa, Lappeenranta, Lemi, Ylämaa, Luumäki, Miehikkälä, Virolahti, Vehkalahti and Hamina between September 1 and March 31. Wolf otherwise protected.
830/1984	5.12.1984	1.1.1985–31.12.1987	It is permitted to hunt wolf in the provinces of Kymi, North Karelia, Oulu and Lapland between September 1 and March 31. Wolf otherwise protected.
1133/1987	23.12.1987	1.1.–31.12.1988	It is permitted to hunt wolf in the provinces of Kymi, North Karelia, Oulu and Lapland between November 1 and the end of February. Wolf otherwise protected.
1165/1988	23.12.1988	1.1.1989–31.12.1990	It is permitted to hunt wolf in the provinces of Uusimaa, Kymi and Lapland between November 1 and the end of March and in the provinces of North Karelia and Oulu between November 1 and the end of February. Wolf otherwise protected.
1136/1990	14.12.1990	1.1.1991–31.12.1992	It is permitted to hunt wolf in the provinces of Kymi and Lapland between November 1 and the end of March and in the provinces of North Karelia and Oulu between November 1 and the end of February. Wolf otherwise protected.
1246/1992	11.12.1992	1.1.1993–31.7.1993 NB! The hunting season remained unchanged until March 31, 1994)	It is permitted to hunt wolf in the provinces of Kymi and Lapland between November 1 and the end of March and in the provinces of North Karelia and Oulu between November 1 and the end of February. Wolf otherwise protected.
666/1993	12.7.1993	1.8.1993–14.1.1997 NB! The hunting season remained unchanged until March 31, 1994)	Game animals are protected as follows: … 5) wolf is protected in the reindeer herding area defined in section 2 of the Reindeer husbandry Act (848/1990) between April 1 – October 31, and elsewhere in Finland throughout the year; …
1374/1996	30.12.1996	15.1.1997– 31.12.1998	Game animals are protected as follows: … 5) wolf is protected in the provinces of Kymi, North Karelia and Lapland, as well as the province of Oulu in the Kainuu game management district and in the Oulu game management district in the reindeer herding area defined in section 2 of the Reindeer Husbandry Act (848/1990) between April 1 – October 31, and elsewhere in Finland throughout the year; …
869/1998	27.11.1998	1.1.1999–	A) Section 24 General closed seasons Game seasons are closed as follows: … 5) wolf in the reindeer herding area April 1 – September 30 … Wolf outside the reindeer herding areas, bear, otter, wolverine, lynx and harbour seal are always protected. B) Section 28 An exception to the general closed seasons … For the purposes referred to in subsection 1 above, the hunting of the following is permitted: 1) wolf outside the reindeer herding area November 1 – March 31; …
664/2001	19.7.2001	1.8.2001–	A hunting licence as referred to in section 10(2) of the Hunting Act (615/1993) must be obtained for: … 4) hunting wolf in the reindeer herding area. Hunting licences are granted by the game management district.

Wolves in the reindeer herding area

Wolves in the reindeer herding area fall under Annex V of the Habitats Directive (Animal and plant species of Community interest whose taking in the wild and exploitation may be subject to management measures). This category, though less strict than that of Annex IV, does not provide for uncontrolled hunting either, since the Habitats Directive requires that the taking of individual wolves from the wild and exploitation must not be detrimental to the maintenance of a favourable conservation status for the wolf. The above has been taken into account in the Hunting Decree by requiring a hunting licence for hunting wolves in the reindeer herding area. Hunting licences are granted by the game management districts within the restrictions set down separately by the Ministry of Agriculture and Forestry. The hunting season is defined by law as the period between October 1 and March 31.

4.2 European Community law

4.2.1 The Habitats Directive

The aim of the Habitats Directive is to promote conservation of biodiversity through the conservation of natural habitats and wild fauna and flora in the European territory of the Member States to which the Treaty applies. Measures taken in accordance with the Directive strive to maintain or restore a favourable conservation status for natural habitats and species of wild fauna and flora of Community interest.

In terms of the conservation of habitats, the wolf is a 'priority species' in Annex II of the Habitats Directive. This means that the wolf is a species of Community interest whose conservation requires the designation of special areas of conservation. In practice, this means that the Natura 2000 network should comprise wolf habitats in order to ensure that a favourable conservation status is maintained or restored for wolf habitats in the natural range of the wolf. However, the requirements in Annex II are not applied to the Finnish wolf population, as Finland was given a derogation on this point in the accession documents.

In terms of protection for the species, the wolf comes under Annex IV of the Habitats Directive (Animal and plant species of Community interest in need of strict protection). According to Article 12 of the Habitats Directive, Member States are required to take measures to establish a system of strict protection for the animal species listed in Annex IV (a) in their natural range and a prohibition on all forms of deliberate capture or killing of specimens of these species in the wild. However, the requirements of Annex IV are not applied to the Finnish wolf population in the reindeer management area, as Finland was given a derogation on this point in the accession documents. The provisions of Annex IV are applied elsewhere in Finland.

Wolves in the reindeer herding area in Finland fall under Annex V of the Habitats Directive (Animal and plant species of Community interest whose taking in the wild and exploitation may be subject to management measures). Under Article 14 of the Habitats Directive, Member States are required to take measures to ensure that the taking in the wild of specimens of species of wild fauna and flora listed in Annex V as well as their exploitation is compatible with their being maintained at a favourable conservation status, if, in the light of surveillance, the Member States deem it necessary.

The Habitats Directive is binding on the Member States. National legislation must comply with the requirements of the Directive, and national derogations from provisions set down in the Directive are not possible.

4.2.2 The CITES regulation

The CITES regulation is European Community legislation governing international trade in endangered species of animals. It is in force in its own right, requiring no national legislation to implement it. The CITES Convention has been established on the basis of the CITES regulation, and the Convention is described in more detail in section 4.3.2 below.

4.3 International treaties

4.3.1 The Bern Convention

Aims

The Convention on the Conservation of European Wildlife and Natural Habitats, often called the Bern Convention, was adopted in Bern on September 19, 1979. The Convention entered into force in Finland on April 1, 1986.

The aim of the Convention is the conservation of wild flora and fauna and their natural habitats, especially those species and habitats whose conservation requires the cooperation of several States, and to promote such cooperation. The Bern Convention gives particular em-

phasis to endangered and vulnerable species, including endangered and vulnerable migratory species.

Under the Bern Convention, the Contracting Parties shall take requisite measures to maintain the population of wild flora and fauna at, or adapt it to, a level which corresponds in particular to ecological, scientific and cultural requirements. In doing this, the Contracting Parties shall take account of economic and recreational requirements and the needs of sub-species, varieties or forms at risk locally.

Each Contracting Party shall take steps to promote national policies for the conservation of wild flora, wild fauna and natural habitats, with particular attention to endangered and vulnerable species, especially endemic ones, and endangered habitats, in accordance with the provisions of the Convention. Each Contracting Party undertakes, in its planning and development policies and in its measures against pollution, to have regard to the conservation of wild flora and fauna. Each Contracting Party shall promote education and disseminate general information on the need to conserve species of wild flora and fauna and their habitats.

The status of the wolf

In the Bern Convention, the wolf falls under 'Strictly protected fauna species' (Appendix II of the Convention). The Convention requires the prohibition of all forms of deliberate capture and keeping and deliberate killing of wolves. However, Finland entered a reservation in the instrument of ratification to the effect that the Convention shall not apply to the wolf.

Measures under the Bern Convention

Action plans for the conservation of all European populations of large carnivores have been made under the Bern Convention (see Boitani 2000, Breitenmoser et al. 2000, Landa et al. 2000, Swenson et al. 2000). The action plans set as a target that all Member States should prepare national management plans for all large carnivores on land. For instance Sweden, Norway and Estonia have already drawn up management plans for large carnivore populations (Appendix 4). In addition to this, several recommendations on large carnivores have been issued. Some of the most important ones are listed below.

Recommendation No 17 (1989)	Recommendation of the Standing Committee on the Protection of the Wolf (Canis lupus) in Europe.
Recommendation No 43 (1995)	Recommendation on the Conservation of Threatened Mammals in Europe.
Recommendation No 59 (1997)	Recommendation on the Drafting and Implementation of Action Plans of Wild Fauna Species.
Recommendation No 74 (1999)	Recommendation on the Conservation of Large Carnivores.
Recommendation No 82 (2000)	Recommendation of the Standing Committee on Urgent Measures Concerning the Implementation of Action Plans for Large Carnivores in Europe.

4.3.2 The CITES Convention

(Veijo Miettinen, Finnish Environment Institute)

The CITES Convention (The Convention on International Trade in Endangered Species of Wild Fauna and Flora) governs international trade in endangered of animals and plants. The Convention entered into force on July 1, 1975. Finland has been a party to the convention since August 8, 1976. So far, over 160 states have become parties to the Convention. Trade in specimens of the species listed in Appendix I of the Convention is prohibited. Trade in species listed in Appendix II of the Convention is not prohibited, but it is subject to permits. These appendices correspond to Annexes A and B of the EU legislation implementing the Convention, Council Regulation 338/97. It should also be taken into account that in the EU this particular regulation on trade applies not only to trade between Member States but also to trade within Member States.

In Finland's neighbouring areas in Norway and Russia, the wolf is listed in Appendix II and thus available to international trade. Within the area of the European Union, the wolf, and also the brown bear and the lynx, are listed in Annex A of the above Council Regulation, the list of species under the strictest protection, because this Regulation also implements the restrictions on trade in species listed in the Habitats Directive. This means that the trade is prohibited. However, it is still possible to sell products derived from wolf in Finland if the wolf in question has been legally obtained and a certificate issued by the game management association

can be produced for it and if a sales permit has been obtained by certificate from the Finnish Environment Institute. Such certificate also confers a sales permit for other parts of the European Union. This permit system makes it difficult to sell products deriving from illegally killed wolves.

4.3.3 The Convention on Biological Diversity

The Convention on Biological Diversity was drawn up in Rio de Janeiro on June 5, 1992. The Convention entered into force in Finland on October 25, 1994.

The aim of the Convention on Biological Diversity is the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources. Sustainable use is defined in the Convention as meaning the use of components of biological diversity in a way and at a rate that does not lead to the long-term decline of biological diversity, thereby maintaining its potential to meet the needs and aspirations of present and future generations.

The aims of the Convention and measures taken in accordance with it have certain impacts on management of the wolf population, too. Responsibility for any measures belongs to the relevant authorities.

4.4 Nordic cooperation

4.4.1 Cooperation between the authorities

The Finnish Ministry of Agriculture and Forestry has been taking part in meetings with the authorities responsible for large carnivores in Sweden and Norway (Naturvårdsverket in Sweden and Direktoratet for Naturforvaltning in Norway) since 2000. Meetings are held once or twice a year in the different countries in turn to discuss topical matters concerning large carnivores and ongoing projects.

4.4.2 The Nordic Council and the Nordic Council of Ministers

The Nordic Council and the Nordic Council of Ministers are in charge of official Nordic cooperation. The Nordic Council was founded in 1952 and is the forum for Nordic parliamentary cooperation. The Council has 87 members, representing the five Nordic countries and three autonomous territories. The Nordic Council of Ministers was founded in 1971 as the forum for cooperation between the governments of the Nordic countries.

The Nordic Council has proposed a common Nordic administrative strategy for large carnivores. The Finnish, Swedish and Norwegian authorities commented on the revised proposal at a seminar arranged by the Council's committee on natural resources and the environment on September 24, 2002. Following closer scrutiny, the Council of Ministers has since found that there is already cooperation between Finland, Norway and Sweden on matters concerning large carnivores and that a common administrative strategy is not feasible.

4.4.3 The North Calotte Council

The North Calotte Council is a permanent cooperation organ between Finland, Sweden and Norway, whose task is to increase cooperation in the North Calotte region in areas such as regional policy, labour market policy and other areas of cooperation that have an impact on employment in the North Calotte. The North Calotte Council is mainly funded by the Nordic Council of Ministers. The area of operations consists of the counties of Nordland, Troms and Finnmark in Norway, the counties of Norrbotten and Västerbotten in Sweden and the province of Lapland in Finland.

The large carnivores committee of the North Calotte environmental council that is subordinate to the North Calotte Council has published four reports on large carnivores: a status report on wolverine, lynx, wolf and brown bear in the North Calotte in 1993; a proposal for parallel monitoring of large carnivore populations in 1994; a proposal for parallel administration in 1996; and a status report on wolverine, lynx, wolf and brown bear in the North Calotte in 1992–2000. In addition, the committee has issued recommendations on cooperation between Finland, Sweden and Norway in matters regarding large carnivores.

4.4.4 The coordination group for Nordic research on large carnivores

The purpose of the group is to coordinate Nordic research on large carnivores. The group comprises representatives of the relevant authorities in Finland, Sweden and Norway (the Finnish Ministry of Agriculture and Forestry, Naturvårdsverket in Sweden and Direktoratet for Naturforvaltning in Norway) and other notable funding bodies. Coordination has been used particularly to start major research projects on large carnivores

between Sweden and Norway. The group meets annually.

4.5 Other international cooperation

Under the cooperation between neighbouring areas of Finland and Russia, the authorities responsible for game species and game researchers have arranged joint seminars and shared information on the status of the animal populations involved, population trends and trends in research and population management. There have been various meetings every year. There is similar cooperation with Estonia and other countries in southeast Europe.

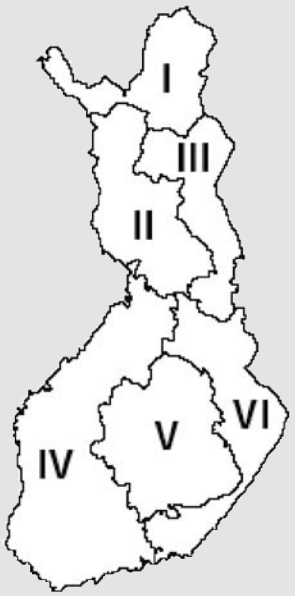
5. Management of the wolf population so far

5.1 The aims of the Working Group for Large Terrestrial Carnivores 1996–2010

(Sauli Härkönen, University of Helsinki)

In January 1996, the Council for Environment and Natural Resources appointed a working group of experts to draw up an estimate of the populations of wolf, bear, lynx and wolverine, the ideal populations of these species and related viewpoints including regional distribution and justifications for it, measures to be taken to avoid damage by carnivores and any issues related to population control, using the best available information and data as background for their report. The working group submitted its unanimous memorandum to the Council for Environment and Natural Resources on October 31, 1996. The Council approved the report of the working group and on November 13, 1996, proposed to the Ministry of Agriculture and Forestry that the management and sustainable use of the populations of large carnivores in Finland should be outlined up to 2010 in the way proposed by the working group, using population management districts.

The 1996 report of the Working Group for Large Terrestrial Carnivores (Ministry of Agriculture and Forestry 1996) put forward the following aims for the wolf population in each population management district up to 2010:



I	Northern reindeer herding area	+/-	remains unchanged, +/- 0.5% per year i.e. +/- 7.5% during the report period
II	Western reindeer herding area	+/-	remains unchanged, +/- 0.5% per year i.e. +/- 7.5% during the report period
III	Eastern reindeer herding area	+/-	remains unchanged, +/- 0.5% per year i.e. +/- 7.5% during the report period
IV	Western Finland	+++	increases clearly, over 4.0% per year i.e. over 60% during the report period
V	Central Finland	+++	increases clearly, over 4.0% per year i.e. over 60% during the report period
VI	Eastern Finland	+/-	remains unchanged, +/- 0.5% per year i.e. +/- 7.5% during the report period

Figure 8. The population management districts and targets for the wolf population proposed by the Working Group for Large Terrestrial Carnivores for 1996-2010.

The objective was to reinforce the wolf population in the population management districts of western and central Finland, while in eastern Finland and whole of the reindeer herding area the population should stay on the level of 1995.

The report was not a binding document for the Ministry of Agriculture and Forestry or other parties. However, efforts have been made to follow the objectives set in the reports in the management of the wolf population at the Ministry.

5.2 Development of an information centre for large carnivores

(Samuli Sillman, Metsähallitus)

5.2.1 Background

The work to develop the visitor centre of Metsähallitus in Kainuu into the Petola Visitor Centre started in 2001 with a feasibility study concerning the founding of a national information centre for large carnivores, which would be managed by Metsähallitus. The initiative for creating an information channel on large carnivores came from the work of the Kainuu regional committee on large carnivores headed by the Regional Council of Kainuu.

At the same time in 2001, work started to set up a website on the initiative of the Finnish Association for Nature Conservation to collect basic information on large carnivores, the latest information on research and population management of large carnivores all in one place. The website (www.suurpedot.fi) was opened in summer 2002, and it had been set up together with representatives from the Ministry of Agriculture and Forestry, Metsähallitus, the Hunters' Central Organization, the Finnish Game and Fisheries Research Institute (RKTL), the Finnish Association for Nature Conservation and the Ministry of the Environment. As it was already known that an information centre for large carnivores would be established, the practical maintenance of the website was assigned to Metsähallitus. Maintenance and development of the website has been guided by a steering group of representatives of the bodies listed above.

From spring 2003, Metsähallitus has been developing its visitor centre in Kainuu into a tool for information on large carnivores with the aid of two projects. One is a content production project that produces, for instance, an exhibition of a high standard on large carnivores and audio-visual and promotional material on large carnivores, which also updates the content of the www.suurpedot.fi website. Funding for this project run by the municipality of Kuhmo comes from the Interreg III A Karelia programme.

The second project is the renovation and extension of the visitor centre to meet these new needs. As the construction work started, the name of the Kainuu visitor centre was changed to the Petola Visitor Centre. The aim of the extension is to improve the visitor centre with the addition of an extensive exhibition space, an auditorium, a classroom for nature studies and new customer service facilities. Metsähallitus received funding for this project from the Labour Market Department of the Kainuu Employment and Economic Development Centre.

5.2.2 Petola Visitor Centre to become part of the national information provision on large carnivores

The Petola Visitor Centre was opened to the public in June 2005. The Centre will have a clearly defined role in the visitor centre network of Metsähallitus as a centre specializing in large carnivores and in providing information on these.

The setting for information provision was completed during spring 2005. Structures have been created for the guidance of information provision on large carnivores to ensure that the service provision and information correspond to the needs of the various parties involved. Following discussions with the Ministry of Agriculture and Forestry, a steering group has been set up to support the Petola Visitor Centre's provision of information on large carnivores. The idea is that the steering group should be responsible for the operation and development of the www.suurpedot.fi website, in addition to the information provision on large carnivores that takes place at the visitor centre.

The role and main aims of the steering group are:

1. Providing instructions for the operating concept and service model of information provision on large carnivores at the Petola Visitor Centre;
2. setting targets for information provision and monitoring it;
3. monitoring and identifying the needs related to information on large carnivores;

4. providing instructions for the distribution of labour and partnerships in information provision;
5. recognition and implementation of any development projects needed; and
6. development of the www.suurpedot.fi website.

In addition to representatives of Metsähallitus, representatives from the following organizations have been invited to join the steering group appointed to support information provision at the Petola Visitor Centre: the municipality of Kuhmo, the Ministry of Agriculture and Forestry, the Hunters' Central Organization, the Finnish Game and Fisheries Research Institute (RKTL), the Finnish Association for Nature Conservation and the Ministry of the Environment.

5.3 The regional cooperation model of North Karelia, Kainuu and North Savo

(Jukka Bisi, University of Helsinki)

A committee for large carnivores was founded in North Karelia in 1999 on the initiative of the provincial government of North Karelia; representatives of forestry, wild berry pickers, hunters, farmers, the Frontier Guard, game management, conservation and the authorities were invited to join the committee. The purpose of the committee was to start discussion between the various stakeholders concerning their attitudes to large carnivores and to develop a regional stance on the issue. In addition to discussion and interaction, the work of the committee also comprised research on large carnivores. Results of the operations included a publication from the University of Joensuu on large carnivores in North Karelia, particularly the encounters and experiences of the local people (Suurpedot Pohjois-Karjalassa, pohjoiskarjalaisten luonnonkäyttäjien kokemuksia suurpedoista; Palviainen 2000) as well as a publication on large carnivores in North Karelia (Lyytikäinen et al. 2004). The committee has convened regularly and it has actively and interactively developed regional information provision on large carnivores and the prevention of damage as well as dealt with problems involved in the hunting of large carnivores.

A regional committee for large carnivores based on the North Karelia regional cooperation model was founded in Kainuu in 2001. Initiatives taken by the Kainuu committee include development of the initial project for the information centre on large carnivores in Kuhmo. It also helped promote interaction and cooperation between different parties. Another result of its operations was a 2003 report on the operations of the Kainuu regional committee for large carnivores in 2001–2003 (Kainuun suurpetoneuvottelukunta 2003).

At the end of 2004, a regional committee for large carnivores based on the North Karelia and Kainuu regional cooperation model was also founded in North Savo. It was founded at a meeting convened by the Regional Council of North Savo. The aim of the committee is to provide further information on the situation of large carnivores in the region among the general public and decision-makers alike and to influence legislative work.

5.4 The hunting licence system maintained by the Ministry of Agriculture and Forestry

(Sauli Härkönen, University of Helsinki)

5.4.1 General

The aim of the Ministry of Agriculture and Forestry has been to maintain a favourable conservation status for the wolf, and that management of the wolf population must be ecologically, economically and socially sustainable. Public statements have repeated that the number of wolves could be allowed to increase in areas that are suitable and where the population density of wolves is still relatively low. The Ministry of Agriculture and Forestry has emphasized, however, that the wolf as a large carnivore must not be allowed to become an unreasonable burden for any particular area, population group or occupation.

5.4.2 Hunting licences, instructions for granting them and their focus

The elimination of individual wolves and wolf hunting to prevent damage have been the means used in wolf population management and in balancing the demands of locals and the conservation needs of wolves. According to the Hunting Decree, the Ministry of Agriculture and Forestry may issue provisions concerning restriction of hunting allowed on the basis of hunting licences, the conditions for granting a hunting licence, the procedure to be adopted in issuing licences and information on allowable hunting, as necessary. Under the above, the Ministry of Agriculture and Forestry has in recent years issued provisions to the game management districts concerning the number of wolves that can be hunted with hunting licences granted by the game manage-

ment districts under the Hunting Decree so as to ensure that a favourable conservation status is maintained for the wolf. It should be noted that the number of wolves that can be hunted with hunting licences is not a quota that has to be filled, nor is it grounds for granting a hunting licence. Restrictions issued have always been based on the annual wolf population estimates made by the Finnish Game and Fisheries Research Institute (RKTL) and the scale of sustainable hunting that has been estimated using these population estimates.

The hunting of wolves has been subject to strict provisions. For instance, the potential for granting hunting licences for the 2005–2006 hunting season was restricted outside the reindeer herding area exclusively to the Kainuu, North Karelia and Kymi game management districts. The game management districts were permitted to grant hunting licences only for purposes given in section 28(1)(1–3) of the Hunting Decree, e.g. specifically to prevent particularly significant damage. In the reindeer herding area, the game management districts of Lapland, Oulu and Kainuu were permitted to apply the normal procedures for granting hunting licences.

The provisions have also taken wolves killed otherwise into account. This is referred to as 'additional losses' and comprises wolves killed either with special licences granted after the provisions were issued under section 41(2) of the Hunting Act or section 25 of the Police Act (493/1995) or other wolves killed by man that have come to light. The game management districts are required to take these additional losses into account as a reduction in the number of wolves for which hunting licences are issued. This procedure exists specifically to ensure that the wolf population is not at risk under any circumstances. The total number of individuals lost from the wolf population due to hunting with hunting permits has been relatively small in recent years (Figure 9).

The fundamental principle has been that hunting always requires a hunting licence issued by a game management district. As an exception, the Ministry of Agriculture and Forestry has had the authority to issue hunting licences for wolf in special cases on the basis of a case-by-case evaluation, despite the protected status of the wolf, for reasons given in Section 41(2) of the Hunting Act (scientific research, game management, the prevention of damage, the prevention of disease or other approved reason) for the killing of a specific individual, even using prohibited hunting equipment and methods.

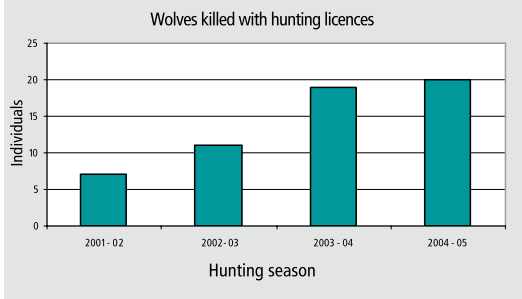


Figure 9. Total number of wolves killed in the hunting seasons 2001/2002 – 2004/2005 with hunting licences granted by game management districts, licences granted by the police and special licences granted by the Ministry of Agriculture and Forestry.

These special licences have been granted as far as possible only during the times when the game management districts have not had the option of making an exception to the protected status of the wolf. In such situations the Ministry of Agriculture and Forestry has performed a case-by-case evaluation on the basis of the information given in the licence application and any statements enclosed with the application. This process also always takes the provisions of the Habitats Directive into account. Furthermore, the Ministry of Agriculture and Forestry has requested statements from the local game management district and the Finnish Game and Fisheries Research Institute (RKTL) as background for its decision on whether to grant a licence whenever necessary. In considering its decisions, the Ministry of Agriculture and Forestry has also used any other available information that has been regarded as relevant for the decision.

5.4.3 Decisions on granting hunting licences and the relevant legislation

Some of the cases where the Ministry of Agriculture and Forestry has refused to grant a hunting licence for wolves have been reported to the Chancellor of Justice. The Chancellor of Justice has examined the matter on the basis of the Constitution of Finland. The relevant provisions for the matter are section 7(1) of the Constitution concerning the right to personal security, section 20(1), according to which nature and biodiversity are the responsibility of everyone, and, finally, section 22, which states that the public authorities shall guarantee the observance of basic rights and liberties and human rights.

In the reply (Dnro 1277/1/03 dated December 20, 2004), the Chancellor of Justice stated the following, among other things, about this matter: "The damage caused to domestic animals by carnivores and the threat they pose to people or are perceived to pose in consequence of being observed near people's homes and immediate living environment are factors that undermine security in such a way as to make it the responsibility of the public authorities to eliminate the said factors. Wolves and indeed other carnivores are not part of the natural fauna of inhabited areas in Finland. In this respect, the authorities must have at their disposal fast-acting and effective means of dealing with carnivores that come near human habitation, built-up areas or traffic routes and other roadways used by people. On the other hand, the authorities also have duties concerning nature and biodiversity under section 20(1) of the Constitution. What we have here is a situation where securing a number of fundamental and human rights would seem to lead to conflict because of their opposing values, due in part to local circumstances. In such a situation, fundamental and human rights must be weighted against each other and an attempt must be made to reconcile the interpretation of provisions causing conflict so as to ensure the implementation of fundamental rights in a way that complies with their intended purpose even in exceptional circumstances. However, the threat posed by carnivores cannot be eliminated in such a way as to endanger the natural biodiversity even of carnivore populations in wilderness areas in breach of the obligations in section 20(1) of the Constitution."

Further, in conclusion the Chancellor of Justice states: "With reference to what has been said above, it must be emphasized that upholding the security that is guaranteed as a fundamental and human right is the first priority of the public authorities. The authorities must be prepared to act and take measures to ensure that animals that cause insecurity can be dealt with or, in the most serious cases, eliminated. When a carnivore is observed in a place where there is a clear danger to human safety, it is self-evident that the threat must be averted. The extreme action is to kill the animal. Assessment must, however, be based upon the provisions for derogation given in Article 16 of the Habitats Directive. In my view, these provisions for derogation enable legislation that allows for the practical implementation of measures needed to protect human life and property against threatening carnivores in the interests of public safety and possibly also in the interest of preventing property damage."

5.4.4 The infringement procedure started by the Commission

The Commission of the European Union has shown interest in Finland's policy concerning large carnivores since 1995. To begin with, the Commission was asking for information mainly about the implementation of hunting legislation in Finland. As Finland gradually amended the legislation, the Commission's statements began to focus more on the policy for granting hunting licences practised under the current legislation.

In January 2005, The Commission announced that it was referring Finland to the European Court of Justice over the hunting of wolves. In a press release, the Commission stated the following: "The EU Habitats Directive requires Member States to strictly protect a number of animal species, including the wolf. Strict protection involves prohibiting all forms of deliberate capture or killing of specimens of these species. Exceptions to this prohibition are subject to strict conditions: they are allowed only if there is no satisfactory alternative, if the species' favourable conservation status is maintained and if certain other preconditions are fulfilled, such as the existence of a need to prevent serious damage. Finland, however, allows the systematic hunting of wolves, with hunting licences granted on the basis of certain predetermined quotas. The Commission considers that this approach does not meet the conditions laid down in the directive for granting exceptions to the general prohibition on deliberate capture or killing. Licences are regularly granted without being linked to individual animals causing serious damage and in spite of alternative solutions being available. The Commission has therefore decided to take Finland to the European Court."

On September 19, 2005, the European Commission referred Finland to the European Court of Justice over the way Finland is handling its wolf population (Case C-342/05). In its claim, the Commission states that the level of protection of the wolf is not favourable in Finland and other alternative methods are available, and that permits for hunting wolves are regularly issued without there being a properly ascertained connection with individuals causing particularly significant damage. It follows that the hunting of wolves is permitted in Finland to an extent which exceeds the conditions laid down in Article 16(1) of Directive 92/43/EEC.

Finland contested these claims in a response dated 7 December 2005.

5.4.5 The impact of hunting on the wolf population

There has been debate in Finland concerning the effect of hunting on the wolf population. Certain parties are of the opinion that continued hunting keeps wolves wary of humans and thus helps reduce damage, while others consider that hunting of wolves which belong to packs only increases damage, especially if the alpha wolf is killed (Bisi & Kurki 2005). There is little biological research available on this topic.

Observations in Finland show that hunting wolves that belong to packs does not automatically cause the disintegration of the pack, not even if the alpha wolf is shot. The consequences apparently depend on the size of the pack, the condition and age of the individuals in it, the food resources available locally and the snow conditions (i.e. how hard it is for the wolves to hunt). The decisive factor is likely to be how significant the lost wolf was for the functioning of the pack, for instance, in the context of hunting as a pack.

On the basis of material collected in Scandinavia it has been estimated that shooting alpha wolves does not prevent favourable development of the population as a whole, but it is still not recommended in the interests of ensuring the stability of the population. The number of individual eliminated is significant, but it is also important to take into account the exceptional reproductive ability of the wolf and the ability of wolf populations to compensate for high mortality rates (Pedersen et al. 2003).

6. Expectations and aims in management of the Finnish wolf population

6.1 History of Finnish policy concerning the wolf

(Sakari Mykrä & Mari Pohja-Mykrä, Satakunta Environmental Research Institute, University of Turku)

6.1.1 Wolves as outlaws in Finland from the 14th century

In the Middle Ages, Finland was part of the Kingdom of Sweden and game was chiefly the property of the Crown, but common laws issued by the Swedish kings Magnus Eriksson in 1347 and Christopher of Bavaria in 1442 stated that all subjects were permitted to kill wolves, bears or foxes wherever they were found, without punishment. The wolf held a special position among these predators. It was decreed a civic duty to hunt wolves, with only "priests, parish clerks and landless women" exempted. Every man was required under penalty of a fine to own a wolf net at least four fathoms long and to take part in general wolf hunts whenever called upon.

The royal hunting decrees from 1647 and 1664 repeated the previous provisions concerning the wolf, and emphasized the need for organizing systematic hunts. The hunts were organized by Crown foresters together with local and district officials. This was also the first time in Finland when the hunting of predators was encouraged through the payment of statutory bounties on wolves killed. It was promised that two riksdaler would be paid from town and district funds for a grown wolf and one for a pup. These provisions remained in force in the new laws of the Kingdom of Sweden from 1734.

6.1.2 Intensive hunting in the 19th century

The hunting decree from 1868 that applied to Finland during Russian rule abolished the citizens' duty to take part in wolf hunting. The Decree did not give specific sums of money as bounties, but emphasized the local authorities' responsibility in setting bounties for their area that were big enough to encourage the elimination of pests. Statistical yearbooks show that a total of 5,598 wolves were killed in Finland in 1866–1890,

The Finnish Game and Fisheries Research Institute fitted 82 wolves with radio or satellite collars during the period 1998–2005.

while only 105 wolves were killed in 1891–1898. In these final years of the 19th century, the average number of wolves killed per year thus fell to less than one tenth of what it had been.

There were several reasons behind this forceful culling of the wolf population. Although people had been encouraged to persecute wolves for centuries, there was a tendency to see the wolves as an uncontrollable force of nature whose occurrence and numbers people had little hope of influencing (Teperi 1977). At the end of the 19th century, however, the perception of nature began to change (Franklin 1999) and as more knowledge accumulated, animal populations began to be perceived as controllable entities. In addition to this, there was a series of incidents in south-western Finland in 1880-1881 where several children were killed by wolves, causing people to turn against wolves more than ever before, and the authorities had to take action to reduce the wolf population. In this, they received official assistance from the army and professional hunters from as far away as Russia. In addition to the new hunting methods brought by the professional hunters, the hunting also became more effective as extra bounties were granted from state funds due to the seriousness of the situation. Other background factors that contributed to successful hunting included the emergence of organized hunting associations in the 1860s, more effective information provision and developments in arms technology.

6.1.3 Losses give rise to persecution

By the 1970s, Finland had seen ten or so extensive laws on the hunting of mammal game species since the common laws of the Middle Ages. A closer look at these laws shows that past generations of Finns tended to approach wolves mainly through intense persecution. The wolf was an outlaw, and the reason for this was the damage caused by — or thought to have been caused by — wolves to game and especially to domestic livestock, and the fact that wolves were perceived as a threat to human health and safety.

The reputation of large carnivores for ravaging game has always been overshadowed by smaller carnivores, but the considerable damage they did to domestic livestock and reindeer well and truly exceeded people's tolerance. The losses were extensive. In the four-year period 1877–1880 alone, just before the drop in the wolf population, large carnivores killed 40,198 sheep, 6,972 bovines, 14,189 reindeer and 4,436 other farm animals in Finland (Official statistics for Finland, 1876–1880). Although other large carnivores took their toll, it was believed that wolves were responsible for most of the livestock losses. There were also cases of people, mainly children, being killed by wolves in the 19th century (Pousette 2000, Linnell et al. 2002), something that explains people's attitude to wolves and the actions of the authorities.

The most notorious case in Finland occurred in the Turku area in the 1880s. At the time, two man-eating wolves were proven to have killed 22 victims, and as many as 35 people according to some data (Pousette 2000). The prominent role played by the press helped ensure that that particular two-year killing spree stayed in people's memory, but similar cases had occurred before. During the 19th century, even before the events in Turku, a total of 42 children and two adults had been savaged to death by wolves (Linnell et al. 2002). These figures do not include people killed by rabies-infected wolves, as attacks by rabid wolves were reported separately (Teperi 1977). In addition to south-western Finland, wolves killed people at least in Käkisalmi, Kemiö, Kivennapa and the Tampere area.

6.1.4 The press encouraged elimination of wolves

In addition to legal texts, material from old newspapers also points to the special position of the wolf in Finnish people's attitudes to carnivores. The historical newspaper archives produce a total of over 900 articles from the 19th century on carnivores and birds of prey and the need to eliminate them (http://digi.lib.helsinki.fi/). As many as two articles in three dealt exclusively with observations of wolves and the need to eliminate them.

Understandably, newspaper reporting on wolves peaked during the child killings in south-western Finland. There is no point in carrying out a long-term analysis on fluctuations in newspaper writing on wolves, however. The media in Finland went through a period of upheaval at the time, as newspapers became far more numerous and widespread in the latter half of the century. The way news on wolves alone was distributed in 1878–1883 is telling, however. In the two-year period 1878–1879 prior to the child killings, the number of news items on wolves was 30, compared with 184 news items on wolves during the years when the killings took place. The individual wolves that had done the damage and numerous other wolves were killed, but even in the following two-year-period, 1882–1883, there were still 79 newspaper items on wolves.

Despite the successful reduction of the wolf population at the end of the 19th century, the persecution of wolves was made even more effective with the 1898 hunting decree, which set a bounty of 100 Finnish marks on wolves. This was four times the bounty on bears.

Encouraged by bounties and aided by more advanced hunting methods, this persecution finally caused wolves to entirely disappear from Finland in practice. In 1926–1932 and in the early 1970s, the annual catch of wolves fell to less than five specimens (Nyholm 1996, Statistical yearbooks 1926–1932), and in 1973, the wolf was finally protected in Finland, except in the reindeer herding area. The payment of bounties on killed wolves ended as of the beginning of 1976, although bounties had not, in practice, been paid out since 1973 when the wolf was declared a protected species. Subsequently, wolf hunting in different parts of Finland has been subject to more detailed provisions given by decree when necessary.

6.2 Recent opinion polls

(Jukka Bisi, University of Helsinki)

There have been several Finnish studies in recent years concerning Finnish people's attitudes to large carnivores. In the following, an overview is given of other earlier opinion polls of Finnish people's attitudes and opinions on large carnivores and the main results of these studies, by way of background. The results can be considered representative of the average attitudes of Finns to large carnivores and of the aims for population management of large carnivores.

6.2.1 Opinion-makers and the media encourage attitudes against large carnivores

Pulliainen has studied fear and hatred of large carnivores in Finland and finds that, in addition to historical events it is linked with, the media — mainly the press — that maintain negative attitudes to large carnivores through the way news is reported. In certain areas, opinion-makers are also creating a negative attitude to large carnivores with their statements. According to Pulliainen, the wolf has become a scapegoat that people use to unload their own frustrations and project their hatred on (Pulliainen 1984, Pulliainen & Rautiainen 1999, Pulliainen, personal communication 2005).

6.2.2 People are afraid of wolves

Lumiaro (1997) has studied Finnish people's attitudes to wolves. The study was conducted using a random sample of 900 people taken from the population register, and 502 responses were received. In Lumiaro's study, 52% of the respondents had positive attitudes to the wolf while 27% had negative attitudes. In response to a question concerning development of the wolf population — against a background of the 100–150 wolves in Finland at the time — 27% of respondents said they hoped the population would remain unchanged, 28% hoped that the population would grow slightly, 11% wanted the population to grow noticeably, 7% wanted no wolves at all and 17% wanted the population to be reduced. 10% said they could not say.

In Lumiaro's study, women tended to be slightly more negative towards wolves than men. People with higher education tended to have more positive attitudes than those with lower education. According to Lumiaro, the age of respondents had high significance for their attitude to wolves, with people over 50 taking a far more negative view of wolves than people under 50. Negative attitudes to wolves were also far more common among people who lived in sparsely populated rural areas than among city-dwellers.

However, fear of wolves occurred in equal measure in both cities and rural areas. About one in three respondents in Lumiaro's material said they were afraid of wolves. Lumiaro interprets these fears as being influenced by the myth of how dangerous large carnivores are, suggesting that stories such as 'Little Red Ridinghood' lie behind these fears.

Lumiaro also studied the attitudes to wolves among people from Kainuu living in sparsely populated rural areas in his material in more detail. He says that a majority of people living in rural areas in Kainuu and prone to suffer some kind of damage or loss caused by wolves have a negative attitude to wolves. Of these respondents, 35% raised sheep or other livestock and 44% were hunters.

6.2.3 Concern about growing large carnivore populations in North Karelia

The Regional Council of North Karelia conducted an extensive opinion poll in autumn 1999 that was sent to 1,700 users of the natural environment in the region, bringing responses from 923 respondents (Palviainen

2000). The study focused on opinions and beliefs about bears and wolves among different groups of users of the natural environment.

Of the respondents, 34.7% were concerned about the threat that wolves pose to children, but only 17% were worried about their own safety. The biggest concern (42.6% of respondents) was felt for the safety of hunting dogs. About one in three respondents was also concerned for other domestic animals.

In comparing the degree of concern among the different groups of users of the natural environment in the study, city dwellers were the most concerned for their own safety (31%) compared with other groups, while hunters were the least concerned. Hikers/campers were the most concerned about children's safety, while members of conservation groups were the least concerned. Similarly, members of conservation groups were the least concerned about the safety of hunting dogs.

On the whole, bears were felt to be more dangerous to people than wolves. A similar pattern emerged in a question concerning the perceived danger of meeting a wolf or bear in the wild. Bears were generally considered slightly more dangerous than wolves. About 40% of hikers/campers, city-dwellers, people living in rural areas and berry-pickers considered it fairly dangerous to meet a wolf in the wild, while the corresponding figure for members of conservation groups was 30% and 25% for hunters.

The study also asked for opinions on the wolf population in North Karelia and found that 67% of respondents were in favour of reducing the population. According to Palviainen, opinions on this subject are far more categorical concerning wolves than bears. At the time of the study, the wolf population of North Karelia was estimated at about 50 wolves.

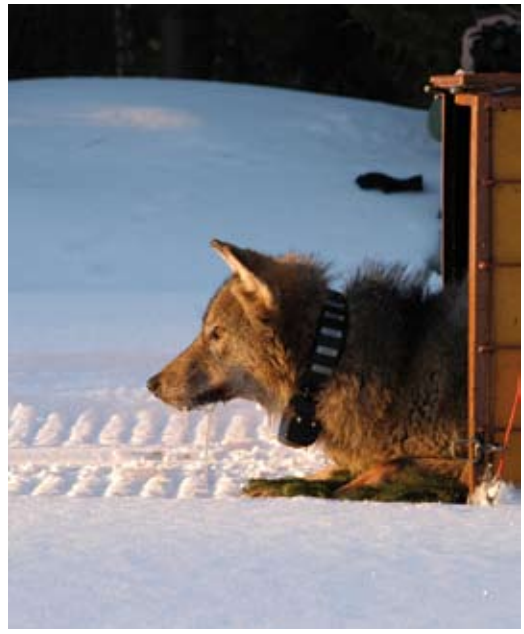
According to Palviainen (2000), the main results of the study show that carnivores arouse concerns in people, they are considered dangerous and people are often in favour of reducing carnivore populations regardless of whether they have ever met such an animal, whether the animals in question exist near the person's home or whether the person even lives in an area where the animals occur at all.

6.2.4 Fear of carnivores on the increase

Vikström (2000) has studied Finnish people's attitudes to large carnivores outside the reindeer herding area. The study was similar to a study concerning the same area from 1996 (Korhonen 1996), though on a more modest scale. In the study questionnaires were sent to 22 municipalities and cities (a sample of 2000 people). The respondents were drawn by lot from the population register. 1,050 people responded to the questionnaire.

According to this study, people's attitudes to large carnivores were typically that Finland should have viable populations of large carnivores, but not in their own immediate surroundings. When respondents were asked to state the suitable population size of large carnivores for their home municipality, more than 60% of respondents in the provinces of Oulu and Western Finland said that there should be no wolves at all in their home municipality. This opinion was also stated by about 40% of respondents in the province of Eastern Finland and close to 60% of respondents in the province of Southern Finland. On the whole, respondents said that a suitable wolf population for all of Finland would be only 100 animals.

In general people were more negative towards the wolf than toward other large carnivores. The most negative attitudes were found among farmers while the most favourable attitude was found among people with higher education. As in Lumiaro's study, older people were generally more negative towards wolves than younger



Research on wolves in recent years has produced valuable new information on wolves in Finland.

people. There were no major differences in attitudes between western and eastern Finland. This means that people in the areas where the Finnish wolf population mainly exists are not more negative towards wolves than people in areas where wolves are only rarely found.

Some 44% of the respondents feared wolves. A fear of wolves was most widespread among people with higher education, with more than half of this group reporting that they were afraid of wolves.

Despite these negative attitudes to wolves, Vikström's conclusion is that attitudes to large carnivores were on the whole more positive in 1999 than in the opinion poll conducted by Korhonen in 1996. The fear of large carnivores had, however, increased over the three years between the studies.

6.2.5 More than 80% of Finns in favour of control of large carnivore populations

In 2004, Taloustutkimus carried out a survey commissioned by the Hunters' Central Organization concerning Finnish people's attitudes to hunting (Taloustutkimus Oy 2004). The data was based on a sample of 1,019 Finns in a representative distribution of age, gender, province and type of municipality. The interviews were carried out in person by 62 trained interviewers.

82% of the respondents said they agreed with the statement "it must be permissible to regulate populations of large carnivores", 9% said they disagreed and 9% said they did not know. Men, people over 60, people with basic education and people who lived in eastern or northern Finland tended to agree. Women, people under 30, people with higher education and people who lived in the Helsinki metropolitan area were less likely to agree.

6.2.6 The policy concerning large carnivores is a source of frustration

A qualitative study by Ratamäki of North Karelian hunters entitled "Do you fear bears, do you hate wolves?" brings out three main observations in its conclusions (Ratamäki 2001). According to Ratamäki, attitudes to large carnivores change slowly. Wolves, in particular, are still hated. Because people are afraid, there are still demands that both the bear and wolf population should be reduced.

Ratamäki points to a division between social and biological tolerance. Although nature could stand bigger populations of large carnivores, the definition of population size should take the social tolerance more into account, and in this, local people should be able to make themselves heard more.

According to Ratamäki, there has always been fear of large carnivores, but it is only in the past few years that they have become a subject of public debate. She considers certain features of contemporary society to be the explanation for this. A general atmosphere of uncertainty creates a need and a drive to control one's immediate environment. Large carnivores represent an unknown threat that occurs in people's own environment. People need to control this threat.

In her work, Ratamäki also gives closer consideration to people's negative attitudes to wolves as a phenomenon. According to her own statement, her interviewees did not include a single 'friend of the wolf'. Negative attitudes to wolves were explained by impressions from fairytales and with dogs lost to wolves. According to Ratamäki, the wolf is also a bone of contention for various interest groups and local people are frustrated because they feel that they cannot influence the policymakers and the policy that is practised in Finland with regard to wolves.

6.2.7 Large carnivores can be accepted in the reindeer herding area on certain specific terms

Sippola et al. (2005) studied reindeer owners' attitudes towards large carnivores in 2002. The study of attitudes was conducted as a postal questionnaire sent to 2,000 reindeer owners over the age of 18. The questionnaire had a response rate of 45%, which corresponded to 18% of the total number of reindeer owners over the age of 18 the previous year.

According to Sippola et al. (2005), reindeer owners' attitudes to large carnivores can be described as utilitarian-humanist. Some 80% of respondents were of the opinion that carnivores are acceptable in the reindeer herding area if damage is compensated for and carnivore populations are controlled. On the other hand, about 80% of the respondents were also of the opinion that man is entitled to eliminate carnivores if they cause economic losses and almost 90% felt that man is entitled to control carnivore populations in whatever way he wants. Older age groups (50–60-year-olds and over

65-year-olds) had a more negative attitude to carnivores than younger age groups, and people who had suffered losses caused by carnivores had a more negative attitude than those who had not. Furthermore, reindeer owners would seem to have a somewhat more negative attitude to large carnivores: about 17% of reindeer owners were of the opinion that large carnivores should be eliminated from the whole of Finland, when the corresponding figure for areas south of the reindeer management area has been 8–12% in previous studies (Korhonen 1996, Vikström 2000).

46% of the respondents in the northern area felt that the present wolf population was acceptable, while the corresponding figure for the western area was 37% and 24% for the eastern area.

6.3 The hearing procedure connected with preparation of the management plan for the wolf population

(Jukka Bisi, University of Helsinki)

6.3.1 Background

The preparation of the management plan for the wolf population comprised a background research process that was implemented in the form of a hearing procedure, carried out by the Institute for Rural Research and Training at the University of Helsinki. The aim of the research was to study the expectations and aims related to the wolf population from both the regional and the national perspective. The study focused on people whose everyday lives are affected by wolves, but also had at its disposal Finnish opinion polls based on random samples and written responses from a broad survey of interest groups. On the basis of this material, a research report was completed in February 2005 concerning the provincial and regional aims and expectations for management of the wolf population in Finland (Bisi & Kurki 2005). The following sections, 6.3.2 and 6.3.3, present a summary of the key parts of the report.

6.3.2 Summary of the research report

The way the wolf population has increased and spread over the past few years has highlighted people's conflicting attitudes to wolves and the differing aims of population management. Debate about wolves has come to a head especially in eastern Finland, the focal point for the Finnish wolf population and also the centre of growth of the wolf population. The international conservation obligations brought by Finland's accession to the European Union and application of a practical policy on wolves at the regional level have led to conflicting views.

The purpose of this study was to identify the aims and expectations concerning the growth of the wolf population, examine their regional and national differences, identify the positions of various stakeholder groups concerning the different aims and particularly to find out the opinions of people who live in the areas where wolves occur and who are involved in interaction with wolves. This was considered important, as it was estimated that these people's attitudes are a crucial factor for successful wolf population management.

A qualitative research method was applied and material was gathered chiefly using two methods. At the provincial level, all the main stakeholders linked with nature, the use of the natural environment or supervision of the use of the natural environment were sent a written questionnaire concerning wolves. Respondents were classified into 9 different categories, responses were entered in a table and the quantitative distribution of responses to key questions was charted. A total of 221 responses were processed.

It was calculated that about 1000 people from the various interest organizations had been involved in prepar-

About 40% of the Finnish wolf population is made up of pups.

ing the responses. Discussions were also arranged with these organizations in each of the 15 game management districts, where the presentation of the responses of the various actors were followed by discussion with the aim of attaining cooperation. A similar process was also carried out with interest groups at the national level. In addition to these, 30 discussion meetings open to the public were arranged in cooperation with the game management districts, and these were attended by a total of 1,617 people who wanted to discuss wolves and the management of the wolf population. The meetings were taped, the tapes were transcribed, the addresses were classified according to content and their content was analysed. About 2,000 addresses on the subject of wolves were heard during these meetings.

People's attitude to wolves is chiefly negatively coloured and the view of wolves tends to focus on the problems involved. The fear of wolves is widespread, and has a background which includes the actual incidents with man-eating wolves in the 19th century, stories about wolves connected with such incidents, and even folktales. Fear of wolves is more of a topic in western and southern Finland than in the northern parts of the country. Wolves are considered to cause great problems for reindeer husbandry and the keeping of sheep and cattle, and also in the use of hunting dogs. The problem is not perceived to be just the damage done; instead the problem of how to provide protection for domestic animals, the prevention of damage and the constant worry about the well-being of animals are also having an impact on people's attitudes to wolves.

Conflicting aims can be found in the ideas that different stakeholders and different regions have on management of the wolf population. Most of the respondents and local people consider the wolf population of eastern Finland to be too big already. People would also like to see the wolf population throughout the country subjected to controlled hunting based on official hunting licences, and people want the social effects of an increase in the wolf population to be taken into consideration in its management. The strongest demands for reducing the wolf population and also the generally most negative attitudes to wolves emerge from the ranks of reindeer owners and people who keep hunting dogs. Unlike other stakeholders, several conservation groups and environmental authorities have aims of increasing the wolf population and they find it hard to accept hunting as a form of population management. The parties in question consider improved information provision and general awareness-raising to be the main means towards ensuring peaceful coexistence between people and wolves, and they also emphasize ecologically sustainable management. There is, however, some dissent within the conservation organizations, too.

In eastern Finland, the local population in some places has already reached the end of their patience. People who live in areas where wolves occur feel that they have no say in decisions that involve their own lives, but that these decisions are made by authorities, conservation organization and the EU without taking any notice of local inhabitants. Almost all respondents wanted a more even distribution of the wolf population, but the rural areas of Finland outside eastern Finland are not particularly willing to play host to a growing wolf population in their own environment. The difficulty of reconciling reindeer husbandry with wolves is also generally recognized. The most favourable attitude to a growing wolf population is found in the southernmost parts of Finland.

Extremely conflicting expectations are placed both on the national authority in charge of game, the Ministry of Agriculture and Forestry, and on the game management districts. This has placed a great deal of pressure on the Ministry of Agriculture and Forestry as it has implemented a policy with regard to wolves that has attracted criticism from nearly every quarter. Similarly, the Finnish Game and Fisheries Research Institute (RKTL), which is responsible for research on wolves, has been operating in a cross-current of opposing motives. A lack of trust that further impedes cooperation has also emerged between the various bodies involved.

If a consensus is to be achieved on wolves, it would demand that the various bodies involved should be willing to make some compromises in their own aims. There are also numerous demands focused on legislation and how it is interpreted, and compliance with these demands would promote attainment of a consensus on wolves and improve people's tolerance with regard to wolves. The demands in question include renewal of the system for compensating for damages and a clearer interpretation of the conservation status of the wolf. However, it may ultimately prove impossible to create a policy on wolves that will please everyone. The numerous possible interpretations of European Union legislation concerning the conservation of individual species is a source of considerable conflict in itself. For example, concepts such as 'favourable conservation status' and 'socially sustainable' are interpreted in the interest of whatever party is doing the interpreting. Due to the nature of the wolf and the fears associated with

it, it should be possible to manage the wolf population in a spirit of consensus. As it is, it has turned into a bone of contention in environmental policy, which makes conservation of wolves and population management more difficult and also makes the cooperation between the various interest groups harder.

6.3.3 Key conclusions from the study

Things that would promote success in managing the wolf population if they were taken into account or developed:

- renewal of the system of compensation for damage caused by wolves,
- development of systems for preventing damage, in which it would be particularly important to find a solution for protecting hunting dogs and securing the resources for preventing damage,
- continuing to take the special position of reindeer husbandry into account in wolf population management,
- in the implementation of population management, it would be important to maintain communication between the various interest groups and to boost cooperation between the various parties involved at the regional and national level,
- clear guidelines should be set down for how to deal with wolves that repeatedly enter the yards of people's houses, cease to fear humans or specialize in preying on domestic animals, and the option of eliminating such wolves should be secured,
- more reliable scientific information should be made available and actively distributed,
- the favourable conservation status of the wolf in Finland or its key principles should be defined, and
- a national management plan for the wolf population should be drawn up and approved on as broad a basis as possible.

Important principles that came up and are important for the maintenance and care of the wolf population particularly from a socio-economic standpoint but which not all interest groups or regions could agree on:

- Joint acceptance that Finland is responsible for maintaining a wolf population in accordance with favourable conservation status in its territory.

This is an aim that is not supported by all individual Finns. Some people feel that Finland has no obligation to take responsibility for the wolf population.

- Continuation of the hunting of the wolf population and monitoring its effects.

Some Finnish conservation organizations and environmental authorities do not approve of controlling the wolf population by hunting, at least not at the present population density.

- Promoting a more even distribution of the wolf population.

People in the rural areas of western Finland are not generally willing to accommodate a growing wolf population.

- Giving more influence to regional administration in the making of decisions.

Certain actors at the national level — especially some of the ideological conservation organizations — would prefer management of the wolf population to be steered mainly from the national level.

- Ensuring adequate resources for research on wolves, monitoring of wolves with transmitter collars, and access to up-to-date information about them.

Some people in sparsely inhabited rural areas — particularly in eastern Finland — do not want wolves to be fitted with transmitter collars anymore, as they feel this worsens the problems caused by wolves.

- It is important to bring in conservation organizations and environmental authorities alike to join in wolf population management.

Some people living in rural areas do not approv of giving added influence to conservation organizations and environmental authorities.

- It is important to admit that social sustainability is an important perspective in the policy on wolves.

Certain ideological conservation organizations would rather put the emphasis more on biological and ecological issues in population management.

PART 2. AIMS AND MEASURES

7. Guidelines for management of the wolf population

7.1 Important principles and conditions of population management

The growth of the wolf population and its expansion to new areas in Finland has provided tangible proof of the challenges of managing the wolf population. The obligations for population management contained in the European Union's Habitats Directive and the demands of local people, especially those who live in areas where wolves occur, are in conflict. The areas where the Finnish wolf population exists are generally sparsely inhabited rural areas. So far, tens of thousands of Finns live in actual interaction with wolves. It is from this group of people that the demand for freer hunting of the wolf population comes, a demand that cannot be accommodated under the legislation currently in force. At present, a large majority of Finns have no first-hand experience of living in interaction with wolves.

One special feature of the shared history of wolves and man in Finland is that there have been negative experiences that are now manifested in the form of fears and, as a consequence, negative attitudes to wolves. In order to ensure that a management plan is also acceptable at the local level, it should be possible to take local demands into account in the future management of the wolf population more than at present. This principle is emphasized on the basis of an assessment that conservation of the wolf will be the most successful if management of the wolf population can take into account the people whose everyday lives are affected by the presence of wolves. This has a considerable impact on people's tolerance of wolves and the potential for successfully managing the population. This must also be taken into account as a kind of socio-economic requirement for managing the wolf population.

The people living in the areas where there are wolves are making increasing demands for amendments both to the Habitats Directive and the relevant Finnish legislation. Any amendment to the Habitats Directive or adaptation of its Annexes to developments in technology and science is, however, a political process, and in addition to a proposal for an amendment from a member state, it also requires international agreement on the amendment and recognition of the need for an amendment. In this sense, other international action may also influence the need for amendments. For instance, with regard to the Bern Convention Switzerland has proposed that the wolf should be transferred from Annex II (Strictly protected fauna species) to Annex III (Protected fauna species). At the 2005 meeting of contracting parties to the Convention, the European Union did not support this proposal, because it would have meant that the wolf could be transferred from Annex IV to Annex V in the Habitats Directive. However, processing of this proposal was not completed and will be dealt with further at the 2006 meeting.

In addition to the socio-economic effects caused by the wolf population, the guidelines for the management of the wolf population also take into account the biology of the wolf and the ecological needs of the species. Although the demands of people living in areas with wolves were mentioned above, the legislation currently in force does not make it possible to answer all those demands. The provisions on ensuring a favourable conservation status for the wolf and the biological requirements of the species in the hunting legislation currently in force have a considerable impact on the practical management and development of the wolf population.

Any guidelines for management of the wolf population over the next few years will also have to take into account the success of past population management and conservation. Despite the conflicting estimates put forward by different parties and the intense debate on wolves, it is clear that the wolf population has developed favourably. Against this background, it would not be justified to change the guidelines applied to population management so far by the Ministry of Agriculture and Forestry in any drastic way. However, a favourable development of the wolf population does create a better situation than hitherto for intervening against wolves or packs that cause problems and for limiting the occurrence of problems.

The growing wolf population will continue to give rise to growing socio-economic challenges. The reproduction rate of the wolves will rise, the population will grow faster and conflicts may occur more than before in an even bigger area, including new areas where wolves have not occurred before.

7.2 A favourable conservation status

In this management plan, a favourable conservation status is examined in the light of the requirements of the Habitats Directive. According to the Habitats Directive, the conservation status will be taken as 'favourable' when:

- population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and
- the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and
- there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

From the point of view of managing and developing the wolf population, the number of breeding pairs is more important than the number of individuals in determining whether the species is able to maintain itself on a long-term basis as a viable component of its natural habitats. This leads us to the concept of the minimum viable wolf population. This is a biologically sustainable entity and a definition that is widely used in wolf conservation (Mech & Boitani 2003b). Furthermore, the minimum viable wolf population must have a balanced gender structure and wolf packs should be stable and functional. In defining viability, the fact that the territories of breeding pairs may extend into Russian Karelia should also be taken into account. The data connected with defining a viable wolf population has been produced by the Finnish Game and Fisheries Research Institute in cooperation with the University of Oulu (Aspi & Kojola, see section 2.4 Viability of the wolf population). On the basis of this data, it can be estimated that the minimum viable wolf population in Finland is 20 breeding pairs. This can also be compared with what has been estimated concerning a viable wolf population in Scandinavia. On the basis of a broad-based expert seminar, Liberg (2005) found that 1–2 wolves arriving in the area per wolf generation (= 5 years) ensures adequate genetic variation to maintain the viability of the Scandinavian wolf population in the long term. On the other hand, if this condition is fulfilled, the effective population size of wolves, i.e. the number of reproducing wolves, should not fall below 50 individuals. In practice, this means an overall population of 150–200 wolves (Liberg 2005).

One key question for the favourable conservation status of the wolf population is in what parts of Finland wolves should occur. At present, wolves exist mainly in eastern Finland. The varied Finnish wilderness provides suitable habitats for wolves practically throughout the country. In western Finland, there are many areas where there are few wolves or none at all today, even if observations of wolves have consistently been made even in westernmost and southernmost parts of Finland. Since the wolf population cannot be maintained at its present size in eastern Finland, maintaining a favourable conservation status for the wolf requires that wolves should also occur in suitable habitats in western and southern Finland. In practice, this means a more even distribution of wolves across Finland, i.e. that individual wolves that leave packs living in eastern and western Finland should ideally move to new areas. This would be a continuation of recent developments and recent management of the wolf population.

The present reproductive potential of the wolf population in Finland is enough to ensure that the population can spread to a wider area. The favourable development of the population in recent years and its systematic development show that the wolf population of Finland in combination with the large wolf population in Russia is viable and that even the elimination of certain individuals has not had a negative impact on the favourable development of the wolf population. Elimination of individual wolves that are dangerous or cause unreasonable trouble has helped improve local people's understanding towards the policy that is practiced where wolves are concerned.

Where the conservation of habitats is concerned, wolves come under the 'priority species' in Annex II of the Habitats Directive. This means that the wolf is a species of Community interest whose conservation requires the designation of special areas of conservation. However, the provisions of Annex II are not applied to the wolf population in Finland, as Finland was given a derogation in this matter in the accession documents. The expansion of the Finnish wolf population in recent years proves that there are enough suitable habitats in Finland to maintain the wolf population at a favourable conservation status.

Aim:
The fundamental aim of management and conservation of the Finnish wolf population is to maintain it at a favourable conservation status. Any

measures taken will take account of economic, social and cultural requirements and regional and local characteristics.

Measures:
The aim will be attained through the combined effect of the measures given below.

7.3 Regional management of the wolf population

7.3.1 New population management regions

The Finnish wolf population centres on eastern Finland, but it is spreading into other parts of the country. In developing the wolf population in different parts of the country, local circumstances and local occupations must be taken into account. As a result, more detailed management measures must be examined and planned separately for each region. In the background, there is also the issue of the differences in status of the wolf in hunting legislation, specifically that the conservation requirements for wolves in the Habitats Directive are implemented differently in the national hunting legislation depending on whether they apply to the reindeer herding area or other parts of Finland.

It is not practical to divide the management of the wolf population at the national level and coordination of the management into too small regional units. On the basis of the situation at present, Finland can be divided into three regions, i.e. population management regions, each with a different situation regarding the wolf population at present and with a different potential for developing it. The proposed new regions are the reindeer herding area, eastern Finland and western Finland (Figure 10).

Measure:
Finland is divided into three wolf population management regions: the reindeer herding area, eastern Finland and western Finland.

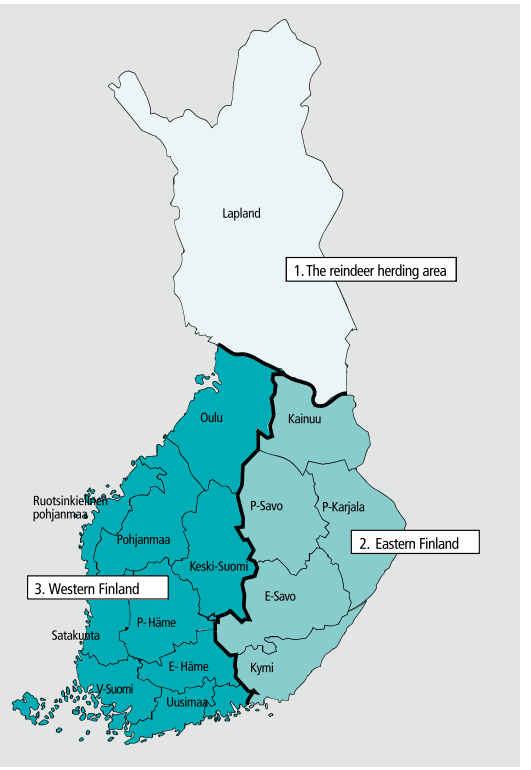


Figure 10. The new population management regions of the Finnish wolf population.

7.3.2 Regional target populations

In the hearing procedure included in the preparation of the management plan, and also in a number of comments on the draft management plan, a demand was put forward that regional target populations should be set for the management of the wolf population. It is not practical to set such target populations with specific numbers given at this stage; instead, they will become defined over time as the wolf population spreads and in relation to the trends in damage caused by wolves and, especially, in relation to demands by local people and the requirements for maintaining wolves at a favourable conservation status. One requirement for increasing the wolf population is that wolves may not cause unreasonable trouble for local people or the work people do to earn a living. Regional game organization in cooperation with regional stakeholder groups will take part in evaluating the regional wolf situation.

Measure:
Development of the wolf population and its effects will be monitored and the need for setting regional target populations with specific numbers given will be examined five years from the approval of the management plan at the latest.

7.3.3 Special aims and measures for specific regions

The reindeer herding area

The reindeer herding area comprises the province of Lapland with the exception of the cities of Kemi and Tornio and the municipality of Keminmaa, and certain municipalities and areas of the province of Oulu, more specifically the municipalities of Hyrynsalmi, Kuivaniemi, Kuusamo, Pudasjärvi, Suomussalmi, Taivalkoski and Ylitornio, and the areas of the municipalities of Puolanka, Utajärvi and Ylikiiminki that lie north of the Kiiminkijoki river and the road between Puolanka and Hyrynsalmi.

In considering the reindeer herding area as a wolf population management district, it must be taken into account that reindeer husbandry is a very important source of income in this area, and that wolves cause substantial damage to it. On the other hand, the wolf population in the reindeer herding area is also subject to certain international expectations, as this area serves as a passage to Scandinavia for reinforcements to the wolf population there. At present, young wolves that wander around are able to disperse freely into Scandinavia during the spring and summer when they normally set out to seek a new territory, since wolves are protected at this time in the reindeer herding area in the same way as elsewhere. Wolf hunting without a hunting licence is no longer permitted in the reindeer herding area at any time, and hunting takes place between October 1 and March 31 with hunting licences granted by the game management district within the limitations set by the Ministry of Agriculture and Forestry.

Measures:
The aim is not to increase the wolf population in the reindeer herding area. The aim is to ensure passage for wolves between Scandinavia and Russia. Monitoring of the wolf population, more provision of current information and prevention of damage are all important measures in wolf population management in this region. Furthermore, cooperation and exchange of information with representatives of reindeer husbandry will be intensified.

Eastern Finland

The wolf population management region of eastern Finland (the areas of the game management districts of North Karelia, North Savo, Kymi and South Savo and the part of the Kainuu game management district that lies outside the reindeer herding area) is the main range of the Finnish wolf population at present. The area is an important core area for the wolf population. The western part of the region still contains suitable habitats for new wolf territories, something which would promote a more even distribution of the wolf population in this region. The present wolf population produces enough young wolves that set out in search of a new territory to the western parts of the region and other parts of Finland.

In many parts of this region (especially the southern parts of Kainuu, Upper Savo and Upper Karelia), the wolf habitats are already fully populated. People who live in this part of Finland generally demand that the wolf population should be controlled through hunting.

Measures:
There is no need to increase the wolf population in the wolf population management region of eastern Finland. Monitoring of the wolf population, more provision of current information and prevention of damage are all important measures in wolf population management in this region. If the total number of litters of Finland's total wolf population allows it, the number of wolves in areas with dense wolf numbers could be reduced.

One further aim in the region of Eastern Finland is to attain a more even distribution of wolves within the region. The human population density and economic structure of the region will be taken into account in management of the wolf population.

Western Finland

The wolf population management region of western Finland (the part of the Oulu game management district that lies outside the reindeer herding area and the areas of the game management districts of Swedish-speaking Ostrobothnia, Finnish-speaking Ostrobothnia, Central Finland, Satakunta, Northern Häme, Southern Häme, Varsinais-Suomi and Uusimaa and the cities of Kemi and Tornio and the municipality of Keminmaa) has plenty of space to offer for a wolf population, but in

many parts of the region wolf population growth would be limited by the human population density, busy traffic and other human activity. There are also strong local attitudes against wolves which would make it difficult to develop the wolf population.

Measures:
In the wolf population management region of western Finland, the aim is that the wolf populations should expand and form new territories, taking into account the human population density and economic structures of the area, however. Monitoring of wolves that wander through the area or settle down in it, more provision of current information and prevention of damage are all important measures in wolf population management in this region.

7.4 Damage prevention and the costs involved

7.4.1 General

Wolves cause damage by killing domestic animals. Damage focuses chiefly on sheep and dogs and, to some extent, on cattle, more rarely on any other domestic animals. However, domestic animals are a particularly problematic category of damage, because losses entail not only economic value but also strong emotional bonds. In addition, wolves in the reindeer herding area may sometimes cause substantial economic losses for reindeer owners locally. Reindeer graze freely and this makes it impossible to prevent damage in practice.

Wolves cause the biggest financial damage to reindeer husbandry in the reindeer herding area.

About two out of three farms with cattle or sheep lie in the wolf population management district of western Finland. However, the numbers of farm animals are proportionally higher in western Finland, as about 80% of all sheep in 2004 were on farms in western Finland (Statistics of the Information Centre (TIKE) of the Ministry of Agriculture and Forestry 5/2005).

Under section 18(3) of the Decree amending the decree on animal welfare (171/2005), dairy cows and heifers raised chiefly for dairy production that are kept tethered shall be released into a pasture or other open space suitable for free movement for a minimum of 60 days between May 1 and September 30. This provision will be applied from July 1, 2006. This provision, designed to promote animal welfare, may have the effect of increasing damage to cattle by wolves unless attention is paid to precautions to prevent damage.

There are different measures available to prevent damage by wolves. One thing they all have in common is that effective measures may give rise to considerable costs. Moreover, the prevention of damage causes extra work and care that it is difficult to estimate a monetary value for.

Support from state funds has been provided for the prevention of damage by wolves. The Ministry of Agriculture and Forestry set aside EUR 800,000 to be allocated for prevention of predator damage and research on the subject in 2005. The corresponding sum was EUR 500,000 in 2003 and 2004. One of the important and well-justified principles applied in preventing damage has been that the costs should correspond to the value of what is being protected. This means that is has not been worthwhile to provide public funding for the prevention of damage to a potential object of damage where the cost of protection clearly exceeds the value of the object being protected.

7.4.2 Fencing

Electric fences

In recent years, about 40 electric fences have been built in Finland to guard against wolves, most of them in eastern Finland and Swedish-speaking Ostrobothnia. The fences in question are usually one of two models: a nylon mesh on posts made from recycled plastic or a metal wire fence supported by wooden posts. In addition, the effectiveness and deterrent effect of the fences has been improved with various plastic ribbons that flutter in the wind.

Building such a fence demands both machinery and human labour. Fences can be built either with paid workers or volunteer work. There have been a certain amount of volunteers available for this sort of work from different quarters. However, it is the farmer himself that plays the crucial part, and this depends on whether he wants volunteers on his farm and how much he is willing to invest in fencing.

The material cost for the nylon mesh fences used in recent years comes to about EUR 1,900 for one kilometre of fencing (Moisio 2005). Similarly, a fence with wooden fence-posts and galvanized wires with insulation fittings would come to about EUR 1,190 per kilometre of fencing. Work costs come to some EUR 2,880 per kilometre if paid workers are used and EUR 1,350 using volunteers (Moisio 2005). One further addition to the costs is the payment for a digger to even out the foundation, at a rate of about EUR 40 an hour. Groundwork and post-holes done by a digger improve the durability of the fence and reduce maintenance costs. On the basis of the above, the level of the total costs for a fence to guard against wolves comes to from EUR 2,500 to over 4,000 for every kilometre of fencing, depending on the methods and materials used and the terrain (see Appendix 5).

Fences are a practical solution for protecting livestock, but one problem in extensive use of fences is their cost and also the other work that they generate, as the upkeep of fencing requires work and vigilance. Vegetation must be regularly removed from under fences and during the winter fences may give way under the weight of snow, while ground permafrost also tends to shift the fence-posts. Fences are also subject to wear and tear during use. If large areas are fenced off, this is an obstacle to other movement in the area, something which may limit the 'everyman's rights', i.e. the general right of free movement in the Finnish countryside. Fences may also limit the free movement of moose and deer, and such animals may break fences. As a consequence, electric fences cannot be considered a suitable damage prevention method for all farms or for large pastures.

According to Moisio (2005), many farmers who have tested fencing on their farms feel that since they have already invested in other fences, wolf-proof fences should be paid for out of public funds. On the other hand, there are also other farmers who feel that the responsibility for protecting their animals is chiefly their own. Since there was previously no need for effective protection of livestock, this changed situation requires a new attitude from farmers.

Over the past years, enough experience has been gained of how practical and durable different types of fences are, and this will be useful in the future fencing projects.

Measures:
Electric wolf-proof fences are, in most cases, a relatively secure way of protecting livestock against wolves. Construction of such fences will continue, but taking the overall expenses and other inconveniences caused by fences into account.

Due to the high cost of fencing, one application that is now being tested is to use an electric fence as a safe overnight area for livestock. This means that a smaller area inside a large pasture is fenced off using an electric fence. Animals are then moved inside this smaller, securely fenced area for the night and released into the larger pasture each morning. From the farmers' point of view, this makes more livestock management work, but considerably reduces the need for investment in new fencing at each farm.

It is not practical to enclose large areas with wolf-proof fencing except in certain special cases.

Lines of streamers

Elsewhere in the world, lines of streamers have been successfully used to prevent damage to livestock by wolves. This alternative is much cheaper than electric fences. There is no experience of it in Finland, however, even if lines of streamers are available.

Measure:
Lines of streamers will be tested as a means of protecting livestock in pastures.

7.4.3 Livestock guarding dogs

Background

The use of livestock guarding dogs is widespread in many countries and has proved an efficient way of protecting livestock from wolves. Finland has no traditions in this area, even if there are people who keep dogs of suitable breeds in Finland. One of the explanations is the traditional Finnish way of pasturing livestock. Farms

generally had few animals which graze near habitation, usually within clearly limited areas. Then again, there has been no special need for livestock guarding dogs in Finland due to the wolf situation for a very long time.

As a consequence of the damage to livestock by wolves, the introduction of livestock guarding dogs is now being considered in Finland. In addition to the lack of traditions and experience in this area, other problems here include the cost of dogs, the demanding training needed and issues of liability. Furthermore, Finnish wolves are bigger and more powerful than the wolves in areas such as the Pyrenees, where livestock guarding dogs have proved successful.

In order to protect livestock from wolves, a team of a few dogs is usually needed. Suitable breeds for this work include many national breeds of sheepdogs and cattle dogs that have been bred for suitable characteristics in the course of practical work (for instance the Akbash, Anatolian Shepherd Dog, Estrela Mountain Dog, South Russian Sheepdog, Caucasian Sheepdog, Central Asian Sheepdog, Komondor, Kuvasz, Maremmano-Abruzzese, Pyrenean Mountain Dog, Sarplaninac and Slovakian Chuvach). Other breeds may also be usable for this purpose, but their handling and working methods may differ. Moreover, the breeding of a number of dog breeds has altered their temper and build so as to make them no longer suitable for the demanding task of guarding livestock.

In order for a livestock guarding dog to operate in the desired fashion, it must be raised and imprinted on the animals it is to guard. The dog must also adopt the pasture as its territory that it will protect. The training of livestock guarding dogs requires consistency and expertise. The protection of livestock also relies on a deterrent effect. As a consequence, certain big breeds of service dog (e.g. German Shepherds) could be suitable for the work as well. One problem in using these dogs, however, is that their temperament includes a strong dependency on their owner, compared with livestock guarding dogs that work independently.

Livestock guarding dogs: costs, opportunities and problems

In acquiring livestock guarding dogs, the cost of a puppy is about EUR 1,000. When the cost of feeding, insurance and other costs (including vaccinations, etc.) are taken into account, the annual maintenance costs for such a dog come to between EUR 500–1,000 depending on the feeding and health of the dog. In the light of this, a team of livestock guarding dogs (three dogs) requires initial investments of about EUR 3,000, with annual maintenance costs of between EUR 1,500–3,000.

Expertise is needed in order to train a livestock guarding dog. It is important to train and raise the dogs with consistency and in the right way. It also has to be ensured that the dogs are not a threat to their environment, as a livestock guarding dog may protect its herd against things other than wolves, and this may create problems in keeping them. Finland traditionally has extensive so-called 'everyman's rights', i.e. a right of free movement across land owned by others. Under these circumstances, it is essential to teach livestock guarding dogs what exactly they are protecting their herd against. It is also an unconditional requirement that the immediate environment has been warned of their presence.

Despite the costs, the requirements for training and the issues of liability involved here, the use of livestock guarding dogs is still one of the alternatives available for protecting a herd of cattle or sheep from wolves.

Measure:
The use of livestock guarding dogs will be tested as a way of protecting cattle in Finnish conditions.

7.4.4 Protecting dogs

If dogs can successfully be protected from wolves, this will prove a key means to improving people's tolerance of wolves. Wolves have taken dogs both from people's yards and during hunting, but in purely numerical terms, these losses are limited to a few dozen individuals per year. Damage by wolves to dogs is definitely on the increase, however, as the wolf population grows. The threat of losing dogs has made it more difficult to use dogs in hunting and in some wolf territories the use of hunting dogs has ceased completely. Since hunting with dogs is an essential part of traditional Finnish outdoor life and considering that nearly half or more than half of the men in some eastern Finnish provinces are active hunters, this is something that has considerable impacts on life in these areas (Kojola et al. 2004b, Bisi & Kurki 2005).

In addition to hunting, there are also other activities involving dogs where the dogs may move alone and off the leash in the terrain, leaving the dog exposed to predation by wolves. These activities include tests and trials with hunting dogs, tracking of wild animals injured

in traffic accidents, tracking, searching, and messenger practice or trials with service dogs, and terrain searches performed by working dogs belonging to the Frontier Guard, the Police or the Defence Forces.

Dog owners are required to comply with the provisions concerning dogs in the Hunting Act and the Animal Welfare Act. Under these provisions, a dog owner is responsible for the handling and welfare of his dog. The dog must further be kept in conditions where the health and general well-being of the animal is ensured.

Dogs kept in yards can be efficiently protected from external dangers by keeping them in netted outdoor runs. Material that is suitable for use as netting in a dog run will also withstand an attack by a wolf. This type of outdoor run should be used more widely in sparsely populated areas. This will add to the cost of keeping a dog, but will provide secure protection for the dog while it is in the yard. A prefabricated outdoor dog run of about 16 square metres costs between EUR 500–700. The dog must also be provided with a shelter from wind and rain in the outdoor run, ideally a dog house with heating. The cost of a dog house depends on the size and materials, and varies from hundreds of euros to thousands.

So far, there has been no adequate method available in Finland for protecting a hunting dog during the hunt. A new invention patented in spring 2005, the 'wolf vest', was tested in the field in autumn 2005. This is a vest that protects the dog's neck, back and pelvis; the surface of the vest carries sensors that also conduct electricity and are powered by a battery. A wolf that sinks its teeth into the vest gets a powerful electric shock that will probably prevent it from continuing to bite. Preliminary information suggests that product development of this vest will produce a final product that will protect dogs against wolves with reasonable certainty. It is predicted that the consumer price for such a vest will be between EUR 500–700. The Ministry of Agriculture and Forestry has supported the project in 2005.

There is a telephone information service that provides information on the movements of wolves with GPS collars, and this may help in protecting dogs. One problem with this service is, however, that the information only applies to wolves that have such collars, and there is still no knowledge of the location of other wolves. However, since wolf packs are likely to move and to hunt together, the existence of even one wolf with a GPS collar in the pack may provide information on the pack's movements that can be valuable in, for instance, the arrangement of moose hunting and the deployment of dogs. The most important time for providing this telephone service from the point of view of protecting dogs is from the beginning of September to the end of December. The telephone information service on wolf movements has received separate funding from the Ministry of Agriculture and Forestry from 2003 onward. At present, the Finnish Game and Fisheries Research Institute is responsible for providing the telephone service.

Dog owners are required by law to ensure that their dogs' living conditions safeguard the health of the dog. New methods have been developed for protecting dogs from wolves even during hunting. For the ordinary dog-owner, the problem here is the cost involved. Since there has not been any real need to invest in effective protection for dogs until recently, the new situation requires that dog owners change their attitude.

Measures:
More effective protection for dogs in yards will be provided by, for instance, constructing suitable outdoor runs.

The telephone information service on wolf movements is maintained during the time of year when the use of dogs in terrain is the most active.

New methods will be developed for protecting dogs.

7.4.5 Principles for the use of funds allocated to prevent damage

The methods available for preventing wolf damage are now more varied and more highly developed. As the wolf population grows and expands, people with farm livestock and dogs who live in areas where wolves exist will have to make added investments to avoid the risk posed by wolves. The government has provided support for preventive actions within the limits of available funds. Material for fencing has been available according to demand.

Development of overall action to prevent damage by wolves and arranging advisory services and training in relation to this has been chiefly the responsibility of the Hunters' Central Organization and the game management districts. Associations promoting the conservation of wolves have also done volunteer work in, for instance, building wolf-proof fences in different parts of

Finland. In recent years, the materials needed to prevent damage have been ordered in bigger consignments and stored centrally by the game management districts. The game management districts have arranged for the provision of advice and instructions on how to use them. This system has worked well. In 2003, the Ministry of Agriculture and Forestry allocated a total of EUR 160,000 for acquisitions of material for preventive fencing, and the corresponding sum for 2004 was EUR 140,000 and EUR 140,600 in 2005.

Measures:
The focus of public funding will be shifted from providing compensation for damage caused by wolves to prevention of such damage.

Damage prevention will apply the principle that the costs should correspond to the value of what is being protected. This means that it is not worthwhile to provide public funding for the prevention of damage to a potential object of damage where the cost of protection clearly exceeds the value of the object being protected.

More information must be distributed concerning the availability of materials for preventing damage by wolves.

7.5 Compensation for damage

Compensation is paid for damage caused by wolves in accordance with the Government Decree on Compensation for Damages Caused by Predatory Animals (277/2000) issued by virtue of the Hunting Act. In 2003, some EUR 30,000 of state funds were used for compensation payments for damage to livestock by wolves, and the corresponding sum for 2004 was EUR 70,000. The state funds allocated for this purpose have covered the compensation payments.

The system for compensation has been the subject of considerable criticism because part of the damage is not covered. In addition to this, the payment schedule for compensation has been considered too slow, since in some cases compensation has been paid with delays of up to a year. The hearing procedure that preceded the drafting of the wolf population management plan showed that all the main stakeholders heard and, especially, people who live in areas where there are wolves all felt that it was important to change the compensation system so as to correspond more accurately to the extent of damage (Bisi & Kurki 2005). Particular demands were made that the deductible should be abolished. Other than that, there were no demands for changes to the compensation system. The Government Decree in force at present defines the system of compensation for damages and the parties responsible for it very clearly.

A working group appointed by the Ministry of Agriculture and Forestry has been preparing a reform of the system of compensation for damage caused by game animals. This work also comprises a study of damage caused by wolves.

The working group that studied compensation for damage submitted its proposal to the Ministry of Agriculture and Forestry on October 19, 2005. The working group proposes a number of amendments to the legislation now in force. The proposal suggests that new legislation should be enacted concerning compensation for damage caused by game animals. The need for a new act arises in part from the need to harmonize the compensations systems for damage by ungulates and predators that are in force at present, and in part from the need to bring certain provisions to a higher level of legislation in accordance with the provisions of the Constitution, e.g. from the level of Government Decree to that of an Act.

The proposed amendments to the system of compensation for damage caused by game animals include, for instance, the proposal that the EUR 250 deductible should be abolished. The working group further suggests that the costs levied for on-site inspection of damage by large carnivores and evaluation of the damage should be reimbursed to the person applying for compensation in a similar way as is already the case with damage caused by moose and deer. The proposal of the working group has been circulated extensively for comment and the plan is to submit the bill to Parliament in early 2006. The intention is that the new act should enter into force as of the beginning of the calendar year that follows the year when it is ratified.

Measure:
The conditions for paying compensation for damage caused by wolves will be reformed through a new act on compensation for damage caused by game animals.

7.6 Derogations from the conservation of wolves and wolf hunting in the reindeer herding area

During the hearing procedure connected with the drafting of the management plan for the wolf population, it became clear that especially in areas where wolves occur, there are widespread demands for permission to hunt wolves and to control population growth or a reduction of wolf numbers (Bisi & Kurki 2005). The legislation in force at present permits derogation from the protection of wolves under certain specific conditions. The primary targets in culling of the wolf population or control of population growth are animals that have learnt to look for food in people's yards, that have become tame due to disease or for other reasons, or wolves that are repeatedly seen near human habitation.

The aim in making derogations from the protected status of the wolf is specifically

- to ensure that the wolf population continues to fear humans and avoid human habitation.

Derogations to the protection of wolves under the Police Act

Under Section 25 of the Police Act (493/1995), police officers have the right to capture or put down an animal causing danger to the life or health of a human being. Police officers have the same right if an animal is causing significant damage to property or serious danger to traffic. Where application of the Police Act is concerned, there is a statement by the Parliamentary Ombudsman pursuant to a complaint addressed to the Parliamentary Ombudsman by Parliament (Dnro 612/4/04). According to the document in question, police officers are also required to take the provisions of the Hunting Act, the Hunting Decree and the Habitats Directive into account in assessing a situation. In practice, this means that it is important to determine whether another satisfactory solution exists and assessment of the impact of whatever decision is made on the favourable conservation status of wolves. According to the statement, application of the Police Act is possible mainly in a situation where there is no time to explore the potential for application of the Hunting Act or Hunting Decree.

Requirements for derogation from the conservation of the wolf in Finnish hunting legislation

According to Finnish hunting legislation, derogations from the conservation of the wolf can be made either by decision of the Ministry of Agriculture and Forestry or by a decision concerning a hunting licence from the game management district. Decisions by the Ministry of Agriculture and Forestry are founded on section 41(2) of the Hunting Act. Decisions concerning hunting licences from the game management districts are founded on section 28 of the Hunting Decree in cases outside the reindeer management area, and on section 1 of the Hunting Decree within the reindeer herding area. The game management districts can make decisions to grant hunting licences outside the reindeer herding area between November 1 – March 31, and in the reindeer herding area between October 1 – March 31. The Ministry of Agriculture and Forestry can make decisions concerning this throughout the year.

According to the Hunting Decree, the Ministry of Agriculture and Forestry may, as necessary, issue provisions concerning restriction of hunting allowed on the basis of hunting licences, the conditions for granting a hunting licence, the procedure to be adopted in issuing licences and information on allowable hunting. The Ministry of Agriculture and Forestry has applied this authorization in giving the game management districts annual instructions limiting the number of wolves that can be hunted with hunting licences granted by the game management districts under the Hunting Decree (so-called regional maximum limits) in order to ensure that the favourable conservation status of wolves is maintained within each game management district.

The number of wolves that can be hunted with the hunting licences granted is not a quota that has to be filled, nor is it the grounds for granting hunting licences. This also means that the maximum limits set by the Ministry of Agriculture and Forestry do not refer to the number of hunting licences. The maximum limit is simply the number of wolves that it is possible to eliminate on biological grounds under the provisions set by the Habitats Directive by decision of the game management districts without endangering the wolf population. The decisions on hunting licences made by the game management districts indicate the number of administrative decisions made, while the number of wolves killed with the hunting licences in question show the number of individuals eliminated from the population through the granting of hunting permits.

More detailed instructions on the conditions for granting hunting licences outside the reindeer herding area are given in the provisions issued by the Ministry, i.e. which of the grounds for making an exception given in

section 28(1)(1–4) of the Hunting Decree (cf. grounds for derogations given in Article 16 of the Habitats Directive) can be used for granting a hunting licence is a situation that occurs in a game management district whereby no other satisfactory solution exists but to make an exception to the general closed season on wolf. In the reindeer herding area, the game management districts of Lapland, Oulu and Kainuu may apply the normal procedures for granting hunting licences. The provisions issued by the Ministry also take into account other killed wolves (those killed with special licences granted after the provisions were issued under section 41(2) of the Hunting Act or section 25 of the Police Act (493/1995) or other wolves killed by man that have come to light). The game management districts have deducted these from the number of wolves that hunting licences have been issued for. This has been done particularly with a view to ensuring that the favourable conservation status of the wolf is not endangered under any circumstances.

The provisions issued by the Ministry have always been based on the annual estimates of the wolf population made by the Finnish Game and Fisheries Research Institute and the scale of sustainable hunting that has been calculated on the basis of the said estimates and on the aim of ensuring a favourable conservation status for the wolf. In setting regional maximum limits for the game management districts, the Ministry of Agriculture and Forestry has also deducted any wolves eliminated through other administrative decisions and all the wolves killed in, for instance, traffic accidents or other human activity that have come to the Ministry's attention. The sustainable hunting quota is determined using the precautionary principle at a level where it cannot endanger the wolf population in a game management district even if the quota is filled.

The provisions issued by the Ministry of Agriculture and Forestry that include the regional maximum limits enable decision-making at the local level, i.e. in the game management districts. This was considered particularly important in the hearing procedure that preceded preparation of the management plan and in many of the statements on the draft management plan. At present, this local decision-making has been made possible in the area in eastern Finland where the wolf population is the strongest. The process is justifiable in the sense that there is special knowledge at the local and regional level about the situation in the area in question, for instance, the number of wolves and their territories, damage caused by wolves, the threat that they pose and the potential for applying some other satisfactory solution than eliminating wolves. Meanwhile, a maximum limit set by the Ministry of Agriculture and Forestry ensures that the wolf population cannot be decimated despite local demands.

In every decision where an exception is made from the protected status of the wolf, the responsible decision-maker defines separately the existence of another satisfactory solution and assesses the effect of the decision on the maintenance of the favourable conservation status of the wolf population. There is no need to make changes to the procedures established under Finnish hunting legislation.

Measures:
The Ministry of Agriculture and Forestry will continue to instruct the game management districts in matters concerning the procedures for granting hunting licences in order to ensure that the favourable conservation status of the wolf population is maintained.

The Ministry of Agriculture and Forestry can give the game management districts further responsibility depending on the development of the wolf population. However, there is no immediate potential for completely autonomous regional management of the wolf population due to the great mobility of wolves and their present uneven geographical distribution in Finland, and as a consequence, coordination at the national level continues to be vital for the present.

7.7 Monitoring of and research on the wolf population and how they can be developed

7.7.1 Monitoring of the wolf population

In monitoring wolf numbers, the observations verified and recorded by the monitoring network for large carnivores as volunteer work have a key role. There is a total of about 1,600 volunteers doing this type of work in Finland. The challenges inherent in this system are to keep up the motivation of these people and to provide training for them. Alongside this observation data, it is also important to use data based on the use of transmitters and intensive follow-up work in order to obtain information on mobility and habitats and also to chart the size of litters. Outside the research areas of the

Finnish Game and Fisheries Research Institute, the usefulness of a new method available as a parallel method for observation data is currently being tested, i.e. determination of DNA profiles from wolf faeces. This method has been used in Sweden, for instance, as a comparative method in determining the number of bears.

The Frontier Guard will continue to record border crossings by wolves. It would be useful to be able to add the data produced by this unique venture in information-collecting, started on the initiative of Professor Erkki Pulliainen in 1968, to the other material that contributes to estimates of the wolf population.

The Ministry of Agriculture and Forestry has been using research results produced by the Finnish Game and Fisheries Research Institute on, for instance, population monitoring, as a basis for its decisions on wolf population management.

Measures:
Steps will be taken to ensure that the monitoring system works in order to produce up-to-date information on the development of the wolf population with good geographical coverage.

The operations of the volunteer monitoring network for large carnivores will be developed so that the people committed to the operations are given regular feedback on their volunteer work and are properly motivated. Maintenance of the system and the provision of motivation and training for the people involved will be implemented in cooperation between the Finnish Game and Fisheries Research Institute and the game management districts.

Alongside the volunteer monitoring network, both transmitter monitoring and data on wolves crossing the border are also needed. Maintenance and development of both these methods will continue.

New methods of population monitoring such as individual DNA profiling will be adopted when it has been established that they are suitable and reliable.

Research cooperation with neighbouring areas, particularly in following the development of the wolf population in Russian Karelia, will be continued.

7.7.2 Other research

Immigration of wolves into Finland from other countries is important for the genetic structure and vitality of the Finnish wolf population. A thorough study of the role of this type of immigration would require a comparative analysis of the genetic structures of the wolf population in northwest Russia and Finland.

It would be useful to know more about how wolves respond to human activity and about various background factors behind the risk of damage. One key issue is to what extent a wolf's behaviour is influenced by individual factors and to what extent by environmental factors. In the background, there are issues such as the obvious problems with obtaining food that young wolves encounter in their new territories in the period shortly after they have left their birth territories. Wolf research in Finland in recent years has focused on Kainuu, Upper Savo and Upper Karelia, and the research on food sources is also from these areas.

The interaction between the wolf population and its prey populations, particularly the moose and deer populations that are regulated through hunting, is not fully understood. This is a crucially important but also difficult and highly complex system, and in order to understand it detailed research material obtained through the use of transmitters and follow-up study is needed in addition to population data.

Empirical data must be collected on the effect of techniques designed to prevent damage on the actual trends in damage, because it is essential to be able to make reliable comparisons of different solutions.

Research on different aspects of wolves generates background information for the management of the Finnish wolf population.

The hearings arranged in preparation for the management plan repeatedly brought out public demands for more sociological study on large carnivores.

Measures:
The scope of research on wolves will be expanded to comprise both ecological and sociological aspects.

The geographical coverage of research on wolves will be expanded to include areas where a wolf population is just beginning to develop. The aim will be to ensure the monitoring of wolves carrying transmitters even in new territories. In addition to being important for the development of basic research, this is also important in the interests of collecting more information on wolves, improving damage prevention, and improving people's tolerance of wolves.

7.8 Training, advisory services and information provision

7.8.1 The Petola Visitor Centre and the www.suurpedot.fi website

There is a great deal of information on wolves available in Finland. There are also many sources that provide such information. One problem in this context is the great variation in the quality of information. Many non-governmental organizations and groups of enthusiasts write about their own views on the wolf population and the biology of wolves, information that they pass on through the media, along with views on what the targets for wolf population management ought to be. It is very difficult for the man in the street to distinguish between truthful and objective information and information that is coloured by ideologies and carries an agenda. The way news about wolves and statements on wolves are presented in the media is often dramatized, too. The importance of information provision on wolves grows as the wolf population grows. What we need at a time like this is distribution of objective, active and unconditionally truthful information.

The Petola Visitor Centre was opened to the public in June 2005. The Centre has a clearly defined role in the visitor centre network of Metsähallitus as a centre that specializes in providing information on large carnivores, including wolves, at the local, national and international level, and the centre also offers other stakeholders opportunities to present their own information about large carnivores. One of the key roles of Petola will be as distributor of information on large carnivores both nationally and internationally, with a target group consisting of anyone who is interested in the subject. The Petola Visitor Centre and the www.suurpedot.fi website maintained by the Centre constitute an objective source of information. Their operations are guided by a monitoring group with representatives of Metsähallitus, the municipality of Kuhmo, the Ministry of Agriculture and Forestry, the Hunters' Central Organization, the Finnish Game and Fisheries Research Institute (RKTL), the Finnish Association for Nature Conservation and the Ministry of the Environment.

Measure:
The Petola Visitor Centre and the www.suurpedot.fi website will actively distribute both national and international current and science-based information on large carnivores.

7.8.2 The hunters' organization

The statutory hunters' organization that belongs to the administrative sphere of the Ministry of Agriculture and Forestry consists of the Hunters' Central Organization at the national level, the game management districts at the provincial level and the game management associations at the local level. The position, structure and tasks of the organization are set down in the Hunting Act. The Hunters' Central Organization and the game management districts are subject to direct performance guidance by the Ministry of Agriculture and Forestry.

The hunters' organization has a statutory duty to provide training, advice and information on game species. Training and advisory services focus chiefly on hunters, but information on game species is directed at the general public, too, via the media. The organization covers the whole of Finland. Everyone who has paid their game management fees receives *Metsästäjä/Jägaren* ('The Hunter') magazine in the post six times a year; the magazine has a circulation of about 300,000, which makes it a significant channel for information in Finland.

The hunters' organization arranges training for hunters including species recognition, tracking and instruction on the legislation concerning hunting and animal welfare. In addition to this, the organization distributes regular information bulletins on regional information, such as the extent of the wolf population. One of its impor-

tant tasks is connected with the training of volunteers for the monitoring network on large carnivores and helping to maintain the network in cooperation with large carnivore research at the Finnish Game and Fisheries Research Institute (RKTL).

The game management associations are the local level of the hunters' organization and important local actors; they operate mainly on the principle of volunteer work and their members are active hunters themselves. This has caused problems for the distribution of information on wolves from time to time, as other organizations have questioned whether information on wolves published by a hunting organization is actually unbiased.

However, management of the wolf population is a topic of particular interest for hunters, since the wolf is a game species and its existence and reproduction have considerable impact on other hunting and on game management. It is also important to bear in mind that the areas where wolves live in Finland consist chiefly of sparsely populated rural areas with a focus on eastern Finland, where a considerable proportion of the people who live in interaction with wolves are hunters. In Kainuu, for instance, about half the total male population over the age of fifteen are registered hunters.

When an alpha pair settles into a new territory and a hunting wolf pack begins to move around the area, this is often a very challenging new situation for people living in the area and the local authorities, and some adjustment is required. In such a situation, it is important to distribute accurate and up-to-date information in the area. Resources should be allocated to farm visits if required, and efforts should be made to dispel unnecessary fears and prejudices against wolves in a neutral manner.

Measures:
The role of the hunters' organization performing its statutory tasks will be reinforced in the management of the wolf population, because its existing operating network and information distribution reaches all hunters in Finland and many other people as well.

The operations of the hunters' organization should be neutral and the organization should distribute current information, provide training and advisory services, with a view to preventing damage amongst other things, and work systematically to improve the general tolerance of wolves.

The key areas of the operations of the hunters' organization are set at performance negotiations that are held annually and the performance guidance document issued on the basis of the negotiations.

7.9 Supervision of hunting

According to section 88 of the Hunting Act, the police, the Frontier Guard, the customs authorities and game wardens appointed by the game management associations are responsible for supervising compliance with the legislation and regulations on hunting within their jurisdiction. In State-owned areas, supervision is carried out by officials designated for the task. Land owners or hunting right holders are also entitled to supervise compliance with the hunting legislation on their land.

The Hunters' Central Organization and the game management districts have taken part in developing the supervision of hunting and the cooperation connected with this work as part of the advisory services for hunters in Finland and the coordination of the work of game management associations. According to section 63 of the Hunting Act, it is the task of a game management association to supervise hunting.

The parties responsible for the supervision of hunting have cooperated to make supervision more effective. Training has also been arranged to this end. Various working groups have also been appointed to study the current state of the supervision of hunting and to propose measures for improving it. The supervision of hunting has proved a demanding task as the resources of the various parties involved have been reduced.

Working groups and projects of interest in improving the effectiveness of the supervision of hunting include a working group appointed by the Ministry of the Interior to improve the effectiveness and contact network of the police in supervising hunting and fishing, a working group on improving the supervision of hunting and fishing by Metsähallitus and amendments to the legislation on the subject, and a project that was jointly administered by the game management districts and police districts in eastern Finland with the aim of making the supervision of hunting part of hunting and fishing.

The supervision of hunting and fishing by Metsähallitus in the State-owned areas under its administration is set down in the act on supervision of hunting and fishing by Metsähallitus. The act will enter into force as of Jan-

uary 1, 2006 and contains provisions on the purpose of supervising hunting and fishing, the task of supervising hunting and fishing, the organization of the supervision of hunting and fishing, the competence requirements for officials performing supervision of hunting and fishing, their authority and the requirements for application of said authority and on the supervision of the operations in question.

Measure:
Cooperation in the supervision of hunting between police, Frontier Guard, customs authority and Metsähallitus personnel performing supervision of hunting and the hunters' organization will be developed further.

7.10 Reintroduction of wolves

Reintroduction of wolves has never been done in Finland (www.suurpedot.fi). Studies of the mobility of wolves have shown that young wolves move around a great deal and have a natural impulse to seek out new territories for themselves. However, there have been repeated demands in eastern Finland for some of the wolves to be reintroduced to other parts of the country as a way of reducing the wolf population in the area. The biggest problem tends to be how wolves and people can find a way of living in fairly close proximity as wolves spread into new areas. When wolves first enter new areas, there is a tendency for a surge in fears and prejudices about wolves. Any reintroduction of wolves carried out through government initiatives would inevitably fuel such negative attitudes and the general resistance to wolves (Bisi & Kurki 2005).

Measure:
There will be no reintroduction of wolves in Finland. The expansion of the wolf population must be allowed to proceed through natural dispersal of young wolves.

7.11 Wolf-dog hybrids

Dog and wolves can interbreed, and it has been suspected that wolf-dog hybrids or feral dogs hunting in packs with wolves have occurred in Finland at least in Perho in 1993 and 1994 and in Juva in 2005. In the Perho case, the animals concerned were part of a pack that could not be analysed in more detail. In Juva, it was a case of a lone male that accompanied a she-wolf, and DNA analysis showed that the male was not a wolf. The method of analysis did not permit further specification.

In both Perho and Juva, the individuals in question proved to cause exceptional amounts of damage and also inspired fear in the local people with their behaviour. These animals did not avoid people as wolves tend to do, and they preyed on dogs in people's yards for food. In the Perho area, they also caused damage to fur farms.

In Finland, there are also wolf-dog hybrids that are owned by private persons, and sometimes such animals are also advertised for sale. There are no data on their numbers. There are also certain breeds of dog (e.g. Saarloos Wolfhund, Ceskoslovensky Vlcak) where wolves have been bred into the lineage. Dogs like this are genetically speaking a type of wolf-dog hybrid, but nevertheless belong to a certain official dog breed. The term wolf-dog hybrid is widely used in referring to dogs that have a wolf cross somewhere in their lineage, even when the cross occurred several generations back.

The Finnish legislation currently in force does not recognize the concept of a wolf-dog hybrid. If a canine animal that does a lot of damage is found in the wild and there is a suspicion that it may be a hybrid, it can be eliminated either under a hunting licence for a wolf issued by the game management authorities, or by the police as the elimination of a dog.

The Finnish Kennel Club has been keeping a register of purebred dogs for the past 116 years, and a register has also been kept of mixed breeds since 1996 (the 'FIX register'). At present, the Finnish Kennel Club register contains information on over 1,069,000 pedigree dogs and the Club has the capacity to maintain a national register of the identification marking of dogs in Finland.

Measures:
The Finnish wolf population will be kept genetically pure. Wolf-dog hybrids and feral dogs running in packs with wolves will be removed from the wild.

A separate study will be made of the need for imposing restrictions or obligatory permits on possession or import of wolf-dog hybrids, and whether a register should be set up for microchip marking of such animals.

7.12 Wolves in eco-tourism

Over the past few years, eco-tourism featuring large carnivores has begun to develop in Finland, and it has inspired growing expectations in different parts of the country (Bisi & Kurki 2005). So far, bears have been a particular focus of this activity. Wolves are also of interest to the eco-tourism sector, but wolves are harder to commercialize than bears. While bears have been lured to tourist viewing spots using carcasses, wolves are unlikely to be attracted with this method, and on the whole, it is difficult if not impossible to arrange for people to see wolves in the wilderness. One possibility is to focus some commercial activity on wolf tracks and tracking, and on opportunities to hear the howling of wolf packs in the wild.

Another thing which makes it difficult to use the wolf as an image in eco-tourism is people's conflicting attitudes to wolves. Local people do not accept the wolf population without reservation, and this must be taken into account in developing eco-tourism that uses wolves as an attraction. The Finnish Game and Fisheries Research Institute, which is responsible for research on wolves, has declined to allow the use of wolves carrying transmitters for eco-tourism as this may hamper research and risk its impartiality.

Measures:
In developing eco-tourism through measures such as commercializing wolves, steps must be taken to ensure that activities are both ecologically and socially sustainable. They must also be acceptable to local people. This is important in view of successful conservation and management of the wolf population.

7.13 Diseases

7.13.1 Animal diseases that can be transmitted to people

A zoonosis is a disease that can be transmitted between animals and humans. A person could get the infection either directly from the animal or, for instance, via foods obtained from that animal. Zoonotic diseases occur in livestock used for food production, in pets and in wild animals.

Rabies is a viral disease of the nervous system that is contagious to all mammals, including humans. The disease is usually transmitted through the bite of an infected animal. The disease is chiefly transmitted by wild carnivores such as foxes, raccoon dogs, wolves and badgers, and by domestic dogs and cats. Rabies can be prevented through vaccination. Rabies occurs in Finland's neighbouring areas in Estonia and Russia mainly in raccoon dogs, foxes and wolves, but it can also affect dogs, cats and other domestic animals.

Finland has been an official rabies-free country since 1991. Rabies is among the animal diseases that Finland actively works to prevent. The prevention programme is designed to stop rabies from entering the country either through imports of domestic animals or through the normal wandering of wild animals from one country to another. Practical measures include obligatory and voluntary vaccination of cats and dogs. Quarantine is also applied in some cases. Inoculation of small carnivores using oral vaccine has also been performed along Finland's southeast border. The cost of the oral vaccine has been paid for by the Finnish government with support from the Commission of the European Union.

The World Health Organization (WHO) carries out surveillance of rabies and regularly publishes bulletins on the subject on http://www.who-rabies-bulletin.org/.

Echinococcus is a genus of small tapeworms with a life cycle that includes a definitive host that is a carnivore (usually among the canidae) and an intermediate host that is a herbivore among the prey species of the definitive host. Most types of echinococcus are zoonotic, i.e. they can be contagious to humans, but humans are then usually meaningless for the life cycle of the parasite. However, having become infected, humans can become very seriously ill. An echinococcus infection is passed on to humans via the faeces of the definitive host (a carnivore).

Echinococcus granulosus occurs in Finland (Maijala et al. 2002). Its definitive host is the wolf (and possibly also dogs), with ungulates (reindeer, deer, moose) as intermediate host. The parasite occurs in the areas near Finland's eastern border, where there are also wolves. *E. granulosus* infection in humans can cause a slowly progressing illness where the parasite forms hydatid cysts especially in the liver and lungs. The available information suggests that the risk of infection in Finland is very small (Maijala et al. 2002).

Another type of Echinococcus that is relevant for Finland is *E. multilocularis* (EELA 2001). It has never been

found in Fennoscandia but occurs in, for instance, Estonia, Denmark, Spitzbergen and northern Russia. The definitive host is fox, but arctic fox, dogs, cats, raccoon dogs and wolves may also act as definitive hosts. Intermediate hosts are rodents, chiefly voles, muskrats and lemmings, but sometimes also squirrels, rats and mice. Infection may be fatal for humans.

E. multilocularis could spread to Finland mainly from Russia, most likely carried by foxes, arctic foxes or wolves. The parasite could also reach Finland through transmission by imported dogs or cats, or carried by Finnish dogs that have been outdoors in wilderness areas in, for instance, Germany, Poland or Switzerland. The risk of transmission of this parasite depends to a great extent on the situation in Finland's neighbouring areas and on the measures taken to control risks in neighbouring areas (EELA 2001).

Research on wild animals is an important aspect of monitoring animal diseases. Anyone in Finland who finds a dead animal can send it in for research. The cause of death is determined free of charge at the National Veterinary and Food Research Institute (EELA).

In Finland, coordination of the monitoring and combating of zoonoses, i.e. diseases that are contagious between animals and humans, is the responsibility of the permanent zoonosis working group appointed by the Ministry of Agriculture and Forestry. The working group has produced a national strategy for combating zoonoses (MMM 2004b).

Measures:
Monitoring and research on zoonoses will continue and be made more effective if necessary in cooperation with other research institutions and authorities.

Measures to stop rabies and *E. multilocularis* from spreading to Finland will continue.

7.13.2 Other diseases

In winter 2004–2005, four wolves infected with mange were put down in the South Savo game management district for animal welfare considerations. The wolves in question had probably contracted mange from raccoon dogs or foxes that they had caught, as mange is highly contagious from one animal to another by direct contact. Wolves with mange have been found in Sweden and Estonia, too.

Mange is caused by mites that are in fact tiny arachnids. The female mite tunnels through the skin of the animal and lays her eggs there. The female then continues to live in these tunnels for a month. The mange mites cause an intense itching followed by skin infection and scabs. Infected animals lick and scratch their skin, and this usually leads to bacterial infections and a darkening and thickening of the skin. Mange can also be transmitted to humans, but the mange mite appears not to breed in humans, so infections generally clear up spontaneously.

If it became more common among wolves, mange might have an effect of reducing the wolf population.

Measures:
Monitoring and research on mange and similar diseases will continue and be made more effective if necessary in cooperation with other research institutions and authorities.

7.14 Cooperation between different authorities and organizations

7.14.1 Regional cooperation

The main responsibility for management of game in Finland at the national level belongs to the Ministry of Agriculture and Forestry. At the regional level, responsibility belongs to the game management districts, and they are part of the hunters' organization. They are subject to performance guidance by the Ministry of Agriculture and Forestry, but they are coordinated at the national level by the Hunters' Central Organization.

However, game is a shared national asset and many other organizations also wish to have a say in game management issues. This is particularly true of large carnivores. In order to develop the cooperation between different authorities and organizations, there are already regional committees for large carnivores in Kainuu, North Karelia and North Savo and their role has evolved into acting as a forum for cooperation and the exchange of information on large carnivores between different users of the natural environment. The Regional Councils convene meetings and chair them.

This model was presented as an alternative worth considering for the other game management districts, too, at regional negotiations led by the University of Helsinki (Bisi & Kurki 2005). It was considered particularly

necessary in areas where a wolf population had already become established. A forum of this kind was not considered to be necessary as yet in areas with sparse wolf populations.

Discussion forums on large carnivores can play an important role in the interaction between different parties and in developing cooperation between them. They make it possible to compile regional opinions and promote cooperation with stakeholder groups, dialogue and the exchange of information.

At the regional level, there is also a general interest in boosting the role of the regional level in decision-making, for instance, on the policy concerning hunting licences. There are, however, problems with the practical implementation of this when an animal that may move across provincial boundaries, such as the wolf, is concerned. The focus of the hunting licences granted by some game management districts in recent years has also drawn public criticism, particularly from conservation groups. Despite such criticism, the game management districts enjoy widespread confidence among regional stakeholder groups in their role as regional actors in game management. Only a few parties have a different view of this. Independent regional decision-making is an aim that has been advocated by the regions themselves on a broad front (Bisi & Kurki 2005).

Measures:
Cooperation with stakeholder groups will be stepped up in all game management districts. Discussion forums will be set up as necessary. Game management districts are in charge of taking the initiative in calling together a wide selection of interest groups. The various bodies taking part in cooperation decide among themselves on how any forum they set up should operate, how often it should meet, who should convene it and how it should be chaired.

The main task of a regional forum is to use cooperation and interaction as a way of bringing regional views and management targets to the attention of the Ministry of Agriculture and Forestry to be used in its decision-making.

7.14.2 National cooperation

At the national level, the responsibility for the management of the wolf population belongs to the Ministry of Agriculture and Forestry. The Ministry of the Environment also acts as an authority in this sphere. It defines the status of any species that is endangered/threatened and as a result, it has considerable influence over the debate on wolves in Finland and internationally. The Finnish Game and Fisheries Research Institute has the main responsibility for research on wolves and monitoring of the wolf population. In addition to this, many public authorities, organizations, associations and other groups operating at the national level are taking a growing interest in stating their own views on the conservation and management of different animal species, and also on population development and ways of preventing damage more efficiently.

Measure:
Cooperation between various actors at the national level will be intensified.

7.14.3 International cooperation

International cooperation and international conventions and their impact have been described in more detail in Part 1 and Section 4. The importance of international cooperation is increasing all the time in issues involving wolves and other large carnivores.

Measures:
The Ministry of Agriculture and Forestry will maintain continued active contact with the authorities in charge of the management of large carnivores in Finland's neighbouring countries. Cooperation with neighbouring areas in Russia, in particular, will continue.

One aim will be to influence the content and interpretation of international conventions and EU regulations so that national characteristics are featured in decision-making while founding the use of natural resources on the principle of sustainable use.

7.15 Responsibility for population management

The main tasks involved in managing the wolf population in Finland are allocated to the various authorities and organizations involved as follows:

ORGANIZATION	TASK
The Ministry of Agriculture and Forestry	The main responsibility for the management and conservation of wolves, delegation, guidance and the issuing of permits/licences. Updating management plans
The Ministry of the Environment	Updating endangered/threatened status
The Finnish Game and Fisheries Research Institute	Responsibility for population monitoring, research and publication of research results
The Hunters' Central Organization	Provision of information, training, advisory services; coordination of the prevention of damage; compilation of statistics; provision of expertise; other coordination work
The game management districts	Regional information provision, training and advisory services; action to prevent damage; issuing licences; regional responsibility for population management
The game management associations	Regional information provision, training and advisory services; action to prevent damage and supervision of hunting
The Police	Supervision of hunting, issuing special hunting licences in emergencies
Metsähallitus	Information provision, supervision of hunting and fishing, and population monitoring mainly in Lapland
The Reindeer Herders' Association	Provision of information, training, advisory services Prevention of damage to reindeer and compilation of statistics on such damage
The Frontier Guard	Supervision of hunting
National Veterinary and Food Research Institute	Monitoring of, research on and information provision concerning zoonoses

7.16 Updating the management plan

This management plan contains a comprehensive overview of the current state of the wolf population and recent research information on wolves in Finland in general. Management of the wolf population will be handled in accordance with the principles outlined in this plan. The fundamental assumption is that the favourable trend in the wolf population will continue and that further research will produce more new information for use in planning and decision-making. It is important to monitor the implementation of the management plan and its impact. If necessary, the management plan should be updated in order to secure the continued favourable conservation status of the wolf population.

Measure:
The implementation of the management plan will be monitored and the plan will be updated as necessary.

7.17 Opportunities and threats for the conservation of the wolf population

In Finland, the wolf population has developed favourably since the early 1990s. The population has grown, reproductive potential has increased, the population has dispersed into a new territory and continues to expand. From 2002 onward, up to one third of Finland's land area is a breeding ground for wolves.

Despite the fact that the Finnish wolf population is defined as 'Endangered' on the basis of a study from 1998 (Rassi et al. 2001), it can be estimated on the basis of the present situation (taking into account the trend in the wolf population, its structure, reproductive potential and genetic structure, management measures that have been implemented and their success) that there is no threat of wolves becoming extinct in Finland at present. In examining the wolf population in Finland, it is also always important to take into account the close

geographical contact of the Finnish wolf population with the large wolf population in Russia.

The present situation would seem to suggest that the systematic management of the wolf population has been successful, even if there has been both regional and national debate on this topic. On the basis of the overall situation and the planned measures mentioned above, it is possible to assume that the favourable development of the Finnish wolf population will continue and that the population will continue to stabilise .

The biggest threats facing the wolf population are estimated to be the same in Finland as in other countries where wolves occur. They are linked with people's attitudes to wolves, people's tolerance of wolves, the fear of wolves and the hatred of wolves that follows from it. There have been incidents of poaching of wolves in Finland on an annual basis, and more specific information on such incidents has been obtained through radio transmitter monitoring. Although wolves have been eliminated from the population every year in the interest of preventing damage and although poaching has also taken place, this has not prevented the favourable development of Finland's wolf population. The good reproductive ability of the wolf population has been able to compensate for the mortality caused by human activity.

The management plan proposes measures that strive to further reinforce the balance between the demands of the local inhabitants and the requirements of the conservation of wolves. The measures focus on prevention of damage, improvement of the system for compensation for damage, development of monitoring and research on wolves, securing the option of eliminating problem wolves and regulating the wolf population, improving people's potential for exerting an influence, developing cooperation at different levels and improving the efficiency of training, advisory services and information provision.

It is particularly important to monitor the development of the wolf population and to ensure that the monitoring system works. The responsible authorities must be prepared to act as developments demand. The biggest future challenges will probably not be the continued existence of the wolf population, but the growth in reproductive potential caused by population growth and the ensuing dispersal of the wolf population and hence a wider range for wolves, which will continue to create needs for measures in ever new areas. In this context, the biggest challenges will be connected with the reactions of local people and the resulting effects.

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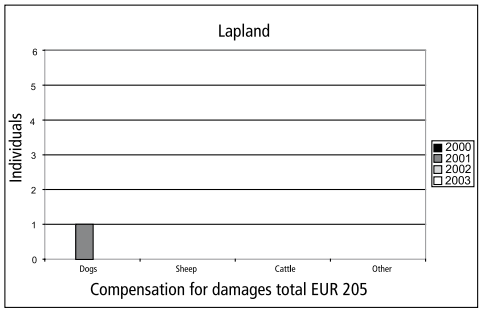
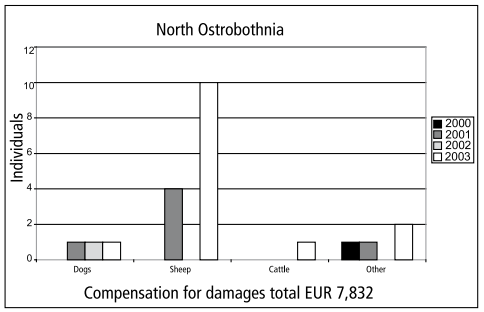
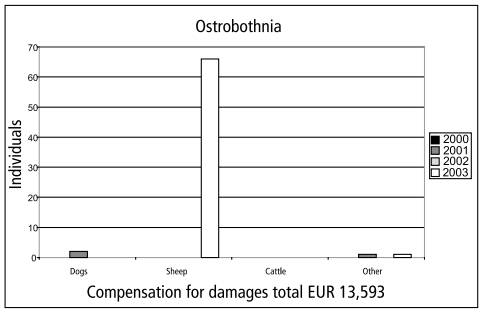
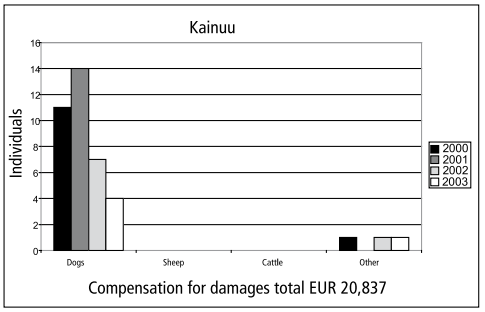
Appendix 1.

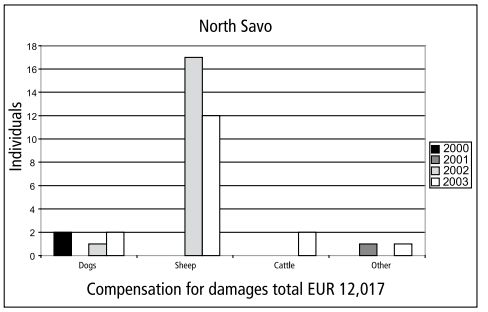
Distribution of damage caused by wolves in Finland by Employment and Economic Development Centre (T&E Centre) in 2000–2003 (excluding reindeer).











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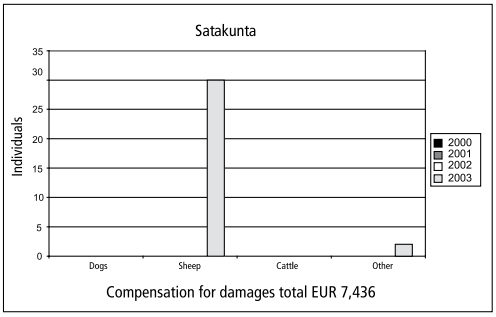
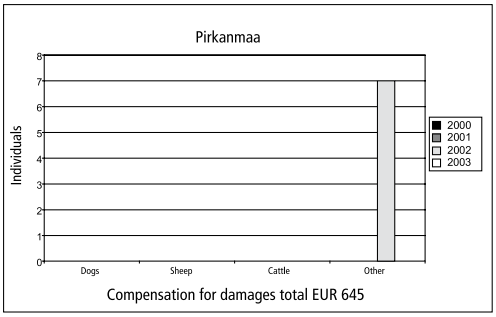
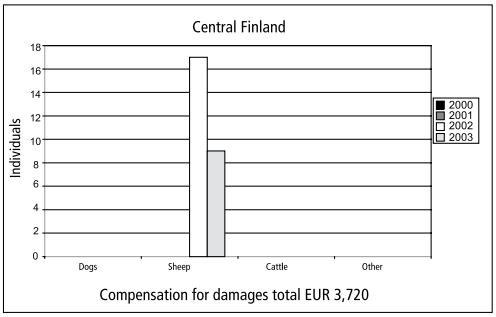
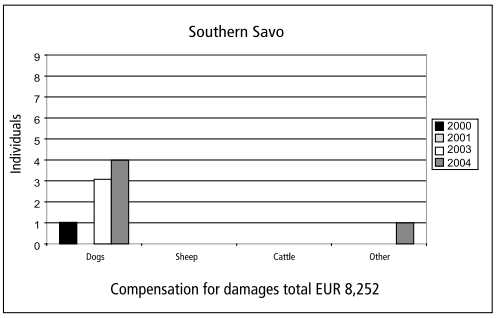
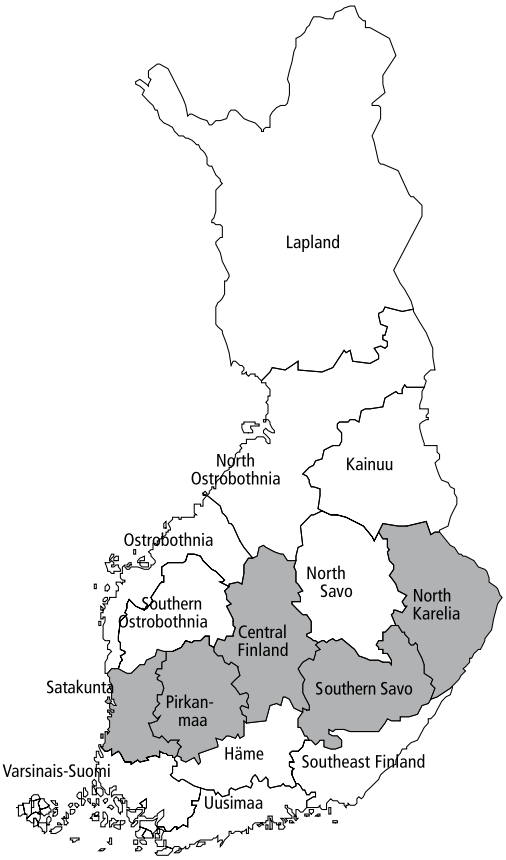
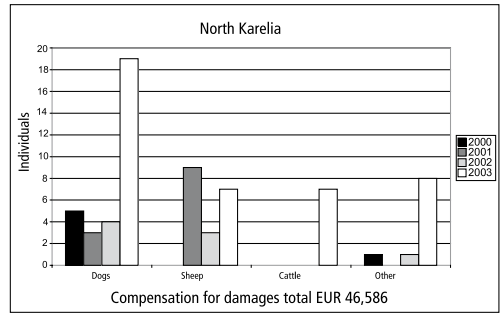






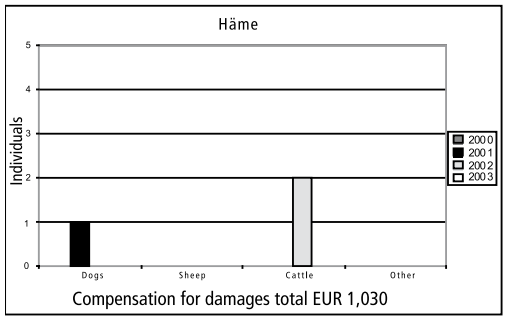


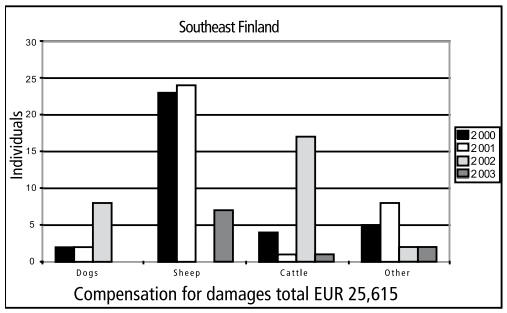


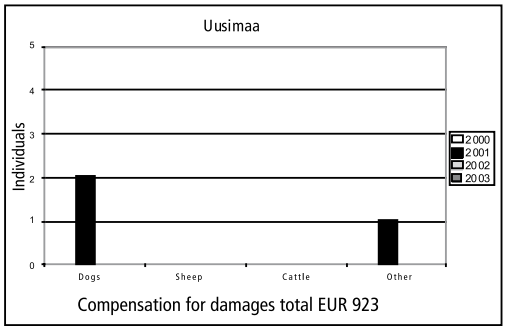


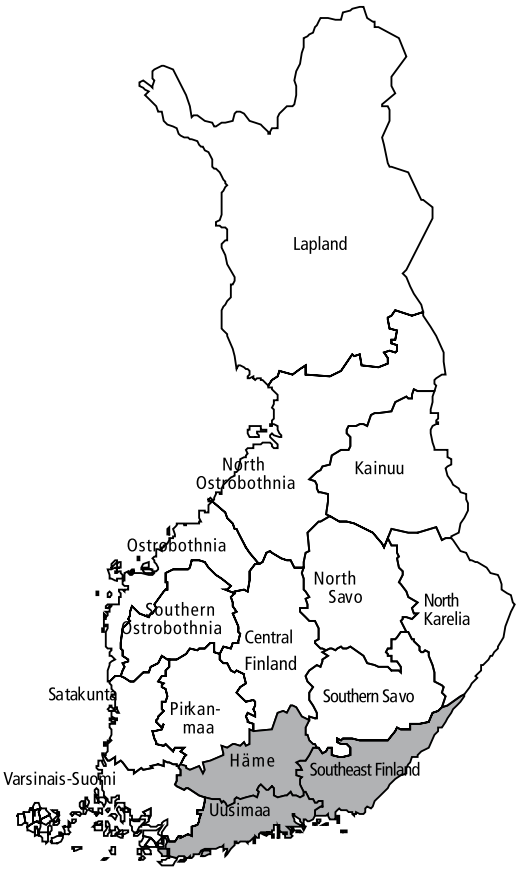
Appendix 3.

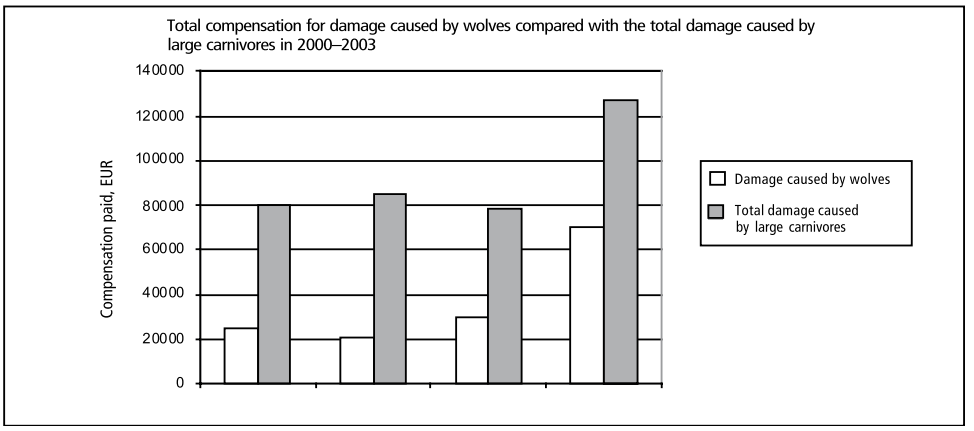
Distribution of damage caused by wolves in Finland by Employment and Economic Development Centre (T&E Centre) in 2000–2003 (excluding reindeer).











Appendix 4. Management plans for large carnivores in Sweden, Norway and Estonia.

Sweden, Norway and Estonia have adopted management plans for large carnivores.

The management of large carnivores in Sweden is based on a Government proposal, 'Regeringens proposition, 2000/01:57 Sammanhållen rovdjurspolitik', approved by the Swedish Riksdag in spring 2001.

The management of large carnivores in Norway is based on a report entitled 'Rovvilt i norsk natur' (Stortingsmelding nr. 15, 2003–2004), approved on December 12, 2003.

The management of large carnivores in Estonia is based on a report from 2002 written by Asko Lõhmus, 'Management of Large Carnivores in Estonia' (Lõhmus 2002).

Aims set for the populations of large carnivores in Sweden, Norway and Estonia:

Country	**Wolf**	**Bear**	**Lynx**	**Wolverine**
Sweden	medium term aim 20 litters/year	minimum aim 100 litters/ year	minimum aim 300 litters/ year	medium term aim 90 litters/year
Norway	Minimum 3 Norwegian litters/year + shared litters with Sweden along the border	Minimum 15 litters/year	Minimum 65 litters/year	Minimum 42 litters/ year
Estonia	100–200 animals	Minimum 500 animals	Minimum 500 animals	——

Appendix 5. The cost of wolf-proof fences per kilometre of finished fence including material and labour costs (Moisio 2005). These calculations do not show the work involved in maintenance and other work on the fences. The price of materials for a wolf-proof electric fence are given at the early 2005 level.

A. MATERIAL COSTS

1. Nylon mesh fence 90 cm/50 m, including 14 posts, à EUR 95.
Cost per kilometre 20 x EUR 95 = EUR 1,900

2. a) Galvanized wire fence 500 m, à EUR 28, 6,000 m, 12 x EUR 28 = EUR 336
b) Treated wood post 180 cm à EUR 4, at intervals of 6 m = 166 posts, 166 x EUR 4 = EUR 664
c) Insulators 100 no., à EUR 19, 166 x 6 = 996 no., 10 x EUR 19 = EUR 190
d) Also needed: spring tighteners and wire connectors.
Cost per kilometre a+b+c = EUR 1,190

3. Electricity-conducting wires of different gauge 5 mm/ 400 m, à EUR 18; 10 mm/200 m, à EUR 12; 12 mm/200 m, à EUR 18; 20 mm/200 m, à EUR 25 and 40 mm/200 m, à EUR 40.

B. LABOUR COSTS

Alternative 1: Cost per kilometre for erecting an electric fence on hourly wages (100 metres of completed fence per day)
- 2 people working, both at EUR 12 an hour
- auxiliary labour costs for the employer, 50% per hour
- 20 working days (total 160 hours)
- costs have been calculated on the assumption that the workers brought some of their own tools and they are not reimbursed for expenses.

Total labour costs: EUR 2,880

Alternative 2: Cost per kilometre for erecting an electric fence using volunteer labour (143 metres of completed fence per day)
- work supervisor is paid EUR 17 an hour, auxiliary labour costs 50% an hour, 7 hours, total EUR 178.50
- 6 volunteers working, travel expenses for one person (excluding student discount) for instance Helsinki – Joensuu – Helsinki, EUR 105.40 (IC train). 6 x 105.40 = EUR 632.40
- Cost per volunteer (full board) for farmer EUR 15 a day, total costs for 6 people EUR 540
- 6 working days (252 hours)

Total labour costs: EUR 1,350.90

Neither calculation includes the cost of a digger to build the foundation, which is likely to cost about EUR 40–55 an hour + 22% VAT depending on the rates of the company operating the digger. Groundwork and post-holes done by a digger improve the durability of the fence and reduce maintenance costs.

Summary

In Finland, the wolf is a game species. The responsibility for the management and conservation of the wolf population belongs to the Finnish Ministry of Agriculture and Forestry. At the regional level, game management is the responsibility of the game management districts, which are administrative units of the Finnish game management and also regional administrative units of the statutory Hunters' Central Organization.

Over the past few years, the growth of the wolf population in Finland and the spread of wolves to new areas have highlighted the challenges of managing the wolf population in Finland. The last time the wolf population was this numerous was in the 19th century. There are strongly conflicting aims involved where the management of the wolf population is concerned, both at the national and the international level.

The management plan for the wolf population in Finland was prepared in compliance with the obligations of Recommendations 59 (1997) and 74 (1999) of the Standing Committee of the Convention on the Conservation of European Wildlife and Natural Habitats, the sustainable use principle of the World Conservation Union (IUCN) and the obligations of Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (known as the Habitats Directive) so as to fulfil the international obligations placed on Finland concerning management of the wolf population. During the various stages of preparation of the management plan, local people, regional stakeholders and national interest organizations were extensively heard.

The management plan for the wolf population in Finland is divided into two main parts. Part 1 sets the background for the Finnish Ministry of Agriculture and Forestry's policy concerning the wolf population. It describes the biology of the wolf and the status of the wolf population and compares the situation in Finland with international research where relevant. Part 1 also deals with topics such as national legislation, international obligations and forms of cooperation, the economic losses caused by wolves, the shared history of the wolf and man, previous aims of wolf population management, the nature of that management so far and sociological research into large carnivores. Further, Part 1 comprises research material drawn from the hearing procedure which is closely linked with the practical part of the plan, i.e. the actual management plan.

The practical management plan presents guidelines based on the biology of the wolf, on the one hand, but also on socio-economic facts that are considered important in this context on the other, all of which the Ministry of Agriculture and Forestry will apply in its continued systematic management of the wolf population in Finland. The fundamental aim of management is to maintain a favourable conservation status for the wolf population. This aim will be implemented through the combined effect of different measures. Measures are proposed for the management of regional wolf populations, the prevention of damage and its costs, compensation for damage, the granting of exceptions from the protection of wolves, monitoring the wolf population, research and how to develop it, the provision of training, advisory services and information, supervision of hunting, transplantation of wolves, wolf-dog hybrids, the potential of wolves in eco-tourism, diseases, cooperation among the various parties involved, how the management plan is to be updated and the allocation of responsibility for population management. The measures to be taken will take into account economic, social and educational demands and regional and local special features. Implementation of the plan will be monitored and the plan will be updated as necessary.

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