

5 Natural, Cultural and Recreational Values in Protected Areas

5.1 Biodiversity Concentrated in Protected Areas

Thanks to the long-sustained work of professional and amateur geologists and naturalists, Finnish nature and its signature features are well known. Long-term monitoring data is available on many well-known organism groups, such as birds and vascular plants. Research has been conducted more recently into plant communities and animal populations, and into the structure of habitats, relations between ecosystems, and the broader and more sustained processes that function within them. Only in the last decades has an overall idea of the factors governing the preservation and loss of species and their habitats begun to emerge. Special attention has been paid to threatened and vulnerable species.

By implementing conservation programmes based on the best available information and on systematic surveys, Finland has sought to create a network of protected areas that covers the broadest possible range of known biodiversity while allowing for social constraints. Studies of habitats and species performed for the Natura 2000 network and other survey work have helped to ensure that biodiversity of European significance is duly conserved within the protected area network.

Systematic habitat inventories and species studies are gathering further data on the natural values of these protected areas. Information compiled in data systems provides an essential basis for planning and monitoring the management and use of these areas.

5.1.1 Biogeographical Zones and Diversity Hot Spots

Finnish natural environments can be divided into a wide range of zones according to their geology, vegetation or other factors. Topography and vegetation vary between major geological zones. The regional distribution of mire systems also primarily reflects geological conditions. Phytogeographical zones based on forest vegetation have been used for such purposes as assessing the coverage and representativeness of forest ecosystem protection.

The geographical distribution of species in Finland is largely dictated by climate. The greatest number of species occur in the southwestern corner of the country and the Åland Islands, while there are fewer species in Northern Lapland. Birds and vascular plants also tend to be more abundant in coastal areas. Mire birds and certain insect groups are exceptions to the general principle that fewer species tend to thrive at higher latitudes. Special habitats, such as herb-rich forests and limestone regions, are also diversity hot spots. The most important areas are shown on the map of Finland's vegetation zones (Figure 9 on page 41).

5.1.2 Geological Diversity Survey Underway

Geodiversity, or variations in the geological characteristics of soils and bedrock, provides a geological perspective on natural diversity. Geodiversity is the foundation of the living environment. Geological factors in soils and bedrock affect an area's landscapes, vegetation and thereby also its species in general. Rock and soil formations also affect the value of an area for human recreation and as sites of interest to archaeologists and cultural historians.

Geological formations are natural formations of rock and soil arising from diverse geological processes that have occurred at various times. These may vary in scale from small, readily identifiable sites, such as giant's kettles, all the way to extensive areas, such as esker formations. Ridges and terminal moraine formations are among Finland's most impressive geomorphological formations, and provide important habitats for many declining species of plant and butterfly. Wind-blown and littoral deposits likewise provide important geological sites and landscapes, and are also ecologically significant habitats for threatened species.

To investigate and conserve geodiversity, the Geological Survey of Finland has been working with the Finnish Environment Institute and other organisations to survey and assess Finland's

geological formations. An inventory of small geological sites has already concluded, with surveys of rocky areas and moraine formations completed at the end of 2005. Ten regional reports of the results of this survey have been prepared so far, covering about 2,500 rocky areas. These inventories classified over 1,000 sites with a combined area of nearly 110,000 hectares (1,100 km²) as nationally valuable rocky areas. A survey of wind-blown and littoral deposits began in 2006 and summaries of this work will be completed over the next few years.

The purpose of these inventories is to survey and assess geological sites from the point of view of biological, geological and landscape value, and to produce a uniformly classified database for such purposes as land use planning. Inventories are compiled with special attention to the natural states of areas, their immediate surroundings, their historical and archaeological importance, and their significance for human recreational purposes. The inventory data for rocky areas has been entered in a database maintained by the Finnish Environment Institute. The Geological Survey of Finland maintains the corresponding data for moraine areas and for wind-blown and littoral deposits. This data is all available to Metsähallitus on the basis of partnership agreements.

Conservation status of geological formations unclear

Protection of geological formations in Finland is mainly based on the Nature Conservation Act and the Land Extraction Act. Small-scale geological sites can also be protected under the Nature Conservation Act as natural monuments. Many well-known and impressive geological formations are located in national parks and other nature reserves. The national landscapes at Punkaharju Ridge and Koli are good examples of this, as are many fells, such as Pallastunturi and Pyhätunturi, the Kevo and Oulanka canyons and Helvetinkolu gorge in Helvetinjärvi National Park. There are also many other less well-known or less impressive formations located in protected areas that may not have been the primary reason for conserving these areas.

The latest survey reports for valuable rocky areas indicate a degree of protection of nationally valuable rocky sites of about 30%, including

sites within the Natura 2000 programme. The conservation of sites outside protected areas has also been quite effective, as the findings of the inventory are widely used as background materials when permits are issued under the Land Extraction Act, and in regional planning. The conservation situation for formations of other kinds has not yet been reviewed systematically.

The conservation status for geological formations was studied on the basis of examples in assessments of the representativeness of protected areas in 2000. This study was based on a map review, with samples taken in five major geological regions. The most common formations, such as aapa mires, eskers and terminal moraines, were found to be well represented. Conservation of less common formations, on the other hand, was found to be poor. Furthermore, many prominent formations cover a large area and are not comprehensively conserved by small protected areas.

In 2006 the Geological Survey of Finland, the Finnish Environment Institute and Metsähallitus launched an extensive joint study of the representativeness of the protected area network from the point of view of conserving geodiversity. This project will investigate geological formations in protected areas, including such formations as eskers, moraines, shifting and stationary dunes, littoral deposits, estuaries, raised, aapa and palsa mires, fell screes, taluses and boulder fields, and polygons created by the action of frost. The results of this work are expected by the year 2015.

5.1.3 Threatened Species and Habitats as Indicators of Biodiversity

National reviews of biodiversity are conducted by monitoring overall trends in species, changes in the relative abundance of species occurring in certain habitats, and trends in the populations of certain key species. Some 60 monitoring programmes providing biodiversity data are underway in Finland. Some of these are “general monitoring”, such as the national monitoring of forests or nesting birds and game species. Others are special monitoring programmes focusing on nationally or internationally rare or endangered habitats, species and populations.

Biodiversity monitoring pays special attention to threatened species, which can help researchers to draw conclusions about the main pressures



Pyhä-Luosto National Park is known for its special geological formations. This 35 km long fell chain is a relic of one of the oldest mountain ranges on the globe. It was formed more than 2,000 million years ago. Photo: Veikko Vasama.

affecting various habitats and the most urgent measures required to prevent any further decline in biodiversity. Habitats that have become threatened have also been assessed in recent years. However, the work done for special monitoring corresponds to only about one third of the efforts devoted to general monitoring.

One in ten species red-listed

The last comprehensive review of the status of species in Finland was conducted in 2000. Previous Red List reviews were made in 1992 and 1986. Work on the next Red List began at the end of 2006 and should be completed by 2010.

According to the estimate made in 2000, there were about 43,000 species in Finland. Only about 35% of these, or about 15,000 species in all, were sufficiently well known at the time to enable any assessment of their threatened status. A total of 1,505 plant and animal species in Finland were classed as threatened. These threatened species have been divided into the following categories using the IUCN system: 249 are critically endangered, 452 are endangered, and 804 are

vulnerable. In all 186 species were found to be extinct and 1,060 were near threatened.

The proportions and numbers of threatened species in various taxonomic groups and habitats are shown in Figures 17 and 18. These figures also show forecasted trends for the red-listed species up to the year 2010. This comparison is based on a review of about 13,500 well-known species.

A species may be protected under the Nature Conservation Act, if its existence is threatened. It may be listed as threatened or placed under strict protection if its preservation under natural conditions in Finland is jeopardised. At the end of 2005 the Government amended the Nature Conservation Decree to update the lists of protected species, threatened species and specially protected species, as well as species covered by the EU Habitats Directive. The Decree now lists 1,410 threatened species, 608 of which are strictly protected. Occurrences of strictly protected species may be demarcated, with land use subsequently restricted within this area. Protection programmes must be prepared for such species where necessary. The amended Decree came into force January 2006.

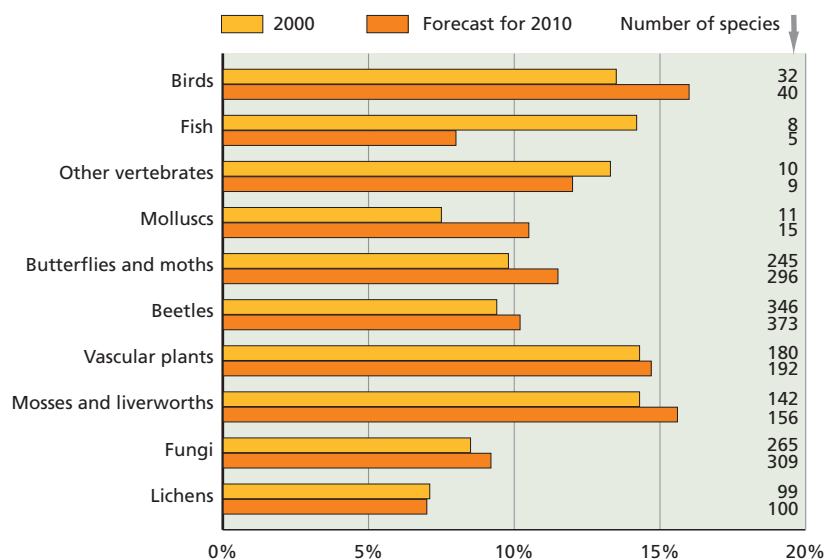


Figure 17. Percentages and numbers of threatened species by taxonomic group, based on national Red List assessment in 2000, and forecast for 2010. Source: Finnish Environment Institute.

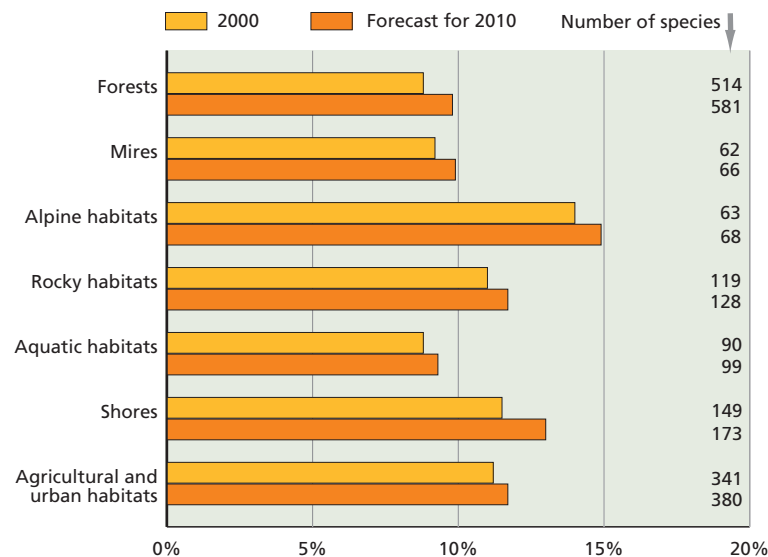


Figure 18. Percentages and numbers of threatened species by habitat type, based on national Red List assessment in 2000, and forecast for 2010. Source: Finnish Environment Institute.

Monitoring of species listed in EU directives

The EU Birds Directive and Habitats Directive require that species of community importance (known as Directive species) and their habitats should be protected, and their exploitation controlled. Steps must also be taken where necessary to achieve a favourable conservation status for such species. A species' conservation status is favourable when long-term conservation of the species is assured in its natural environment and

the natural range of the species does not diminish. The habitats of the species must also suffice to ensure that populations are maintained in the long term. The principal instrument for achieving this objective is the Natura 2000 network.

Finland is home to 83 animal species, 46 plant species and 3 plant families that are listed under the Habitats Directive. A total of 62 species covered by the Birds Directive also occur in Finland. With respect to the European beaver, wolf, bear, lynx and all six fish species, Finland has secured derogations from the general provision of the Di-

rective requiring Special Areas of Conservation to be established for Directive species. Finland is also authorised to deviate from the requirement of strict protection for the European beaver and the wolf in regions where reindeer husbandry is practised. Care must nevertheless be taken in these regions to avoid jeopardising the favourable conservation status of these species.

The conservation situation for plants and invertebrates covered by the Habitats Directive was assessed in Finland in the year 2000. The basis for this assessment was the existing proposal for Finland's Natura 2000 network, which has later been further extended. While the degree of conservation of these species was found to be relatively good, the conservation status of some was unfavourable, especially in the case of certain forest species. The findings of this study are described in Information Box 8. The conservation situation for vertebrates was also investigated in assessments of Natura network representativeness. This review focused on certain red-listed species of mammals and birds that had already been monitored for several years. Aside from the arctic fox and lesser white-fronted goose, the conservation degree and status of most of these species were fairly good.

A group of Directive species formed the special focus of an assessment conducted for Finland's National Action Plan for Biodiversity over the period 1997-2005. The aims of reviewing changes in populations of these species included investigating how joint European responsibility for species protection had succeeded during the term of the action programme. Altogether 79 Habitats Directive species and all of the Birds Directive species occurring in Finland were selected for the target group.

Trends in the populations of Directive species and other threatened species appear to differ. This is partly due to the shortness of the review period for Directive species compared to the ten-year period used in the previous review of threatened species. The conservation situation for Directive species is better than that of red-listed species on average, as their occurrences were the basis for establishing the Natura network. The difference is also partly due to the fact that the Directive species were largely selected on the basis of principles derived from countries in Southern and



The little grape fern (*Botrychium simplex*). This species is endangered in Europe and is under special protection in Finland. Metsähallitus has particular responsibility for its viability as all eight of its known occurrences lie within Natura 2000 sites managed by the NHS. Active management at three sites has led to significant increases in populations. Photo: Leif Lindgren.

Central Europe, even though the species annex to the Directive was enlarged to include Boreal Region species at the request of Finland and Sweden. Some of the Directive species are threatened in European terms, but remain relatively common in Finland. Populations of some species are replenished from regions to the East lying beyond the boundaries of the EU. One good example of this is the large carnivores, whose conservation situation in 2005 is examined in Information Box 9.

As part of the Habitats Directive implementation report for the period 2001-2006, new data is currently being compiled for the purpose of nationally assessing the conservation statuses of Directive habitats and species. The conservation situation across the EU will be assessed as a whole after 2007.

Conservation Situation of Directive Species Generally Favourable

The conservation situation of the Habitat Directive Annex II species found in Finland was evaluated in 2000. A total of 74 species were covered, including 30 vascular plants, 13 mosses, 9 butterflies, 14 beetles, 2 dragonflies, 1 bug and 5 mollusc species. The distributions, population trends and conservation situation in Finland of each species were evaluated. Occurrence data was collected mainly from natural history museums, the Finnish environmental administration's database of threatened species, Metsähallitus, regional environment centres, and individual researchers and amateur naturalists. Most of this information has now been incorporated into the Finnish Environment Institute's Hertta threatened species database.

The conservation situation of the species is assessed in two ways. The **conservation degree** of each species expresses in percentage terms the proportion of all known recent occurrences of the species located within the Natura 2000 network. The **conservation statuses** of species for which sufficient data was available were also assessed as defined in the Habitats Directive. In assessing whether each species' conservation status is favourable or not, researchers evaluated the status of and changes in all known localities of the species, and analysed the likely future trends related to species' distributions, potential habitats and the viability of their populations.

Species were divided into three categories, according to the assessment method developed by the European Environmental Agency (Figure A). The lowest category includes species with less than 20% of all their known recent occurrences under protection. In the middle category, the conservation degree is 20–60%. The highest category includes species with more than 60% of their occurrences protected. In Figure B, species have been divided into three categories according to their conservation degree: unfavourable, partly favourable and favourable. The fourth category includes species whose conservation degree could not be evaluated.

According to the assessment, the conservation degree of the Habitats Directive species was already quite high in 2000. It was presumed that Finland's Natura proposals would be approved together with additions made in 2001. Therefore

the estimate closely matches the current situation, even though a few additions to the network have been made since.

Half of the listed species have a conservation degree exceeding 60%. There are 20 completely protected species, which is more than a quarter of all the assessed species. Species with a conservation degree of more than 60% clearly have fewer known recent occurrences than species in other categories. A third of the assessed species have a conservation degree of 20–60%, and only eight species have a degree less than 20%. In these categories, species have an average of almost a hundred known recent occurrences. This indicates that the rarest species of all tend to be under the highest degree of protection. The highest protection percentages are reached in the groups of mosses, beetles and molluscs. Butterflies have the highest variation in their conservation degree.

The conservation status, which better describes both how threatened any species is, and its qualitative conservation situation, is not necessarily congruent with the quantitative conservation degree. A total of 31 species (42% of those assessed) had unfavourable conservation statuses, whereas 20 species (27%) had favourable conservation statuses. Partly or probably favourable was the conservation status of 15 species (20%). It was not possible to assess the situation of 8 species. The least favourable conservation statuses were most commonly assigned to beetles and mosses, and the most favourable statuses for butterflies. The conservation statuses are particularly unfavourable when the numbers of occurrences and the quality of the required habitats have drastically declined, and only few recent occurrences are known. In such cases the protection of a small number of remaining sites is not sufficient to secure a favourable conservation status.

In most cases, a species' conservation status can best be improved by ensuring that recent known occurrences are managed or restored, or by initiating active measures to revitalise species. It is most important to remove any threats, and to make habitats more favourable for the survival and recovery of species' populations. The types of measures necessary can vary greatly between species. To plan the most effective measures, detailed

information is required on the demands of the species, and the state of its occurrences. More detailed data is still needed for almost all the assessed species to maintain their conservation statuses or purposefully improve them.

Source: Ilmonen, J., Rytteri, T. & Alanen, A. (eds) 2001: Finnish plants and invertebrate animals in the EU Habitats Directive. A scientific evaluation of the Finnish Natura 2000 -proposal – The Finnish Environment 510. Pp. 172-173.

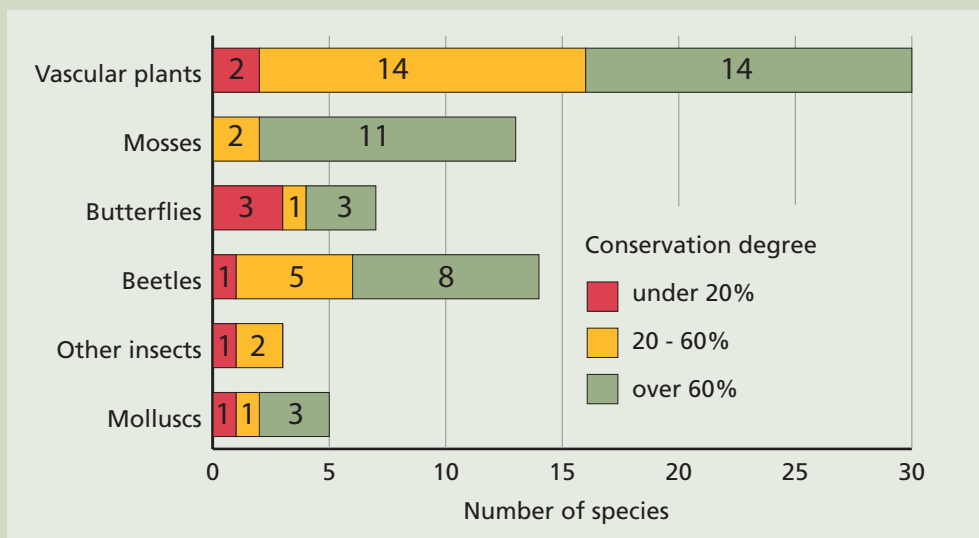


Figure A. Conservation degree of Habitats Directive Annex II species by taxonomic group.

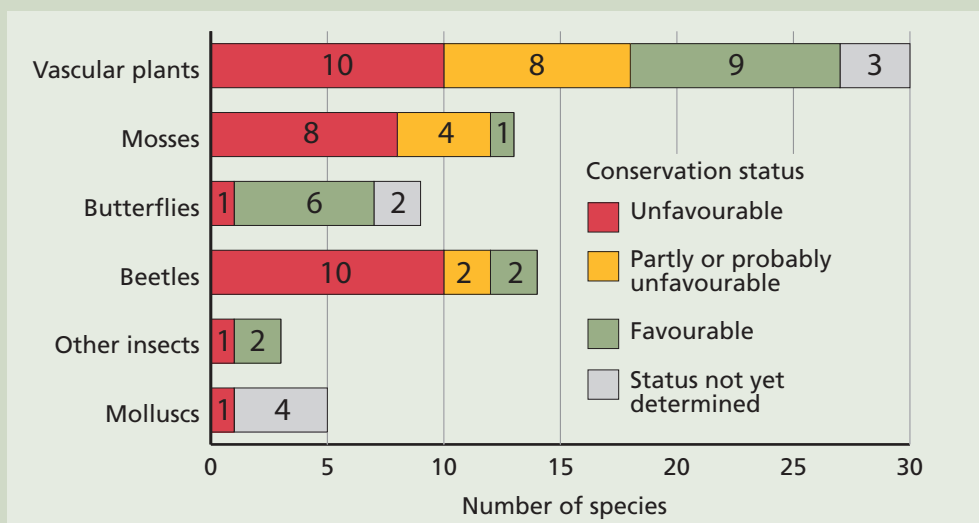


Figure B. Conservation status of Habitats Directive Annex II species by taxonomic group.

Finland's Large Carnivore Species Among the Threatened in Europe

There are four large land carnivores in Finland: the brown bear (*Ursus arctos*), the wolf (*Canis lupus*), the wolverine (*Gulo gulo*) and the lynx (*Lynx lynx*). These species are listed in EU directives for strict protection, except for the lynx.

Most of Finland's bear and wolf territories are located in eastern parts of the country. The lynx population is more southerly, and also more evenly distributed between eastern and western parts of Finland. Wolverines are mostly found in Fell Lapland and Eastern Finland. Some 52% of wolverines and 23% of bears live in the reindeer herding region. All the large carnivores require extensive territories. Sweden and Norway share the Scandinavian populations of all four species, and Finland's wolf and bear populations are especially strengthened by the connection to larger Russian populations. Individual protected areas are not very important in maintaining populations of large carnivores, which will only remain viable in large enough areas of unbroken and undisturbed habitat, with no excessive hunting or poaching.

The Finnish Game and Fisheries Research Institute estimates that, in the end of 2005, there were 810-860 bears, 205-215 wolves, 145-150 wolverines and 1,100-1,200 lynx in Finland. The most recent Red List evaluation of threatened species in Finland, in 2000, lists the wolf and the wolverine as endangered, and facing a very high risk of extinction in the wild in the near future. These species could both even be classified as critically endangered, if they were not

connected to Russian populations. Bears and lynxes are classed as near threatened, and there is no evidence that they could become extinct in the medium term. Without the strengthening of their populations from Northeast Russia they could be classified as vulnerable, based on the limited size of their populations. Estimates of the numbers and breeding rates of large carnivores are mostly based on information on sightings collected by designated contact persons. Populations have clearly become more abundant over the last twenty years.

The presence of large carnivores has led to conflicts involving reindeer herders and other groups, and the State compensates for damage caused to livestock by large carnivores. The aim of this is to prevent poaching, and to safeguard living space of the carnivores. Population management plans are also drawn up, stating measures needed locally and nationally.

A management plan for Finland's wolf population was completed in the end of 2006. It includes guidelines describing how the Ministry of Agriculture and Forestry resolves to manage the wolf population and resolve conflicts related to wolves. During the drafting of the plan, the opinions of many different stakeholder groups were heard, including local residents, local NGOs, and national organisations interested in wolves. Similar population management plans for lynx and bear are due to be completed by the end of 2007.



Wolf (*Canis lupus*). In Finland wolves have plenty of suitable habitat and prey. The main problem in conservation is their bad reputation. People consider wolves as a threat. This makes it important to reduce damage caused by individual wolves and to provide reliable information on the species. Photo: www.tunturisuus.com.

Protection and assessment of rare habitats

Habitats are conserved in nature reserves to safeguard biodiversity and the preservation of their associated species. Habitat types, that have become rare or are of particular value for biodiversity, also enjoy statutory protection in commercially exploited areas. The Nature Conservation Act protects nine types of biotope and the Forest Act protects seven habitat types of special importance. Four types of aquatic biotope are protected under the Water Act. To be eligible for protection, habitats must be in a natural or near natural state. Habitat protection under the Nature Conservation Act differs from conservation in conventional nature reserves in the manner of establishment and protection. The boundaries of such protected sites are specified in decisions made by the regional environment centres. This protection seeks to conserve the characteristics of habitat types, rather than imposing complete inviolability on the area. Indeed, many habitats cannot be conserved without continual management and use.

The Habitats Directive protects nearly two hundred habitat types that are considered important at EU level. These “Natura habitats” are habitat types that only occur naturally in very small areas, or are otherwise in danger of disappearing from the territory of the Community. They may also effectively exemplify characteristic features of biogeographic areas within the EU. Some of these biotopes are also priority natural habitat types that are in danger of disappearing altogether, and the Community has particular responsibility for conserving them. A total of 69 Habitats Directive habitat types occur in Finland, of which 14 are priority natural habitat types. These prioritised habitats include natural boreal forests, land uplift coastline forests, raised bogs, aapa mires, palsa mires, dunes and many kinds of traditional agricultural biotopes shaped by man, such as coastal and wooded meadows.

Table 7 shows the occurrence of Natura habitats by habitat class in protected areas and sites reserved for protection. The table shows the situation at the end of 2005 when about 71% of all areas administered by the Natural Heritage Services had been inventoried. Nearly 80% of all established nature reserves, almost 90% of national parks and strict nature reserves, and as

much as 96% of wilderness reserves had been surveyed. The precision of habitat data varies from area to area, as most of the habitats in expansive northerly regions have been recorded by interpreting aerial photographs. The data in small and diverse southern areas is based mostly on field surveys.

The forest and mire Natura habitat types account for about half of the total areas surveyed, while Natura habitats for fells make up nearly one third. National parks contain the highest proportion of forest Natura habitats; mire reserves have the highest proportion of mire Natura habitats; and wilderness reserves have the highest proportion of fell Natura habitat types. The highest proportions of rare coastal, moorland and meadow, and inland water habitat types are found in areas covered by conservation programmes. By the end of 2005 almost two-thirds of such programme sites still had to be surveyed. More of these rare Natura habitat types are likely to be registered in future inventories, as in many cases the presence of such habitats was the basis for selecting areas for the Natura 2000 network.

Further details of Natura habitats were collected during 2006 for the purposes of monitoring and assessing the METSO Forest Biodiversity Programme for Southern Finland. This information was based on habitat surveys completed by the end of 2005. Altogether 44 terrestrial Natura habitat types were found in protected areas, 17 of which are habitat types of special importance under the Habitats Directive. These habitats cover nearly 300,000 hectares (3,000 km²), or 70% of the METSO areas surveyed. Protected areas include the highest proportions of aapa mires, wooded mires, raised bogs and natural boreal forest. A total of over 30,000 ha of forested habitats with their representativeness classed as excellent were found. In the areas surveyed, the habitat types not classified as Natura habitats have often been used as commercially managed forest, and efforts are made where possible to restore these habitats. Such areas cover a total of about 100,000 ha.

In 2004 the Finnish Environment Institute began a project to assess the statuses of all habitat types found in Finland, including aquatic biotopes. This status assessment is due to be completed by the end of 2007. The outcome will be a list and descriptions of Finland's threat-

Table 7. Summary of Natura 2000 habitat types surveyed in protected areas (ha). Source: Metsähallitus.

| Protected area type | Forest habitats | Mire habitats | Rocky habitats | Alpine habitats | Coastal habitats | Heaths, meadows and scrub | Fresh-water habitats | Non Natura habitats | Total area surveyed | Total area of PA class | Not yet surveyed | Not yet surveyed (% of total area) |
|---|-----------------|----------------|----------------|------------------|------------------|---------------------------|----------------------|---------------------|---------------------|------------------------|------------------|------------------------------------|
| Strict nature reserves | 33 325 | 31 894 | 2 495 | 57 530 | 0 | 5 | 2 434 | 4 809 | 132 491 | 150 692 | 18 201 | 12 |
| National parks | 382 729 | 147 240 | 12 025 | 141 078 | 695 | 197 | 10 901 | 71 391 | 766 256 | 863 376 | 97 120 | 11 |
| Other nature reserves | 15 676 | 11 224 | 92 | 108 | 112 | 27 | 5 771 | 7 921 | 40 931 | 143 420 | 102 489 | 71 |
| Old-growth forest reserves | 4 026 | 1 095 | 45 | 0 | 0 | 0 | 118 | 2 537 | 7 821 | 9 997 | 2 176 | 22 |
| Mire reserves | 32 810 | 205 073 | 141 | 49 630 | 0 | 53 | 9 238 | 22 571 | 319 516 | 452 986 | 133 470 | 29 |
| Herb-rich forest reserves | 348 | 35 | 12 | 35 | 24 | 2 | 5 | 162 | 623 | 1 092 | 469 | 43 |
| Reserves established by Metsähallitus | 291 | 62 | 7 | 5 | 0 | 2 | 3 | 347 | 716 | 826 | 110 | 13 |
| Conservation programme sites | 112 912 | 147 677 | 1 232 | 10 853 | 4 716 | 263 | 11 205 | 70 918 | 359 776 | 976 633 | 616 857 | 63 |
| Areas reserved for protection in land use plans | 44 | 368 | 0 | 0 | 2 | 0 | 1 | 232 | 647 | 2 972 | 2 325 | 78 |
| Protected areas included in land use plans | 142 | 154 | 55 | 0 | 92 | 4 | 1 | 594 | 1 043 | 155 482 | 154 439 | 99 |
| Metsähallitus's protected forests | 1735 | 1 779 | 203 | 986 | 258 | 1 | 238 | 4 519 | 9 719 | 34 516 | 24 797 | 72 |
| Metsähallitus's recreation areas | 7 | 21 | 0 | 0 | 0 | 0 | 0 | 30 | 58 | 40 423 | 40 365 | 99 |
| Wilderness reserves | 225 427 | 229 973 | 35 157 | 774 529 | 0 | 0 | 105 854 | 51 483 | 1 422 424 | 1 490 348 | 67 924 | <5 |
| National hiking areas | 402 | 196 | 14 | 0 | 0 | 0 | 23 | 125 | 760 | 15 353 | 14 593 | 95 |
| Metsähallitus's recreational forests | 38 368 | 6 385 | 795 | 5 242 | 1 | 3 | 70 364 | 14 137 | 135 295 | 140 613 | 5 318 | <4 |
| Total | 848 241 | 783 177 | 52 273 | 1 039 995 | 5 899 | 557 | 216 158 | 251 776 | 3 198 077 | 4 478 728 | 1 280 651 | mean 29 |
| Percentage of total area surveyed | 27 | 25 | 2 | 33 | <1 | <1 | 7 | 8 | 100 | | | |

ened, near threatened and inadequately known biotopes. Expert teams are completing this work for each habitat type in the same way as the assessments of threatened species were compiled. The completion of this assessment will provide essential planning tools to help conserve habitats and species.

5.1.4 State and Conservation of Biodiversity Reviewed by Ecosystem

The extents, structures and functions of available habitats are crucial for sustaining biodiversity. Quantitative and qualitative changes in habitats are the most important cause of declining biodiversity in all ecosystems.

The assessment of the National Action Plan for Biodiversity in Finland completed in spring 2005 included a broad review of the state of biodiversity in the main types of habitats or ecosystems. Conservation programmes and assessments of the representativeness of the protected area network have focused on specific ecosystem types, so the significance of protected areas for biodiversity may be reviewed on the basis of the biodiversity report.

The review of habitats was intended to be comprehensive. It divided main types of habitat into the following classes: forests, mires, fells, rocky areas, inland waters, the Baltic Sea, shores, agricultural environments and built-up areas, thereby covering all of the main habitat types in Finland. A primary habitat was assigned to every sufficiently known species.

It was estimated that some 50,000 species are native to Finland, of which about 44,000 species were known in 2005. Primary habitats could be defined for about 45% of these species. The best-known species groups are vertebrates, all of which were included. Other well known groups include vascular plants, mosses and certain insect groups such as butterflies and beetles. The least well-known groups include algae and many insect groups. The species under review were species that are native to Finland and have stable occurrences in the country today. Annelids, arachnids, crustaceans, diploids, centipedes, small fungi and microalgae were excluded. Ecologically the most important species groups excluded from the review were soil organisms and primary producers in aquatic ecosystems.



Endangered Russian thistle (*Salsola kali*), Tulliniemi Nature Reserve. Tulliniemi is the outermost mainland extension of the massive Salpausselkä moraine ridge, and an important site for dune habitat types in Southern Finland. Photo: Antti Below.

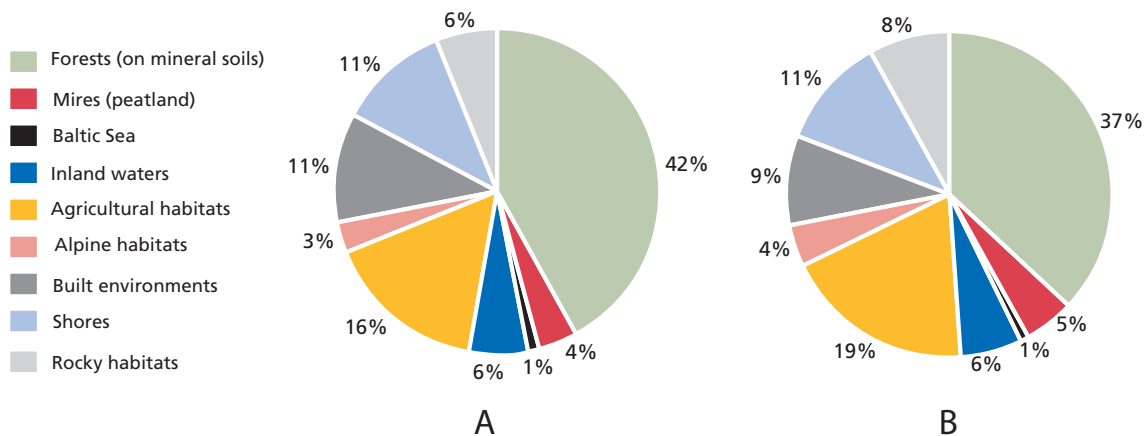


Figure 19. A. Primary habitats of all species. B. Primary habitats of threatened species. About 20,000 species were assessed in 2000, comprising c. 45% of known species in Finland. Source: Finnish Environment Institute.

Some 42% of all the species assessed are forest species, 27% are associated with agricultural and built environments, and 11% with shores (see Fig. 19A). The proportions of species in agricultural, rocky, shoreline and built environments are greater than the share of these environments in terms of surface area (see Fig. 7). Habitat distributions differ for various taxonomic groups. The bird and plant groups, for example, include smaller proportions of forest species and larger shares of mire species than the overall average. Fell and inland water environments are also favoured habitats for birds, while more vascular plant species tend to be found in agricultural and shore habitats.

The distributions of threatened species in various habitats and the factors influencing the associated threats in these environments were assessed in extensive summaries to the Red List report on Finland's threatened species in the year 2000. The habitat distributions are shown in Figure 19B and Appendix 14.

More than one third (37%) of red-listed species primarily live in forests, and especially in herb-rich forests and old coniferous forests. Nearly one fifth (19%) of threatened species live in traditional agricultural habitats, and this proportion shows a marked increase compared to the previous Red List assessment of 1992. The third most important habitat types are shores, which provide the primary habitats for 11% of threatened species. The most common reasons for threats to or the extinction of species are related to the overgrowth of open traditional agricultural or other cultural habitats following the end of

their active management and use, and to changes caused by the use and management of forests.

The following sections of this report review the state of biodiversity in typical Finnish habitats and assess the conservation situation for each major ecosystem.

The habitat classes are divided as follows:

Forest environments

- forests
- (wooded) mires
- rocky habitats and eskers

Alpine and wilderness environments

- fells
- (certain types of open mires)

Aquatic and shore environments

- inland waters
- the Baltic Sea
- shores
- (certain types of open mires)

Cultural environments

- agricultural habitats
- built-up areas (urban and transport)

Habitats classified as wetlands are particularly difficult to categorise unambiguously in a single class. In the following discussion mires will be included with forest habitats, even though many types of mires are entirely or largely open. Wilderness reserves are reviewed together with fells, even though these large protected areas also include extensive forest and mire ecosystems.

5.2 Forest Environments

5.2.1 Forests are the Most Widespread Habitat Types in Finland

Both in terms of their overall extent and their species numbers, forests are the most important natural habitat types in Finland. The total area covered by forest environments in Finland has been estimated at just under 15 million hectares (150,000 km²), corresponding to about one third of the total area of the country and nearly half of its land surface (see Fig. 7, p. 35).

High species diversity in herb-rich and old-growth forests

Nutrient-poor and dry forests generally host fewer species, while nutrient-rich and herb-rich forests generally have more species. Particularly as a result of land clearance for cultivation, areas of herb-rich forest have shrunk considerably and now such habitats only amount to about 1% of all the country's forest land. Even so, nearly one third of all forest species are regarded as herb-rich forest species.

Forests are the most important habitats for threatened species. More than one third of all red-listed species are forest species (see Fig. 20B). Most threatened forest species live in herb-rich and heath forests (see Fig. 20C). Herb-rich forests have become fragmented, and the spread of spruce often impairs the quality of surviving herb-rich forests. Most of the red-listed heath forest species live in old-growth forests. Especially species-rich groups in old-growth forests include polypores and beetles. Nearly one quarter of forest species



Herb-rich forest, Karkali Strict Nature Reserve. This park is known for its rich vegetation and rare plant species. Though it was established primarily for scientific research and strict nature conservation, parts of the reserve are open to visitors. Photo: Jari Kostet.

live in dead and decaying wood. One third of the species now extinct in Finland were from forests. These lost species include many invertebrates, particularly beetles, and fungi.

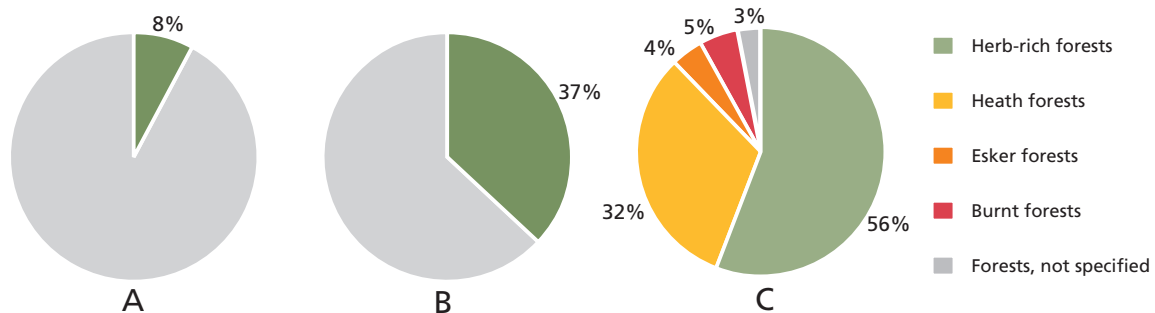


Figure 20. Threatened forest species. A. Threatened forest species as a percentage of assessed forest species. B. Threatened forest species as a percentage of all threatened species. C. Primary habitats of threatened forest species. Source: Hildén et al. 2005 and Auvinen 2006.



Dead wood in an old natural pine forest. The longhorn beetle (*Tragosoma depsarium*) is one of a large group of insects specialised on well-decayed pine wood. Photos: Timo Nieminen and Petri Martikainen.

Vital structural elements of natural forests

The factors threatening forest species have particularly included the loss of certain structural features of natural forest, such as various types of dead and decaying wood, in commercially managed forests, and also the decline and low degree of conservation in certain types of forest, especially nutrient-rich forests. The greatest changes have occurred in Southern Finland, where the diversity of species associated with dead and decaying wood is naturally highest.

Many species are capable of maintaining viable populations and proliferating only when the state of their habitat exceeds a certain threshold value. This value varies according to species and habitat on various scales. For populations of species living in dead and decaying wood, the main habitat requirements concern the quantities of suitable wood and its continued availability locally. The findings of comparative studies at landscape level for polypores and beetles living in dead and decaying wood indicate that the

most demanding species are entirely absent even from suitable forest stands, or that their populations have declined where such stands are isolated within areas of commercially managed forest, when the quantities of dead and decaying wood have remained small over a long period.

The remaining forests that are in a natural or near natural state are now practically all old-growth forests, as virtually no young forests in a natural state have been left in recent years. Forests can be described as being in a near natural state, when they have largely retained the structural features of untouched forests. The decline of these features in commercially managed forests has caused a growing threat to forest species. In individual forest stands such features include various types of sturdy dead and decaying wood and old individual trees. The restoration of forest habitats in protected areas has proved to be the only effective way to create conditions that expand the total area of forest in a condition comparable to a natural state.

Deficiencies in forest conservation in Southern Finland

Finnish forests are protected in national parks and strict nature reserves, in the parts of wilderness reserves maintained in their natural state, in areas covered by national conservation programmes, in private nature reserves, and in areas designated for protection purposes in the natural resource plans of Metsähallitus. Separate old-growth forest and herb-rich forest conservation programmes seek to focus conservation measures on these particularly threatened forest habitats. The old-growth forest conservation programme covers a total area of slightly over 350,000 hectares (3,500 km²). Most sites in the programme are State-owned and located in Northern and Eastern Finland. Less than one tenth of the area reserved for this programme lies south of Oulu Province.

Forest statistics compiled by the Finnish Forest Research Institute indicate that, including forest and scrub lands, protected forests made up about 9% of Finland's total forest area at the beginning of 2005 (see Table 8). The proportion of protected forest in Southern Finland is only about 2%, as most protected areas are in Northern Finland. Only 4.5% of Finland's forest land is strictly protected. This proportion is only 1.5% in Southern Finland, but 8.3% in the north.

Deficiencies in forest protection arise particularly when reviewing the distribution of protected woodland forests in their natural state into geographical vegetation zones (see Table 9). Based on Finland's eighth national forest inventory (1986-1994), about 0.2% of old-growth forests in forest land was protected in the hemiboreal and southern boreal zones at the turn of the century, while 1.6% was protected in the middle boreal zone. Only a third of the remaining old-growth forests were in protected areas, on average.

The ninth national forest inventory, conducted in 1996-2003, suggests that this situation has improved, insofar as 40% of old-growth forests are now protected in the hemiboreal, southern boreal and middle boreal zones (the area covered by the METSO Programme), while 56% are protected in the northern boreal zone. However, the proportion of woodland forest protected in its natural state in southern Finland remains no greater than 0.05% and less than 2% in the entire METSO area. Figure 21 shows the shares

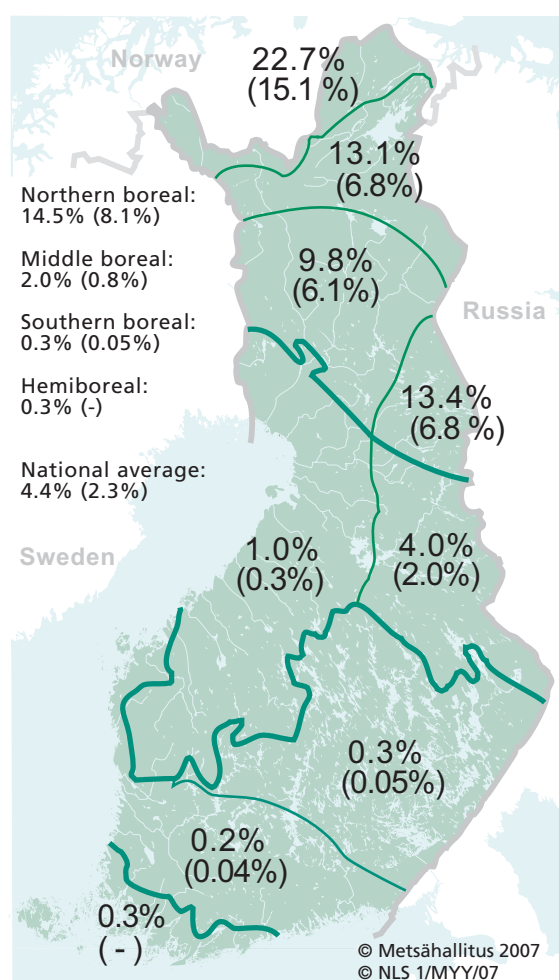


Figure 21. Proportion of forest land consisting of old natural forest, and proportion of protected old-growth forest (in brackets), within forest vegetation zones and subzones according to Finland's 9th National Forest Inventory (1996-2003). See Figure 9 for details on zoning. Source: Horne et al. 2006.

of old-growth forest in its natural state by vegetation zone.

The Natura 2000 network includes 30,000 ha of old-growth forest in Southern Finland that had not previously been included in any other conservation programme. The forests to be secured for protection under the METSO Programme will also bring a slight improvement to the conservation situation for old-growth forest. In addition to this, Metsähallitus's landscape ecological planning enables small and valuable old-growth forest areas to be conserved in their natural state in commercially managed forests under its administration. The landscape ecological planning completed in 2001 identified about 168,000 ha of such forest as valuable natural sites, of which 41,000 ha comprises old-growth forest.

Table 8. Strictly protected and other protected forest areas 1.1.2005, including both forest and scrub land. Source: Forest Research Institute.

| Forest and scrub land | Whole country | | Southern Finland | | Northern Finland | |
|---|---------------|------------|------------------|------------|------------------|-------------|
| | 1 000 ha | % | 1 000 ha | % | 1 000 ha | % |
| Strictly protected forests | 1 885 | 8.2 | 203 | 1.8 | 1 682 | 14.7 |
| Protected forests where carefully planned felling is possible | 173 | 0.8 | 53 | 0.5 | 120 | 1.1 |
| Total | 2 058 | 8.9 | 257 | 2.2 | 1 802 | 15.8 |

Table 9. Natural old-growth forest areas, their proportion of forest land, and their conservation status by forest zone, excluding Åland. Source: Virkkala et al. 2000 and Horne et al. 2006

| Forest vegetation zone | Natural old-growth forest areas (1 000 ha) | Proportion of forest land (%) 8th national forest inventory | Proportions of old-growth forests in protected areas (%) | |
|---------------------------|--|--|--|-------------------------------|
| | | | 8th national forest inventory | 9th national forest inventory |
| Hemi- and southern boreal | 162 | 0.2 | 12 | 40 |
| Middle boreal | 1 193 | 1.6 | 39 | |
| Northern boreal | 8 388 | 17.0 | 43 | 56 |

5.2.2 Finland Has Special Responsibility for Mire Protection

In terms of total area, mires are the second most common main habitat type in Finland. Their total extent of just under nine million hectares (90,000 km²) means that they make up one fifth of Finland's total area and just under one third of its land area.

Scanty but valuable species assemblages

Mire species make up about 4% of Finland's known species. Mires generally host rather few species, but these species represent a much higher proportion – nearly one fifth – of the species that Finland is considered to bear special international responsibility for conserving. Raised bogs, aapa and palsa mires and wooded mires are priority natural habitat types for the EU and more of these have survived in Finland than anywhere else in Europe.

Some 19% of Finland's mires are treeless, 55% are wooded pine mires and 26% spruce mires. There are considerably fewer treeless mires in Southern Finland than in the north of the country. There is very little nutrient-rich fenland, which comprises less than 2% of the total mire area. About 19% of mire species are associated with treeless mires, 17% with fens, 26% with pine mires and 23% with spruce mires. A large

number of species primarily associated with forest habitats also occur in mires, and especially in spruce mires. The proportion of fenland species is noticeably high, given the small surface area of rich fens compared to other types of mire.

Habitat integrity prioritised in mire conservation

Finland's mires are primarily protected through a national mire conservation programme drawn up in 1979 and 1981. This programme covers a total surface area of about 625,000 hectares (6,250 km²), corresponding to about 7% of the current total area of Finland's mires. In addition to this mire conservation programme, mires with a total area of about 500,000 ha are protected in national parks, other nature and wilderness reserves. This means that altogether nearly 13% of the total area of Finland's mires today is under protection.

There are substantial differences in mire conservation depending on the region and the type of mire in question (see Fig. 22). Particularly in the concentric and eccentric raised bog zones of southernmost Finland the average degree of conservation of spruce mires is very low at only 0.5%. Aside from northernmost Lapland, there is also no comprehensive protection of pine mires. The numbers of undrained nutrient-rich mire types have declined to about one tenth since the

1950s, and aside from northernmost Lapland the degree of conservation of the remaining nutrient-rich mires is low.

Mire protection is quite comprehensive in the two most northerly mire zones, i.e. the aapa mire zone of Forest Lapland and the palsa mire and treeless alpine mire zones of Fell Lapland. Deficiencies have been found in the coverage of the mire conservation with respect to certain rare and small-scale mire types. Little protection has been given, in particular, to mires representing different stages of succession along land uplift coasts, mires with small-scale variations between mire and forest vegetation, and hanging bogs.

Even though, nationally speaking, mire species have survived major habitat changes relatively well, this is not the case with near threatened and regionally threatened species. Regional studies of mire butterflies and vascular plants stress the poor state of species in southern Finland. The Red List survey of 2000 indicates that the largest numbers of threatened mire species are in treeless rich fens (see Fig. 23C).

Another problem that arises, in addition to regional and type-specific failings in mire protection, is that the boundaries of protected sites do not always enclose areas that are ecologically and hydrologically coherent. Particularly when outlining protected areas for the mire conservation programme, the transition zones and margins of mires and mineral soils were often left outside the protected areas. The situation is slightly better in mire conservation areas on State-owned land, because some habitat restoration projects pursued in recent years have managed to restore the margins of mires close to their natural condition. A review of the boundaries of protected mire areas is nevertheless still considered necessary.

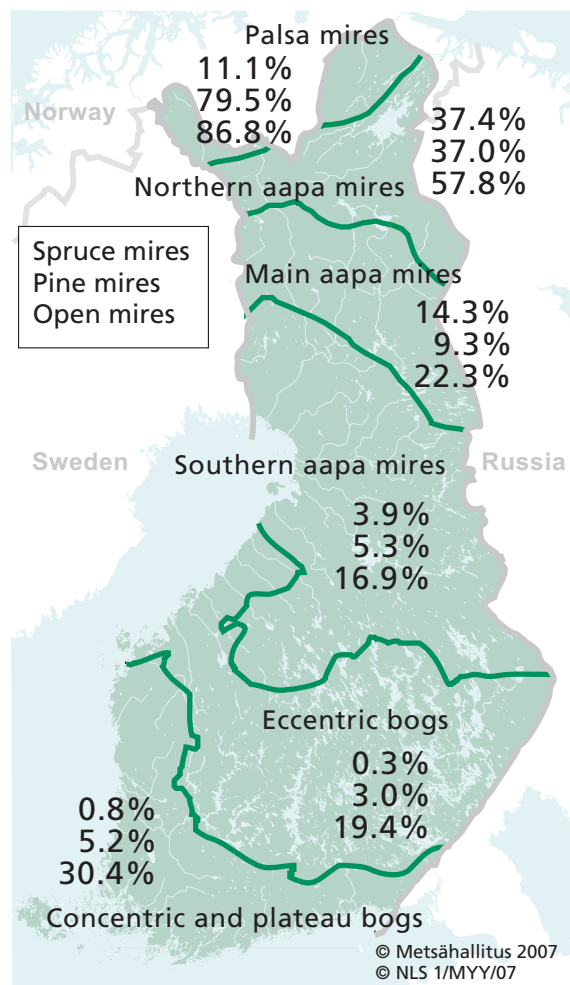


Figure 22. Percentages of mires of different types under protection by mire vegetation zone. Source: Finnish Environment Institute.

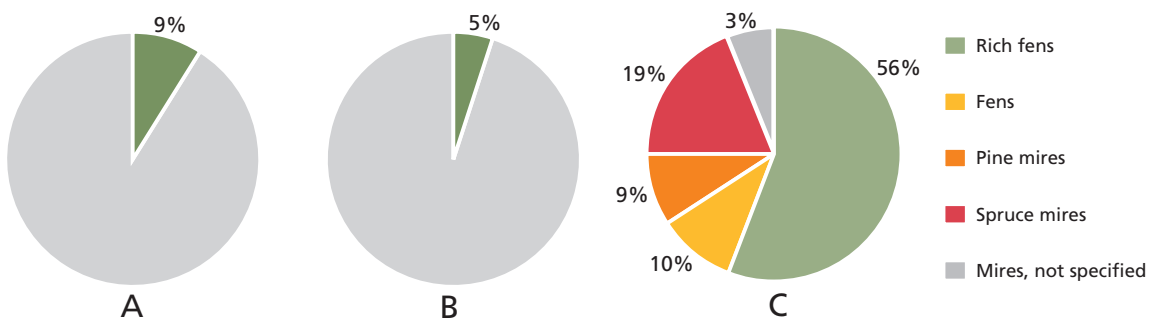


Figure 23. Threatened mire species. A. Threatened mire species as a percentage of assessed mire species, B. Threatened mire species as a percentage of all threatened species, C. Primary habitats of threatened mire species. Source: Hildén et al. 2005 and Auvinen 2006.



Marshland in Patvinsuo National Park. This park is situated in an intermediate zone and features a mosaic-like mixture of raised bogs and open mires of types typical for both Southern and Northern Finland. Photo: Jari Kostet.

5.2.3 Rocky and Esker Habitats Host Declining Species

Rocky outcrops and eskers are geological formations with habitats characterised by various combinations of microclimatic, light and nutrient conditions. It is estimated that exposed bedrock surfaces cover a total area of more than 500,000 hectares (5,000 km²), corresponding to 1.2% of Finland's total area and 1.7% of the land area. About 70,000 ha of this area consists of open bedrock with no tree cover. The overall proportion of rocky habitats is highest along the southern coast and lowest in western parts of Oulu Province and in Southern Lapland.

Glaciofluvial eskers are estimated to cover about one million hectares, corresponding to 2.6% of Finland's total surface area and 3.3% of the land. However, the habitats of true esker species, i.e. sunlit esker slopes, are considerably smaller than this, and are estimated at only one tenth of the total area of eskers.

Nearly 6% of Finnish species are found in rocky habitats (see Fig. 19A). This is a large proportion compared to the share of such areas in Finland. Some 33% of species in rocky habitats

are typical of calcareous rocks, 2% live on serpentine rock and 18% are associated with other rock types. More than half of all rocky area species are lichens and one quarter are mosses. Vascular plants and butterflies are also found to a lesser extent, with vascular plants making up as much as half of the species found on serpentine rocks.

The proportion of rocky habitat species, that are threatened clearly exceeds the share of rocky species in all Finnish species. These red-listed species mainly occur on limestone rocks (see Fig. 24C), and include many mosses and lichens. There are rather few true esker species – about 5% of forest species are classified as primarily esker forest species. About 4% of threatened forest species are typical of esker forests. Rocky areas and eskers are typically wooded, so the states of habitats in rocky areas and eskers largely depend on how the forests are managed.

Valuable sites only partly in protected areas

Eskers are mainly protected through the national esker conservation programme established in 1984. This programme includes 159 esker areas

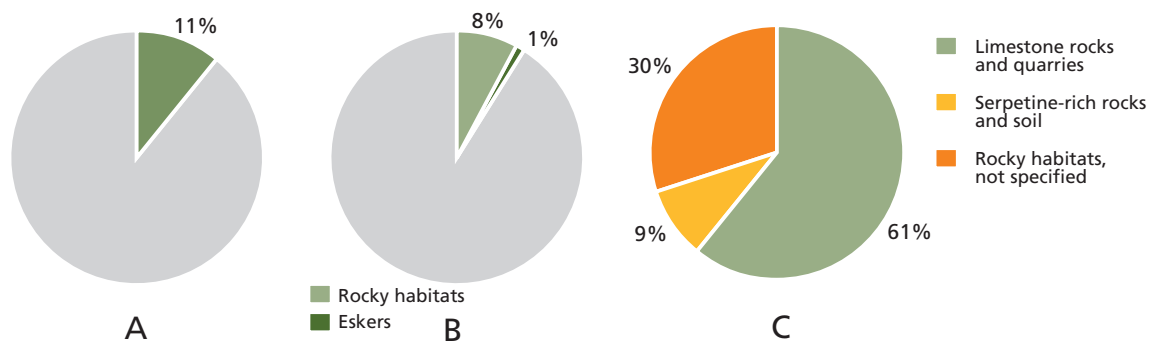


Figure 24. Threatened species of rocky habitats. A. Threatened species of rocky habitats as a percentage of assessed rocky habitat species, B. Percentages of all threatened species found in rocky and esker habitats, C. Primary habitats of threatened species of rocky habitats. Source: Hildén et al. 2005 and Auvinen 2006.

with a total extent of 96,000 ha, which is just over one tenth of the total esker area in Finland. However, the esker conservation programme was not primarily motivated by ecological considerations, but on the grounds of geology and landscape.

There are more strictly protected esker areas in other nature reserves. Without specific geological data it is hard to assess the number of esker areas that are included in various protected areas. It can be roughly estimated that most protected esker areas are in Lapland's wilderness reserves (about 60,000 ha) and national parks (about 20,000 ha). There are also thousands of hectares of protected eskers in strict nature reserves and old-growth forest conservation programme sites. The total esker area in which esker habitats are also protected probably amount to about 10% of all esker areas. Most of these sites are in Northern Finland. Only about 1% of the total area of eskers in southern Finland and Ostrobothnia is strictly protected. It is estimated that about one third of the esker forests in Southern Finland are covered by the Natura 2000 programme. Most of this area is protected under the esker conservation programme.

Some individual rocky areas, and areas where rare species of rocky habitats occur, are protected in their own separate protected areas. Rocky habitats are also included in other protected areas, such as national parks and wilderness reserves. However, rocky areas are mainly protected under the Land Extraction Act and Decree. The conservation situation for rocky areas was discussed under geodiversity (see Section 5.1.2).

5.3 Fell and Wilderness Environments

Finland's arctic fell region mainly extends through the country's three most northerly municipalities. There are also other isolated fells throughout the Province of Lapland. The total area of Finland's alpine habitats has been estimated at slightly more than 1.5 million hectares (15,000 km²) corresponding to 3.6% of Finland's total area and 5.0% of the country's land area.

5.3.1 Fell Species Are Vulnerable

Fells are the primary habitat of just under 3% of Finnish species. The Enontekiö region of major fells in Finland's northwestern corner is especially renowned for its rare species. Some of the most unique species are only found on the fells of Saana or Malla. These fells may host some of the most valuable and diverse mosses in the whole of northern Fennoscandia.

Northern ecosystems are sensitive to variations in natural phenomena and changes in the species balance. Many ecosystems are directly in danger of disappearing completely, as they have no real prospects of adapting to changing climatic conditions, for example. Air and soil pollution also impair the resistance and recovery capacity of the environment in arctic and northern regions.

Increasing attention has been paid in recent years to the decline in the palsa mires that are characteristic of arctic regions. The gradual rise in temperature is regarded as at least a contributory reason for this decline. Studies indicate that the total extent of palsa mires in Northern Lapland has declined to one third. If this trend

continues, *palsa* mires are in danger of disappearing altogether as distinct habitats in Finland. *Palsa* mires have exceptionally rich bird life in particular, due to the diverse habitats they provide. National monitoring of nesting birds has observed a decline in the diversity of bird life on Finland's arctic fells ever since the 1940s when monitoring began. The Red List review prepared in the year 2000 reveals no changes in the status of threatened fell species compared to earlier reviews. Various species groups are fairly evenly represented among threatened fell species. Most of the threatened species are associated with fellside heaths and scree fields (see Fig. 25C).

5.3.2 Wilderness Well Protected in Northern Lapland

Finland's most important fell regions are nearly all in protected areas. The country's oldest national parks and strict nature reserves were established in the Pyhätunturi, Pallas-Ounastunturi and Malla areas in 1938. The recently enlarged national park at Pallas-Yllästunturi is very important from the point of view of conserving the fell, forest, mire and aquatic environments of Finland's northerly regions. The similarly expanded national park at Pyhä-Luosto now incorporates the whole of a 35-kilometre fell range. The landscapes of Lemmenjoki, Finland's largest national park, are divided by the 70-kilometre River Lemmenjoki, which passes between two fell chains. The eastern wilderness zone of the

great Urho Kekkonen National Park includes several extensive fells. A large number of fells also lie in Lapland's wilderness reserves.

The extents of Finland's wilderness areas diminished in particular between the Second World War and the 1980s, initially on account of widespread clearances for new settlements and later with the construction of forest roads. The total extent of areas lying more than eight kilometres from the nearest road fell by nearly 60% between 1965 and 1980. The Wilderness Act represents an effort to conserve the character of Finland's remaining wilderness areas. The twelve wilderness reserves established in 1991 cover a total area of nearly 1.5 million hectares (15,000 km²). They are all in the fell and forest regions of Lapland.

In addition to these established wilderness reserves, other remaining wilderness-like areas are protected in Lapland's strict nature reserves and national parks, and in mire and old-growth forest reserves, with all such areas combined amounting to an estimated total area of about one million hectares (10,000 km²). Preserving the wilderness reserves of Lapland with no construction, other than the buildings needed for traditional livelihoods and hiking services, now appears to be assured under current legislation and management plans. Particularly off-road traffic, for the purposes of tourism and commercial reindeer husbandry, nevertheless causes pressures that threaten the continued wilderness-like character of these areas.

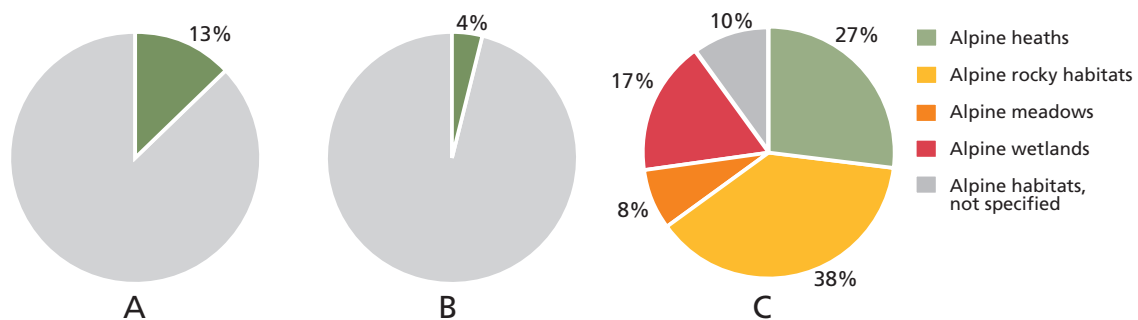


Figure 25. Threatened alpine species. A. Threatened alpine species as a percentage of assessed alpine species, B. Threatened alpine species as a percentage of all threatened species, C. Primary habitats of threatened alpine species. Source: Hildén et al. 2005 and Auvinen 2006.



Mountain birch (*Betula pubescens czerepanovii*) in Northern Lapland. These low-growing shrubs form a vegetation zone between the pine timberline and the treeless tundra. In Finland 70% of this habitat type, which is listed in the EU Habitat Directive, is found within protected areas. Photo: Matti-Sakari Pitkänen.

5.4 Water and Shore Environments

5.4.1 A Wealth of Inland Waters

Finland has plenty of inland waters, covering a vast area of some 3.4 million hectares (34,000 km²), corresponding to 8% of the total area of the country. There are nearly 190,000 lakes with the extent of 500 m² or more. Finland's lakes are uniquely fragmentary, shallow, and rich with islands. Their combined total shoreline amounts to some 130,000 kilometres. Inland waters include all freshwater areas, i.e. both lakes and flowing watercourses such as rivers and streams, as well as small water bodies such as springs, ponds and pools.

There are still major gaps in our knowledge of species diversity in Finland's inland waters. Algae in particular remain little known. There is a lack of information about the geographical ranges of many more familiar species. Some 7%

of Finland's known species are aquatic, and most of these occur in inland waters. These waters provide some of the most important habitats for fish, dragonflies and caddis flies, as well as many molluscs, birds, mosses and vascular plants. Most freshwater species occur in lakes and ponds. Various flowing waters and small watercourses also provide important environments hosting large numbers of species. These habitats are often quite small, and therefore highly sensitive to change.

Most of the aquatic species known to be threatened are associated with inland waters (see Fig. 26C). Half of all red-listed lake-dwelling vertebrates are birds and most of the threatened lake-dwelling invertebrates are beetles. Rivers and streams are the primary habitat for a large number of threatened fish and dragonfly species. Red-listed aquatic mosses are mainly found in streams and springs.

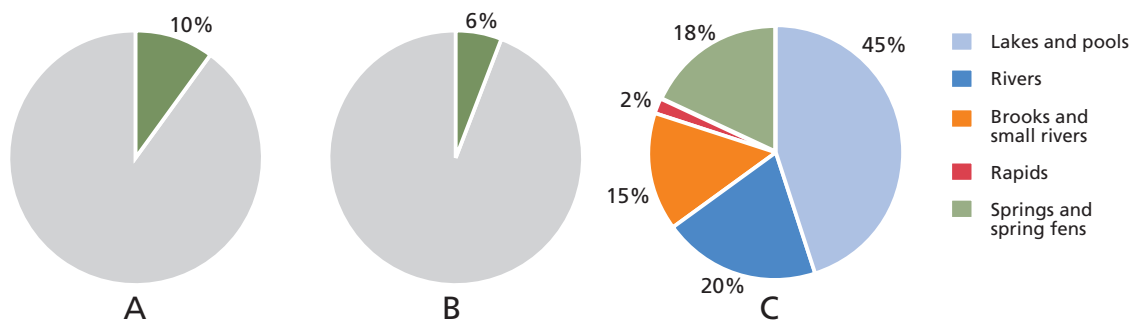


Figure 26. Threatened species of inland waters. A. Threatened inland water species as a percentage of assessed inland water species, B. Threatened inland water species as a percentage of all threatened species, C. Primary habitats of threatened inland water species. Source: Hildén et al. 2005 and Auvinen 2006.

Natura 2000 network patches up conservation gaps

While many national parks and wilderness reserves include impressive water areas, aquatic environments have not previously been of primary concern in expanding the network of nature reserves. The boundaries of many protected areas have been drawn so as to exclude waters lying within protected lands from the areas under protection. The national bird wetlands conservation programme, rapids conservation programme and shores conservation programme have substantially improved the conservation situation for aquatic and shore environments, even though in many cases the demarcation of sites is restricted and fails to conserve the whole hydrological basis of the site. The shares of protected waters vary between 13% in the South Coast region and 73% in Northern Lapland (see Fig. 27).

The Natura 2000 network substantially enlarged the total area of waters protected in various ways, especially in Southern Finland. Natura areas established to protect the Saimaa ringed seal cover a significant portion of the extensive Saimaa Lake System in SE Finland. Natura areas cover one fifth of Finland's lakes. The lakes in Natura sites include a representative sample of Finland's lakes in terms of water quality factors. While on average they contain lower nutrient levels and clearer water than other lakes, the network also includes lakes with high nutrient levels.

According to a study of threatened vascular plants, aquatic mosses and water beetles, the protected area network hosts more red-listed species than might be assumed solely on the basis of extent. Sites within the bird wetland conservation programme are particularly important in

this respect. The lakes within Finland's protected area network are also rich in certain species of oligotrophic waters that are rare elsewhere in Europe.

Natura sites were selected with a view to establishing more extensive and better-integrated conservation networks. At the same time there has been a considerable increase in the extent of

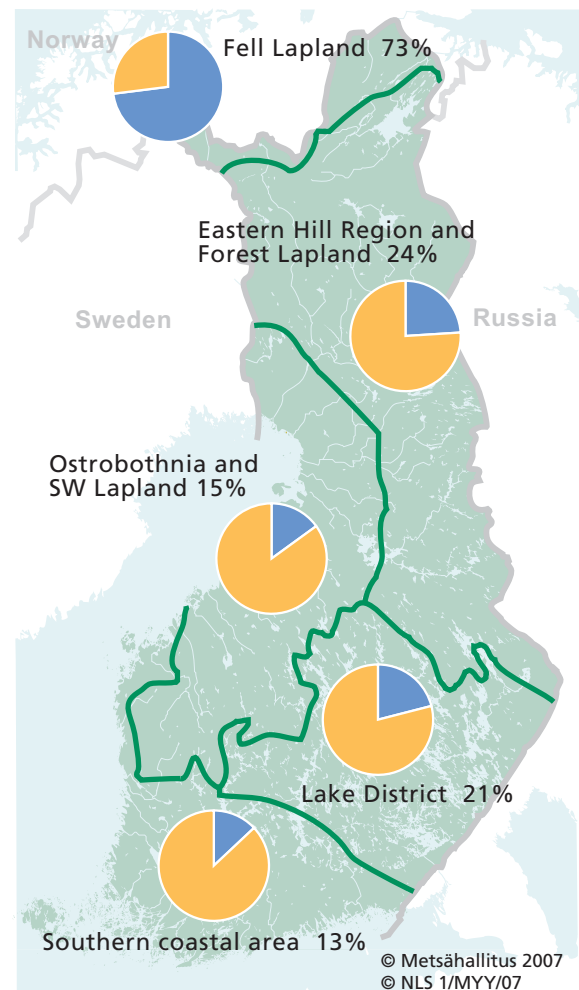


Figure 27. Proportions of lakes and lakeshores under protection in the five main inland water regions. Source: Finnish Environment Institute.

water areas that are protected on basis other than the Nature Conservation Act. The Natura 2000 network did not substantially alter the conservation situation for smaller bodies of water. On the other hand, amendments to nature conservation and forest legislation have significantly improved the prospects for protecting these bodies. Land use, especially in forestry and agriculture, has a substantial impact on small water features.

5.4.2 Special Baltic Habitats and Brackish Water Species

The Baltic Sea has a total area of 422,000 square kilometres, of which Finland's territorial waters and the Exclusive Economic Zone (EEZ) account for one fifth (82,000 km²). The Baltic Sea waters constitute just under 20% of Finland's total area.

In marine areas, the archipelagos formed by the fractured nature of Finland's bedrock correspond to the labyrinthine forms of inland waters. The history of the Baltic Sea since the last Ice

Age, with brackish water and freshwater stages, the sharp seasonal temperature variations, low salinity and other special features, have greatly influenced its characteristics and species mix.

The salinity levels of Finland's coastal waters are low, and largely for this reason very few true marine species are found in these waters. Only 1.4% of their species are considered to be primarily Baltic Sea species, but this is clearly an underestimate, as a large number of microalgae was excluded from the assessment (about 5,000 species in all). The Baltic Sea is the primary habitat for macroalgae, molluscs, fish, marine mammals and many sea birds.

The coastal (flada and glo) lagoons of the Baltic Sea provide shore habitats for a wide range of organisms where diverse vegetation develops through a combination of land uplift processes and hydrological conditions. Coastal lagoons are important breeding and spawning areas for fish, and also provide vital habitats for waterfowl. Sandy and gravelly beaches have their own diversity of species. For example, the dune formations



The rocky shores of Mustaviiri Island, with Suursaari Island also visible on the Russian horizon. The Eastern Gulf of Finland National Park is known for its rich bird life and wartime history. It is also a part of HELCOM's network of Baltic Sea Protected Areas. This Finnish island complex is complemented by still more islands on the Russian side of the border, which have been proposed for inclusion in a new national park. Photo: Jari Kostet.

of sandy Baltic seashores host many specialised species including a large number of threatened species. Finland has very few dunes, covering a total area of only about 1,300 hectares, and a decline in the plant communities typical of open dunes has been detected in recent decades.

The Red List survey compiled in the year 2000 indicated that 10% of Finland's threatened aquatic species occur in the Baltic Sea. The growing threat to aquatic species in these waters does not appear to be a matter of very urgent concern, as most of the red-listed species also occur in inland waters, and the deteriorating state of the Baltic Sea therefore only affects a fairly small number of species. It should be noted, however, that this development, caused by eutrophication and pollution, is changing the functioning of Baltic Sea ecosystems. Many Baltic Sea species have also been excluded from the threat assessments merely because they are insufficiently known.

Progress on marine and coastal conservation

There are still major gaps in our knowledge of species and habitats in the Baltic Sea. This is one reason why only a few specifically protected water areas have been established. The protected area network for Finland's sea areas consists of four national parks that include marine areas, seven seal reserves and areas within the shore and bird wetland conservation programmes.

By the beginning of 2005 slightly more than 150,000 hectares (1,500 km²) of sea formed part of protected areas established under the Nature Conservation Act, corresponding to 2.7% of Finland's marine territorial waters. Most of these protected areas, amounting to some 67,000 ha, were in the national parks. The largest single protected sea area, by far, is the Archipelago National Park, which includes 47,000 ha of sea. By contrast, only very small sea areas are included within the boundaries of the Eastern Gulf of Finland National Park.

The new areas approved for the Natura 2000 network substantially increase the conservation of marine areas. The marine areas covered by conservation programmes now total some 750,000 hectares (7,500 km²), corresponding to about 14% of Finland's territorial waters. The

seabed and submarine environment included in the Natura 2000 programme is protected mainly under the Water Act, not under the Nature Conservation Act. Other methods of protecting marine Natura areas include shoreline, regional and local land use plans, and agreements concluded with landowners.

The Act on the Finnish Exclusive Economic Zone, which took effect in February 2005, stipulates that Finland's exclusive economic zone (previously part of the undivided international sea area) falls within the scope of the Nature Conservation Act and Environmental Protection Act. This means that the portion of the biodiversity of the Baltic Sea, for which Finland is responsible, covers the whole of the country's territorial waters and the EEZ. There are no protected areas in the EEZ, nor could any such areas even be established before the new act took effect. The need to extend the Natura 2000 network into the EEZ will be investigated over the next few years together with other EU countries.

5.4.3 High Species Diversity on Shores

It is difficult to estimate the total extent of shore habitats. As a rough guide, the shore habitats of the Baltic Sea in Finland cover an area of about 120,000 hectares (1,200 km²), while those of the country's inland waters may be about six times larger in total. These habitats include open and semi-open shore environments up to the average floodwater level. These estimates suggest that shore environments constitute 1.9% of Finland's total surface area and 2.6% of the country's land area.

Shore habitats are notably rich in species, hosting 11% of all of the known species in Finland. Two-thirds of these species may be considered to occur primarily on the shores of inland waters, while the remaining third are native to Baltic seashores. Most of the species living by the shores of inland waters are found in shore meadows and flood meadows, although sandy shores also have their own characteristic flora and fauna. Although a considerable portion of shore species consists of vascular plants, the shores of inland waters also host a wide variety of insects such as beetles, hymenoptera and diptera.

The Red List review of threatened species in 2000 showed a clear increase in the number of

threatened shore species since 1990. This was partly because improved knowledge meant that new species were classified as threatened. A substantial share of these new species consisted of invertebrates, but there were also some vascular plants. Species that depend on sandy habitats or favour sandy soils (see Fig. 28C) were among the most threatened species of Baltic seashores, as were those that rely on brackish water and prefer saline soils. These categories also include many species now classified as extinct in Finland.

Areas of open sandy seashore are widely shrinking as a result of such factors as eutrophication and the increased recreational use of beaches. Species that require rare open saline clay coastlines continue to survive on the outermost islands of southwestern Finland, but even these shores are changing due to increased construction of landing sites for boating. The threatened aquatic species of Baltic seashores are concentrated in coastal lagoons, many of which are dredged from time to time.

Varying conservation status of shore types

Shore habitats have been protected under conservation programmes for shores and bird wetlands. The Finnish State has acquired about 70% of the former privately owned areas included in the shore protection programme. This programme covers a total area of about 146,000 hectares (1,460 km²), including about 3-4% of the Baltic coastline in Finland.

About 16% of all of Finland's lakeshores are included in the protected area networks formed by all conservation programmes and Natura 2000 sites. The degree of shore conservation in the major aquatic habitat zones of the South

Coast, the Lake District and the region reaching from Ostrobothnia to SW Lapland is around 8-11%. The degree of conservation is 20% in the wooded hill region of Eastern Finland and in Southern Lapland, and almost 80% in the Fell Lapland region.

The State has acquired about half of all wetlands designated for the bird wetland conservation programme, and most of the total area of the programme consists of waters. Although wetland habitats have survived much better in Finland than in Central Europe, for example, many previously valuable Finnish waterfowl habitats have also been drained or used for other purposes. Only 6% of the sites in the 1982 national bird wetland programme had been established as nature reserves before the EU Natura 2000 Programme was confirmed. With the implementation of the Natura 2000 network, about 65% of the nearly three hundred sites within the bird wetland conservation programme will be under protection.

5.5 Cultural Environments

5.5.1 Changing Agricultural Habitats

Slightly more than two million hectares of arable land were cultivated in Finland in 2004. An additional 230,000 hectares (2,300 km²) of farmland were lying fallow or in other use. However, agricultural environments may also be considered to cover a broader area than the immediate vicinity of fields and gardens. Important areas include traditional agricultural biotopes, small forest stands, field-forest margins and farmyards. Agricultural land constitutes just under 6.5% of Finland's total area and 9.0% of the land.

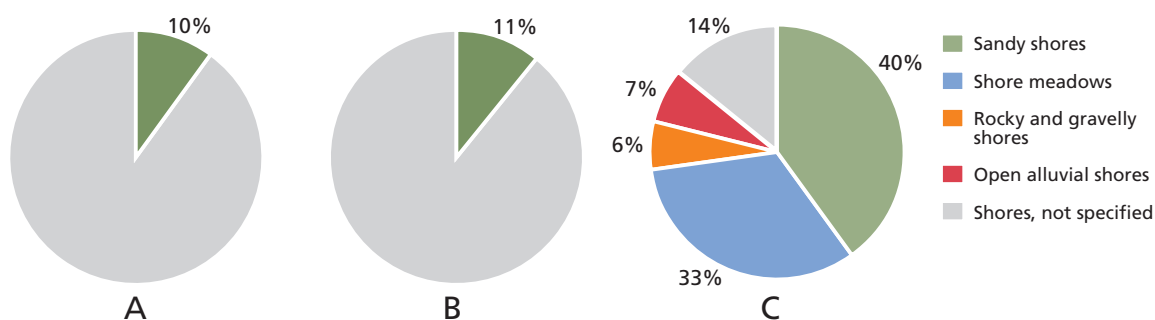


Figure 28. Threatened species of shore habitats. A. Threatened shore species as a percentage of assessed shore species, B. Threatened shore species as a percentage of all threatened species, C. Primary habitats of threatened shore species. Source: Hildén et al. 2005 and Auvinen 2006.

The species found in various agricultural habitats account for 16% of known Finnish species. Traditional agricultural biotopes provide habitats for the largest number of species. Half of the species found in agricultural environments occur in dry meadows. Moist meadows host a further 15%, wet meadows and wooded pastures each accommodate 13%, and land used for cultivation provides habitats for 9% of species. Some 42% of dry meadow species are beetles and butterflies. These habitats also host a fairly large number of homoptera, diptera and vascular plants. The second most important habitats for butterflies and hymenoptera are wooded pastures and fresh meadows, respectively.

Many farmland species have declined in Finland, especially over the last 30 years. Of the various groups of animals, the best available data on population changes concern butterflies and birds. More than 70 species of butterfly are established in Finnish agricultural environments. Most of the declining species live in meadows, while some also occur on the margins of forests. On the other hand, none of the butterflies typically found in fields, farmyards and wasteland seem to be in decline.

Some 68% of the threatened species of cultural environments live in agricultural habitats. Most of these occur in dry meadows, though some are also found in wooded pastures and in moist and wet meadows (see Fig. 29C). A total of 52 threatened species have disappeared from agricultural environments. Dry meadows in particular have lost a great many insects, including beetles, butterflies and hymenoptera.

Only half of traditional agricultural biotopes are managed

Traditional agricultural biotopes include the types of mown and grazed areas created by traditional animal husbandry. There has been a major decline in such habitats since the end of the 19th century, particularly due to field clearance, reforestation, and overgrowth after mowing and grazing were ended. Eutrophication and construction have also reduced such habitats. About one fifth of Finland's threatened species depend on traditional agricultural biotopes, which are the most important habitats for biodiversity in agricultural environments.

Finland's traditional agricultural biotopes were surveyed over the years 1992-1998. These surveys found just under 19,000 hectares of such habitats of importance for biodiversity. A little over half of these sites had been managed. Nearly one third of the sites listed were wooded pastures, which generally differ only in minor respects from commercially managed forest and are of no extraordinary biological value. Most of the habitats surveyed were on privately owned land, and only 12% of such areas were under State ownership.

Some 1,400 ha of traditional agricultural biotopes classified as valuable lie within established protected areas and about 2,000 ha lie within nature conservation programme areas. This is an exceptionally small proportion by the standards of other European countries. In Sweden, for example, some 40,000 ha of such habitats are within protected areas.

Most of the heritage habitats administered by Metsähallitus are in Southern Finland and Ostro-

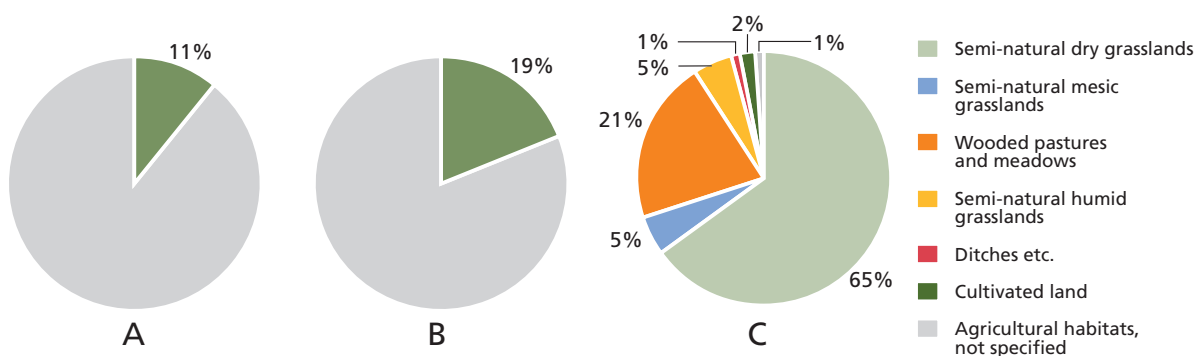


Figure 29. Threatened species of agricultural habitats. A. Threatened species of agricultural habitats as a percentage of assessed species of agricultural habitats, B. Threatened species of agricultural habitats as a percentage of all threatened species, C. Primary habitats of threatened species of agricultural habitats. Source: Hildén et al. 2005 and Auvinen 2006.



Volunteers making hay in Syöte National Park. Nowadays traditional agricultural biotopes are often managed with voluntary help. The goal is to restore and maintain environments that resemble as closely as possible the former meadows or pastures. Traditional working methods are also revived whenever possible. Photo: Metsähallitus.

bothnia. Southern Finland has a wide variety of meadows and burnt over clearings. Most of the traditional agricultural biotopes of Ostrobothnia and Lapland are peatland meadows. A large proportion of the biotopes covered by conservation programmes are flood meadows associated with waterfowl habitats.

Although the Metsähallitus NHS has been managing traditional agricultural biotopes in a few protected areas including Linnansaari National Park and the Archipelago National Park since as long ago as the 1970s, most habitat management work in protected areas did not begin until the 1990s. Since 1995 such habitats have been managed in at least ten projects co-financed by the EU. Metsähallitus has played a pivotal role, particularly in conserving and managing rare wooded meadows, flood meadows on northern riverbanks, dry meadows, moorlands and the heritage landscapes of slash-and-burn agriculture. Finland has special international responsibility for meadows and associated species on land uplift coastlines, northern riverbanks and mires. The habitats created by Finnish slash-and-burn agriculture are also unique in Europe.

5.5.2 Parks Established in Urban Surroundings

Built environments are a heterogeneous group of habitat types that can be defined in various ways. For present purposes they may be understood primarily as centres of human habitation and industrial areas together with their immediate surroundings and areas modified for the purposes of transportation. Built habitats are estimated to account for 3.5 % of the total area of all habitats in Finland.

The proportion of Finnish species that occupy built habitats (11%) is much larger than the area share of those habitats would imply. Most built habitat species are found in settlements, parks, yards and gardens, as well as in ruderal sites on wasteland, roadsides, railway embankments and gravel pits. A large number of alien species are also typical of urban environments. A total of 21 threatened species have disappeared from built environments. Most of these species are insects that have disappeared from parks, yards and gardens.

Since 2001, three national urban parks have been established in Finland: in Hämeenlinna, Pori and Heinola. National urban parks are a novel approach to conserving the natural and cultural landscapes of towns and cities. Parks, recreational sites and nature reserves, that have been permanently set aside in land use planning processes, are united as a coherent entity. One criterion for national urban parks is that they form ecological corridors facilitating the movements of species between urban areas and their greener surroundings. The objective is to establish about ten urban national parks in the next few years.

Nature reserves and recreational areas owned by cities can provide significant support for State protected areas, as the recreational areas administered by the cities of Espoo and Helsinki complement the Nuuksio National Park, for instance.

5.6 Valuable Cultural Heritage in the Protected Areas

Cultural heritage consists of the remnants or contents of culture created by earlier generations. Protected cultural heritage sites may include such elements as cultural landscapes, buildings or places associated with past human activity.

Finnish cultural heritage has formed in close association with nature and long remained markedly local. The country's first settlers after the Ice Age lived by gathering and fishing, and also by catching seals, deer and small game animals in the winter. Fixed settlements gradually began to form in the Archipelago and by the Gulf of Finland as the land slowly emerged from the sea. By the Iron Age farming communities already occupied the whole of Southern Finland. Eastern Finland and Lapland remained wilderness areas that continued to be occupied by hunter-gatherer communities right up to the spread of slash-and-burn agriculture in the early 11th century.

During the period of Swedish rule from the 12th century to the early 19th century the population of Finland remained small and concentrated on the coast and in the immediate vicinity of waterways, which also became sustained centres of agriculture and forestry because of the availability of waterborne transport. This was the Golden Age of local slash-and-burn agriculture in the hills of Eastern Finland, and of tar burning along the rivers of Ostrobothnia.

Finland endured several military conflicts before being annexed to Russia as an autonomous Grand Duchy in 1809. It was not until the end of the 19th century that the road and rail network enabled a significant expansion and mechanisation of forestry. The exploitation of forests remained the core of the Finnish economy for decades after the country gained independence in 1917.

5.6.1 Classification of Cultural Heritage in Protected Areas

Traces of old hunting cultures and the subsequent uses of forests are still visible in many protected areas. A great deal of Finland's cultural heritage has survived as remains of prehistoric settlements, surviving historic buildings and artefacts, and broader cultural environments. Some of this heritage is well known and its value is nationally or even internationally acknowledged, while some has yet to be assessed or even remains as an unrecognised reserve of cultural heritage.

The main types of cultural heritage associated with protected areas are:

- cultural landscapes (national landscapes, heritage landscapes, national urban parks and productive landscapes, e.g. areas associated with gold prospecting)
- built cultural environments (old buildings, yards, productive environments) and their associated cultural heritage of artefacts (interiors and tools)
- antiquities (immovable ancient relics and shipwrecks)
- heritage and customs linked with local history and especially built environments (traditional working practices, folklore and other oral traditions, and memories and knowledge of historic events and people).

Such cultural heritage may be classified in many ways. The NHS has introduced a conservation classification based on geographical levels of significance (see Appendix 15). The international level includes built cultural environments and ancient relics included in the World Heritage List, as well as sacred natural sites within protected areas designated for the IUCN's Delos Initiative.

The national level comprises sites registered by Finnish public authorities, assessed by the National Board of Antiquities (NBA) and approved by the Government. These include valuable landscape areas, significant cultural history environments, listed protected buildings and registered ancient relics. Hague Convention sites specified by the NBA are also included in the list of national sites. The 1954 Hague Convention is a UNESCO humanitarian convention that seeks to protect cultural property in the event of armed conflict.

The cultural heritage conservation classification at provincial and local level comprises sites classified by the NBA, the Finnish Road Administration and provincial authorities, for example in the course of land-use planning. Finland's cultural heritage reserve also includes national and heritage landscapes, sights, elements of the built cultural environments included in new official lists not yet approved, buildings in protected areas, and ancient relics that have been inspected by archaeologists and notified to the NBA.

5.6.2 World Heritage Sites within Protected Areas

Finland signed up to the World Heritage Convention (Convention Concerning the Protection of the World Cultural and Natural Heritage) in 1987. The principal motivation for this Convention is concern for preserving the world's threatened cultural and natural heritage for the benefit of future generations. The World Heritage List may include cultural heritage sites, natural heritage sites or a combination of these.

To qualify for the World Heritage List, a cultural heritage site must be a masterpiece of human creativity or provide exceptionally significant evidence of an existing or extinct culture. The site may be a building type that exemplifies a significant historical period or it may illustrate traditional settlement by a certain culture. It may also be associated with events, living traditions, ideals, religious traditions and beliefs, or

works of art and literature. A natural heritage site may relate an important developmental stage in the earth's history or constitute an example of ongoing ecological or biological change. It may represent an exceptionally beautiful landscape, or be home to a threatened animal species.

Over 800 sites, most of them cultural, had been included in the World Heritage List by 2005. These sites were located within the territories of the 137 signatory countries to the World Heritage Convention. There are currently seven world heritage sites in Finland. These include cultural environments at the fortress island of Suomenlinna and Old Rauma, the buildings of Petäjävesi Old Church and Verla Paper Mills, and the Sammallahdenmäki Bronze Age Burial Site, all of which were placed on the list in the 1990s.

The Struve Geodetic Arc was approved for the World Heritage List in summer 2005 representing science and technology. Six of the arc's preserved survey points are in Finland, with three of them in protected or other areas administered by Metsähallitus. The Kvarken Archipelago natural heritage site was approved for the World Heritage List in July 2006 (see Information Box 10). Most of this area is included in nature reserves or conservation programmes and also forms part of the Natura 2000 network.

The Saimaa-Pielinen Lake System was approved for inclusion in Finland's national list of candidate World Heritage List sites in 2004 and actual project preparations began in 2006. This site is based on Natura 2000 areas, the Linnansaari, Kolovesi and Koli national parks and other established protected areas, most of which are managed by Metsähallitus. The rocky island of Ukonsaari in Lake Inarinjärvi, which is an old Sámi place of worship in Lapland, and the rock carvings at the old Hauensuoli anchorage near Hanko are also candidates for the World Heritage List. Other proposed candidates include the aapa mires of Northern Finland and the Fennoscandian Green Belt network of protected areas along the Finnish-Russian border.

The Kvarken Archipelago – Unique Natural Heritage

In summer 2006, UNESCO's World Heritage Committee accepted Finland's nomination of the Kvarken Archipelago for the World Heritage List, as the country's first natural heritage site. Kvarken is now connected to Sweden's High Coast site, which already was on the World Heritage List, to form the Kvarken – High Coast World Heritage Site. The High Coast and the shallow waters of Kvarken together provide the best example of the geological impact of the most recent Ice Age. The landscapes of Kvarken include rocky islands and islets, moraine ridges and a series of shallow bays that are gradually becoming separated from the sea. Such bays first become "fladas", almost closed lagoons with frequent connections to the sea, before they evolve into "glo-lakes". During the Ice Age, a heavy ice sheet weighed down on this part of the earth's crust, and when the ice melted the land began to rise slowly. The natural features of the area are in a state of constant change, because the local rate of land-uplift is still as much as 8 mm a year.

The declaration of the world heritage site was preceded by ten years of work, studying the area's ecological and geological features, producing demonstration material, sharing information with interest groups, and preparing several versions of the proposal. Preparations were lengthened by the complex local land ownership condi-

tions and the need for close coordination with Swedish counterparts.

Managing and coordinating Finland's first World Natural Heritage Site is a novel of task for Metsähallitus. The area is similar to Central European national parks, as it is home to some 2,500 people, and it includes villages with many kinds of local economies, as well as more strictly protected areas. The site is shared between six municipalities, so there are many interest groups, from the local authorities and people with holiday homes in the area to local NGOs and amateur naturalists.

The status of a world heritage site does not in itself bring new regulations or restrictions, or alter the powers of the authorities in Kvarken. To reconcile the actions of different quarters, an advisory board has been established, with Metsähallitus in an administrative role. Cooperation is needed in preparing management plans, carrying out different management measures, developing facilities, and marketing.

Only 8% of the World Heritage Site, consisting of areas with a total extent of about 2,500 hectares, is owned by the State, but these areas will play a key role in the planning of the World Heritage Site as an attraction for visitors. Metsähallitus manages three former coastguard and pilot stations and two disused fortress areas, which are now open to visitors as guiding and lodging points. The area also has hiking and nature trails. The Terranova – Kvarken Visitor Centre is situated in the town of Vaasa, in the same facilities as the Ostrobothnian Museum.

Thanks to the World Heritage project, the Kvarken area has gained good connections to other areas in the Baltic and Nordic Countries. Joint projects have been set up together with Norway's Vega World Heritage Site, as well as Sweden's High Coast site.



DeGeer moraines in the Kvarken Archipelago World Heritage Site. The Kvarken Archipelago was formed before and after the Ice Age, some 10,000-24,000 years ago. The glacial formations outside Svedjehamn village on Björköby Island are among this area's unique natural features. Photo: Arto Hämäläinen.



A fishing village on Jurmo Island in the outer parts of the Archipelago National Park. The island is full of rich cultural heritage left by former generations. The old village is surrounded by heathland formed by grazing and burning. Traditional land use practices are continued to maintain the landscape and its rare vegetation. Photo: Seppo Keränen.

5.6.3 Nationally Significant Cultural Areas

National land use objectives defined by the Government identify four areas of particular environmental and cultural importance in Finland: the SW Archipelago, the land up lift coasts of Western Finland, the Saimaa Lake System and the fells of Lapland. The cores of all of these areas lie within protected areas and are managed by the NHS. According to these national objectives, the key features of these areas will be identified and their various uses will be harmonised to safeguard important natural conditions and cultural values. These areas also represent the principal natural and cultural heritage of Finland more broadly.

Coastal settlements and navigation marks

The Finnish coast and archipelago have been inhabited since the late Stone Age (between about 2000 and 1300 BC). As the climate warmed following the Ice Age, a plentiful supply of naturally occurring food encouraged Stone Age and Bronze Age people to settle by the sea. The Baltic Sea was saltier at this time and rich in

seals, sea fish and birds. The warmer weather even meant that conditions for animal husbandry and small-scale farming could have been better than nowadays.

In addition to the basic livelihoods of the Archipelago region, trade, handicrafts and navigation were early pursuits. Sailing throughout the Baltic Sea region began no later than the Bronze Age, when the Finnish coast had become part of the northern Baltic cultural area, united by similar livelihoods, uses of metal, and burial customs.

During the Iron Age (500 BC-1150) habitation began to spread into areas now in the Archipelago National Park and other coasts. Pollen analyses have shown that the coast has been in continual use for agriculture from the Iron Age to the present day. Boosted by Swedish immigrants, the population of the Archipelago region increased substantially after the middle of the 13th century. About half of the villages in the present Archipelago National Park cooperation area were already inhabited by the Middle Ages.

The population of this region continued to increase with new technical innovations, and periodically to decrease due to wars and plague. New opportunities on the mainland drew people away from the archipelago in the early 20th century, but brought new ones in the 70s with the rising popularity of summer homes in the area. Continued habitation over the centuries has ensured the preservation of valuable cultural environments.

Old navigation marks can be found throughout Finland's coastal waters. The oldest known and charted Baltic Sea sailing route, known as the Baltic Sea itinerary from the start of the 14th century, passed through the outer SW Archipelago. Many buildings and other structures associated with navigation still remain in all the archipelago areas. Some of the most notable are on the islands of Jungfrusund in the SW Archipelago and the lighthouse communities of the Kvarken Archipelago, together with many pilot facilities and coastguard stations. The rock carvings at Hauensuoli near Hanko were made as navigators waited for favourable winds or customs clearance. The oldest of these etchings date

from the 17th century and the newest are from the 20th century.

Eastern slash-and-burn culture

Waterways have always had major significance to the inhabitants of Eastern Finland, even more so in earlier times. Almost without exception the earliest settlements lay along important waterways. Fishing has been one of the region's most important livelihoods ever since the Stone Age. Hunting has also been an important means of livelihood since prehistoric times. This is evident from the rock paintings found in locations including the Kolovesi National Park, the Pihlajavesi Natura site and Hossa Hiking Area.

Commercial fur trapping began in inland regions of Finland during the first millennium AD. It has been suggested that already by the 17th century the most valuable fur animals, the beaver and the sable, had been hunted virtually to extinction. Slash-and-burn agriculture began to spread through the wilderness regions of Eastern Finland and Karelia as the hunting trade declined.



Traditional annual burn over, Telkkämäki Nature Reserve. Telkkämäki is a living traditional farm unique in the Nordic countries. Traditional broadleaved woodlands are maintained using old slash-and-burn techniques. Photo: Jorma Peiponen.

The history of this form of agriculture in Finland dates back to prehistoric times, and it was integral to habitation in the North Savo region from at least the 15th century. Slash-and-burn agriculture in coniferous forests was one of the technical and economic cornerstones behind the occupation of this region by new settlers.

From the end of the 17th century, however, slash-and-burn agriculture began to fall out of favour with the Swedish administration due to fears that the forests would be exhausted, reducing the supply of charcoal for the national mining and iron industry. It was not until the 19th century, however, that slash-and-burn agriculture began to decline in Savo. The last such clearings were burned as recently as after the Second World War. Telkkämäki Nature Reserve has a unique living slash-and-burn heritage farm where this tradition is still maintained.

Old and New Sámi Heritage

Finnish Lapland was first inhabited immediately after the continental ice sheet receded. The earliest known inhabitants of Northern Finland were the Sámi. Remains of earlier settlements dating from 8,000 to 9,000 years ago have been found throughout the current Sámi Homeland.

Early habitation by the Sámi was based on a hunting culture that lasted until the end of the 17th century, when reindeer husbandry began to spread. Other traditional Sámi livelihoods were hunting, fishing and handicrafts. Together with tourism and forestry, these have remained the basic livelihoods of the Sámi to this day.

The Sámi of today are an indigenous people living in Norway, Sweden, Finland and Russia with their own language, culture, lifestyle and identity. There are about 7,000 Sámi in Finland, occupying a homeland region that consists of Finland's three northernmost municipalities (see Fig. 30 and Information Box 11).

Several sites containing Sámi cultural heritage have survived in the national parks and wilderness reserves of Lapland, and efforts have been made to restore and preserve these sites as places of use and interest for future generations. Immovable ancient relics are an integral part of the cultural heritage of the people of Lapland. The Stone Age settlements of Lapland constitute a noticeably large share of all ancient sites com-

pared to the situation elsewhere in Finland. Some of the finest sites include the Koltta-Sámi village at Suomujoki in the Urho Kekkonen National Park and the Sallivaara reindeer corral in Lemmenjoki National Park.

About 70% of the Sámi Homeland region consists of protected areas. Under Metsähallitus' administration, the management, use and conservation of natural resources are harmonised to enable the Sámi to enjoy their constitutional right to maintain and develop their own culture. The Sámi Parliament is an autonomous body that deals with issues related to the languages and cultures of the Sámi and their status as an indigenous people. The other local residents of Northern Finland also enjoy the right to practice traditional nature-based livelihoods.

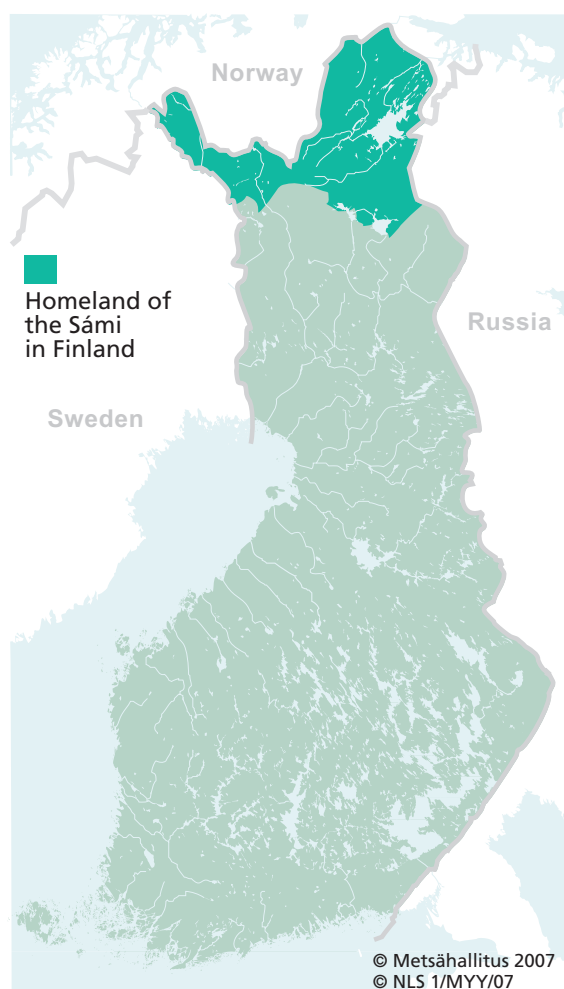


Figure 30. Homeland of the indigenous Sámi people in Finland.

The Sámi - Europe's Last Indigenous People

The Sámi are the only official indigenous people in the Nordic countries. They also are the only indigenous people in the EU, because the Inuits of Greenland do not belong to the Union. The status of the Sámi as an indigenous people has been recognised in Finland, Norway and Sweden. However, Finland has not yet ratified the International Labour Organization's (ILO) Indigenous and Tribal Peoples Convention, because certain key issues related to the land rights of the Sámi in Finland remain unresolved.

The Sámi people live in Lapland, which encompasses northern parts of Norway, Sweden, Finland and European Russia. The officially recognised homeland of the Finnish Sámi covers the northernmost municipalities. It is estimated that a total of about 65,000 Sámi live in Lapland, including about 7,000 in Finnish Lapland, of whom about 3,000 speak a Sámi language as their first language. Many of Finland's Sámi people nowadays live outside the Sámi Homeland region.

Early history unclear

The Sámi, like the Finns, probably descended from several population groups who arrived in the region from different directions. It was earlier thought that the Sámi came from Siberia and were related to the Samoyed people, for example. Modern genetic research shows, however, that the Sámi are not closely related to eastern peoples. Their relationship to the other European peoples, who speak Baltic-Finn and Indo-European languages, is also remote, but closer than to the eastern peoples. The genetic distance to eastern peoples suggests that the ancestors of the Sámi have lived in Europe for thousands of years.

According to some researchers, at least some of the ancestors of today's Sámi probably arrived at the end of the Ice Age from Western Europe by travelling along the Norwegian coast, which was already free of ice. After they ended up in the north, they lived in isolation for a long time. At some stage, this population probably met an eastern people, and adopted their Uralic language.

The cultural and linguistic characteristics of the Sámi originate from the early Metal Age, at the latest. In the final stage of the Stone Age, the early root language form of Finnish is thought

to have been separated into two. Those living on the Finnish coast became the linguistic ancestors of today's Finns. Those living inland, and in the large northern areas of Fennoscandia, spoke a language which later developed into the present-day Sámi languages.

Language as a Key to Culture

In the Nordic countries, language is the criterion for belonging to the Sámi. People who regard themselves as Sámi, and who speak Sámi as their first language, or have parents or grandparents who speak Sámi as a first language, are considered as belonging to the Sámi people.

The Sámi languages form a long continuum that can be divided into at least ten different languages. The Northern Sámi language has most speakers, as well as an established standard language, and it is widely used in literature and media. Koltta Sámi and Inari Sámi are also spoken in Finland.

In addition to their varying languages, different Sámi groups have had different religions, environmental conditions and means of livelihood. The Koltta Sámi and the Kola Sámi joined the Orthodox church in the 1500s, whereas the other Sámi groups have been more strongly influenced by the Lutheran church.

The ancient Sámi religion was shamanism. The Sámi believed that everything had a soul. Religious practices were expressed through respect to ancestors and the worshipping of sacrificial stones known as "seitas". To the old Sámi people, religion was not a symbolic system, but a comprehensive experience of life.

Reindeer husbandry adopted in the 1800s

The Sámi people started to herd reindeer after they had domesticated the wild reindeer (*Rangifer tarandus tarandus*). There are differences of opinion as to when reindeer husbandry actually began. Reindeer had already earlier been domesticated for transport and for producing milk and leather, and the Sámi people of Finland supported themselves largely by hunting and fishing during the period when Finland was under Swedish rule. The basic unit of the old Sámi community

was a “siita” – a kind of cooperative, formed of several families, which shared the tasks of wild reindeer hunting, related production, and the management of joint reindeer herds. This system gradually died out as reindeer husbandry became dominated by large-scale meat production.

The “golden age” of reindeer husbandry as large-scale meat production began in the 1800s, and ended in the beginning of the 1900s when the borders between Sweden, Finland and Norway were closed. It is supposed that this large-scale reindeer management came from the west, from the Sámi people of Scandinavia. However, it is possible that they had learnt such practices from other Sámi who originated further east. Komis and Nenets wandered through the Kola Peninsula in the 1800s, and had a strong influence on the reindeer husbandry practices of the Koltta Sámi and other eastern Sámi peoples.

Reindeer husbandry has not been a common source of livelihood for all Sámi peoples, and the new larger reindeer stocks took up the living space of the wild reindeer. Wild reindeer herds were important to the hunting Inari Sámi, for example, in addition to fishing, collecting and trading. According to their living environment and means of livelihood, Sámi peoples have been traditionally divided into three groups: the Forest Sámi (who also fished), the Coastal Sámi and the Fell Sámi, also known as the Reindeer Sámi.

Today reindeer husbandry is not only practised by the Sámi in Finland, but also by other

Finns. In Norway, the Sámi have an exclusive statutory right to practise reindeer husbandry.

Cultural autonomy and the Sámi Parliament

All the countries, where Sámi live, have tried for a long time to either assimilate Sámi people into the mainstream culture, or to marginalise them by restricting them to their homes in the remote fells. Assimilation policies were strengthened during the Second World War, and into the 1950s. In the 1960s and 70s a national Sámi awakening began, and teaching in Sámi language was approved in primary schools. To improve the status of the Sámi language in Finland, the Sámi Language Act was passed in 1992, and amended in 2004.

As an indigenous people, the Sámi nowadays have autonomy over matters concerning their language and culture in their official homeland. The Sámi Parliament of Finland was established in the beginning of 1996, to replace the Sámi Delegation founded in 1973. The Sámi Parliament is the highest political body of the Finnish Sámi people. It operates under the Ministry of Justice, but separately from the Finnish State administration. The most important function of the Sámi Parliament is to plan and carry out cultural self-government as defined in the Finnish Constitution. The Sámi Parliament also decides on the use of allocations from the State budget, and has the right to speak out on all matters concerning land use in the Sámi Homeland region.



Reindeer herding is still a fundamental part of the culture of the indigenous Sámi. Meat production is the mainstay, but reindeer tourism nowadays provides important secondary income for herders as well as a local attraction. Photo: Sulo Norberg.

5.6.4 National and Heritage Landscapes

The European Landscape Convention took effect in 2004 and has been signed by 30 countries. Finland signed up to the Convention in 2000, and ratified it in 2007. Finland's legislation, administrative programmes and practices provide adequate instruments for implementing the protection, management and planning of landscapes as required by the Convention.

Finland has been divided into ten landscape regions, some of which are further divided into sub-regions (see Fig. 31). This division is based on differences between the natural and cultural landscapes of the various provinces and regions. There are no sharp boundaries between the landscapes of adjacent regions and sub-regions, with changes occurring gradually when passing from one region to the next. At the extremes of the scale, however, Finland's landscapes vary

considerably. The landscape regions in Southern Finland are the southwestern plains; the southern coastland; the inland plains, hills and lakes of Häme; the eastern Lake District; and the Karelian hills. The Ostrobothnia area comprises the Ostrobothnian coastline; the hills of Suomenselkä divide; the Oulujärvi Lakeland; and the hills of Kainuu and Kuusamo. Lapland's fells and forests form an extensive landscape region of its own. This division into landscape regions reflects both regional environmental conditions and land use practices that have consequently developed and further shaped the landscapes.

Finland's most famous landscapes are known as the national landscapes. These areas include the finest scenic features of Finland's natural and cultural landscapes. They have inspired many artists to depict them in works that have made them known and loved. A total of 27 national landscapes in various parts of Finland were nominated in 1992 to mark the 75th anniversary of Finnish independence.

Eight national landscapes lie entirely or partly within nature reserves:

- The Archipelago National Park is part of the Archipelago national landscape.
- The Aulanko Nature Reserve is part of the Vanajavesi national landscape.
- The national landscape of Olavinlinna Castle and Lake Pihlajavesi lies partly within the Pihlajavesi Nature Reserve.
- The Koli National Park has one of the most famous landscapes depicted in Finnish art.
- The Kermajärvi Nature Reserve and Kolovesi National Park form part of the Lake Heinävesi Route national landscape.
- The national landscape of the Kvarken Archipelago includes many nature reserves.
- The Oulankajoki national landscape is mainly within the Oulanka National Park.
- The Pallastunturi national landscape is the most famous part of the Pallas-Yllästunturi National Park.

The national landscapes of Aavasaksa, River Utsjoki valley and maritime Helsinki also include State-owned lands that are managed as protected sites.



Figure 31. Landscape regions in Finland. Source: Ministry of the Environment.



A scenic picnic spot in the 'national landscape' of the Koli National Park. Altogether 27 national landscapes were nominated around the country as national landscapes in 1992 to commemorate the 75th anniversary of Finland's independence. Photo: Markku Tano.

In 1995 the Government defined 156 nationally significant landscape areas, with a total area of 730,000 hectares (7,300 km²). Most of these landscape areas are in the agricultural regions of Southern and Western Finland, and 27 are in lands administered by the NHS. Eight of these areas are in Southern Finland, nine are in Ostrobothnia and ten are in Lapland. Many sites are the same as those that have been declared national landscapes, such as the Archipelago on the southwest coast, the Kvarken Archipelago on the west coast, the Koli region in the hills of Karelia, Oulanka Rapids in Kuusamo, and Pallastunturi Fell in Western Lapland.

Nationally or provincially important landscape conservation areas may be established under the Nature Conservation Act in order to preserve and manage the beauty, historical characteristics or other special values of natu-

ral and cultural landscapes. So far only a few Finnish landscape conservation areas have been established under the Nature Conservation Act, although some projects aiming to establish new landscape conservation areas in various parts of Finland are currently under preparation.

Heritage landscapes created by slash-and-burn agriculture and other historical forms of land use constitute some of the most diverse, but also most threatened habitats in Finland. They host a wealth of species as a consequence of human labour and livestock grazing, and the same measures are needed to maintain them. The NHS staff, with the help of many volunteers, manage more than 2,000 ha of heritage landscape. However, this work often focuses solely on the management of the traditional agricultural biotopes. Efforts will be made in the future to better manage also the built environment.

5.6.5 Cultural Sites and Historic Buildings

In 1993 the National Board of Antiquities (NBA) listed more than 1,700 nationally important cultural historical environments, comprising rural and archipelago villages, old wooden towns, workers' residential districts, urban centres, ironworks, mills and factories, sawmills, manor houses, parsonages and churches with their immediate environs. About 50 of these sites are in protected areas administered by the Metsähallitus NHS. Some of the sites on this list are also included in the lists of national landscapes and nationally important landscape areas. Besides the coastal village communities referred to above (in the SW Archipelago and Kvarken Archipelago), such sites also include the main island of the Linnansaari National Park, situated within the Saimaa Lake System.

The built cultural historical environments in protected areas in Southern Finland mainly consist of building complexes associated with the archipelago and agriculture. Sites in Ostrobothnia include villages, a coastguard station and an ironworks. Cultural historical environments in Lapland's protected areas are associated with the sacred sites of the Sámi or with reindeer husbandry. In all the NHS administers 16% of nationally valuable sites in Lapland Province, most of them within the Sámi Homeland.

An EU project launched in 2004 and led by the Lapland Regional Environment Centre is due to complete an inventory of cultural environments in Lapland Province by the end of 2007. The Sámi section of this project is especially expected to provide new information about many features of Sámi built cultural environments.



A small traditional village of the Koltta Sámi at Suomujoki, Urho Kekkonen National Park. Photo: Sulo Norberg.

The Natural Heritage Services maintains 12% of valuable State-owned buildings

The NHS administers 25 building complexes with a total of nearly one hundred buildings protected under the 1985 Decree on the Protection of State-owned Buildings. Most of these buildings are in the region of NHS Southern Finland. The protected buildings mainly represent constructions resulting from old forms of land use, hunting and fishing, and the exploitation of forests. The NHS also administers 40 buildings or building complexes protected by agreement between Metsähallitus and the National Board of Antiquities (NBA).

Some of Metsähallitus's protected buildings form a series of structures of national importance for Finland's cultural history. Such sights open to the public include the 18th century Huhtala Croft in Isojärvi National Park, and the late 19th century Kultala Crown Station at the old River Ivalojoiki gold panning site, which today lies within the Hammastunturi Wilderness Reserve.

The NHS also administers a large stock of valuable buildings that have not been formally catalogued or protected. A geographical information register listing in 2005 indicates that the NHS administers about one hundred buildings constructed before 1920, more than one hundred buildings dating from the period 1920-1944, and over 350 buildings from the period 1945-1975. Details of the years of construction are not available for more than 700 buildings, which probably include several hundred old buildings. A particular problem arises with buildings that have been transferred from other central government authorities such as the Finnish Defence Forces, the Finnish Maritime Administration and the Coast Guard. It can be difficult to find new uses for such sites, which are typically expensive to maintain.

5.6.6 Relics of Ancient Dwellings and Historical Events

Immovable ancient relics are preserved traces in the landscape and soil of the activities of people who lived in Finland in ancient times. Examples of ancient relics include prehistoric burial sites and dwelling places, ancient hunting pits and



Lookout tower in Aulanko Nature Reserve. Aulanko has been a popular destination with visitors for more than a hundred years. From the top of Aulangonvuori Hill, there is a great view over the national landscape of Lake Vanajavesi. The English-style park, which forms a part of the nature reserve, is with its buildings and cultural history a nationally valuable site. Nowadays, the Aulanko area belongs to the first National Urban Park in Finland. Photo: Outi Mäenpää.

rock paintings. They also include natural monuments associated with old customs and beliefs. The remains of more recent human activity, such as military campaigns or navigation, are also often seen as ancient relics.

Ancient relics may be regarded as priceless sources of information about the past, and have been protected under the Antiquities Act. This legislation automatically protects all ancient relics, which may not be touched in any manner without the express permission of the NBA or the regional environment centre.

The NBA maintains a catalogue of ancient relics found in Finland. Nationally important protected prehistoric areas were separately listed in 1983. According to the NBA register of ancient relics, a total of 765 sites, comprising about 5% of all registered sites are on lands administered by the NHS. Most of these sites, 528 in all, are in Lapland. There are 124 such sites in Southern Finland and 113 in Ostrobothnia.



Rock paintings in Kolovesi National Park. Human and animal figures painted on steep rock walls along lake waters depict the lives of hunters who lived here 5,000 years ago. Kolovesi has been nominated as a site for the Delos Initiative, which aims to conserve sacred sites in protected areas designated by the IUCN as part of our common world heritage. Photos: Anne Pyykönen and Katri Suhonen.

Relics of national value

The NHS administers certain sites that include ancient relics of national importance. These sites include the protected Harola Iron Age mound in Satakunta (see Information Box 21, p. 202) the Vieruvuori rock paintings in Kolovesi National Park, and the old Bishop's Stone boundary mark in the Perämeri National Park. Finland's oldest continuous period of cultivation, dating from about 600 to 200 BC, has recently been ascertained from sediment samples taken in Repovesi National Park. A dwelling place studied

at Vetsijärvi in Inari has been dated at 8500 BC, making it the oldest known dwelling place in Finnish Lapland. This site is in the Kaldoaivi Wilderness Reserve.

According to the NBA register of ancient relics, the most important concentrations of valuable sites are in the large northern protected areas. Many sites pertaining to the Sámi and traditional use of wilderness have been identified in the Lemmenjoki and Urho Kekkonen national parks, in the Kevo and Sompio strict nature reserves and within nearly all wilderness reserves. Other valuable sites include habitation sites on islands in the Archipelago Sea and sites related to forest work in Oulanka and Syöte national parks. No significant ancient relic sites have been found or catalogued within other national parks or strict nature reserves, particularly those that protect mire and forest environments. While

there is an important rock painting site within the Hossa Hiking Area, no notable ancient relic sites have been registered in other State-owned hiking areas.

As an administrator of public waters, the NHS also plays a significant role in protecting submerged cultural heritage. Old shipwrecks have survived comparatively intact in the northern waters of the Baltic Sea, because salinity levels are too low for the shipworms that normally destroy such wrecks. There are about twenty valuable wrecks in parts of the archipelago where navigation is very hazardous. The best-known and best-preserved wrecks are in the Archipelago Sea and the Eastern Gulf of Finland.

Remains of defensive structures

The transfer of State areas used by the Finnish Defence Forces to the care of Metsähallitus has left the NHS responsible for managing structures created for military operations throughout Finland from the Middle Ages to the Second World War (WW II). These include old fortified hills at locations including Aulanko and Linnansaari.

Many sites on the Southern Finland have 18th century island and inland fortifications constructed by both the Russians and the Swedes.

In assuming control of sea areas, the NHS has also acquired a substantial share of coastal defence facilities. The fortress of Gustavsvärn was constructed near Hanko in the 1740s, and some parts of the Suomenlinna fortifications at Vallisaari off the Helsinki coast are now administered by the NHS. The most important First World War fortifications are probably the Katanpää island fortress, which was the northern pillar of a series of coastal fortifications protecting St Petersburg in Russia. Parts of these fortifications are in protected areas.

The NHS administers parts of the Salpa and Mannerheim line fortifications and several battle sites from WW II. There are also important coastal defence sites from this period in the Eastern Gulf of Finland National Park, at Hanko and on the Porkkala Peninsula. In Lapland, the NHS is also responsible for managing fortifications constructed by the Germans during WW II. Some of these fortifications are in established protected areas.



Gun emplacement on the Island of Ulko-Tammio, Eastern Gulf of Finland National Park. During the Second World War this remote outer archipelago became Finland's eastern front. Relics of the war bring many interested visitors to the island during the summer. Photo: Jari Kostet.

Unregistered and unidentified relics

No systematic archaeological reviews have been conducted in protected areas. Only one national park – the Archipelago National Park – had been comprehensively catalogued by the end of 2005. Metsähallitus’s geographical information system includes nearly one thousand sites within areas administered by the NHS, most of which are different from sites in the NBA register of ancient relics, and therefore would still need to be entered in the official register. Assessments suggest that many more sites have yet to be identified and located. The lands administered by the NHS may be estimated to include as many as 15,000 ancient relics. Probably only a fraction of these will require active management, but information on these sites would help to ensure that they can be preserved and made available for scientific study.

5.6.7 Living Heritage of Forest Rangers, Hunters and Hikers

The oldest built cultural environments administered by Metsähallitus, that are associated with forestry, are now in nature reserves. Forest rangers’ farms were the basis for the management and control of forest areas. Some of these today serve as “heritage farms” that continue to be managed in the old style. Traditional Finnish crop varieties are cultivated in their fields and vegetable gardens, and old livestock breeds also continue to be kept. Another aim of heritage farms is to preserve plant and animal species whose existence depends on environments created by earlier forms of farming, such as meadows or cattle pastures. This also involves the upkeep of traditional working methods and buildings.

Four heritage farms are currently maintained:

- Kortenieniemi Farm, in Liesjärvi National Park, is the only forest ranger’s farm maintained by Metsähallitus in Southern Finland.
- Kovero Crown Tenant Farm in Seitsemien National Park presents the lifestyle of rural residents in the early 20th century.
- Linnansaari Croft with its surroundings in Linnansaari National Park is a nationally valuable heritage landscape in Lake Saimaa.
- The unique Telkkämäki Slash-and-burn Heritage Farm lies at the heart of the Telkkämäki Nature Reserve in Eastern Finland.

The NHS has also continued to administer the oldest forest workers’ lodges of Metsähallitus remaining on their original sites: Pitkäjärvi in Seitsemien National Park, and Heretty in Isojärvi National Park. Nature reserves also include traditional built cultural environments associated with hunting and fishing. These sites have been venues for seasonal hunting and fishing since time immemorial. The fishermen’s villages of the Perämeri National Park are important sites of this kind.

The cultural environments created by hiking survive in protected areas. Some of the oldest buildings used for nature recreation are probably to be found in the first national parks and wilderness reserves. Open wilderness huts are among the oldest surviving buildings used for hiking. Areas administered by the NHS also include some sites associated with the earliest forms of nature tourism. The oldest of these, the Hetta-Pallas hiking trail that was first signposted back in the 1950s in the Pallas-Yllästunturi National Park, remains one of the most popular trails in Finland.

With the exception of certain special sites in protected areas, such as the Imperial Fishing Lodge cultural environment in the Langinkoski Nature Reserve, the sites created by fishing and hunting tourism remain unregistered.



A summer morning at Korteniemi Farm, Liesjärvi National Park. This traditional farm takes visitors back to the everyday life of a forest ranger in the 1910's. The surrounding fields are cultivated using old methods. Photo: Tapio Tuomela.

5.7 National Parks as Attractions

State-owned lands are used for both recreation and nature tourism. Protected areas form the core of nature tourism areas, and are therefore important for local and regional economies. National parks are generally the most important protected areas for nature tourism. In an international context, national parks are understood to be areas of special character providing tourists with the best way of discovering the most interesting natural phenomena and attractive landscapes in a country. National parks play a pivotal role in developing nature tourism, and local businesses may draw on their appeal in their own marketing.

The factors affecting the extent of recreational use of a protected area include natural conditions, cultural sites, recreational service facilities, and the reputation, location and accessibility of the area. The natural characteristics of a protected area that attract tourists include the presence of old-growth forests, scenic waters and wilderness-like landscapes. Recreational facilities that make areas more attractive include signposted trails, facilities for fishing, boating and other

pastimes, and networks of open wilderness huts. The services available in the surrounding area and previous positive experiences are also important (see Information Box 12).

5.7.1 Captivating Natural Landscapes and Historic Sites

National parks are the most popular tourist attractions in the Finnish protected area network. The distinctive landscapes of many parks are familiar to everyone in Finland from photographs and paintings. Such national landscapes include the views from Ukko-Koli Hill in Koli National Park and the Oulanka Canyon in Oulanka National Park. Besides their natural sites and landscapes, many national parks include valuable cultural sites of interest for historical reasons. Many of these are managed as part of the service facilities of parks. Heritage farms, such as Kovero Crown Tenant Farm in Seitsemien National Park, present the settlement history and early farming methods of an area. The history of the Sámi people is illustrated at such sites as the previously mentioned Koltta-Sámi settlement in the Urho Kekkonen National Park and the Sallivaara

Good Facilities Attracting Most Visitors

According to the National Outdoor Recreation Demand and Supply Assessment (LVVI) study, carried out in 1998-2000, about one in every five people in Finland aged from 15 to 74 uses State-owned areas, such as national parks, wilderness reserves and hiking areas, for recreation. According to the study, visitors choose their destination on the basis of areas' natural conditions, facilities and accessibility.

Visitor numbers vary between national parks with different attractions. According to a study by the Finnish Forest Research Institute (Metla), the dominant natural habitat types of an area and the availability of services in the surrounding region contribute significantly to the numbers of visits. In the study Finland's 35 national parks were grouped on the basis of these factors, as presented in the table below. Marked trails, activities, buildings, campfire sites and interpretation services were considered as essential facilities inside national parks. Numbers of beds, activity organisers and catering services, marked hiking trails and cultural history sites were considered to be significant services and attractions in surrounding areas.

The first group largely consists of quite small national parks where the number of natural habitat types is low, and mires are the typical natural features. In the second group, forests are the main habitat types. The third group is dominated by waters and exceptional landscapes. The numbers of habitat types and the average surface areas of parks are largest in the fourth group, which includes national parks with fells, and often also valuable landscapes.

The mire parks have few facilities, while parks dominated by forests and waters have moderate levels of facilities. The fell parks of Lapland and parks located near cities have many facilities for visitors both inside the parks and in the surrounding regions. High visitor numbers seem to be especially associated with beautiful landscapes and abundant facilities within the parks and in the surrounding areas.

Source: Puustinen, J., Neuvonen, M., Sievänen, T. & Pouta, E. 2006: Kansallispuistojen vetovoimatekijät ja kävijämäärät. [Attraction factors and visitor numbers in national parks.] – In: Horne, P. et al.(eds) 2006: Metson jäljillä. Pp. 308-310.

National park visits compared to service levels inside and nearby the parks and to the dominant natural features of the parks.

| Service level inside the park | Service level around the park | Dominant habitat | | | |
|-------------------------------|-------------------------------|---|-------------|----------------------|---------------------|
| | | Mire | Forest | Waters and landscape | Fells and landscape |
| | | Number of parks (average annual visits) | | | |
| Low | Low | 2 (13 000) | 4 (13 600) | | |
| | Average | 2 (10 000) | 2 (6 800) | 1 (7 200) | |
| | High | 1 (20 000) | | | |
| Average | Low | | 4 (14 300) | 1 (6 000) | |
| | Average | | 2 (19 500) | 5 (37 600) | |
| | High | | | | |
| High | Low | | | | |
| | Average | | 2 (32 000) | | 1 (95 000) |
| | High | 1 (15 000) | 1 (100 000) | 3 (104 300) | 3 (129 000) |

Landscapes and Nature Experiences Top Reasons for Visits

Beautiful landscapes and opportunities to experience nature are invariably the most important motives for the recreational use of protected areas, according to all visitor surveys. The results of a visitor survey carried out in the Pallas-Ounastunturi National Park in 2003 (see figure) exemplify this trend. Comparisons with a similar survey conducted in 1998 show that the reasons behind visits have not changed significantly in five years, although relaxation was only rated in sixth place in the earlier survey, so its importance has increased a little.

A recently published doctoral thesis examines the responses of visitors to four tourist centres in fell regions, of which three are closely connected to national parks (Pyhätunturi, Luosto and Pallas-Ounastunturi). The study showed, consistently with Metsähallitus's own surveys, that peace and quiet, beautiful landscapes, and nature in general, are the most important attractions influencing visitors' choice of destination. According to the data, women emphasise the importance of natural features more than men on average. The ages of the respondents also affected their evaluations: for older age groups natural features were more

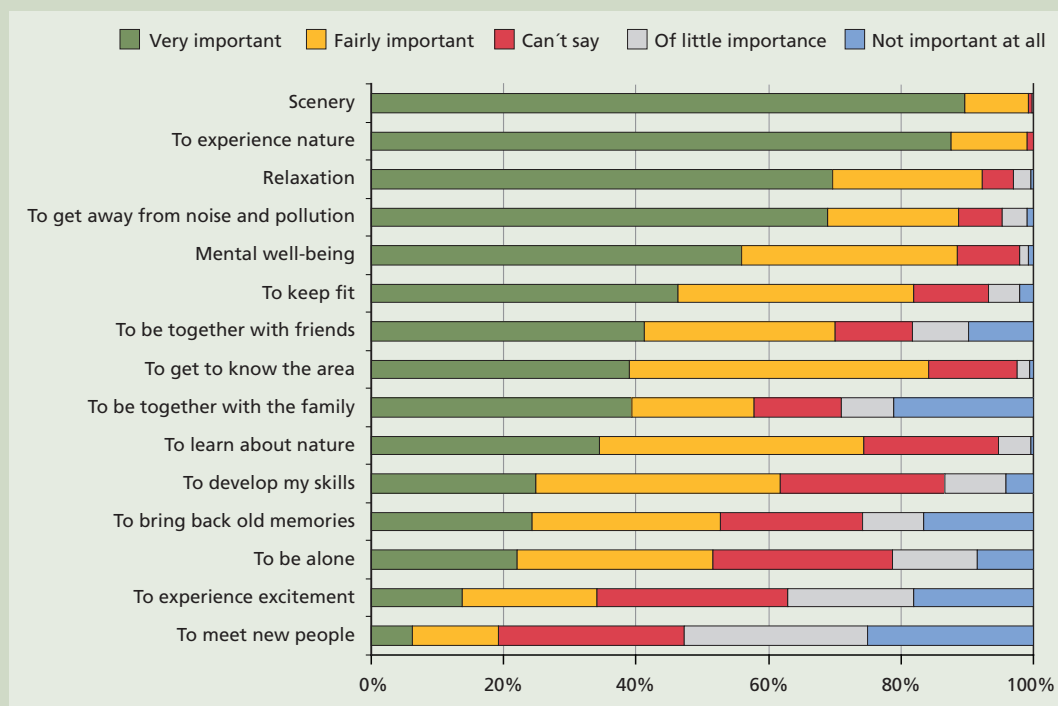
important reasons for their choice of destination than for visitors on average.

On the basis of such visitor surveys it is possible to make a careful generalisation that, for independent hikers in protected areas, the most important recreational motives are landscapes and natural features, and the next most important motives are relaxation, breaking away from everyday life, and then mental well-being. The desire to be alone, or find excitement, are not common reasons for coming to such destinations. The least important of the listed motives is to meet new people. However, many visitors find it important to be together with their family or friends.

Sources:

Järviluoma, J. 2006: Turistin luonto. [Tourist's nature.] – Acta Universitatis Lapponiensis 96. 214 p.

Sulkava, P., Hatanpää, M. & Ollila, E. 2004: Pallas-Ounastunturin kansallispuiston kävijät 2003. [Visitors to Pallas-Ounastunturi National Park in 2003.] Metsähallitus. 92 p.



Reasons for visiting the Pallas-Ounastunturi National Park according to a visitor survey in 2003. Source: Metsähallitus.



Long-distance skating on the frozen lake in Linnansaari National Park. The protected areas of Lake Saimaa are popular sites for nature tourism in the summer months. Recently much effort has been put into developing new attractions to promote tourism in the quieter winter months. Photo: Marie Louise Fant.

reindeer corral in Lemmenjoki National Park. Military history enthusiasts can find the remains of wartime constructions and restored museum sites in various national parks. One example is the Second World War Ulko-Tammio island fortress in the Eastern Gulf of Finland National Park.

Visitor surveys conducted by Metsähallitus have investigated the recreational motives of visitors. The five main reasons for visits identified in surveys covering the whole of Finland are to experience nature, to enjoy scenery, to relax, to get away from noise and pollution, and for mental well-being. Nature experiences are most commonly given as the reason for visiting an area. A detailed visitor survey conducted at Pallas-Ounastunturi National Park (now Pallas-Yllästunturi National Park) in 1998 provides a fairly typical profile of the average visitor. This impression has been confirmed by a new visitor survey at Pallas in 2003, and a recently completed academic thesis on visitors to the fell tourism area in Lapland (see Information Box 13).

5.7.2 Facilities for a Wide Range of Activities

Trails and services for all

Metsähallitus maintains a wide range of facilities for nature tourism and hiking throughout Finland. Visitors' movements through natural areas are facilitated and guided by trails, structures, information boards and cabins, together with customer service points and nature interpretation. At the beginning of 2006 the NHS was maintaining a total of more than 16,000 structures, nearly 1,700 buildings, 800 bridges, and about 14,000 kilometres of nature trails. Most of these facilities serve visitors to national parks, hiking areas and other popular nature sights (see Fig. 32). Seven hiking areas have the greatest shares of service facilities. The locations and nature of all these structures are recorded in the NHS's geographical information system, which also enables the monitoring of their condition and the planning of repairs. This information was collated into a single system in 2006.

Hiking, skiing and observing nature

The main recreational activities offered by each area have been catalogued for the Outdoors.fi website, which presents Metsähallitus's nature tourism sites (see Table 10). In 2006 the website covered about one hundred areas, including all national parks, State-owned hiking areas, wilderness reserves, strict nature reserves and other protected areas with facilities for the public.

It is possible to walk along trails in all of the areas presented on the Outdoors.fi website. Most visitors hike or go for a shorter walk during their visits. Popular trails for a single day's hiking include routes in the Oulanka and Pallas-Yllästunturi national parks. Many parks have thematic nature trails that present local natural features of interest and lead visitors to scenic viewpoints. Some trails also allow for visitors with special needs such as children and the disabled. Sign-posted summer nature trails, hiking trails on dry

terrain and duckboards in wetland areas extend for a total of 5,300 kilometres. The first underwater nature trail opened in summer 2006 in the Archipelago National Park. The best locations for wilderness trekking away from signposted trail networks are in the large national parks and wilderness reserves of Northern Finland, which have an extensive network of open-access and reservable wilderness huts.

Cross-country skiing trails are also available at most parks in the north and even many in the south of Finland. Nearly a thousand kilometres of ski trails are maintained, together with a couple of hundred kilometres of other winter routes. On the grounds of public right of access, dog-sledding is allowed, with the exception of nature reserves in which local regulations specifically limit this to certain trails. Although canoeing may be practised in very many parks, recreational canoeing and rowing have become especially popular in parks in the Saimaa Lake

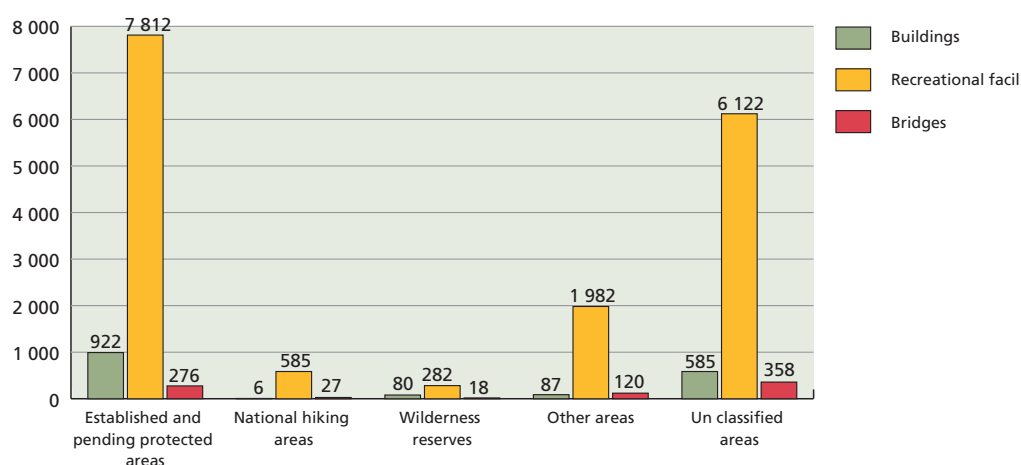


Figure 32. Buildings, recreational facilities and bridges owned by Metsähallitus and maintained by the Natural Heritage Services by area type as of 31.12.2005. Source: Metsähallitus.

Table 10. Activities offered in protected areas, according to classification used in Metsähallitus's Outdoors.fi web service.

| | | |
|------------------------------|----------------------|--------------------------|
| walking on trails | cross-country skiing | bird-watching |
| Nordic walking | downhill skiing | botany |
| jogging | snowshoeing | nature observation |
| hiking | dog-sledding | nature photography |
| picnicking | reindeer-sledding | educational activities |
| wilderness trekking | horse-riding | visiting a nature centre |
| walking the dog | cycling | scout camp |
| picking mushrooms or berries | canoeing or rowing | school camp |
| fishing | hunting | orienteering |

System. Basic angling and ice fishing may be practised in almost all waters. Licensed fishing is also possible in most parks, but hunting is only allowed to a limited extent in a few areas.

Campfires are an integral part of the Finnish hiking tradition, and parks have hundreds of sites provided where both day-trippers and campers may light campfires. Tent areas and campfire sites are also usually provided with dry compost toilets. Disabled toilets have been constructed at hiking sites that are suitable for the disabled.

Protected areas provide dozens of observation towers and platforms for birdwatchers. Many of these facilities are actively used by local amateur ornithologists. Rocky outcrops in coastal parks, such as the Eastern Gulf of Finland National Park, are also popular observation points during the migration season of birds nesting in the Arctic. Cycling, riding and climbing can easily erode the terrain, and are therefore confined to certain trails. Special locations for rock-climbing and ice-climbing are maintained in areas including the Repovesi National Park and Korouoma Nature Reserve.

Metsähallitus is Finland's most important nation-wide provider of services for boaters in

both marine and inland waters. Metsähallitus administers about 180 recreational harbours, of which 40% are marine. Two-thirds of these harbours include facilities, and one quarter are natural harbours. Nearly all harbours are navigable by small motorboats, and most can also be reached in keeled vessels. Metsähallitus manages nearly 1,600 mooring points for boats.

A nationwide customer service network

Information about of the most popular parks can be obtained in advance of visits at the 26 visitor centres run by Metsähallitus, or at other NHS customer service points. With a few exceptions, customer service points are located near national parks, hiking areas or other protected areas, but not within their boundaries. The themes of exhibitions at visitor centres describe phenomena of particular importance in the local areas. The Blåmusslan Visitor Centre, for instance, presents the environment and culture of the Archipelago region, the Häme Visitor Centre focuses on the natural characteristics of mires, the Seitsemien Visitor Centre describes local forests, and the Oskari-Linnansaari Visitor Centre presents lake-



A campfire site in Helvetinjärvi National Park. Along the thousands of trail kilometres in Finland's protected areas there are hundreds of serviced sites where visitors can take a break and have a snack. Photo: Timo Nieminen.



Kasnäs's Blåmusslan Visitor Centre introduces the diverse nature of the Archipelago National Park. Photo: Jari Kostet.

land environments. The Siida Exhibition, which was constructed in association with the Sámi Museum, provides a diverse account of the eight seasons of Lapland. Most centres have special facilities for school groups, and many are also equipped for the disabled. Their programmes also include various special events.

Metsähallitus also disseminates information and offers nature guidance and interpretation at many nature information points. These facilities provide information about local natural features and hiking opportunities. A total of 50 customer service points with varying levels of facilities make up a network covering the whole of Finland (see Fig. 33).

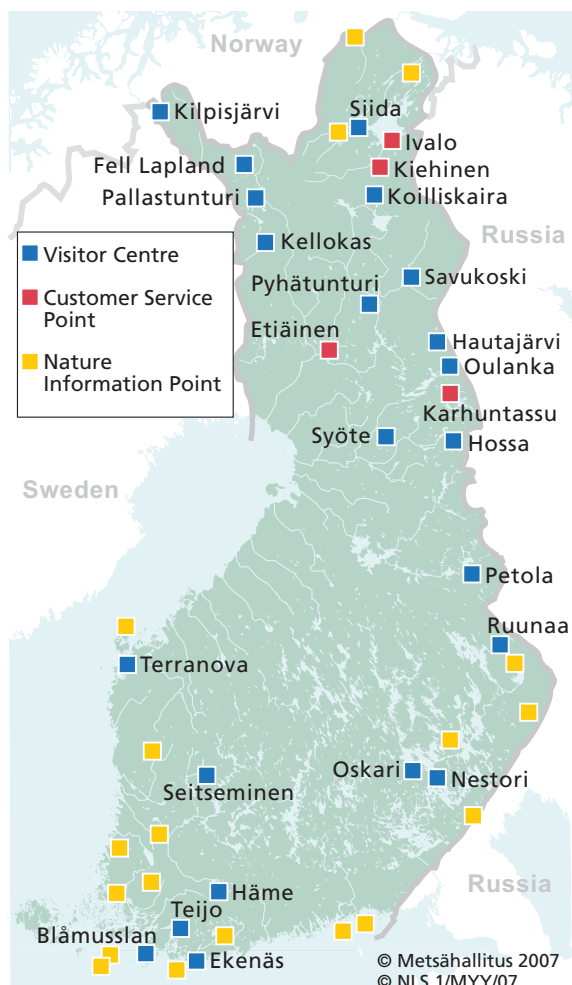


Figure 33. Metsähallitus's customer service network. The NHS runs a network of 26 visitor centres and customer service points around the country. These centres make excellent starting points for trips to nearby parks. Interpretation for groups is available both at the centres and in the parks.

5.7.3 Protected Areas in the Heart of Nature Tourism Centres

In 2000, 2003 and 2006 Metsähallitus reviewed the demand, service facilities and operating context of the protected areas that it administers from the perspective of tourism development. This review involved a study of sites with the greatest appeal, and an identification of the focus areas considered to be most important for tourism (see Fig. 34). For example, the large national parks of Lapland attract many visitors, they have a diverse range of facilities, and good services are available at tourist centres in the vicinity of the parks. These parks are nationally important focus areas for tourism development with a considerable regional economic impact. While it is appropriate

to promote nature tourism in these areas, the desired increase in visitor numbers must occur in a controlled manner that does not jeopardise the conservation values of protected areas. The expansion and development of tourism must be systematically planned in collaboration with local stakeholders.

In each of the Metsähallitus NHS's operating regions there are several expanding tourist areas where visitor flows are based on the appeal of a protected area. Tourists in the Ostrobothnia region are particularly attracted to the Oulanka and Syöte national parks, and also to national hiking areas and the Kvarken Archipelago. Major tourist attractions in Southern Finland include the Archipelago National Park and the national parks of the Finnish Lake District, Koli National Park, Ruunaa Hiking Area, and Nuuksio National Park near Helsinki.

In addition to these most popular areas, there is a large group of regionally important attractions that draw on the appeal of a protected area or places of interest located inside them. The facilities of these areas will also be maintained and developed, but they are not nationally important growth areas for nature tourism.

The majority of protected areas were primarily established to protect natural values, and it is neither appropriate (in the case of remote mires, for example) nor even legally permissible (in the case of most strict nature reserves) to set up facilities for the public in these areas.

The classification system developed for reviewing nature recreation and tourism in protected areas has so far served as a useful tool for Metsähallitus's natural resource planning and the for management and operational planning of the NHS. Nature tourism is also planned with due consideration given to regional tourism strategies.

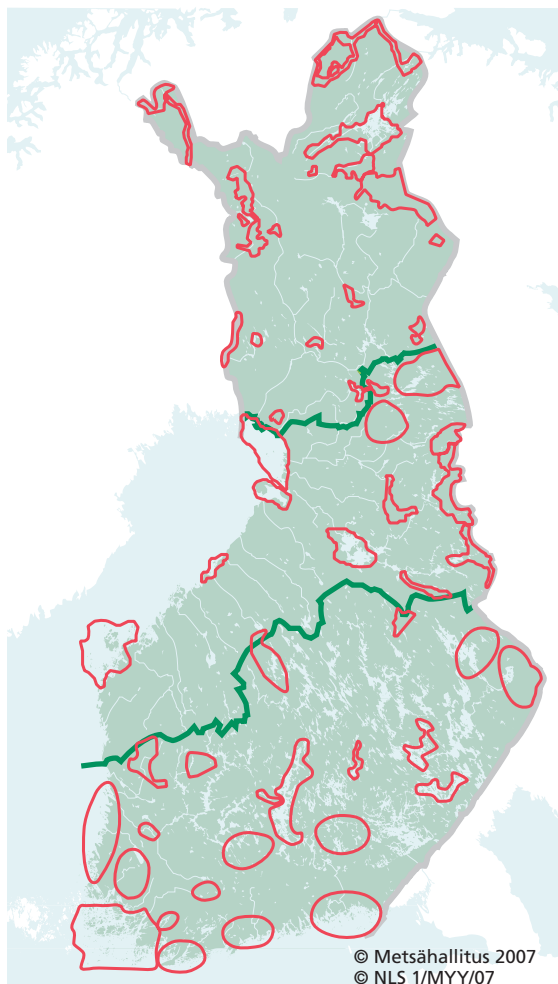


Figure 34. Special areas for tourism development. These areas have been identified in provincial tourism strategies and Metsähallitus's natural resource management plans. Each area has one or more national park, hiking area or other protected area as their principal tourist attraction. Source: Metsähallitus.