WWF report

Insight into Europe's Forest Protection

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MAURI RAUTKARI

Preface

Europe has more than one tenth of the world's forests. Despite this, the status of European forest protection has just been surveyed for the first time. The study shows that endangered animal and plant species are struggling to survive in protected areas that are either too small or too widely scattered. The new map depicting the current level of forest protection is alarming: only a handful of forest types in a few countries are well represented in the network of protected areas and serious gaps are evident, especially in forests on rich soils and lowlands. One could argue that forest protection in Europe has thus far emphasized administration rather than ecology.

Despite forest protection to date, natural forests and those richest in biodiversity are still in decline. WWF estimates that only 2–3 per cent of the forest estate in Western Europe and around 5-10 per cent in the European part of Russia can be classified as relatively intact natural forest. Of these areas, perhaps less than 50 per cent is considered to be effectively protected. Thousands of forest sites and their invaluable biodiversity remain completely unprotected.

Protection of Europe's forest heritage is essential if sustainable forest management is to become a reality. The network of forest protected areas is the European continent's 'web of life', whose protection is as important as that of Europe's most valuable cultural treasures. WWF hopes that this report will encourage governments and the private sector to take urgent action to establish an ecologically representative network of forest protected areas in Europe.

Dr Claude Martin
Director General
WWF International

Executive Summary

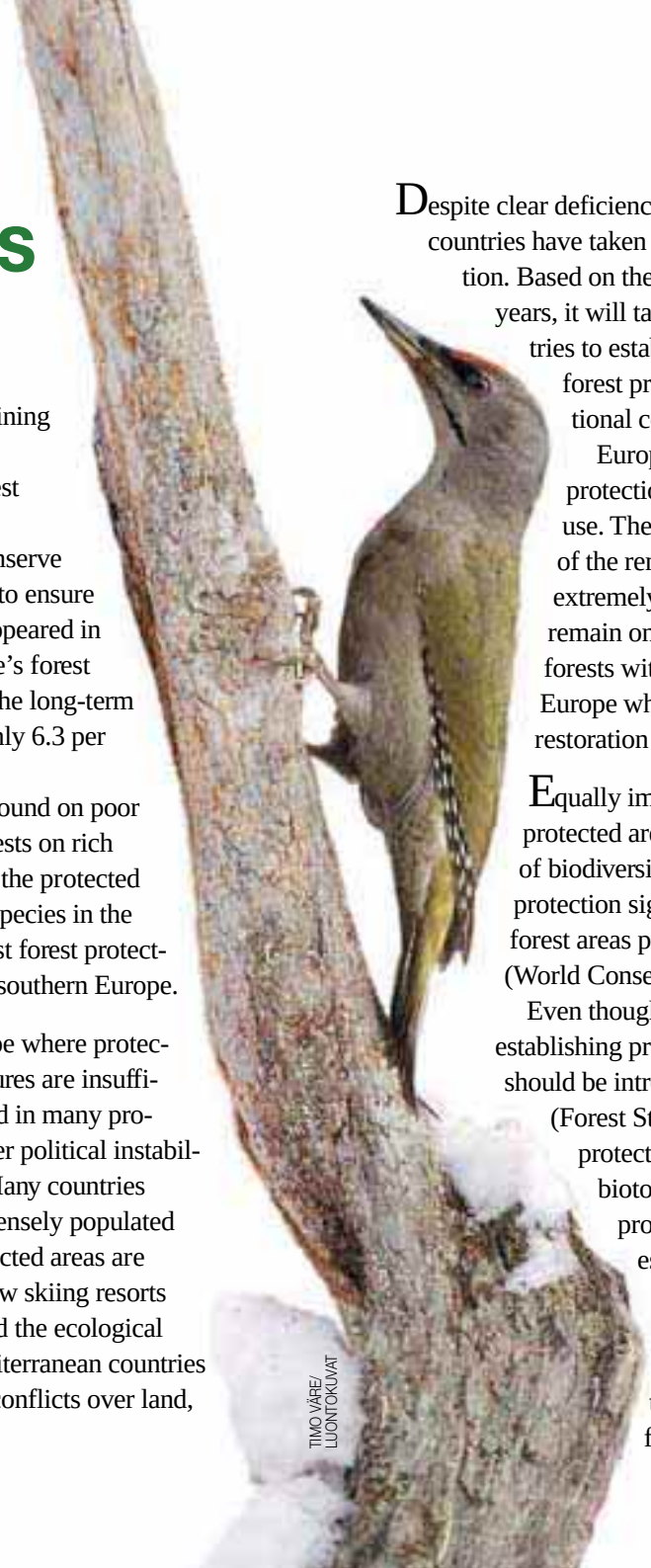
Insight into Europe's Forest Protection

Loss of forest cover and increased degradation of the remaining forests have had a deep impact on biodiversity in European forests: unique habitats have been lost and thousands of forest dwelling species have become endangered.

Protected areas have been the most effective means to conserve samples of pristine forests and natural forest dynamics, and to ensure habitats for original animal and plant species that have disappeared in many contemporary European landscapes. However, Europe's forest protected area network is not sufficient and will not ensure the long-term protection of all forest types and their associated species. Only 6.3 per cent of current forests have a protected status.

Europe's forest protected areas are biased towards those found on poor soils, in mountainous areas, and in inaccessible places – forests on rich soils and in the lowlands are under-represented. In addition, the protected forests are scattered in 37,851 patches throughout Europe. Species in the small areas in particular are threatened. Among the 50 largest forest protected areas, 39 are in Russia, 6 in Fennoscandia, and only 4 in southern Europe.

Surprisingly, there are many forest protected areas in Europe where protection is inadequately implemented or where protection measures are insufficient. Controversial logging, sometimes illegal, can be found in many protected areas in Continental Europe, in Balkan countries under political instability, such as Albania, and in some Russian protected areas. Many countries allow hunting within the boundaries of protected areas. In densely populated countries, such as France, Spain and Italy, many forest protected areas are threatened by fragmentation due to the building of roads, new skiing resorts and other infrastructure. The growth in tourism has exceeded the ecological carrying capacity of many European national parks. In Mediterranean countries forest fires, sometimes set intentionally in connection with conflicts over land, also threaten protected areas.



TIMO VÄRE/ LUONTOKUVAT

Despite clear deficiencies in European forest protection, only a few countries have taken rigorous steps to increase and improve protection. Based on the average implementation rate in the past five years, it will take 20 years or more in most European countries to establish an ecologically representative network of forest protected areas, and thus implement international commitments on forest protection.

European countries must give priority to forest protection in order to ensure truly sustainable forest use. The most urgent task is to safeguard the protection of the remaining unprotected old-growth forests, the extremely threatened relic forests, of which nowadays remain only several thousands of hectares, and other forests with high conservation values. In those parts of Europe where forests are most degraded ecological restoration measures are necessary.

Equally important is to raise the standard of forest protected area management to clearly follow the principles of biodiversity protection. This would improve biodiversity protection significantly, since in many countries the largest forest areas protected are only weakly protected via IUCN (World Conservation Union) categories V–VI.

Even though legal protection remains the major tool for establishing protected areas, new complementary measures should be introduced. One of the most potent tools, FSC (Forest Stewardship Council) certification, supports protection and promotes the restoration of key forest biotopes in forests managed primarily for wood production. Moreover, FSC-certification decreases the increasing pressure for commercial logging in Europe's remaining unprotected old-growth forests, since it is the only certification system that has a mechanism to ensure the protection of high conservation value forests.

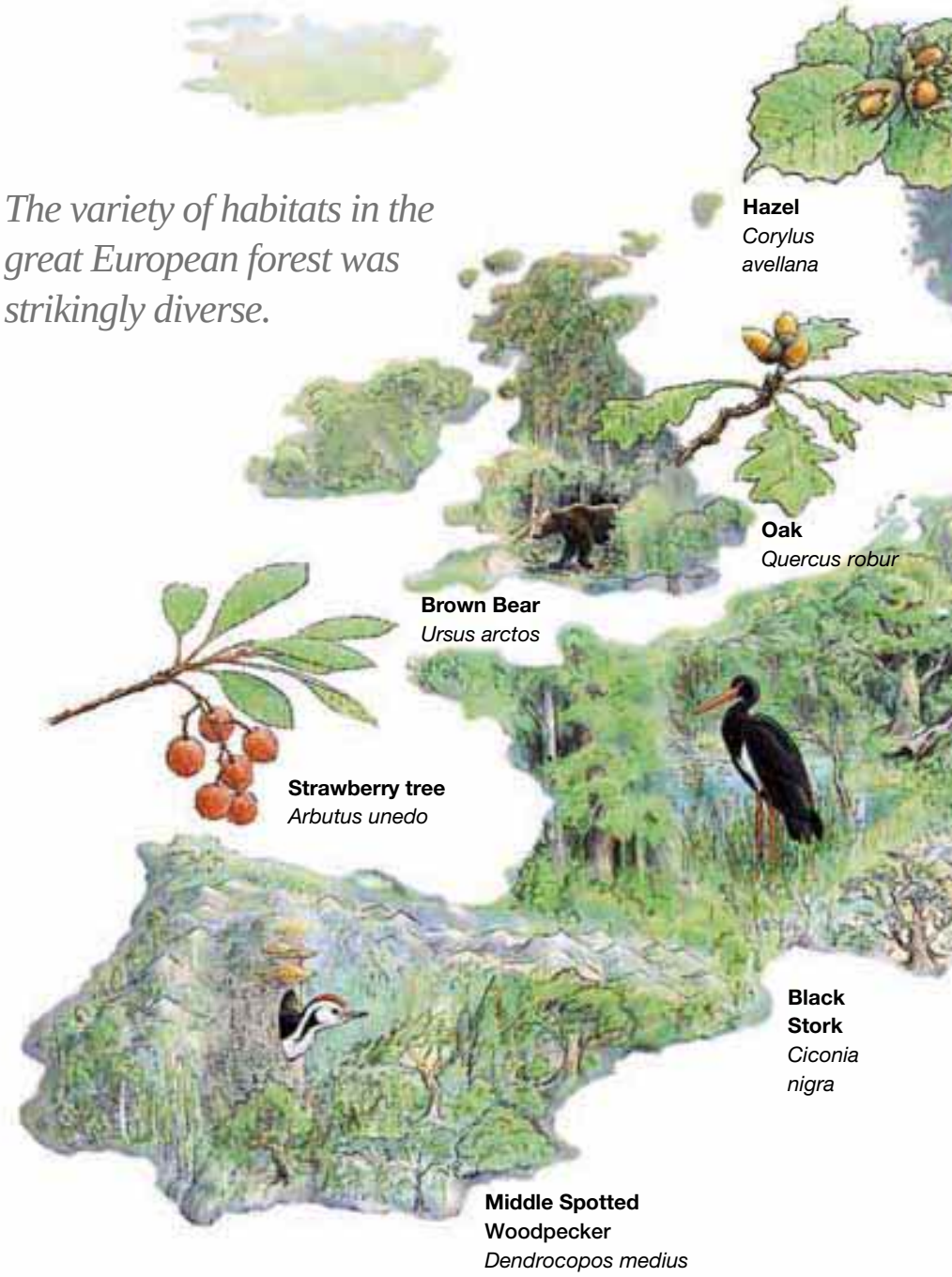
Europe was a Forest

The landscape of Europe has seen vast change. It is not easy to conceive that it was once essentially a huge forest, stretching from the Arctic Ocean to the Mediterranean. In the millennia following the last Ice Age, the forest cover in Europe was at its most extensive. European elk and other forest species are familiar to us from prehistoric art.

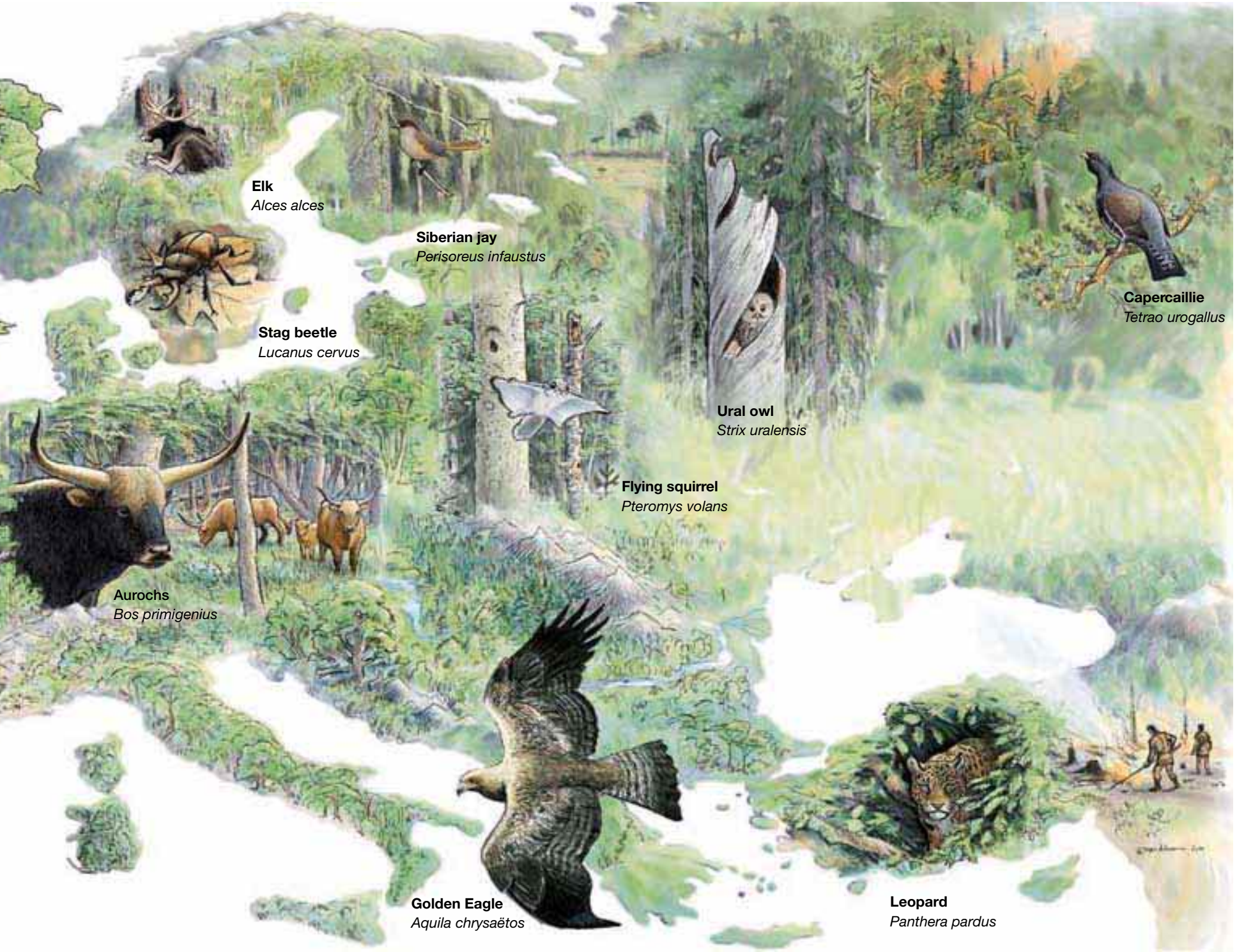
From studies on soil and climate, it has been estimated that the original forest covered 80–90 per cent of Europe's land area. In total these forests are thought to have covered at least 7,000,000 square kilometres – an area equal to the forested land area of present-day Canada and the United States put together.

The variety of habitats in the great European forest was strikingly diverse – now in some cases represented only by scattered remnants. However, we do still have amazingly rich forests – from the fell forests of Scandinavia, resounding with the call of the willow grouse, and the vast coniferous forests of Russia, to the temperate rainforests of the Caucasus and the very diverse evergreen and deciduous forests of the Mediterranean.

The variety of habitats in the great European forest was strikingly diverse.



The favourable climates and soils allow rich forest growth throughout much of Europe. The continent is warmed by the Gulf Stream and its extension, the North Atlantic Stream. The mountain chains lie mainly in an east–west orientation and thus do not prevent the westerly winds from carrying rain far to the east. Rain coming in from the Atlantic Ocean is vital to the growth of the European forests. The southern part of the continent has a special climate type, known as a Mediterranean climate, characterised by the existence of a more or less severe summer drought.



SEPPO LEINONEN

MAURI RAUTKARI

In terms of reduced extent, the Mediterranean forests are among the greatest losers, while alluvial forests have met with total defeat.

In a pristine Europe, beech forests would have covered a huge part of the continent – from the northern tip of Denmark to the southern toe of Italy, and from southern England and northern Spain to the Carpathians in the east. An area corresponding to the entire land areas of the United Kingdom and Germany put together has been lost.

Green Natural Heritage Threatened

Europe's landscape has been profoundly changed by its human inhabitants over thousands of years. It can be argued that people have shaped every square metre of extensive parts of western and southern Europe. Forests are no exception: rather than a pristine wilderness, most of them are man's silvicultural creations.

Over half of Europe's original forest cover has disappeared. On average, the forest cover is one-third of the total land area. Much of the remaining forests consist of species poor monocultures or plantations of exotic species.

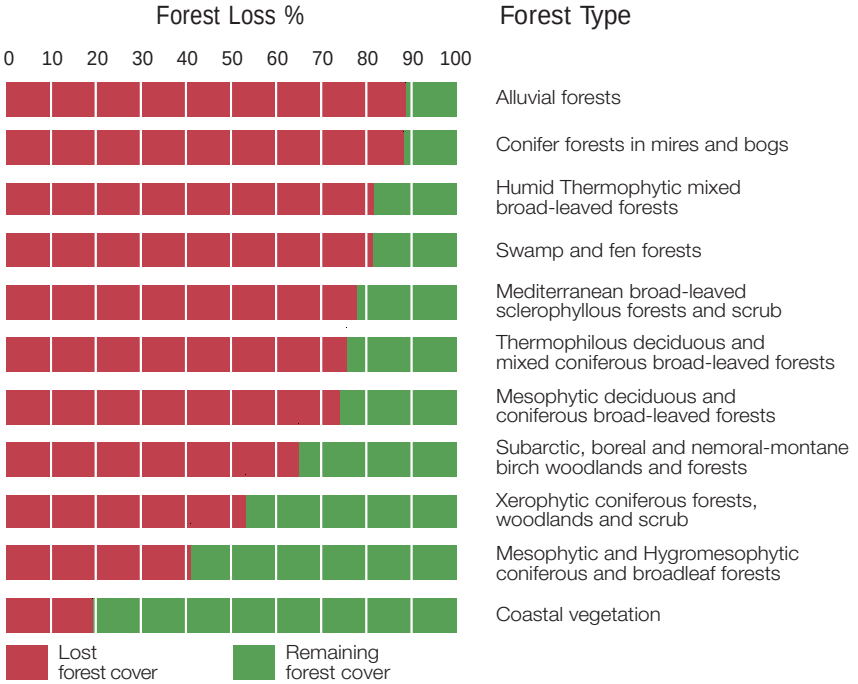
The present forest cover in Europe ranges from 8 per cent in Ireland to 72 per cent in Finland. In relative terms, Russia has lost less forest (40 per cent) than other countries, while the United Kingdom and the Netherlands are among the greatest losers.

Paradise Lost

The lost realms of forest richness, equal in size to large countries, tell a gloomy tale of the disappearance of biodiversity. Thousands of forest species have lost their homes. Cultivated fields have silenced the tapping of tens of thousands of woodpeckers. The stark statistics can be felt and understood as the hoots of Ural owls are no longer heard and the nests of eagles and hawks no longer seen.

In terms of reduction, the Mediterranean forests are among the greatest losers, while alluvial forests have met with total defeat (see figure 1). According to the recent UNEP-WCMC (World Conservation Monitoring Centre) survey commissioned by WWF, almost 99.5 per cent of willow alluvial and tamarisk alluvial forests have been lost and the fate of continental willow forests and Mediterranean wet mixed ash and plane tree forests has been little better. Losing the wet paradises teeming with life is one of the saddest stories of the loss of European biodiversity.

Figure 1. **Forest types ranked according to greatest relative forest loss**



Data source: European Forests and Protected Areas: Gap Analysis. UNEP-World Conservation Monitoring Centre. July 2000.

Table 1. **Current forest types with area <250 km²**

Current Forest Type Description	Current Area km²
Riverine forest	248
Central European raised bogs wooded with *Pinus rotundata*	181
Quercus pubescens forests in Crimean herb-grass steppes	181
Pre-Ural Spruce woodland amid hygrophilous birch tundra	145
Birch swamp forests amid Icelandic coastal heaths	74
Continental willow alluvial forests (*Populus nigra, P. alba, Salix alba)* and tamarisk alluvial scrub (*Tamarix ramosissima*)	71
Greek evergreen scrub	33
Juniperus foetidissima forest	28
Orocantabrian *juniperus sibirica* scrub	2
Apenine mountain pine scrub (*Pinus mugo*)	1

Data source: European Forests and Protected Areas: Gap Analysis. UNEP-World Conservation Monitoring Centre. July 2000.

HARTMUT JUNGIUS/WWF-CANON

Many lowland forest types in Europe have been transformed into intensive agricultural lands.

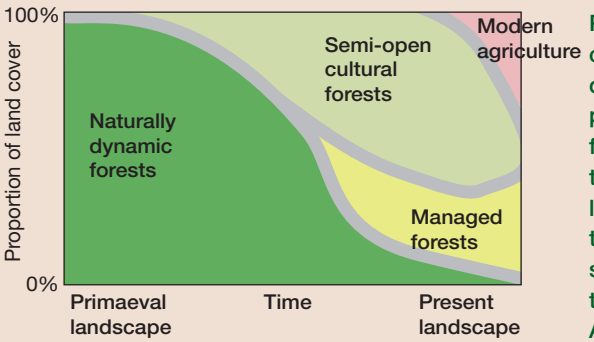
Forest Countdown Begins in Prehistoric Times

Neanderthal people used wooden spears and fire was familiar to our European ancestors hundreds of thousands of years ago. But it was the introduction of agriculture into Greece, in approximately 6000 BC, that was a turning point for the forests in Europe. People increasingly started to clear forests with the help of fire and animals. Growing settlements consumed more wood for fuel and building materials.

From Greece agriculture spread slowly but steadily northwards, one kilometre a year according to one theory. As early as 5000–5500 BC, cultivation and animal husbandry had a hold on a zone thousands of kilometres wide extending from the Ukraine to France. As early as 4000 BC, agriculture had reached Scandinavia. The earliest texts cite the loss of forests: Aristotele, Plato, and Pliny emphasised the significance of forests in improving the climate. Despite these changes, the original forest cover remained extremely widespread in the southern European areas which proved difficult to exploit until the Middle Ages and even later in northern Europe.

For much of what remained, the 19th century was the time of change. The age of the railway opened up many of the once remote areas to exploitation.

Figure 2. **Trends in land cover**



Primaeval Europe was covered by naturally dynamic forests. During prehistoric times, most forests were transformed to a semi-open cultural landscape. For a long time this cultural landscape rescued populations of forest specialists. After the industrial revolution the natural and cultural remnants declined rapidly. Today both land cover types are endangered by intensification of agriculture, timber, and fibre crop reforestation, as well as by infrastructural development.

Data source: Mikusinski & Angelstam 1998.

MAURI RAUTKARI

Plantation forests, in particular those planted with non-native tree species like this Eucalyptus plantation in Portugal, are poor habitats for original forest-related species. In Europe the largest plantations can be found in Germany, France, Spain, the United Kingdom and Belgium.

Hidden behind the figures of increasing forest cover is the fact that pristine and near pristine forests are vanishing all the time.

Plantations Take Over

During recent decades, Europe's tree cover has been expanding. In a sense, then, Europe has become greener. Unfortunately, this apparently encouraging news is deceptive.

The preference for conifers over original deciduous trees is evident throughout Europe. In Poland, for example, beech, hornbeam and oak forests would predominate rather than pine if the climate and soil were left to decide. In the Czech Republic, spruce would cover 11.2 per cent of forest land, while it now covers 55.4 per cent. In the Black Forest, in Germany, broad-leaved trees have declined from 77 to 35 per cent. The plantations and monocultures, which now cover vast tracts of land usually, offer very poor habitats for European forest dwelling species.

Hidden behind the figures of increasing forest cover is also the fact that pristine and near pristine forests are vanishing all the time. Forest roads bring modern forestry to the last wildernesses of Europe, and the indicators of a pristine or good semi-natural forest – old age, large amounts of dead wood – is often seen by old-fashioned forestry concerns as encouragement to regenerate the forest.

The Degree of Naturalness in the Forests of Europe

WWF-CANON/MARTHA WAGEUS

Boreal pristine forest in Russia

Natural/Pristine Forests

Following the last Ice Age, natural or pristine forests developed freely without human intervention. These forests should show no or almost no sign of human intervention. Old-growth and even younger stages of natural forest have a considerable amount of dead wood in the form of snags, stumps and logs. Natural forests usually have a varied age structure; they are a rich mosaic of trees and patches of forests of different ages. Old-growth natural forests typically contain trees (such as pines and spruces in the north, and oaks in central Europe, and pine and firs in southern Europe) which are several hundred years old. Some pines, cedars, plane trees, junipers and wild olive trees have existed since Viking times – around 1,000 years.

The data on figure 3 has been compiled from the following sources: lost forest cover – European Forests and Protected Areas: Gap Analysis. UNEP-World Conservation Monitoring Centre. July 2000; current forest cover – Temperate and Boreal Forest Resource Assessment (TBRFA) 2000; plantations & pristine forests – Temperate and Boreal Forest Resource Assessment (TBRFA) 2000 & WWF European Forest Scorecards 2000.

Relic Forests

PEDRO REGATO

Mediterranean relic forest.

Many Mediterranean endemic forest types, as well as other forest types in Eastern Europe, constitute relic forests, included in the IUCN red list of plants, and characterised by the existence of only several thousands of hectares, after a long and intense human impact. About six Mediterranean species nowadays constitute only relic forests, with a more or less old-growth structure, such as in the Taurus Mountains and southern Spain, or with a very fragmented and small tree cover, such as the Nebrodi fir forests in Sicily. Other species, some very rare, and endemic deciduous trees species, like the Turkish *Liquidambar orientalis* floodplain forests, the Balkan *Aesculus hippocastanum* forests, the Sicilian and Crete Zelkova (*Z. sicula and Z. abelicea*) woodlands, as well as the only natural palm in Europe, the *Phoenix theofrasti* coastal grove of Crete and Southwest Turkey.

Semi-natural Forests

MAURI RAUTKARI

Semi-natural forest in Swiss Alps.

Semi-natural forests may appear very natural and contain the same tree species as would grow there in natural conditions. Semi-natural forests, however, show signs of human intervention: the number of decaying trees is relatively low, many forests are managed and rarely allowed to reach maximum age. Semi-natural forests are essential as a basis for our wood supply and can contribute to the future development of the protected forest area network of Europe – by protecting and restoring them, we can gradually put back the lost forests of Europe.

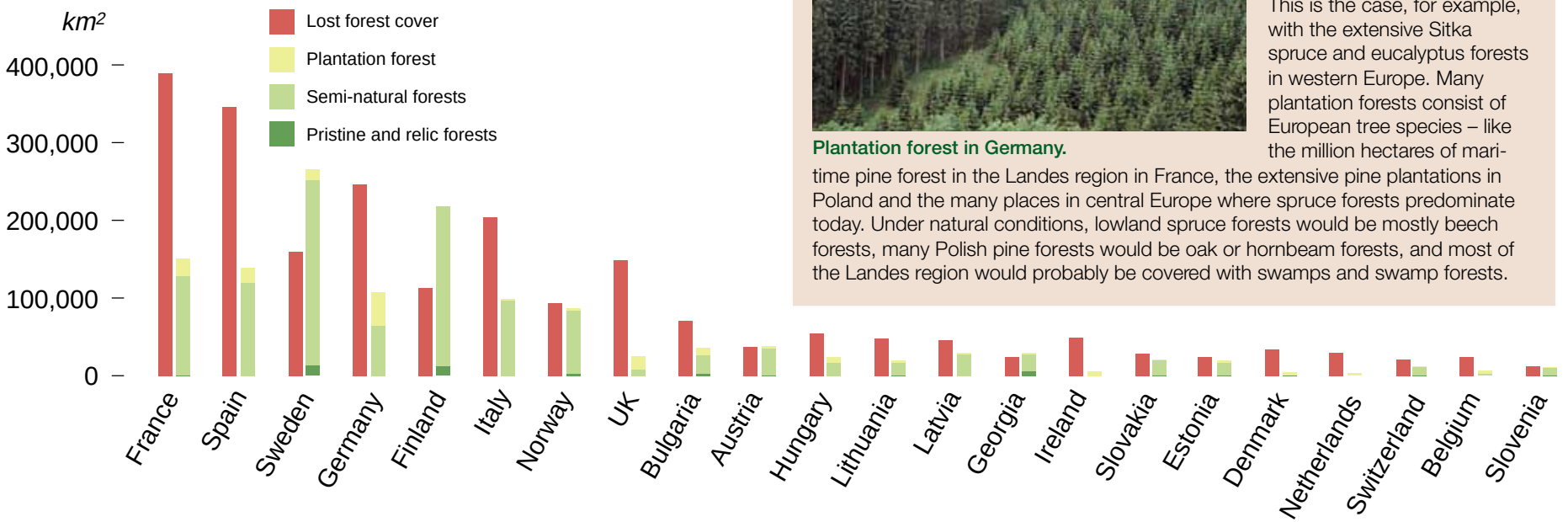
Plantation Forests

MAURI RAUTKARI

Plantation forest in Germany.

Only some plantation forests show clear signs that they have actually been planted. This is the case, for example, with the extensive Sitka spruce and eucalyptus forests in western Europe. Many plantation forests consist of European tree species – like the million hectares of maritime pine forest in the Landes region in France, the extensive pine plantations in Poland and the many places in central Europe where spruce forests predominate today. Under natural conditions, lowland spruce forests would be mostly beech forests, many Polish pine forests would be oak or hornbeam forests, and most of the Landes region would probably be covered with swamps and swamp forests.

Figure 3. **The loss of original forest in selected countries**



European Forests Still Thrive in Places

MAURI RAUTKARI

Despite huge losses, forests can still be considered as the most important component of European nature. One indicator of the vitality of forests is that the forest biotope remains home to the largest number of vertebrates on the continent.

We are overjoyed to observe that there are still very rich forests left – the European forest heritage struggles to survive. We can roam the strawberry tree woodlands of the Mediterranean, enjoy the spring blossoming of the beech and oak forests in central Europe and hike deeper and deeper into the great remaining forest wilderness in the north.

The degree to which natural and pristine forests remain increases the further east and north in Europe one goes. The boreal forests have been best preserved, and of the beech forest in central Europe, almost 400,000 square kilometres is left. Representative remnants of the Mediterranean forest types also still exist.

ROGER LEGUEN/WWF-CANON

Undisturbed, large forests are ideal habitats for European Lynx.

Pristine Forests are Found in the East and North

With the new data from the WWF forest scorecards, Taiga Rescue Network and the UN/ECE/FAO assessment of the temperate and boreal forests of the world, in this report WWF can for the first time present a rough estimate of the amount of pristine or near pristine forests in Europe. These still cover a heartening 15–20 million

The Alps, Carpathians, Balkan Mountains, Apennines, Pyrenees, Cantabrian Mountains — in southern Europe one mountain chain follows another. Mountain forests are of the utmost importance for forest protection in Europe, because they contribute much of what is left of the original forest cover in central and southern Europe. It is in these forests where the wolf, bear, lynx, various woodpecker species and owls can still thrive.

We are overjoyed to observe that there are still very rich forests left – the European forest heritage struggles to survive.

hectares – nearly as much as the entire forest area of Finland or Sweden. With almost 5 per cent of the present forest cover in an essentially natural condition, there is still a chance to save some outstanding remnants of our European forest heritage.

The most extensive pristine forests can be found in the northern taiga. The most outstanding northern forests, with the richest biodiversity, are located on the southern side of the forest tundra on the Ural slopes in the Komi Republic and between the White Sea and the Urals. The magnificent belt of taiga forests continues westwards in Europe as fragmented patches across the Russian-Finnish border and in the fell forests of the Scandic Mountains between Norway and Sweden.

The amount of biologically diverse semi-natural forest in eastern, central and southern Europe is also encouraging. For example, Slovakia, Bosnia and Bulgaria can boast of forests with over 50 per cent in a somewhat semi-natural condition.

Further east the chances of finding pristine forest also improve. In Slovakia, Poland, FYR Macedonia and Bulgaria, the amount of pristine forest is over one per cent. In the Caucasus and Southern Ural most of the forests are still semi-natural, and perhaps 12–15 per cent of the forests can be described as pristine.

MAURI RAUTKARI

Strawberry trees still thrive in some well-preserved Mediterranean forests.

HARTMUT JUNGIUS/WWF-CANON

A group of European bison in Okskiy Nature Reserve in the Russian Federation.

MAURI RAUTKARI

Mediterranean pine forest.

Endemic Species Found in the South and South-west

In densely populated Europe, pristine forests must be looked for in the mountains: the Alps, Apennines, Dinaric Alps, Iberian Mountains, and Sierras. In the Carpathian and Balkan mountains, we encounter a unique situation: in preserved forests there exist endemic species not found anywhere else in the world. Moreover, perhaps the most extensive semi-natural and pristine beech and fir forests in Europe are found here.

The Caucasus is a place very rich in endemic species; it has unique forests with endemic birches, oaks, wild chestnut, wild apple, Nordmann fir and azad (*Zelkova carpinifolia*). The forests of the Caucasus are also important for the Caucasian grouse and Caucasian chiff-chaff – endemic birds.

The Carpathian Mountains in central Europe support an entirely irreplaceable concentration of preserved forests. Simultaneously, they provide the last base for the wolf, bear, lynx, and wild cat in the very heart of Europe.

An amazing total number of 30,000 vascular plants, 13,000 of which are exclusively regional, grow in the countries surrounding the Mediterranean. This makes the region the second richest in endemism in the world, after the tropical Andes. In spite of the great diversity, forest types related to this amazing flora, after a long history of human impact, about 17 conifer species, and some other broadleaf species, all of them characterising many different habitat types, are included in the last IUCN red list of plants.

What Remains of Natural Forest ?

Map 1. Numbers show the location of the most representative pristine, old-growth and relic forests in Europe, and the potential and current forest extent.

1. In the Scandic Mountains, there is an extensive montane forest belt, which extends from southern Norway to Finnish Lapland. This is joined, for the present, without a major break to the green belt of the Russian-Finnish border and to the Russian sub-tundra old-growth forests.

2. In the border area between Finland and Russian Karelia, there are extensive boreal forests. This green belt forms a crucially important forest chain, stretching north to south, in a essentially natural condition.

3. The Baltic countries no longer harbour much old-growth forest. There is, however, a high number of old semi-natural forests and forests in early successional stages. These forests are vitally important to many bird species, such as the black stork and greater spotted eagle.

4. Some fragments of almost pristine forest can still be found in eastern Europe. The Bialowieza forests in Poland and Belarus provide an excellent sample of the original forests of temperate Europe. This area is home to a wild European bison population.

5. The swamp and bog forests and other wet forests in the Ukraine and Belarus are very well preserved compared with western Europe.

6. In the Alps some forests of almost natural appearance still exist.

7. Important fragments of the alluvial forests along the Danube, Tisza and Sava and some other rivers remain.

8. The Carpathian Mountains have rich and varied forests. The western slopes host the largest concentration of yew (*Taxus baccata*) in Europe, totalling 20,000 hectares.

9. Some Spanish mountain ranges have preserved much of their original forest character, and feature among the highest rates of plant endemism.

10. The forests of the Pyrenees are to a considerable extent in a semi-natural state.

Map source: European Forests and Protected Areas: Gap Analysis. UNEP-World Conservation Monitoring Centre. July 2000.

12. The Balkan mountains are an area exhibiting high endemism.

13. Isolated natural occurrences of horse chestnut (*Aesculus hippocastanum*) in Bulgaria and FYR Macedonia and Greece, *Zelkova sicula* in Sicily and *Zelkova abelicea* in Crete.

14. FYR Macedonia and Albania are home to endemic conifers: Macedonian pine (*Pinus peuce*), Bosnian pine (*Pinus leucodermis*) and hybrid Greek fir (*Abies borisii-regis*).

15. In the Aoos Valley a complete range of Greek forest ecosystems is represented containing around 20 tree species. These are important habitats for woodpeckers, vultures and eagles.

Europe still has some 15–20 million hectares of forests that can be classified pristine or near pristine forests. Around 5–10 per cent of the forests in European part of Russia, and some 2–3 per cent of the forests in Western Europe belong to this category.

16. Both sides of the Arctic tundra are bordered by a sub-tundra old-growth forest zone almost 2,000 kilometres long, which extends from the Urals to the Kola Peninsula. The width of this zone, mostly in a natural condition, is 100–200 kilometres. For the present, it has mostly escaped logging since there is sufficient timber further south and the regenerative properties of the old-growth forest here are uncertain.

17. Immediately on the southern side of the sub-tundra, between the White Sea and the Ural Mountains, there are massive areas of old-growth forest. These forests are mostly located in the Archangelsk Oblast and the Komi Republic.

18. Along the Pechora River, we encounter probably the largest wilderness of boreal forest in its natural condition. In recognition of this the core areas of this forest have been declared a World Heritage Site by UNESCO.

19. The southern Urals have Europe's last remaining extensive mixed oak and spruce mountain old-growth forests.

11. Mediterranean region is home to endemic conifers: Macedonian pine (*Pinus peuce*), *Pinus leucodermis* (southern Balkans and southern Italy), *Abies pisapo* (southern Spain), *Abies cephalonica* and hybrid *Abies borisii-regis* (Greece), *Abies nebrodensis* (Sicily), the five Mediterranean endemic subspecies of *Pinus nigra*, which characterised the dolomite ranges of eastern Spain, the dolomite and serpentine massifs in the Balkans, Cyprus and Turkey and the chrystalline and volanic high elevations of Corsica, southern Italy and Sicily. The juniper woodlands (*Juniperus thurifera, J. excelsa, J. foetidissima*) of the high plateaus and summits of eastern Spain, Creece and Turkey, the Cypress forests of Crete, Cyprus and Turkey, and the relict populations of North African endemic conifer (*Tetraclinis articulata*) in south-east Spain and Malta.

20. The Caucasus Mountains and the coast of the Black Sea host extensive forests in which many endemic species thrive. The amount of pristine and semi-natural forests is still outstandingly high.

21. The Crimean Mountains have some patches of Mediterranean forest left.

22. The Mediterranean riparian forests are characterised by a large number of poplar, willow, tamarisk, alder, plane tree, ash tree, elm, and linden species, of which there are still some well preserved patches, such as in the Guadiana river basin in southern Spain and Portugal. Moreover, there are some tertiary relics, like the Liquidambar orientalis flood plain forests in south-west Turkey.

Forests Full of Life

Since Europe was a forest, forest habitats are of the utmost importance for the continent's animals and plants. For example, almost half of all species in Finland and Sweden, and two-thirds of all species in Poland, are regarded as forest dwelling species.

In all, there are tens of thousands of forest species in Europe. They are mostly insects and invertebrates, as in the world in general. But the monarchs of the European species are also forest dwellers. Large grazers like elk, forest reindeer, red deer and the last European bison live in the forests, as do the last bears. It is interesting and understandable that words and phrases associated with hunting, forests and silviculture are intertwined with many European languages. The largest of our livestock also originate from forests – auroch and wild boar. These were tamed long ago and had been long hunted by man from the Stone Age onwards.

The distinctive nature of European ecosystems is often forgotten. Many dominant species of the European forests are virtually restricted to Europe. Trees like European beech and holm oak are not found further east than the Black Sea or the Caucasus. Ordinary English oak does not survive further east than the Ural Mountains, just on the border of Europe. European hornbeams still thrive in the Caucasus but not in Asia proper.

Habitats and plant associations are indeed very European and thus it is solely the responsibility of European countries to safeguard the future of them. Moreover, Europe hosts a number of restricted range endemic species.

Species in Trouble

The violent change in forests over the last few centuries is seen in the great number of species on the verge of extinction. Many species are about to disappear from several European countries, perhaps from the whole continent. Europe has already lost the wild horse or tarpan and the European bison, which was later successfully reintroduced to

The monarchs of the European species are forest dwellers: capercaillie, elk, forest reindeer, red deer and the last European bison live in the forests, as do the last bears.

The Capercaillie is one of the most magnificent birds of the Old World boreal and temperate forests. The species is highly dimorphic; the heavily built males measure their strength in the communal displays – while the forest crashes…

PENTTI JOHANSSON/LUONTOKUVAT

forests from zoos. The capercaillie has also been reintroduced in countries and areas where it had disappeared.

As part of a new UN/ECE/FAO assessment of the temperate and boreal forests of the world (TBFRA 2000), unique data on forest dwelling species was gathered for the first time. The number of threatened taxa is alarmingly high. Among mammals, typically 20–50 %, and among birds 15–40 %, of the forest dwelling species were categorised as threatened (see figures 4 & 5). A typical European country harbours dozens of endangered mammal and bird species! In many countries the proportion of endangered mammals and birds was over 40 per cent. The situation was almost as bad even for the lichens, mosses and vascular plants – in some countries, nearly a half of the forest associated lichen species were at risk.

In Europe, the Nordic countries have compiled the most up-to-date statistics on forest species threatened by extinction. These statistics make gloomy reading. In new lists of threatened species in Sweden and Finland, published in 2000, the forest is the habitat, together with cultivated areas, with the highest number of threatened species (see table 2 on page 16). Forestry poses the most imminent threat to the forest dwelling species. Forest managers tend to be tidier than nature likes, removing dead and hollow trees, fallen branches and the like.

Capercaillie

Wiping out suitable forest habitats has led to the disappearance of the capercaillie from many of its traditional areas in Europe. The population in Scotland was already extinct by the end of the 1700s, although it was later reintroduced. Reintroduction has been the only solution also in parts of Germany and some other European countries.

The capercaillie needs relatively open coniferous pine, fir or spruce forests. Bilberry undergrowth is important for the species; the capercaillie and its chicks eat the berries and the chicks also eat insect larvae. In southern Europe, it is also found in hardwood forests.

The Carpathians and the Alps are strongholds for the central European population, which consists of increasingly isolated populations. If the area of suitable forests is further reduced, local extinctions and a reduction of the species' range will be the result.

Figure 4. **Threatened mammals**

Forest-related threatened mammal species and their proportion of all forest-related mammal species in selected European countries.

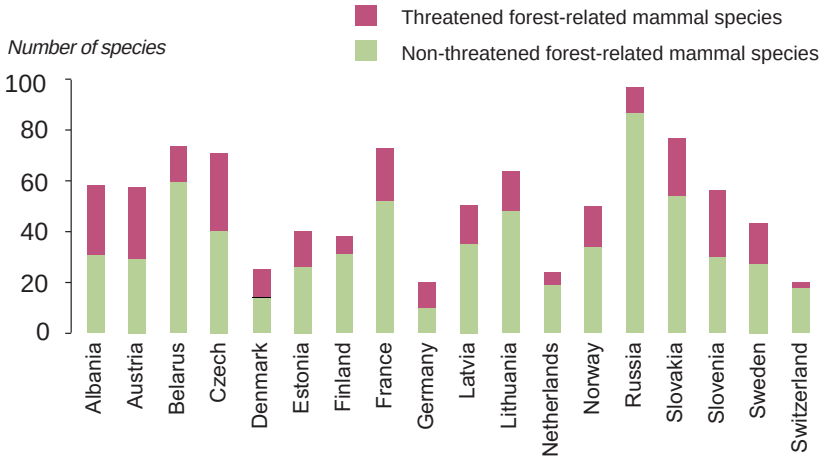
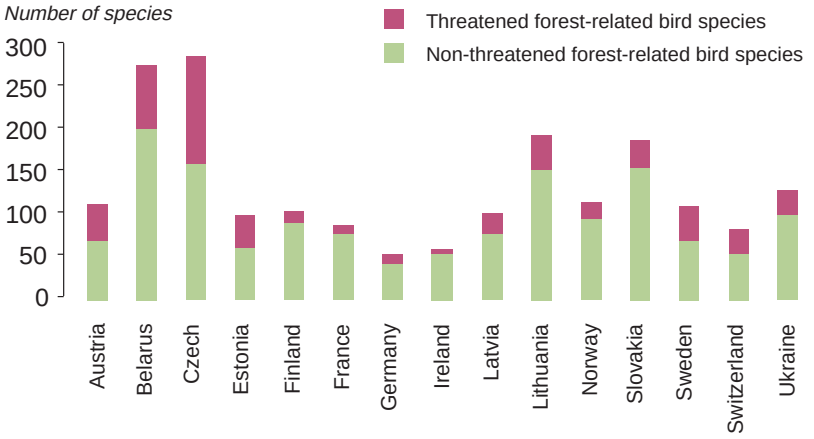


Figure 5. **Threatened birds**

Forest-related threatened bird species and their proportion of all forest-related bird species in selected European countries.



Data source: Temperate and Boreal Forest Resource Assessment (TBRFA) 2000

Table 2. **Forest dwelling red-listed species in Fennoscandia**

	Red-listed	Forest dwelling	
Sweden	4,120	2,101	51%
Finland*	1,505	564	37%
Finland**	2,751	1,258	46%
Norway	3,062	1,405	46%

* Only threatened species (excluding the nearly threatened and extinct)

** All red-listed species

Data sources: The 2000 Red List of Sweden. U. Gärdefors (ed.), The 2000 Red List of Finland. The Ministery of Environment & The Red List of Norway. Norwegian Directorate for Land Management, 1998.

Where the Bear Finds Berries – Europe's Large Carnivores Depend Heavily on Forests

Europe's largest populations of lynx, wolf, brown bear, and wolverine are to be found in forested districts. Also, the rare and extremely endangered Iberian lynx finds shelter amongst the scrublands of Spain and Portugal.

The continuous range of the bear, wolf and Eurasian lynx extends to Fennoscandia and the Baltic countries in the west. In southern and western Europe, these stately large carnivores are only found in some mountain areas. The Carpathians are especially important for them; the bear population in these mountains accounts for almost 50 per cent of the European population outside Russia.

The preservation of forests in as wilderness-like a state as possible is extremely important for large carnivores. Further intensive forestry expansion usually means the establishment of a road network which facilitates not only legal, but also illegal, hunting.

NILS SUNDBERG/LUONTOKUVAT

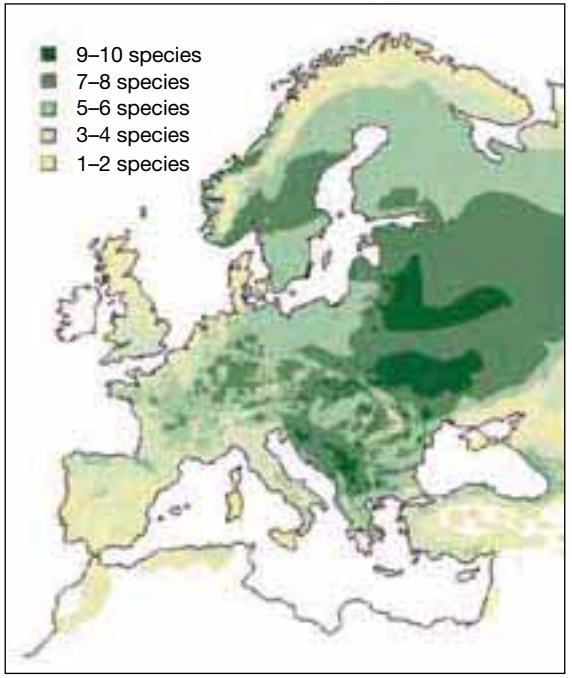
Brown bears still find berries in the large forests of Northern Europe and the mountain ranges of the Continental Europe.

Even many of the native tree species in Europe seem to be endangered. The situation is most alarming in the Balkan Peninsula, with Macedonia, Bosnia-Herzegovina and Albania having 10–20 endangered native tree species each. There are several reasons for the situation. Wych elm and smooth-leaved elm have gone into decline due to Dutch elm disease. Wild forest fruit trees are in decline because of forestry and a lack of protection.

Repercussions of the loss and increasingly homogenous state of European forests are shown in the decline in birds. Peninsular European countries in particular have witnessed a loss of their bird species. A good example is the fate of the woodpeckers in Europe: the highest woodpecker diversity is now concentrated in eastern Europe, especially in mountainous areas (see map 2).

Habitats and plant associations are very European and thus it is solely the responsibility of European countries to safeguard their future.

Map 2. **Woodpecker species in European countries**



Due to changes of forest structure, the highest woodpecker diversity is nowadays concentrated in eastern Europe, especially in mountainous areas.

Data source: Mikusinski, G. & P. Angelstam 1997: European woodpeckers and anthropogenic habitat change: a review. Vogelwelt 118: 277-283.

JOUKO VEIKKOLAINEN

Flying Squirrel

In the European Union, the flying squirrel (*Pteromys volans*) is an eastern species. Amongst the EU member states it is only found in Finland, where there is a flying squirrel population of 10,000–20,000. The decline of the population has been so dramatic that it was listed in the Finnish 2000 red list of species under the vulnerable category.

Intensive old-fashioned forestry poses the greatest threat to the flying squirrel since it destroys suitable mixed forests and nesting holes. The responsibility for preserving the flying squirrel in Europe lies with Finland, the Baltic countries and Russia.

GERHARD ZIMMERT/WWF

A stag beetle is well-armoured against the natural foes, but not against human forest destruction.

Stag Beetle

The biggest beetle in Europe is a forest dweller. The stag beetle (*Lucanus cervus*) has declined nearly everywhere, because it lives in old deciduous forests. The larval development takes place in decaying oak wood – the larvae usually eat wood for several years before developing fully.

The stag beetle is close to extinction in the Czech Republic and in several German states, and entomologists report a decline in Hungary, Portugal, the United Kingdom, Switzerland and Sweden. In Italy the situation may be better.

The beetle is protected under the Habitats Directive (Annex II) and the Bern Convention (Appendix III). Habitat protection and a sufficient amount of dead oak wood are the only way to save the stag beetle. The species will probably fail to survive without the preservation of large natural oak and mixed oak forests.

An Archipelago of Protected Areas

New data shows the alarmingly poor level of forest protection in Europe: only 6.3 per cent of current European forests are dedicated to biodiversity protection. The protected area network has serious gaps, especially in forests on rich soil and in lowlands. Furthermore, protected areas are scattered throughout Europe in tiny patches, making many original forest dwelling species threatened.

The importance of protected areas for biodiversity protection in Europe is invaluable. To date, protected areas have been the only refuges where forests have remained relatively untouched, and thus they have safeguarded homes for hundreds of species that have disappeared from Europe's man-made landscapes.

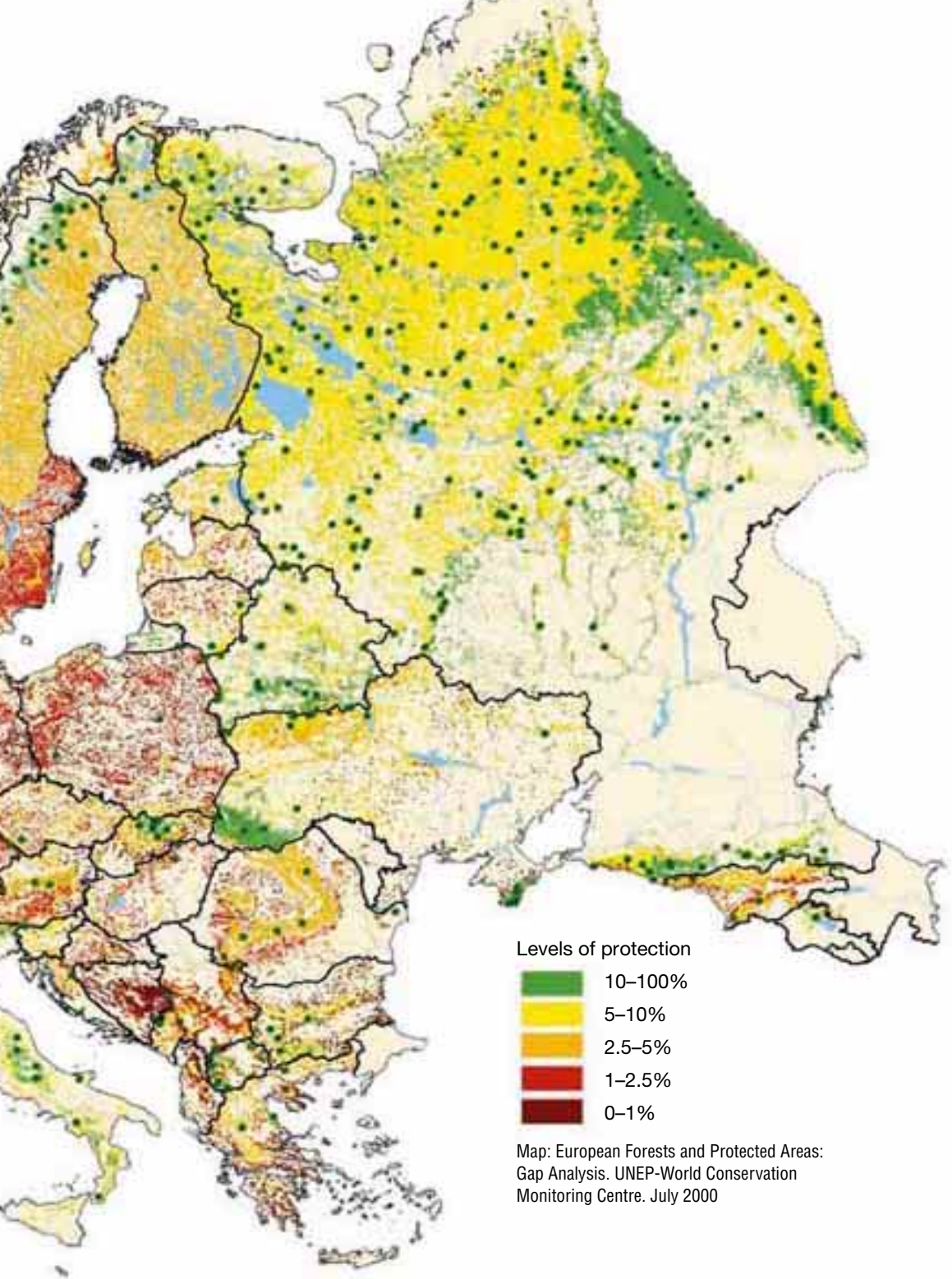
Serious Gaps in Forest Protection

At the beginning of the new millennium we are able, for the first time, to present a digital map of Europe's protected areas. This huge task was carried out by the UNEP-WCMC, with support and supervision from WWF. The new data displays an archipelago of protected forest areas which, together with sustainable forestry practices, will determine the fate of biodiversity in European forests.

To date, protected areas have been the only refuges where forests have remained relatively untouched, and thus they have safeguarded homes for hundreds of species that have disappeared from Europe's man-made landscapes...

Map 3.
Level of protection
Percentage of forest protection in European countries by major forest types. Green dots show the location of forest protected areas larger than 100 km^2.

HANNU HAUTALA/LUONTOKUVAT



Map: European Forests and Protected Areas: Gap Analysis. UNEP-World Conservation Monitoring Centre. July 2000

…nevertheless, Europe's forest protected area network is not sufficient and will not ensure the long-term protection of all forest types and their associated species.

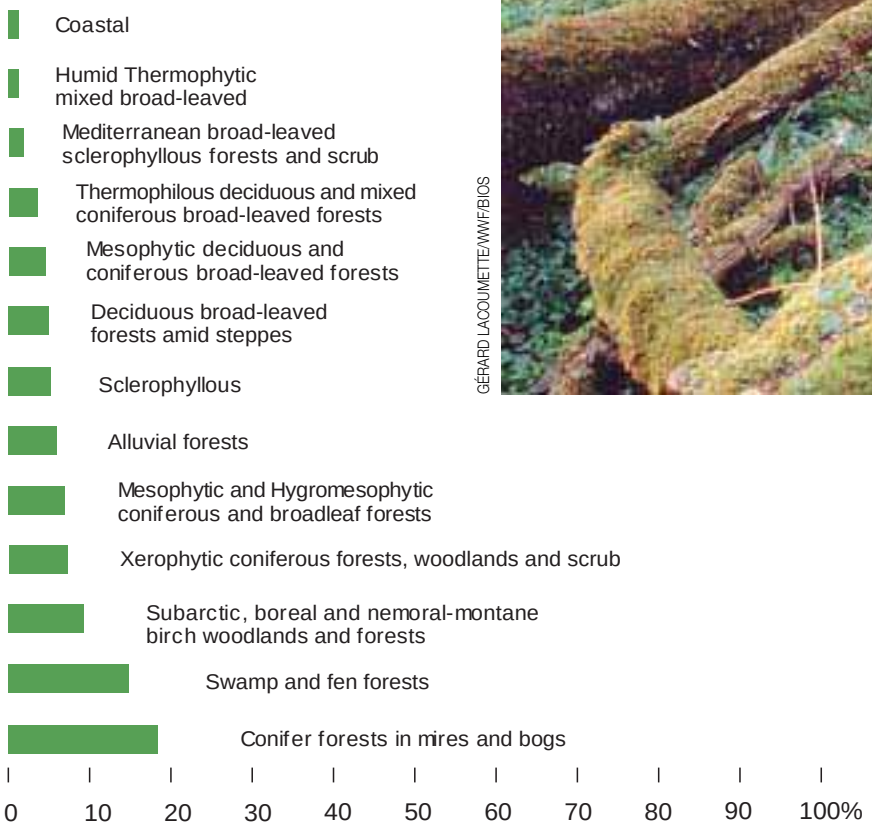
The analysis shows that Europe's forest protected area network is not sufficient and does not ensure long-term protection of all forest types and associated species. Europe has protected only 6.3 per cent of its current forests (IUCN categories I–IV), which equates to half of the size of Germany only. Levels of protection range from 11.7 per cent of current forest area in Belarus to very low levels in countries such as the United Kingdom (0.6 per cent), Portugal (1.2 per cent) and France (1.2 per cent).

WCMC analysed how the various forest types have been protected in Europe. The results are shown on a graph and a map (see map 3), which are alarmingly red. Only a handful of forest types in a few countries are well represented in the protected area networks. According to UNEP-WCMC there seems to be the greatest gaps in protection in *coastal vegetation* forests (1.2 per cent protected) and *humid thermophytic mixed broad-leaved forest* (1.3 per cent). Another forest type with low protection (less than 2 per cent) is *Mediterranean broad-leaved sclerophyllous forests and scrub*. In general, most European countries have protected forests on poor and wet soils or in mountainous areas better than forests on rich soils and in the lowlands.

GÉRARD LACOUMETTE/WWF/BIOS

The Bialowieza forest on the Polish-Belarus border is one of the largest fragments of temperate pristine and seminatural forest in Europe. It contains over 60 mammal species, over 1,000 plant species, over 200 bird species and some 10,000 insect species, including 3,000 species of beetle.

Figure 6. **Level of protection of the major forest types**



Data source: European Forests and Protected Areas: Gap Analysis. UNEP-World Conservation Monitoring Centre. July 2000.

The protected forests are scattered throughout Europe in 37,851 patches. Rather few, 329, relatively large (greater than 100 km^2) sites account for 67 per cent of Europe's protected forests. Conversely, 95 per cent of Europe's protected forests are fragments of less than 10 km^2. Together these fragments protect only 0.6 per cent of Europe's forests. Among the 50 largest forest protected areas, 39 are in Russia, 6 in Fennoscandia, and only 4 in southern Europe.

The fragmentary nature of the protected forests is the greatest concern of nature conservation ecologists since the distances between protected areas may hinder the spreading of specialised species. Historically, a high number of species have adapted to conditions where forests form large continuous areas. Species in small protected areas in particular are threatened. To survive, these species require a proper network of protected areas.

The Largest Forest Protected Areas in Europe

UNEP-WCMC analysis has made it possible to present a top list of the forest protected areas in Europe. The largest protected forests are conspicuously concentrated in Russia.

One-tenth of all protected forests in Europe are located in the same region – in the north-eastern corner of the continent. This large concentration of forest protected areas in Komi is unique and is due to the fact that the strictly protected areas of Pechora-Ilychskiy (6,900 km2) and its buffer zone (4,600 km^2) belong to the same entity as the Yugud-Va National park. This means that the area of protected forest unity totals over 20,000 square kilometres.

In 50 the top list of the largest forest protected areas there are also parks in Finland, Italy, Norway, Slovakia, Slovenia, Spain, and Sweden. The fact that only 4 out of the 50 largest protected areas lie in southern Europe underlines the regrettable truth that forests are now only small patches across this region. However, there are many suitable areas in central Europe that could join the Top 50, even the Top 10!

Table 3. **The 20 largest forest protected areas in Europe according to UNEP-WCMC***

Area Name	Country	Protected Forest Area (km^2)
1. Yugyd-Va	Russia	11384,01
2. Pechoro-Ilychskiy	Russia	6935,04
3. Pechoro-Ilychskogo	Russia	4618,21
4. Soyanskiy	Russia	3572,86
5. Schugorskiy	Russia	3387,54
6. Ilychskiy	Russia	3102,70
7. Vodlozersky	Russia	2835,87
8. Udorskiy	Russia	2654,27
9. Vymskiy	Russia	2605,78
10. Urho Kekkonen	Finland	2529,31
11. Laplandsky	Russia	2499,81
12. Visherskiy	Russia	2431,59
13. Juzshno-Ural'skiy	Russia	2322,26
14. Sjaunja	Sweden	2077,16
15. Vindelfjällen	Sweden	1968,78
16. Kavkazskiy	Russia	1966,16
17. Gran Sasso e Monti della Laga	Italy	1832,64
18. Permilovskiy	Russia	1730,90
19. Sebys'	Russia	1635,78
20. Lemmenjoki	Finland	1516,75

* According to national sources the forest area of some protected areas is under- or overestimated by the method.

Data source: European Forests and Protected Areas: Gap Analysis. UNEP-World Conservation Monitoring Centre. July 2000.

PER ANGELSTAM/ WWF-CANON

Russia has more forest protected areas than all the other European countries put together — 134,500 square kilometres out of a total of 205,000. These extensive forests in Komi Republic are the home of the wolf, lynx and bear, and the best place where we can study the original dynamics of Europe's boreal forests.

Table 4. **Size distribution of protected forest areas in Europe**

Size class (km^2)	Number of protected forest areas	Area protected (km^2)	Area protected (% of total area protected)
>1,000	20	56,212	27
500–999,9	34	24,485	12
100–499,9	275	57,472	28
10–99,9	1,497	47,172	23
<10	36,025	19,655	10
Total	**37,851**	**204,996**	

Data source: European Forests and Protected Areas: Gap Analysis. UNEP-World Conservation Monitoring Centre. July 2000.

Protected – But Still in Danger

Once the forest is protected, one would assume that its ecological values would be safeguarded for perpetuity. Unfortunately, this is not the case in Europe: many forest protected areas are protected only on a paper.

Large-scale clear-felling in the Sumava National Park in the Czech Republic.

Logging and Building Threaten the Most Valuable Parts of Sumava National Park

The Sumava Mountains in the Czech Republic represent one of the most extensive forested areas in central Europe. Established in 1991, Sumava National Park comprises 690 km^2, of which 81 per cent is forested.

Since the 1930s, the national park's core areas in close proximity to the Austrian and German border have been allowed to develop in an almost natural condition without major disturbances. A threat, however, looms large over this wonder of nature: ever since the mid-1990s, the spruce forests lying in the south-eastern zone in Sumava have been logged because of spruce bark beetle (*Ips typhographus*) occurrences. In 1999, logging was extended to the spruce forests of the core areas. Conservationists and forest ecology experts opposed the logging but despite this, felling continued in the core areas in 2000 as well. The Czech NGOs and WWF International have appealed to the government of the Czech Republic to draw up a management plan that would cater to the ecological values.

Is Sumava, a pearl of central Europe's forest land, now becoming an alarming example of bad maintenance of a protected area and destruction of the European forest heritage?

By definition, a protected area is an area dedicated to biodiversity protection. Thus, only human activities which support biodiversity conservation goals should be accepted within a protected area.

In European countries, there are more than 90 protection categories, each with differing definitions. Moreover, the level and means of protection vary a great deal: in many protected areas controversial human activities, such as logging and building, are permitted. Sometimes protection is inadequately monitored, thus allowing illegal logging or hunting. Intensive forest management in adjacent areas can also threaten the wildlife of the protected areas.

Administrative Problems

Local people and local administration may in many cases fail to respect decisions on protected areas made at the national level. Attitudes towards protected areas may turn negative, if the values of protected areas are not communicated to local people, and they are not involved in the decision-making and designing process or in the preparation of the management plan. Sometimes the protection decision might have been taken but sufficient resources not allocated.

The inconsistent nature of protection administration poses problems in many countries. There are usually several organisations responsible for different issues within park boundaries. National forest authorities in some countries continually refuse collaboration with their environmental colleagues when co-operation would bring benefits to both.

Legal and Illegal Logging

Opinions on logging in protected forests vary a great deal. In Fennoscandian countries, for example, protection usually means abandoning forestry. However, many of the protected areas in Continental Europe, in particular in areas belonging to IUCN categories V and VI, have been exposed to questionable logging.

In Hungary logging takes place in practically all forested national parks. The riverine forests of the Danube and Drava, situated in the Danube-Drava National Park, have experienced severe logging. Logging is also a common practice in protected areas in France, Germany and Italy. In the Czech Republic, bark beetle occurrences are given as a reason for controversial logging in Sumava National Park.

Controversial logging, sometimes illegal, can be found in many protected areas in Continental Europe and in some Russian protected areas.

On paper, Russian forest protection might seem good, but there are weaknesses. Many of the protected forest areas are so called *zakazniks*, which, in many cases, means weak protection. Some *zakazniks* permit full economic activity. According to a recent analysis by the Taiga Rescue Network (TRN), logging is prohibited in only about half of the protected areas of the taiga zone. A considerable amount of the income of some Russian national parks comes from the sale of timber.

Table 4. **Definition of forest protected area**

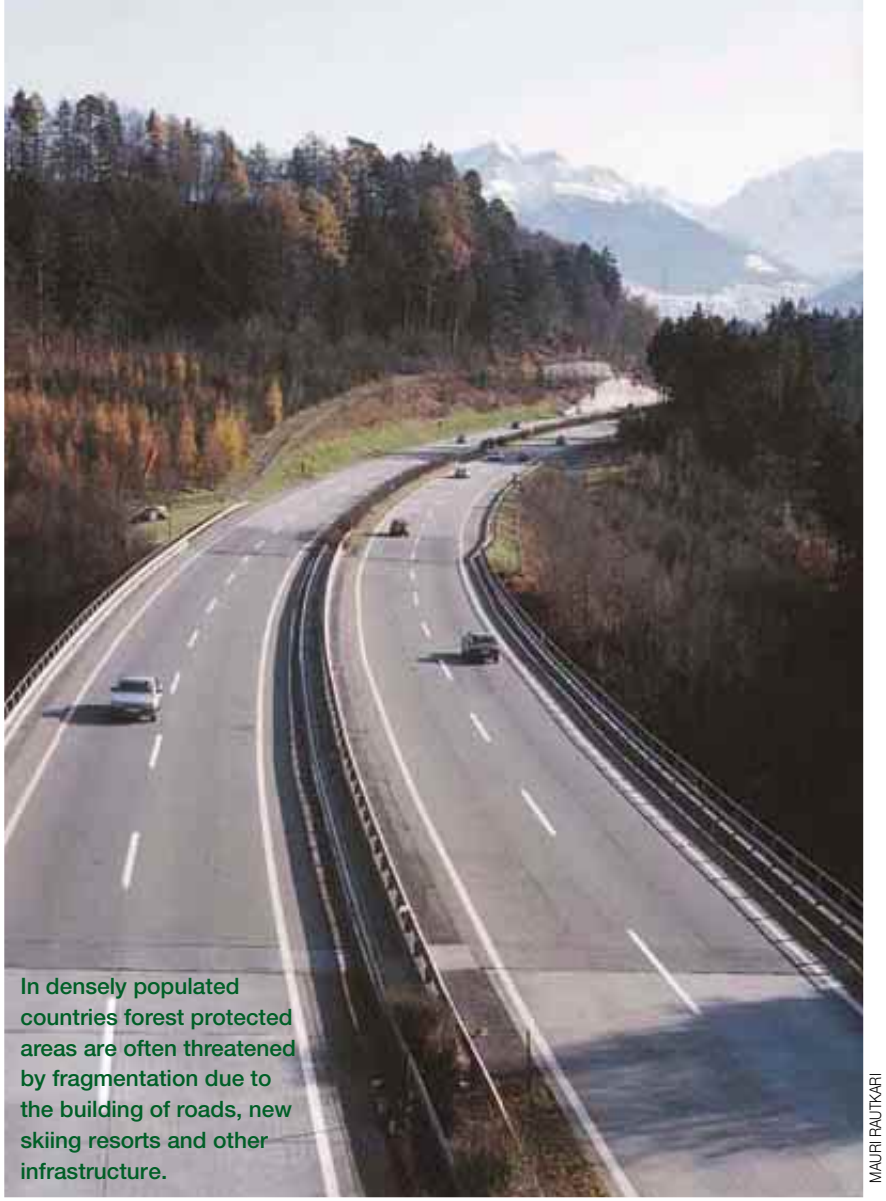
IUCN defines a protected area as “an area of land/or sea especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means”.

Six categories of protected areas are recognised:

- **I** Strict Nature Reserve/Wilderness Area – managed mainly for science and wilderness protection
- **II** National Park – ecosystem protection and recreation
- **III** National Monument – conservation of specific natural features
- **IV** Habitat/Species Management Area – conservation through management intervention
- **V** Protected Landscape – landscape/seascape conservation or recreation
- **VI** Management Resource Protected Area – sustainable use of natural resources

According to the above definition, the primary goal of management in these areas is to maintain or enhance biological diversity; commercial or extractive activities should only be allowed within the framework of the conservation goals.

JOEP DE VLASSEKER



In densely populated countries forest protected areas are often threatened by fragmentation due to the building of roads, new skiing resorts and other infrastructure.

MAURI RAUTKARI

Owing to inadequate monitoring, illegal logging is known to take place in the Czech Republic, Estonia, Italy, Lithuania and Slovakia. Also in Russia, the quality of protection is remarkably poor: illegal logging is common at many sites.

In many European countries, the need for forest restoration is great. Recovering the natural composition of tree species or establishing enough decaying trees may exceptionally require felling of trees, especially if the forest has been in commercial use prior to protection. Successful examples of forest restoration can be found in the Netherlands, where natural forests have been restored along rivers. Sweden and Finland have also used logging in some protected areas to restore plantations to more natural forests.

Hunting

Even in protected areas animals cannot roam in peace from hunters' bullets: local inhabitants have the right to hunt game in some of Europe's protected areas.

Hunting of threatened large carnivores is permitted because of the alleged threat they pose to domestic animals. For example, the hunting of the wolverine is permitted in Norwegian nature reserves and the wolf and various game animals can be hunted throughout Finnish Lapland – also in protected areas. In Germany and France, hunting and game management prevents natural regeneration of protected forests.

Building of Roads and Other Infrastructure

Protected areas are also not spared from building. Dams, electricity, sewer systems, water pipes and houses rob nature of its space. These activities threaten some of Europe's finest forests in France, Italy, Spain and Russia.

A road is being planned for construction in the Caucasus Biosphere Reserve. The road in the Picos de Europa National Park in Spain is being widened and a cable car route being built. In Italy, a skiing resort, which has been proposed for construction in Gran Sasso Lago National Park, will have a detrimental effect on alpine meadows and associated species.

Non-native Species

In the United Kingdom, non-native species such as the North American grey squirrel (*Neosciurus caroliensis*) and rhododendron (*Rhododendron ponticum*) are gradually displacing native species.

Forestry resorting to plantations can also shatter the ecological balance. This is the case in the United Kingdom. For instance, in the Snowdonia National Park in Wales, where the area of original forest is only 5 per cent, non-native species are still being introduced.

RAIMO LIETSALA/LUONTOKUVAT

MAURI RAUTKARI

Mining

Gold mines modify the environment in the pristine Komi forests which harbour the only viable habitats of Pinus sibirica in Europe. Machine-aided gold mining on the riverbanks is a problem in Lemmenjoki National Park in Finland.

Uncontrolled Tourism

The right kind of tourism can be fully compatible with the objectives of a protected area. The growth in tourism has, however, exceeded the ecological carrying capacity of many European national parks. Tourist hordes that are too large and improperly guided are capable of destroying the very ecological values for which they come in the first place.

In Spain, for example, tourist numbers have placed ecological values in peril. There are 3,000,000 visitors to national parks annually and this creates serious pressure on the environment.

Forest fires, uncontrolled tourism, building of roads, skiing resorts, dams, electricity, sewer systems, water pipes and houses threaten Europe's finest forests.

Forest Fires

Fire is a natural element and an important part of the natural dynamics in northern taiga forests. Modern fire surveillance is a problem for many species found in northern coniferous forests that live only in forests subject to periodical burning. In Finland and Sweden, for example, opportunities for restoring these natural dynamics in protected forests have been tested on a small scale and the results seem promising.

Fire can, on the other hand, be a destructive force. In the Mediterranean forest zones human activities greatly increase the risk of forest fires. Almost every summer, flora and fauna of valuable protected areas in Greece, Italy and Spain are lost.

Time to Protect European Forests!

Today, remnants of the lush and dense forests that once covered the whole of Europe are all that remain. However, only a few countries have taken the necessary steps to protect Europe's green natural heritage, and thus begun to implement international commitments on biodiversity conservation and sustainable forest management.

The protection of Europe's forests has never been as urgent a task as it is today: many forest types have been reduced to tiny fragments, and large parts of the remaining forests are species-poor plantations rather than functioning natural forests. Moreover, the average percentage of protection, 6.3 per cent, is under critical threshold levels needed for the long-term survival of a specialised flora and fauna.

It is indefensible, that Europe has protected less forests than Canada and many tropical countries; the continent is showing a bad example to the rest of the world.

European Forest Protection is Inadequate

The Earth Summit in Rio de Janeiro in 1992 was a turning point in the history of the conservation of biological diversity. Since that year, over 170 states have expressed their commitment to the conservation of biodiversity by signing and ratifying the Convention on Biological Diversity. In Europe, the Convention on Biological Diversity and the Forest Principles agreement have been applied in a follow-up convention, namely the resolutions of the Pan-European Ministerial Conference on the Protection of Europe's Forests in Helsinki 1993.

The WWF European Forest Scorecards Report, published in January 2000, analysed how 20 European countries have implemented these major international commitments. Out of the total maximum score of 100 on forest protected

It is indefensible that Europe has protected less forest than Canada and many tropical countries; the continent is showing a bad example to the rest of the world.

areas, even the highest scoring country, Slovakia, scored only 66. The average score on forest protected areas is 45 (see page 27).

Only the governments in Greece, Latvia and Poland have made clear commitments to retain and increase the area and quality of forest protected areas to the level needed to sustain biodiversity. Even though the trend of forest protected areas in most European countries has been positive during the past five years, the rate is generally extremely inadequate. At this rate it would take 20 years or more in most European countries to establish an ecologically representative network of forest protected areas.

PEDRO REGATO

Table 5. **WWF forest scorecards analysing the performance of 20 European countries on forest protected areas (PAs)**

Selection of scores analysing the performance of 20 European countries on forest protected areas (PAs) on scale bad tolerable fair good.

COUNTRY \ SCORE	Data quality: Gap analysis	Government commitment	Trend in protection	Ecological representation	National geographical distribution	Size distribution	Management plans	Quality of active management	Quality of protection	Total score on forest protected areas	
Slovakia										66	Preliminary gap-analysis exists. Mountain forests well protected, whereas lowland forests poorly protected through landscape protection. Illegal logging and fire create problems.
Hungary										58	Approximately 20% of forests protected. Most PAs undergo logging. Only a couple of PAs have a management plan. Huge need for restoration, but little action.
Belgium (Flanders)										55	Strong policy to create new forest PAs. Data on protected areas rather good, as well as on conservation needs of forests. Some PAs are rather small.
Finland										55	Less than 1% of forests in the hemiboreal and southern boreal zone protected. Almost all national parks have management plans. Restoration implemented only on a small scale.
Spain										55	Major deficiencies in the national park network. Juniperus-forests poorly represented.Most of the natural parks do not have approved management plans. Problems with fires. Too many visitors in all national parks.
Greece										53	Data on PAs good. Gap analysis carried out by WWF but not yet adopted by the government. The quality of protection is poor. The lack of a land register is a problem.
Netherlands										50	Huge restoration needs, implementation only started. Forests on rich soils poorly protected. PAs in general too small. PAs well covered by management plans.
France										48	Many forest types protected as too few samples. Logging and building hamper protection. Population pressure high, since many of the parks are frequently visited by tourists.
Poland										47	No Gap-analysis exists. Many protected areas are small. PAs are generally strictly protected.
Turkey										47	New Forest PAs established recently. Still gaps in ecological representation. The rights of local people and the restrictions on forest use created political problems in some PAs.
Austria										45	PAs concentrated in mountain areas, forests at low elevations and in the pannonical east of Austria are fragmented and poorly protected. The management of PAs varies a great deal.
Estonia										45	Gaps in forest protection are being surveyed. Management plans have small coverage, and they lack ecological aspects. Some areas suffer from illegal logging.
Sweden										40	Gap analysis has been carried out but data on PAs is insufficient. Forests in southern and central Sweden poorly protected. Need for active use of fire, but rarely implemented in PA management.
Belgium (Wallonia)										40	Only nine forests covering about 300 hectares have been protected. The forest PAs are often too small. Strict forest reserves do not exist.
UK										40	Huge variation in PA designations. Majority of PAs are relatively small. Atlantic oak woods, bog woodlands and Tilio-Acerion woodlands poorly represented. A fair proportion of PAs have a management plan.
Switzerland										39	Gap analysis has been carried out. Only 1.1% of forest land is strictly protected. Only one natural forest type (Kalkbuchenwald) is well represented in protected areas.
Lithuania										39	Government considers commercial forestry more important than PAs. Central and SW Lithuania poorly protected. Controversial loggings in lower protection categories.
Romania										39	The aim is to protect 8—10% of forests by 2005, but the implementation has been slow. Gaps in protecttion of hilly and plain forests. Only some PAs are staffed.
Norway										34	Partial Gap analysis done. Boreal rainforests, spruce forests in lowlands and nemoral deciduous forests poorly protected. Government has low ambitions to improve forest protection.
Germany										25	Data on PAs is scattered, which hampers planning. Proportion of PAs in forests is still too small. Management plans often outdated and inadequate. Logging is carried out in PAs.
Latvia										24	Goverment supports forest protection. Productive forest types and wet forests poorly protected. No management plans for PAs. Few PAs without any logging.

Data source: WWF European Forest Scorecards 2000. January 2000.

It is clearly a lack of political priority, not a lack of resources or valuable natural areas, which is threatening many of Europe's finest forests.

Natura 2000 is Promising – but Weakly Implemented

Within the European Union, the Bern Convention and the Rio Convention commitments, aimed at protecting species and habitats, have been applied in the Habitats and Birds Directives. The Habitats Directive establishes a legal framework for the conservation of animals, plants and natural habitats listed in the Annexes and provides for the creation of a network of special areas of conservation called Natura 2000. Special protection areas designated under the Birds Directive will also be included in Natura 2000.

New evaluation by WWF and other partner NGOs concerning the implementation of EU's Habitats Directive shows that the member states' proposals for Natura 2000 sites still fail to ensure the conservation of Europe's most threatened habitats and species. The individual size of the proposed sites is generally not suitable for supporting a favourable conservation status for the species and habitats concerned. The issue of site sizes is all the more critical in the absence of a coherent network of sites. The lack of corridors or stepping-stones between sites to support wide ranging species such as the brown bear (*Ursus arctos*) and Iberian lynx (*Lynx pardinus*) is particularly serious.

This shows how little priority is given to conservation issues in many EU member states, which are among the wealthiest on the continent. It is clearly a lack of political priority, not a lack of resources or valuable natural areas, which is threatening many of Europe's finest forests.

European Union candidate countries are preparing amendments to environmental legislation to comply with EU directives. Despite gross shortcomings in environmental policies, some candidate countries actually have a much better level of nature conservation than many EU member states. The EU and the countries in transition must take the advantage of their well-preserved nature and take the benefits that full implementation of Natura 2000 can offer to rural development.

LAURI KASURINEN/LUONTOKUVAT

Call for Action

Huge numbers of forest species and ecosystems are threatened today. European countries must act now to protect the strongholds of the richest European forests. Establishing an ecologically representative and effectively managed network of forest protected areas is imperative for truly sustainable forest use.

WWF's vision is a Europe of living landscapes, where forests and woodlands are valued for their natural diversity as well as for the benefits they provide people and society. Hence, Europe must become a model for the ecological recovery and restoration of her forests – this requires vision as well as bold decisions today.

WWF calls on European governments to be more ambitious in their forest work and to meet their international commitments on biodiversity conservation and sustainable forest management, such as the Convention on Biological Diversity and the Ministerial Conference on the Protection of European Forests. In the framework of the implementation of the European Union legislation particular attention should be paid to the protection of forest habitat types under the Natura 2000 European ecological network.

Setting up an ecologically representative network of effectively managed forest protected areas also needs commitments and action by the private sector, since large parts of the European forests are privately owned today or will be privatised in the future. Creating space for nature throughout Europe should be seen as equal in importance to the network concepts for transportation and telecommunications.

Since the main topic of this publication is forest protected areas, we provide recommendations for the development of a European-wide network of protected areas. Setting aside blocks of forests with sufficient diversity and size to guarantee the survival of the original plant and animal species and natural forest communities is the only way to ensure that representative samples of biological diversity will survive. However, protected areas would not, on their own, be enough to safeguard biodiversity or ensure watershed protection, soil stabilisation and other environmental necessities. Many of these functions will, in practice, have to carry on alongside other forms of management. To be successful, any protected area strategy must assume a holistic approach and be integrated with other land use and management strategies at a regional or landscape level.

WWF's Global Objectives for Forest Conservation

WWF and IUCN have identified five priority objectives to halt and reverse the decline in the global forest estate:

Objective 1. To establish a network of ecologically representative, socially beneficial and effectively managed forest protected areas.

Objective 2. To achieve environmentally appropriate, socially beneficial and economically viable management of forests outside protected areas.

Objective 3. To develop and implement environmentally appropriate and socially beneficial programmes to restore deforested and degraded forest landscapes.

Objective 4. To protect forests from pollution and global warming by reducing polluting emissions and managing forests for resilience to climate change.

Objective 5. To ensure that political and commercial decisions taken in other sectors safeguard forest resources and result in a fair distribution of associated costs and benefits.

WWF believes European governments and the private sector should urgently take the following action:

1. Secure the protection of the remaining old-growth, relic and other high conservation value forests

Only 2–3 % of the forests in Western Europe, and around 5-10 % in the European part of Russia can be classified as pristine or near pristine natural forests. Of these areas, perhaps less than 50 per cent is considered to be effectively protected. The remaining unprotected old-growth and relic forests must be the priority areas for adding to the existing protected area networks in Europe. These forests represent the last vestiges of the forests which once covered Europe before the arrival of man. They hold much of the continent's biodiversity, and can be the nuclei for tomorrow's forests – the 'base' from which Europe can restore its natural forests. Moreover, the old-growth forests are huge natural storage of carbon, thus their protection contributes significantly to the prevention of global climate change. Their protection is an urgent task, because many of these forests are gravely threatened by exploitation, in particular bad forest management practices.

SEDAT KALEM

Turkey's government announced a Gift to the Earth for WWF by declaring National Park status for Kure Mountain and launching the process leading to the legal protection of eight other forest hotspots. Implementation of the Gift to the Earth will increase the amount of protected areas in Turkey by 2%.

Mediterranean Hotspots Forests

WWF has identified more than 300 of the region's most ecologically and biologically important forest areas. As a first step towards saving the Mediterranean forests, WWF is urging governments to take immediate action to protect their respective important forest areas. WWF's Hotspots Campaign has identified the top ten sites in the region that are most severely threatened and require immediate protection. A concrete action or credible commitment by governments for these hotspots would contribute significantly to the goals of forest conservation set by WWF and would be considered as "Gifts to the Earth".

Regions with large areas of old-growth forests

In regions with large areas of old-growth forests, such as the boreal regions in the European part of Russia, forests still are characterised by natural dynamics and host viable populations of all naturally occurring species. Human activities have begun to have an impact on these areas, hence, the imperative for the development of a framework for nature conservation which provides for the establishment of an ecologically representative network of forest protected areas.

WWF proposes that

- *The most extensive natural forest areas (>50,000ha) should be protected, thus safeguarding the undisturbed development of long-term natural processes*

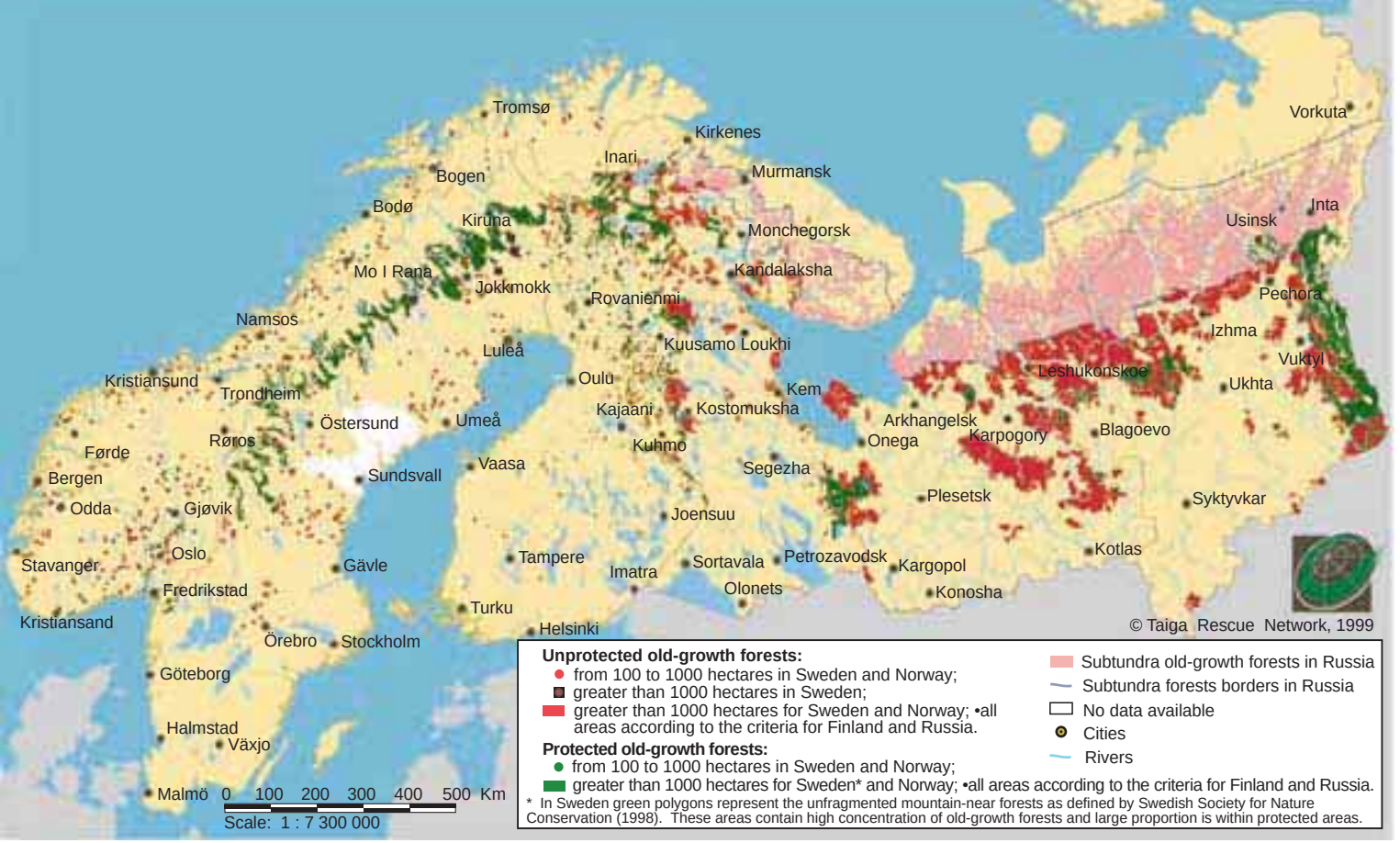
Any development of forest management regimes should not reduce the amount of old-growth forests below ecological thresholds.

Regions with small areas of old-growth and relic forests

In Western Europe, smaller patches of old-growth or relic forests are still found even in the most densely populated European countries. The area of these forests has already dropped below the ecological threshold and as a result specialised animal and plant species have dramatically declined and struggle to survive in these last fragments of original forests.

WWF proposes that

- *The remaining old-growth, relic and other forests with high nature conservation values in regard to biodiversity, structure and ecological function, must be protected, where possible enlarged, and the ecological corridors between protected areas must be safeguarded.*
- *There is a great need for the restoration of forests currently lacking old-growth features in Western Europe. The maintenance of biological diversity also requires the restoration of forest habitats to reach the ecological threshold values needed for the maintenance of viable populations in the future.*



Map 4.
Old growth forests in Boreal Europe

Taiga Rescue Network maps (published late 1999) reveal that extensive tracts of old-growth forests lie outside forest protected areas in Fennoscandia and Russia. A common threat facing these forests is bad forestry practices. The question of Russian forest protection is also a question of preserving continuous old-growth forests in the boreal zone lying in an east-west and north-south direction. The link between the coniferous and mixed forest of Western Europe and the great taiga belt will be severed if the logging of old-growth forests in Russia is allowed to continue.

Responsible timber trade

Companies can also contribute significantly to the protection of Europe's remaining unprotected old-growth forests and other high conservation value forests. Companies should act in an environmentally responsible manner in their forest management and purchasing policy, and

WWF proposes specifically that

- *Companies should have a clear policy and take active measures to avoid using timber from unprotected old-growth forests and other high conservation value forests;*
- *Eventually, companies should use timber from FSC-certified forests only, since this is the only certification system which has a mechanism to ensure the protection of high conservation value forests.*

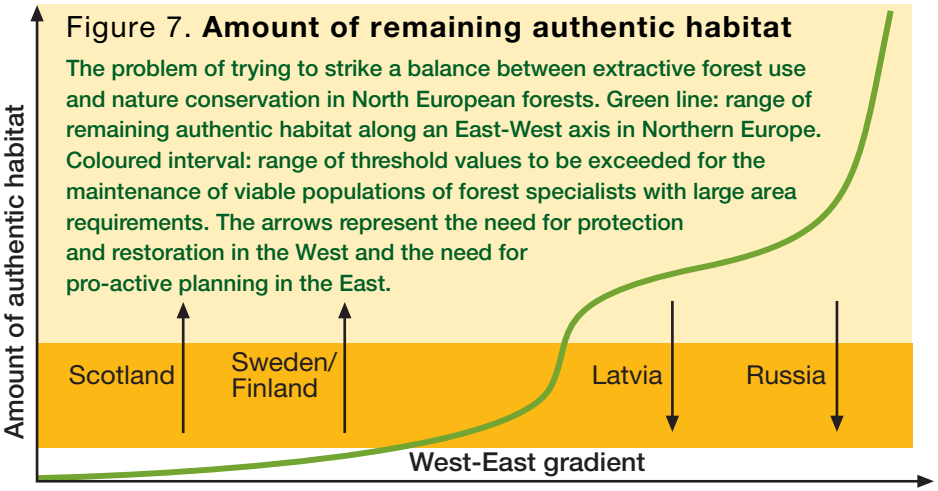


Figure 7. **Amount of remaining authentic habitat**

The problem of trying to strike a balance between extractive forest use and nature conservation in North European forests. Green line: range of remaining authentic habitat along an East-West axis in Northern Europe. Coloured interval: range of threshold values to be exceeded for the maintenance of viable populations of forest specialists with large area requirements. The arrows represent the need for protection and restoration in the West and the need for pro-active planning in the East.

Data source: Per Angelstam & Marius Ladzinis 2000

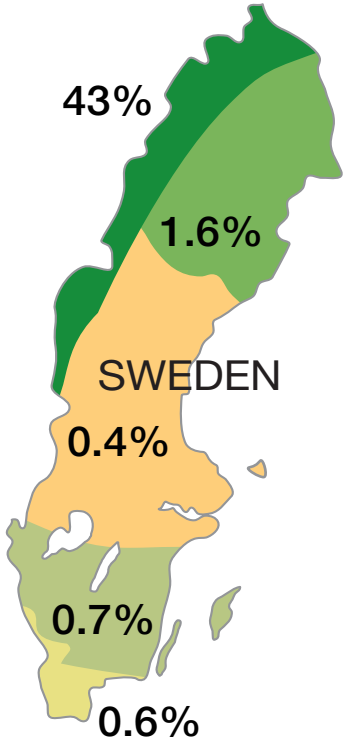
2. Use ecological criteria in the design and location of forest protected areas

A new UNEP-WCMC study shows an alarmingly poor level of forest protection in Europe: only a handful of forest types in a few countries are well represented in protected area networks and with serious gaps identified, especially in forests on rich soil and lowlands. Protected areas are scattered throughout Europe in tiny patches, and species in the small areas in particular are threatened. Forest protection in Europe has been ad-hoc, political and opportunistic rather than based on ecological principles.

Setting up an ecologically representative network of protected forest areas requires systematic conservation planning. A basic role of protected areas is to separate elements of biodiversity (e.g. species, forest types) from processes that threaten their existence in the wild. The extent to which protected areas succeed in doing this depends on how well they meet two objectives. The first is representativeness, referring to the need for protected areas to represent, or sample, the full variety of biodiversity in a region or country. The second is persistence - protected areas, once established, should promote the long-term survival of the species and other elements of biodiversity they contain by maintaining natural processes and viable populations and excluding threats. To meet these objectives, conservation planning must deal not only with the location of reserves in relation to natural physical and biological patterns, but also with reserve design, which includes variables such as size, connectivity, replication, and alignment of boundaries, for example, with watersheds. A structured, systematic approach to conservation planning provides a firm foundation for achieving these objectives.

WWF urges

- *European governments to adopt the principles of systematic conservation planning and without delay, evaluate their forest protection networks and, on the basis of evaluation, design a protection programme which aims at improving the protection of under-represented forest types.*



Map 5
Gap analysis encouraged Sweden to increase forest protected areas

Perhaps the most significant analysis of the need for forest protected areas covering an entire country was carried out in Sweden in 1997. The message of Sweden's gap analysis left no room for misinterpretation: the amount of forest protected areas should approach 9–16% of the total forest area in different parts of the country. This was much more than the level of existing protection, which was only 0.8 % in most of the country's forests (the exception being fell forests, of which 43% were protected). The Committee for Forest Protection proposed that 900,000 hectares of forest needed to be protected in the very near future.

3. Make the management of existing forest protected areas effective

Most European countries have serious weaknesses in the management of forest protected areas. Talking about paper parks is well-justified, even in Europe: logging, hunting, building of human infrastructures, unsustainable tourism, and other incompatible human activities are surprisingly common in protected areas.

The biodiversity protection could be significantly improved, if the standard of management in existing forest protected areas were raised and incompatible land uses eliminated.

WWF proposes the following concrete measures:

- *Authorities responsible for the protected areas should clarify the objectives of management in forest protected areas, specifically: the management objectives of forest protected areas should in the first instance be for biodiversity conservation.*
- *Authorities responsible for the protected areas should establish a monitoring and evaluation system which enables them to assess the effectiveness and impact of their management on biodiversity and provides feedback to improve performance.*
- *Since human impact in many European forest protected areas has been negative in respect to biodiversity conservation, protected area management should pay more attention to the active ecological restoration of forests that have been degraded.*
- *A management plan based on sound ecological knowledge defining those areas where the protection of biodiversity is the main aim of the management should be drawn up for each protected area. The plan must also clearly indicate which human activities are allowed and which are in breach of the management principles.*

KEES JAN VAN DEN HERIK

In The Netherlands, successful ecological restoration in protected areas has been carried out to bring back riverine forests and their associated fauna and flora in former agricultural areas.

- *The planning of forest protected areas and their management has to take full account of the needs and desires of local people, including indigenous people.*
- *Countries whose forest protected area networks are grossly insufficient in terms of ecological representation should be encouraged to transfer forests from loosely protected categories, such as forests protected on the basis of landscape protection (IUCN category V) and other protected forest categories (e.g., forests protected for watersheds, erosion, avalanches), to more strictly protected categories (e.g., IUCN I–II), and managed accordingly, whenever possible.*

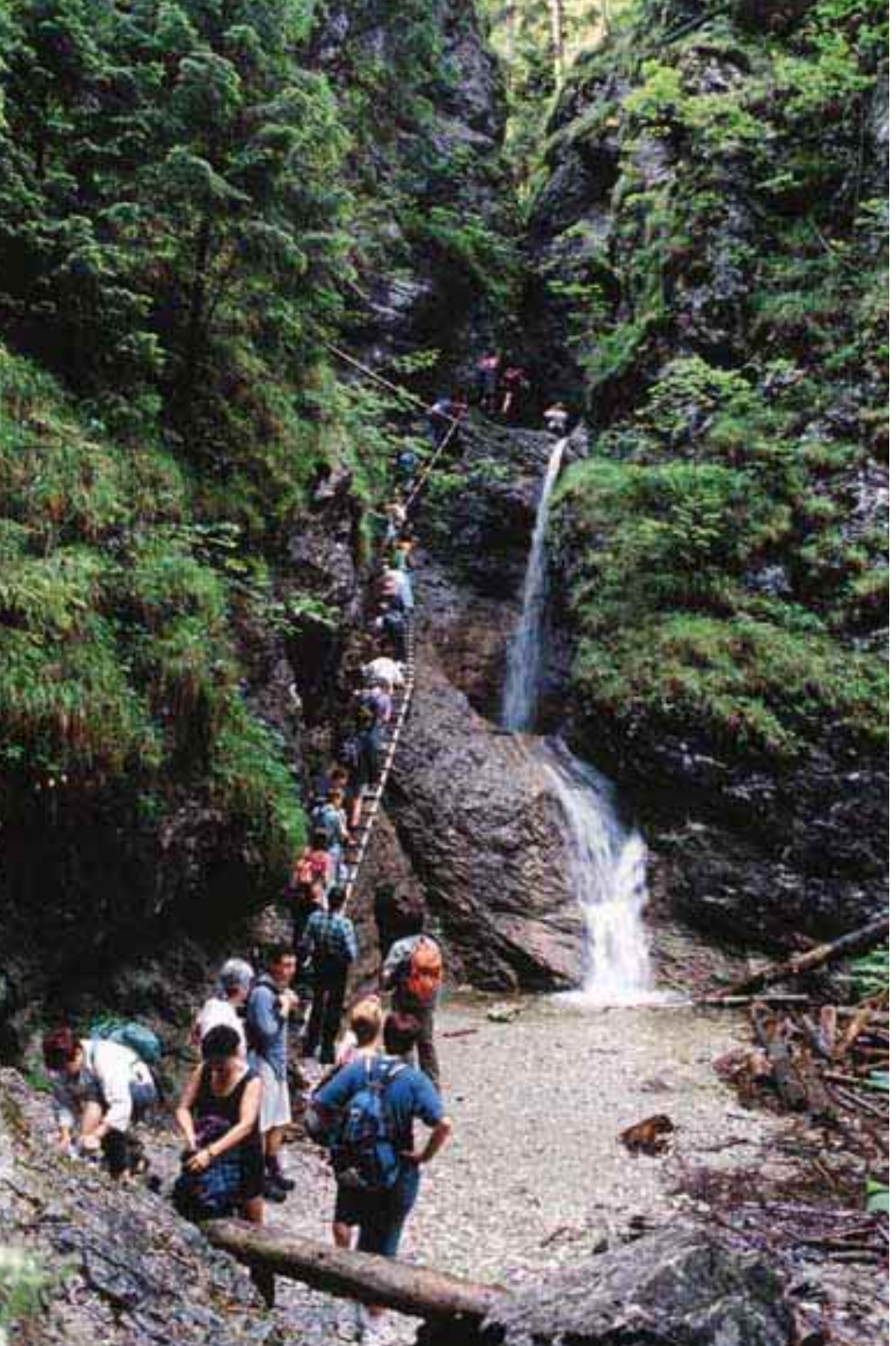
4. Use a range of tools to create and manage forest protected areas in the future.

Governments obviously remain the major players in the establishment and management of forest protected areas. The basic instrument for securing biodiversity in forests are proper forest codes and laws for environmental considerations that protect biologically important forest habitats in daily forest work, but new, complementary, even innovative measures, should be introduced.

One challenge is to promote the protection of biodiversity in privately owned forests. Private ownership of forests, which is common in Western Europe, is not necessarily an obstacle to effective protection.

Voluntary certification of forests in accordance with FSC principles promotes biodiversity protection in commercial forests. For example, Swedish private forest owners, whose forests are FSC-certified, set aside at least 5% of their productive forests. This has already resulted in some 500,000 hectares of voluntary forest protected areas on privately owned lands.

Another voluntary tool for ensuring biodiversity in high conservation value productive forests has recently been developed in Sweden. Through so-called "Conservation Agreements" the landowner makes a legal agreement with the regional forest authority which states which part of his/her land will be a protected area, a restored forest, managed in a certain manner, or used for commercial forestry. The agreement stands for 50 years, and the landowner receives a minor subsidy as encouragement for his or her engagement.



PETER OLEKSAK

Slovensky raj National Park in Slovak Republic is collaborating with WWF in order to join the PAN Parks network. The Park's beautiful and wilderness type ecosystem, featuring the highest number of gorges with waterfalls in the Carpathians, attracts 400,000 – 600, 000 visitors a year, and a green type of tourism provides an important source of income for local people. Joining PAN Parks would mean among other things that park managers will develop a sustainable tourism development strategy with local stakeholders to ensure that the ecological carrying capacity will not be exceeded in the future.

There are several new and promising ways of supporting the management of protected areas. A number of traditional and modern sustainable livelihoods exist which can be well-combined with forest protection programmes. These include eco-tourism, the medicinal use of plants, cork production, mushroom collection and berry picking. These will also have the dual benefit of revitalising local economies and fighting rural depopulation.

Nature-oriented tourism, if well implemented, can be an activity compatible and even supportive, with the goals of the forest protected area. WWF and partners are setting up a new labelling scheme, PAN Parks, which aims to develop a quality standard for well-managed protected areas and to generate new income for people living in National Parks through responsible nature-oriented tourism.

Heritage Forest Campaign Promotes Voluntary Protection

The Heritage Forest Campaign, a new initiative promoting voluntary forest protection, is attracting increasing numbers of private forest owners in Finland. The forest owner voluntarily decides to designate a specific forest area as a Heritage Forest. The emphasis on preserving a Heritage Forest is of a personal nature. The idea is that the Heritage Forest would be preserved in its natural state from one generation to another. The continuity is based on respect for parents, grandparents, and the natural environment.

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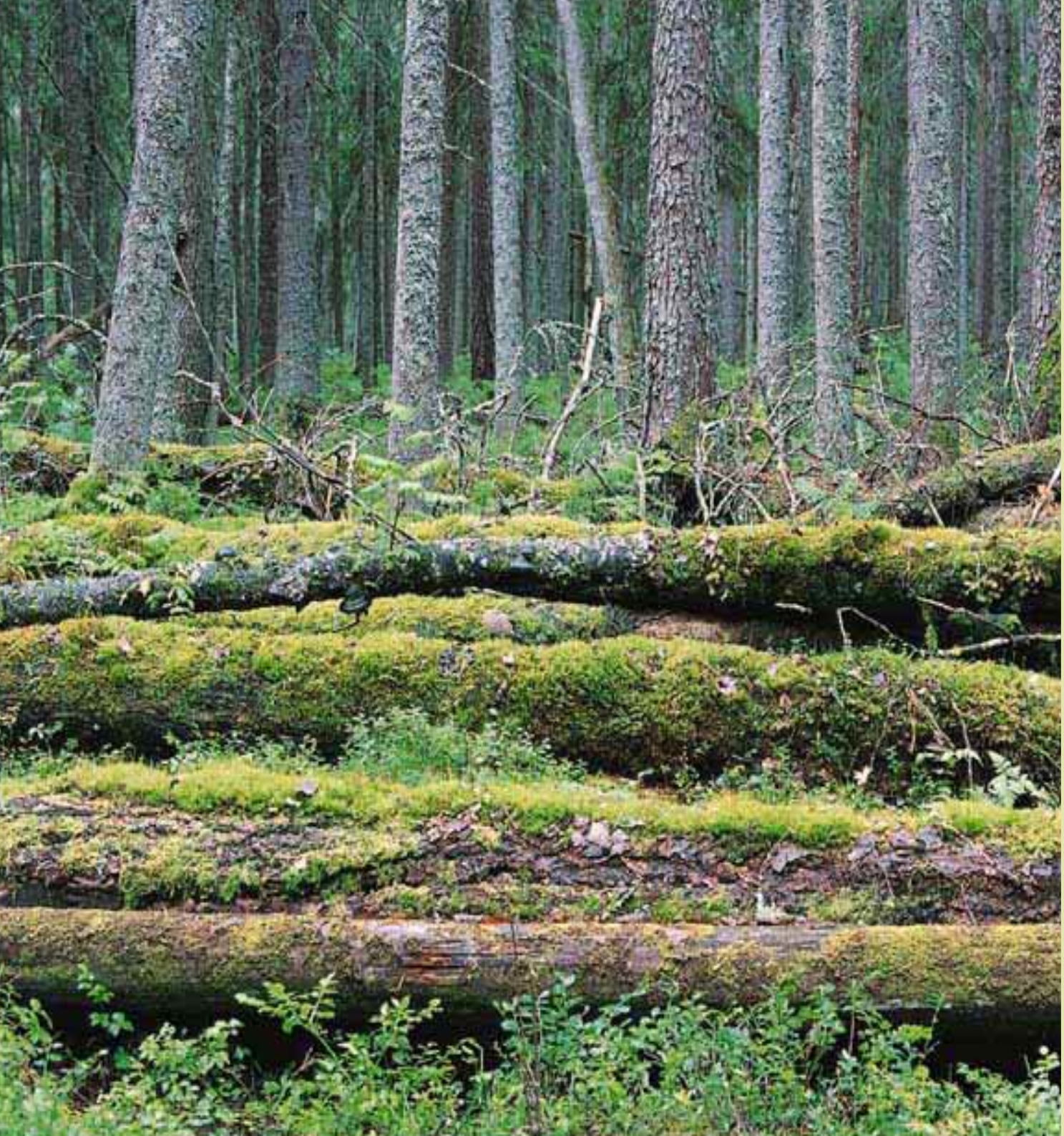

WWF report

Insight into Europe's Forest Protection

WWF's mission is to stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature by:

- conserving the world's biological diversity;
- ensuring that the use of renewable natural resources is sustainable;
- promoting the reduction of pollution and wasteful consumption.

WWF Global Forest Campaign on the web: www.panda.org/forests4life

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