

# 11. Biodiversity and landscape

*Europe has a significant responsibility for the conservation of globally-threatened mammals, birds and plant species. Some areas, like the Mediterranean and the Caucasia, stand out for their species richness. The continent is also home to a large proportion of the world's domestic animal diversity, and nearly half of Europe's breeds are at risk of extinction. Important eco-systems continue to be at risk, including forests, wetlands, species-rich agricultural habitats, several dry and arid areas, and some marine areas. Most countries, however, are improving their monitoring of such areas and, in application of global, European, regional or national commitments, are implementing plans to halt the further degradation of biodiversity and decline of important habitats. Species population trends are mixed – some previously highly threatened species are starting to recover, others continue to decline at alarming rates, generally as a result of the disappearance or degradation of their habitats.*

## 11.1 Introduction

Europe's biodiversity in its widest sense – from wild to cultivated species, with all their genetic variability, and from little-utilised to highly-cultivated ecosystems– is embedded in a complex network of rural landscapes fragmented by transport and urban infrastructures. Although largely rural, Europe is the most urbanised and, together with Asia, the most densely populated continent in the world. Central Asia, however, still has extensive barely utilised areas.

Biodiversity has its own intrinsic value but is also increasingly recognised for the goods and services it provides. Agriculture, forestry, fisheries, hunting and the production of other biological products including pharmaceuticals directly depend upon biodiversity. It is also important for nutrient cycling and soil fertility, flood and storm protection, erosion prevention, atmospheric and climate regulation, etc.

Biodiversity is affected by major changes in land use, large-scale impacts of air and water pollution, and invasive species; the effects depend strongly on the biogeographic and cultural context. The consequences of climate change, while still difficult to predict, are likely to lead to considerable changes in species distribution, physiology and migration behaviour. Furthermore, we can expect functional ecosystem responses. Desertification as a result of land-use, combined with climate change, is occurring in or threatening a large part of the Mediterranean, Iceland and dry areas of Central and Eastern Europe as well as in Central Asia.

Different biogeographical regions are susceptible to different threats (Figure 11.2.1).

**Figure 11.1. Main threats to biodiversity by Biogeographic context (editorial note: text box for a future figure)**

Biogeographic region	Main threats to biodiversity
Arctic region	Climate change may change conditions for plant and animal communities Ozone depletion
Boreal region	- Intensive forestry practices Exploitation for hydroelectric power Freshwater acidification
Atlantic region	High degree of habitat fragmentation by transport and urban infrastructures Intensive agriculture Eutrophication with massive algal blooms Invasive alien species

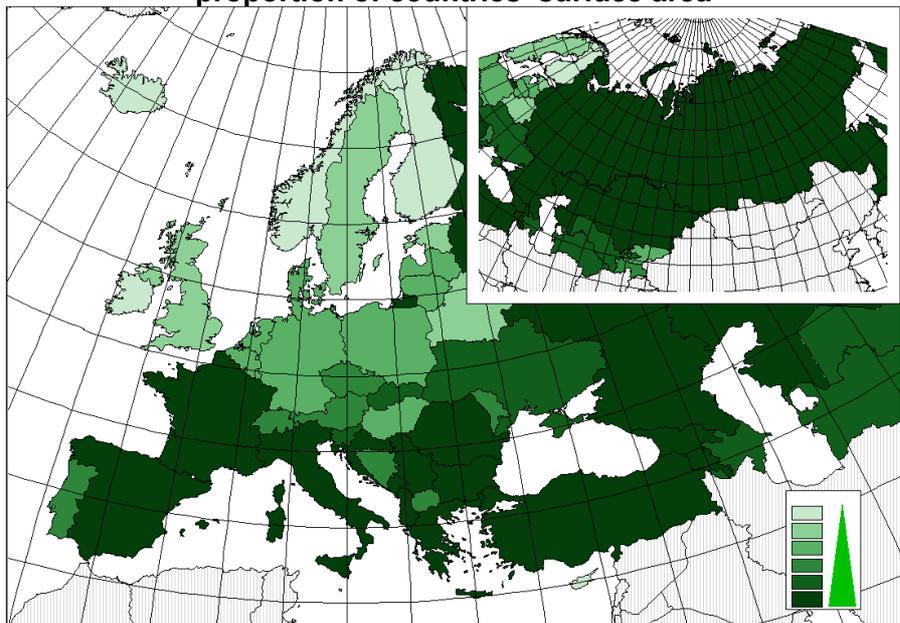
Continental	High degree of habitat fragmentation by transport and urban infrastructures Industry and mining Atmospheric pollution Intensive agriculture Intensive use of rivers
Alpine (Alps, Pyrenees, Carpathians, Dinaric Alps, Balkans and Rhodopes, Scandes, Urals and Caucasia).	Climate change may change conditions for plant and animal communities Transport infrastructures Tourism Dams
Pannonian	Intensification of agriculture Drainage of wetlands Irrigation combined with evaporation leads to salinisation and alkalisation Eutrophication of large lakes Mining industry with heavy metals pollution of some rivers
Mediterranean	The world's most important tourism destination High pressures from urbanisation in coastal areas Intensification of agriculture in plains, land-abandonment in mid-mountains Desertification in some areas Invasive alien species
Macaronesian (Includes Azores, Madeira, Canaries islands)	Invasive alien species Tourism Forest fires and uncontrolled tree-felling Intensification of agriculture with large greenhouses
Steppic	Intensification of agriculture, e.g. abandonment of nomadic pastoral activities Desertification Large mining and industrial settlements, with pollution problems
Black Sea	Intensification of agriculture: irrigation, salinisation Waterlogging Tourism
Anatolian	Intensification of agriculture : conversion of steppes into arable lands, irrigation, drainage of wetlands, overgrazing Building of dams

**Source:** EEA report on Europe's Biodiversity (under preparation)

## 11.2 Europe's responsibility for biodiversity: wild species

The number of species present in a given area – often called “species richness”- is used as an indicator of biodiversity and, to some extent, a measure of a country's responsibility for conservation. Among the 25 regions which have been recognised as ‘biodiversity hot spots’ at the global level, two are partly in Europe: the Mediterranean basin and Caucasia. This is reflected in figure 11.2 which shows the density of vertebrates and vascular plants in relation to country surface areas. However, species-poor areas, for example in the Arctic region, have important specific species, often in large populations, and habitats.

**Figure 11.2: Species richness (Vertebrates and vascular plants) in proportion of countries' surface area**

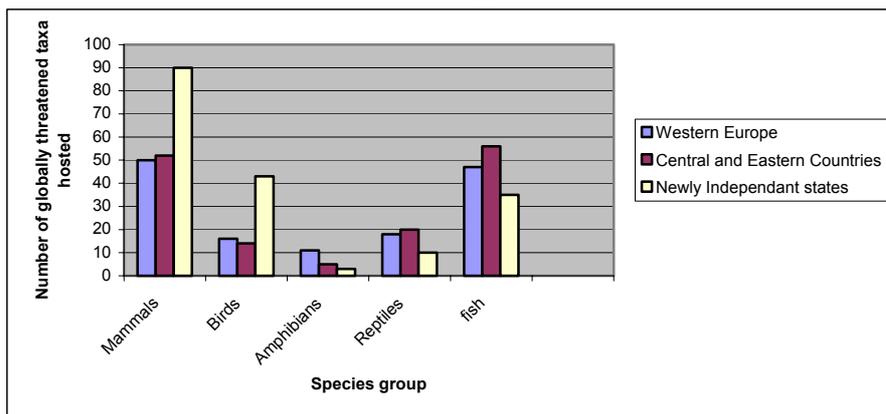


**Note:** Given Russia's considerable surface area, the figure for this country is over-represented. Macaronesia is not taken into account

**Source:** EUNIS database/ ETC/NPB (from various sources)

Among the 3 948 globally-threatened vertebrate species (categories Vulnerable, Endangered and Critically endangered) assessed by the World Conservation Union (IUCN), 335 occur in Europe and Central Asian countries; of these 37 % are mammals, 15 % birds, 4 % amphibians, 10 % reptiles and 34 % freshwater fish. NIS countries have a particular responsibility for the conservation of globally-threatened mammals and birds (figure 11.3).

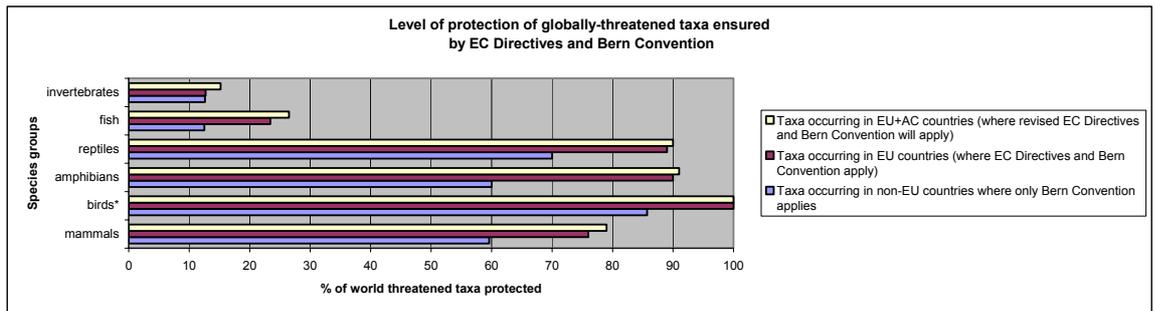
**Figure 11.3. Share of responsibility for conservation of globally-threatened vertebrates within regions**



Source: 2000 IUCN Red List of threatened species (database); EUNIS database

For the flora, analysis is more difficult due to taxonomic problems. However, it is estimated that out of about 32 000 globally-threatened plant species, some 500 occur in Europe (excluding Caucasia). Figure 11.4. shows the level of protection of globally-threatened species by European legal instruments and agreements.

**Figure 11.4 Level of protection of world threatened taxa occurring in Europe, ensured by EC Directives and Bern Convention**



Notes: The EC Bird Directive calls for the protection of all bird species. The Bern Convention applies to all countries of the 'Environment for Europe process' except Armenia, Bosnia-Herzegovina, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Russian Federation, Tajikistan, Turkmenistan, Uzbekistan, and Yugoslavia.  
Sources: 2000 IUCN Red List of threatened species (database); EUNIS database (Annex IV EC Habitats Directive, EC Bird Directive, Annex I & II Bern Convention).

Except for fish, globally-threatened vertebrates are generally well-covered by legal instruments, especially in EU countries with a combination of EC Directives and the Bern Convention. In non-EU countries where only the Bern Convention applies, gaps in protection remain. With the EU enlargement process, new species will be added to the Habitats Directive, some of them being globally threatened. For invertebrates, important gaps in knowledge remain.

It is important to stress, however, that both the EU Habitat Directive and the Bern Convention (through the Emerald process) will protect a wide range of species in an indirect way by protecting their habitats.

### 11.3 Europe's responsibility for biodiversity: domestic animals and crops

In relation to its size, Europe is home to a large proportion of the world's domestic animal diversity with 2 576 breeds registered in the FAO Breeds database. This represents almost half of the world's recorded breed diversity. Of the European breeds, almost half are categorised as being at risk of extinction. Two successive updatings of the database (1995 and 1999) show critical trends: the percentage of mammalian breeds in Europe at risk of extinction increased from 33 to 49 %, and of bird breeds from 65 to 79 %

The declining genetic diversity of livestock is due mainly to the destruction of the native habitats of livestock breeds, the development of genetically-uniform breeds, and changing farmer and/or consumer preferences for certain varieties and breeds.

However, Europe is the region where the highest proportion of breeds is under active conservation programmes, covering about 26 % of the mammalian and 24 % of the bird breeds.

Although not often thought of as a major centre of crop diversity, the European continent also harbours wild relatives of many crop and tree species which form a 'gene pool' to breed and cross with species currently used in agriculture. These include cereals, food legumes, fruit crops, vegetables, pot herbs, condiments and aromatic plants. It also harbours a very large number of ornamentals, many of which have been taken into cultivation in Europe.

Though difficult to quantify, genetic erosion of such resources has been globally recognised and a number of coordinated in situ and ex-situ conservation programmes have been set up as part of the Global Plan of Action for the Conservation and

Sustainable Utilization of Plant Genetic Resources for Food and Agriculture. Although Central Asian countries host rich genetic resources, conservation programmes are generally not yet well developed.

### 11.4 State and trends of European ecosystems

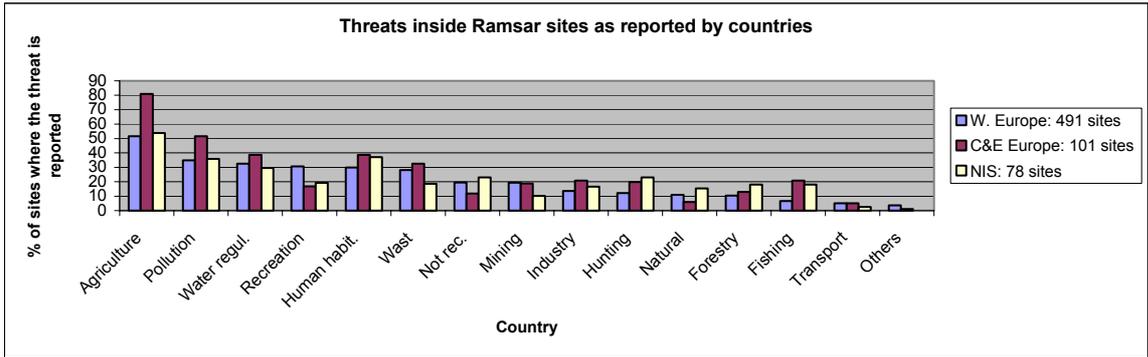
The need to monitor the state of ecosystems is now widely recognised, as reflected, for example, in the global Millennium Ecosystem Assessment (MA) programme: *“The capacity of ecosystems to produce goods and services ranging from food to clean water is fundamentally important for meeting human needs and ultimately influence the development prospects of nations. .... But while policymakers have ready access to information on the condition of their nation's economy, educational programs, or health care system, comparable information on the condition of ecosystems is unavailable despite the important role that they play.”* This general statement is also valid for Europe and Central Asia. However, most European countries are making progress in monitoring their main ecosystems. The data currently reflect mainly the quantity (area) of the ecosystems - information about their quality is scarcer.

#### 11.4.1 Wetlands

Wetlands provide multiple social, economic and environmental benefits. They cover about 9.9 % of the whole Europe, about 4.4 % of the EU, 4.4 % of non-EU Europe excluding the Russian Federation and 12.7 % of the Russian Federation (Stevenson & Frazier, 1999). In southern European countries wetlands nowadays are scarce (0.3 to 2.1 % of land area).

Wetlands have been generally declining for decades - both in area and quality – but this is still difficult to quantify. An assessment of the main threats to these ecosystem-types can be derived from the Ramsar database (Figure 11.5). Although the Ramsar sites represent the most remarkable wetlands in Europe, the information can be extrapolated to wetlands in general.

**Figure 11.5 Threats to wetlands as reported by countries for Ramsar sites**



Source: Ramsar database managed by Wetlands International

In all countries, agriculture is perceived as the main threat to wetlands, followed by pollution –probably partly due to agriculture – and water regulation. The presence of human habitations in Ramsar sites is perceived as a greater source of threat in Central and Eastern European countries and NIS than in West European countries, possibly because contractual agreements with local populations are less well developed. The intensity and the effects of these pressures depend largely on the type of wetlands concerned (marshlands, bogs, floodplains, etc).

Estimates of wetlands losses are available from of a pilot project lead by Wetlands International, as well as from national reports on biodiversity. Only Denmark provides an indication of trends since the 1990s.

**Table 11.1. Trends in wetlands loss as reported by some countries in their first National Biodiversity report**

Country	Armenia	Bulgaria	Belarus	Denmark	France	Lithuania	Switzerland	Turkey
<b>Estimated surface area loss</b>	20 000 ha drained	90 % lost	50 % loss wet meadows 80 % floodplains	60 % shallow wetlands	75 % wetlands loss	70 % wetlands loss	90 % of all Swiss wetlands	1 300 000 ha lost
<b>Reference period</b>	over last 50 years	since beginning 20 <sup>th</sup> Century	Meadows: since 1930-45 Floodplains 1950-1990	since 1960. No further loss recorded for 10-15 years	Between 1900-93	since last 30 years	Since 1800	Since 1900s, mainly since 1960

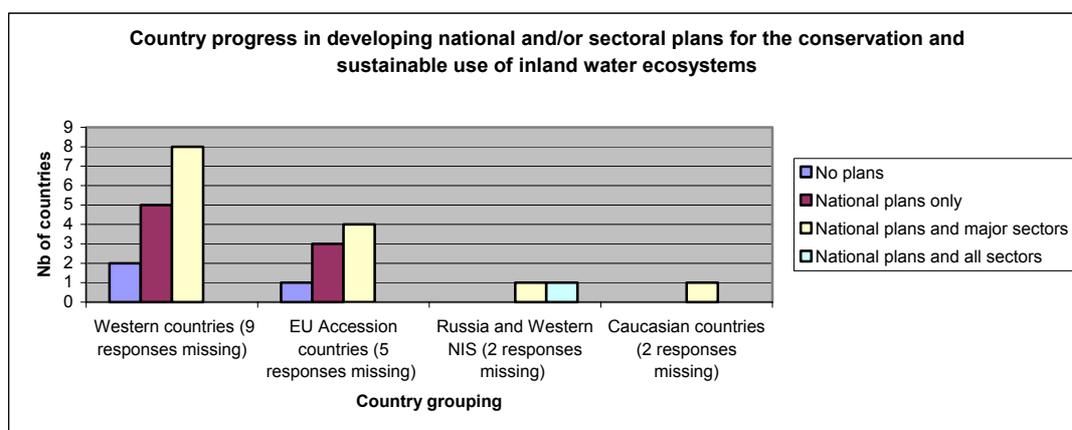
**Source:** Wetlands International and national reports to the CBD

At the EU level, the Water Framework Directive provides a solid regulatory background instrument for wetland conservation strategies. The European Charter on Water Resources adopted by the Environment Ministers in October 2001 provides a framework at the pan-European level.

As requested by the Ramsar Convention, many countries have implemented policies or national action plans to halt the decline of wetlands. These, combined with increasing wetlands restoration programmes, may be stabilising the very negative trend perceptible up to the late 1980, at least in the EU countries. Rates of wetland loss due to the different economic conditions in Eastern Europe are likely to be higher now than in the mid-1980s (Moser, 2000).

Figure 11.6 shows the level of concern by European countries in implementing wetlands conservation related policies, as reported in their second national report under the CBD.

**Figure 11.6 Implementation of national and or sectoral plans for the conservation and sustainable use of inland water ecosystems.**



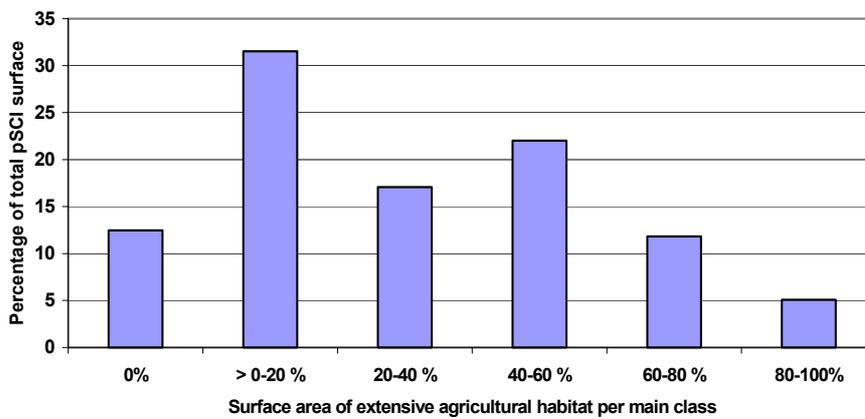
Note: This diagram only refers to inland water ecosystems. Coastal wetlands are considered in the marine and coastal section

Source: National reports to CBD Secretariat (Analyser)

### 11.4.2 Low-intensity farming systems and semi-natural grasslands

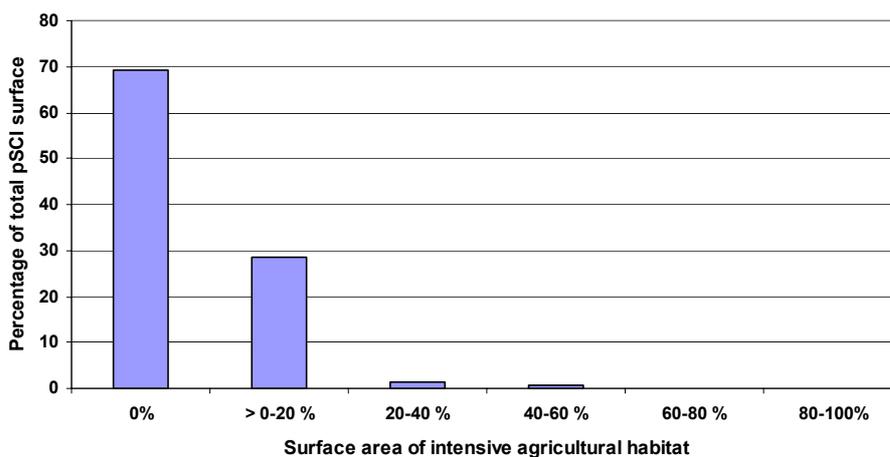
Establishing trends on grasslands and low-intensity farming systems in Europe is even harder than for wetlands. There is much evidence, however, that these ecosystems host a high and very specific biodiversity, particularly for plants and insects such as butterflies (see for instance Peeters, cited in IEEP 1994). For example, an analysis made by ETC/NPB on proposed Sites of Community Interest (pSCI) under the EC Habitat Directive shows that extensive agricultural habitats occur much more frequently in the pSCIs than intensive agricultural habitats. Extensive agricultural habitats occupy a significant proportion of the total area of pSCIs, particularly in the Alpine, Mediterranean and Atlantic regions.

**Figure 11.7 Proportion of extensive agricultural habitats in proposed Sites of Community Interest (pSCI). Surface of pSCIs with extensive agricultural habitat cover by % class**



(Source: ETC/NPB: NATURA 2000 database).

**Fig. 11.8 Proportion of intensive agricultural habitats in proposed Sites of Community Interest (pSCI). Surface of pSCIs with intensive agricultural habitat cover by % class**



Note: Extensive agricultural habitats: Salt marshes, Salt pastures, Salt steppes, Heath, Scrub, Maquis and Garrigue, Phygrana, Dry grassland, Steppes, Humid grassland, Mesophile grassland, Alpine and sub-Alpine grassland, Extensive cereal cultures(including rotation cultures with regular fallowing), Non-forest areas cultivated with woody plants (including orchards, olive groves, vineyards, dehesas).

Intensive agricultural habitats: Ricefields, Improved grassland, other arable land.

Source: ETC/NPB: NATURA 2000 database

Bignal & McCracken (1996) and Veen *et al.* (2000) provide two independent estimates of the proportion of low-intensity farming systems and semi-natural grasslands (Tables 11.2. and 11.3.). Their combined data cover a large part of Europe but comparisons are difficult. Veen only considers grasslands and therefore arrives at lower figures (compare the estimates for Poland and Hungary, for instance). The relatively low scores for Central and Eastern Europe are nevertheless surprising, given the relatively extensive agriculture in these countries. Time series are not available for any of these datasets. The trends in farm structure, farm management and farmland species, as discussed in chapter on agriculture leave little doubt that species-rich agricultural habitats in Europe have declined considerably during recent decades.

**Table 11.2 Proportion of low-intensity farming systems as percentage of the total utilized agricultural area**

Country	Proportion of low-intensity farming systems (% of Utilised Agricultural Area)
Spain	82
Greece	61
Portugal	60
Republic of Ireland	35
Italy	31
France	25
United Kingdom	25
Hungary	23
Poland	14

Source: Bignal & McCracken (1996).

**Table 11.3 Proportion of semi-natural grasslands as percentage of the total utilized agricultural area.**

Country	Proportion of semi-natural grasslands (% of UAA)
Slovenia	54
Romania	20
Hungary	14
Czech Republic	13
Slovak Republic	12
Poland	11
Bulgaria	7
Estonia	5
Latvia	5
Lithuania	5

Source: Veen (2001)

At pan-European level, the Bern Convention and its Emerald network recognise the importance of extensive farming systems and semi-natural grasslands. So does, at EU level, Annex I of the Habitat Directive. Extensification of farming practices is part of the agri-environmental measures implemented in the European Union as well as in the Accession countries.

#### ***11.4.3 Marine and coastal biodiversity***

A considerable part of the marine biodiversity, including phytoplankton and microbes, is important for the healthy functioning of ecosystems. Marine and coastal areas provide a huge number of goods and services, including fisheries, aquaculture, recreation and bathing, oil and gas, shipping, wind energy, sand and gravel extraction. Some of these involve the exploitation of some components of ecosystems (e.g. fish, mammals, molluscs, crustaceans), for example for eco-tourism, hunting, angling or food, and depend

on the good functioning of the whole ecosystem. Marine ecosystems also play a significant role in global carbon exchange.

Biodiversity in seas and oceans suffer from a number of pressures of various intensity depending on the environmental context as shown in Table 11.4.4 .

**Table 11.4.4.: Main pressures affecting the different seas around Europe**

Pressure	Arctic	Baltic	Black sea	Caspian	Mediterranean	North sea	Wider Atlantic
Eutrophication (fertilisation, sewage, combustion)		XX	XX	XX	XX	XX	XX
Contamination (pesticides, waste, sewage, oil and gas, other industries)	X	XX	XX	XX	XX	X	XX
Construction (dredging, dumping of dredged material)		XX					XX
Recreational activities and tourist infrastructures		X	X		XX		
Fishing (overfishing, bottom trawling, mariculture) or whaling	XX	X				XX	XX
Poaching (for example sturgeon)				XX			
Exotic species	X		X	X	XX		
Climate change	XX	XX	XX	XX	XX	XX	XX

Note: XX major impact; X serious impact.

Source: EEA, Biodiversity report

The conservation and sustainable use of marine and coastal biological diversity are covered by regulatory frameworks at the international and regional level, including the Convention on Biological Diversity, the OSPAR Commission for the Protection of the Marine Environment of the North-East Atlantic, the Helsinki Convention (Baltic Sea), the Barcelona Convention (Mediterranean) and the Black Sea Convention. The Global Law of the Sea aims to develop global agreements about the management of the seas outside territorial waters.

At the EU level, coastal biodiversity is quite well covered by the Bird and Habitats Directives, as well as the Bern Convention, but the marine compartment is far less well covered. However, following a recent interpretation by the Commission –now accepted by Member States – both the EC Birds and Habitats Directives apply to offshore waters, beyond the 200 nautical miles or Economic Exclusive Zones. The delayed revision of the Common Fisheries Policy, the general principles of which are reflected in the EU Biodiversity Action Plan on Fisheries, stresses the urgency of combating the unsustainable use of living marine resources. Nature protection in coastal areas is enhanced by the European Strategy for Integrated Coastal Zone Management adopted in September 2000.

Under the Pan-European Biological Landscape Diversity Strategy (PEBLDS) process, a European Code of Conduct for the Coastal Zone was adopted by the Council of Europe Ministers in April 1999.

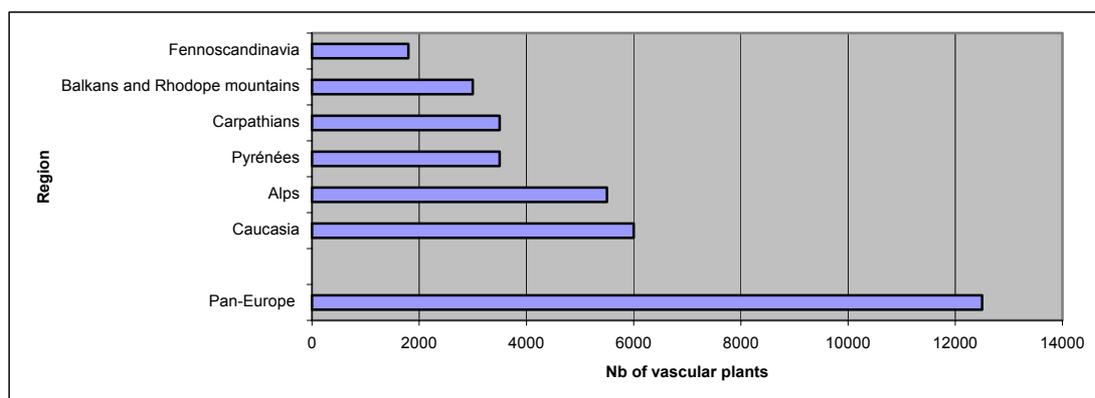
At the national level, all 19 countries covered by this report with a coastal interface report that they promote the conservation and sustainable use of marine and coastal biological diversity in their national strategy and action plan, 13 to a significant extent and 6 to a limited extent (CBD Secretariat, 2002).

#### 11.4.4 Mountain ecosystems

Most European mountain ranges from the western Mediterranean to the borders of Siberia are included in the definition of the Alpine Biogeographic region (see figure 11.2.1). These are: the Alps, Pyrenees, Carpathians, Dinaric Alps, Balkans and Rhodopes, Scandes, Urals and Caucasia. They represent some of the oldest and the newest mountains to be found in the world. However, other important mountain chains are to be found in other biogeographic regions, for example the Mediterranean and the Anatolian.

Natural and semi-natural habitats cover more than 90 % of the Alpine region: forests more than 40 % and grasslands more than 25 %. Mountain ranges represent some of the largest reservoirs of flora and fauna in Europe and Central Asia, including endemic species as well as large predators: large carnivores and raptors.

**Figure 11.10: Flora richness in some main European mountain ranges**



Source: Heywood, 1994

The mountain ranges also host an exceptional gene bank and are a natural laboratory where evolutionary processes continue. The flora is estimated at over 7 000 species, with a maximum in the Caucasian mountains (one of the 25 'hot spots' of biodiversity in the world). For comparison, Central Asian mountains host about 5 500 vascular plant species (Figure 11.10).

The extreme physical conditions make mountains a fragile environment. Key issues, which are being addressed within different research, administrative and NGO fora and in the context of the 2002 United Nations Year for Mountains, which will culminate at the Global Mountain Summit in Bishkek (Kyrgyzstan) in November 2002, include:

- International and regional agreements and cooperation and sustainable mountain development, such as the Alpine Convention;
- National policies and institutions for sustainable mountain development;
- Legal, economic, and compensation mechanisms in support of sustainable mountain development;
- Sustainable livelihoods and poverty alleviation;
- Tourism and the conservation and maintenance of biological and cultural diversity;
- Institutions for democratic and decentralized sustainable mountain development;
- Conflicts and peace in mountain areas;
- Mountain infrastructure: access, communications, energy;
- Promotion and integration of education, science and culture in mountain protection and development;
- Water, natural resources, hazards, desertification and the implications of climate change.

**Box 11.1. Kyrgyzstan leading nature conservation and enhancement of cultural values in Central Asia**

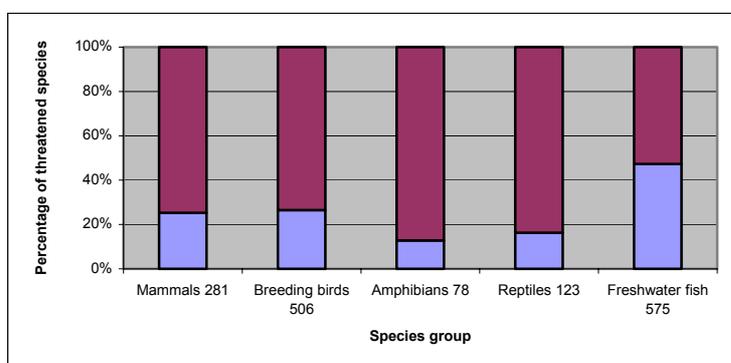
With a large part of its territory as mountains, Kyrgyzstan, though one of the poorest countries in the world, has chosen a sustainable development strategy, based on natural and cultural values, and excluding mining and hydroelectric developments. Thus the Issyk-Kul Biosphere reserve covers almost a quarter of the whole country’s territory. Furthermore, a transboundary biosphere reserve is being created in the Western Tien Shan, at the border between Kyrgyzstan, Kazakhstan and Uzbekistan. This is part of the IUCN project “Transboundary Protected Areas for Peace and Cooperation” which aims at protecting biodiversity while moderating potential tensions linked to countries’ borders.

**11.5 Ups and downs in species populations**

The implementation of policies for the protection of species and habitats, combined with restoration programmes and moves towards more sustainable management practices are all helping to counteract major negative impacts on Europe’s biodiversity. But such measures have not yet reversed the general decline.

Red lists are a useful tool for assessing biodiversity status. However, no comparative trends can yet be identified. There are national red lists in almost all European and Central Asian countries while regional Red lists have been established under regional conventions such as the marine conventions. A preliminary assessment prepared on behalf of the Council of Europe and the EEA provides a picture of the status of vertebrates at the pan-European level (Council of Europe and European Environment Agency, under publication).

**Figure 11.11 Proportion of Vertebrates threatened at pan-European level per species group**



Notes: Coverage is pan-Europe including Macaronesia, except for Reptiles and Amphibians. The proportion of threatened Reptiles and Amphibians is probably underestimated, due to bias in the method used.

Sources: European species atlases, Bird life; Benigno Elvira for freshwater fish

The trends in biodiversity vary between species, ecosystems and regions: some previously highly-threatened species are starting to recover, with stabilised or even increasing populations. Others continue to decline at an alarming rate. Some species have been monitored for a long time, because they are particularly rare, endemic or flagship species. For these, data on remaining populations, threats and requirements for conservation provide a sound basis for the design of specific, adapted action plans. This has been done, for example, for some of the most threatened birds in Europe and the large European predatory mammals.

**Table 11.4 State and trends of large European carnivores.**

Species	Previous	Remaining	Current trends	Main threats
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	<b>distribution in Europe</b>	<b>population</b>		
Brown bear	Throughout Europe except large islands	50 000 (14 000 outside Russia)	↘ for small, isolated populations (France, ..) ➔ for larger populations	- Logging and forest clearance - Habitat fragmentation- (high-speed roads and rail networks) - Poaching
Wolf	In 1960s, numerous populations in Eastern Europe. Only small remnants in Portugal, Spain, Italy, Greece, Finland		↗ but too many small, vulnerable populations	- Persecution - Poaching
Eurasian lynx	Originally throughout Russia and Europe, except large islands and Iberian peninsula. Exterminated in Western Europe in the 1950s	7000	↗ in Northern and eastern Europe	- Deforestation - Loss of prey species - Expansion of agriculture - Unsustainable hunting and poaching - Traffic accidents
Iberian lynx	Endemic from the Iberian peninsula	500, possibly only 300	↘↘ may disappear in the first half of the 21st century	- Accidental catches in traps and snares - Decline in prey (rabbit) - Habitat deterioration (dams, afforestation, road building)
Wolverine	European Russia, Norway, Finland, Sweden, Baltic States, Northeast Poland. During the 19 <sup>th</sup> century, disappeared from the Southernmost of these areas	2000	↗ remain in high altitude alpine habitats	- too small and fragmented distribution - conflicts with human use in forests

Source: Large Carnivore Initiative for Europe, WWF.

Not only rare or flagship species provide a picture on biodiversity trends. Results from surveys on common breeding Bird species based on long-time series are beginning to be available in a number of European countries. They show the serious decline in some previously widespread species towards very unstable populations and reduced distribution ranges.

A recent survey from comparable monitoring data existing in France, United Kingdom and the Netherlands shows the following trends in common Bird species populations for the 20 most declining species and the 10 most increasing ones. (Table 11.5).

**Table 11.5: Comparative trends in selected common Bird species populations in three Western European countries between 1989 and 2001**

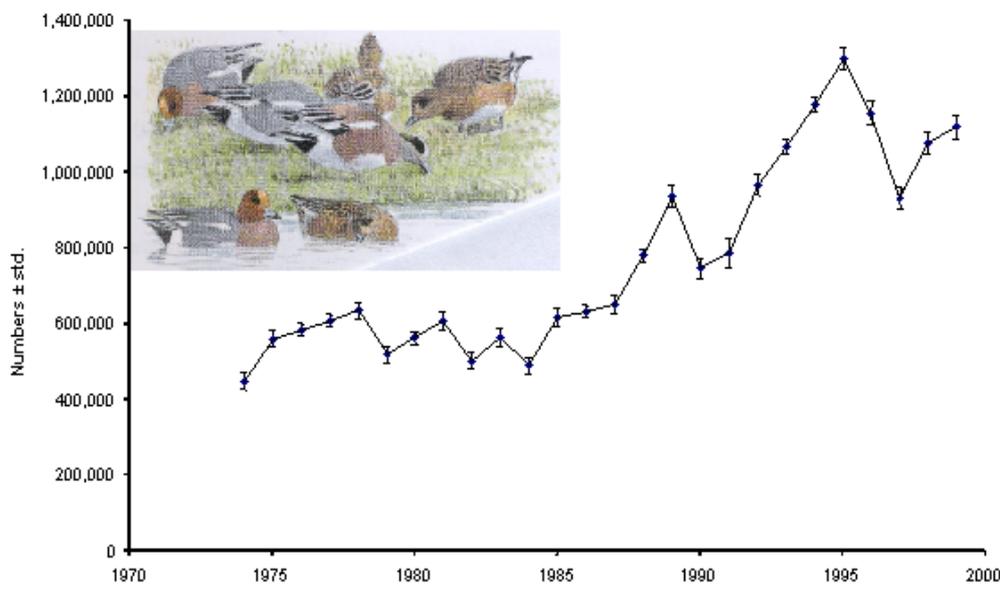
Bird species	Trends in species population in				average	
	NL	FR	UK			
Wood warbler	-72%	-73%	-76%	-74%	↓↓↓	
Winchat	-83%	-69%	-20%	-65%	↓↓↓	
Grey partridge	-63%	-49%	-59%	-57%	↓↓↓	
House martin	-39%	-84%	17%	-51%	↓↓	
Tree pipit	8%	-41%	-75%	-45%	↓↓	
Tree sparrow	-35%	-24%	-65%	-44%	↓↓	
Willow tit	0%	-47%	-63%	-42%	↓↓	
Turtle dove	-65%	9%	-45%	-41%	↓↓	
Linnet	-20%	-62%	-30%	-40%	↓↓	
Magpy	-39%	-61%	1%	-38%	↓↓	
Willow warbler	-15%	-56%	-33%	-37%	↓↓	
House sparrow	-41%	-21%	-33%	-32%	↓↓	
Starling	-11%	-27%	-51%	-32%	↓↓	
Lapwing	-39%	-24%	-25%	-30%	↓	
marsh tit	26%	-59%	-29%	-29%	↓	
reed bunting	29%	-58%	-27%	-26%	↓	
Meadow pipit	14%	-58%	-14%	-26%	↓	
cuckoo	-21%	-28%	-26%	-25%	↓	
skylark	-31%	-18%	-17%	-22%	↓	
Bullfinch	+8%	-47%	-15%	-21%	↓	
great spotted woodpecker	+62%	+9%	+26%	+30%	↗	
song thrush	+78%	+65%	-12%	+37%	↗↗	
blackcap	+80%	+2%	+55%	+42%	↗↗	
whitethroat	+75%	+8%	+51%	+42%	↗↗	
robin	+31%	+79%	+31%	+45%	↗↗	
sedge warbler	+82%	+117%	+10%	+63%	↗↗↗	
collared dove	+16%	+188%	+71%	+78%	↗↗↗	
goldfinch	+188%	+31%	+61%	+82%	↗↗↗↗	
stonechat	+170%	+59%	+103%	+105%	↗↗↗↗	
buzzard	+212%	+18%	+237%	+132%	↗↗↗↗	

Source: CRBPO/MNHN, 2002

Some of the trends can be directly related to changes in habitats and the ways they are managed, for example the Skylark and the Grey partridge which breed and winter in arable lands seem to face an overall decline at European level (up to 95 % since 1960 for the latter in Hungary). Other trends are more difficult to relate to one single type of pressure. It is recognised that the more specific a bird species is to its main habitat, the more important is its current decline, because such birds are less able to adapt to other habitat types when their favourite one is degraded.

Changes in habitats can be beneficial to species in part of their life cycle. For instance several waterbird species wintering in Europe (some ducks, geese, crane) benefit from much more nutrient rich grasslands, due to agriculture intensification and thus show significant increases of populations as recorded by the International Waterbird Census. Figure....shows the population trends of the Wigeon (*Anas penelope*) in North-West Europe since 1974.

**Figure 11.11. Northwest population trends of the Wigeon (*Anas penelope*) as recorded on wintering sites**



In general however, European-level time series data are still lacking for almost all other taxonomic groups. Monitoring programmes need to be enhanced.

## 11.6 Alien species - a serious threat to biodiversity

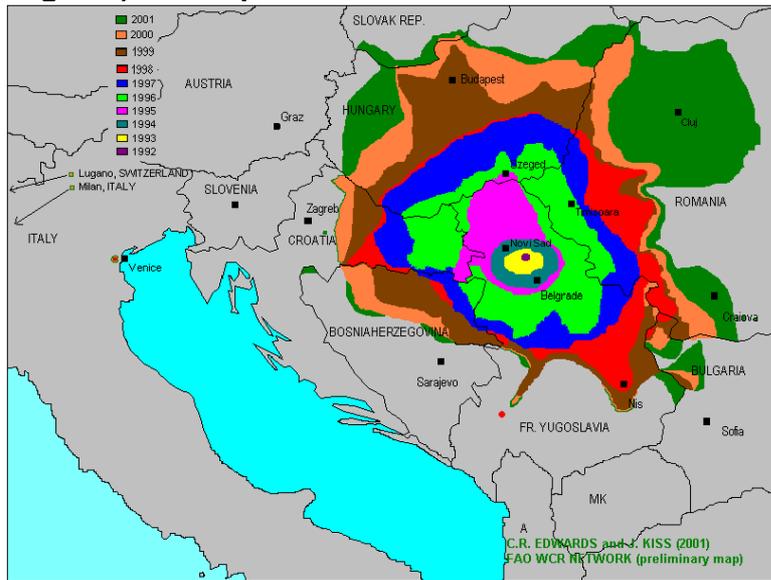
Alien species have been introduced intentionally or unintentionally for centuries. The process has accelerated during recent decades with the growth in transport and the use of alien species for aquaculture, fisheries, game, crops, forestry and horticulture. For instance, freshwater fish have been introduced for aquaculture, angling/sport, aquaria and weed control.

In general, only some introduced species survive in their new environment and eventually get naturalised without creating any problems. However, others are highly successful competitors for space and food and become a threat to indigenous species or to a whole ecosystem by disrupting the food chain or altering the habitat. Other problems relate to mixing with original gene pools (for examples wild salmon, mallards, many plant species including trees, and recent concerns regarding GMOs) or the introduction of diseases. This is happening both within or outside protected areas. With effects of climate change there is a growing concern on how some of these alien species may benefit from newly created conditions and become even more competitive to other species.

### Box 11.2:

A recent invasive American pest on arable land in Europe is the Western Corn Rootworm (WCR, *Diabrotica virgifera virgifera*). It is likely to have arrived in Yugoslavia in the early to mid-1980s. By the end of 2001 it had spread over 182 000 km<sup>2</sup> in Europe (Bulgaria, Bosnia-Herzegovina, Croatia, Hungary, Romania, Slovakia and Yugoslavia). WCR beetles were trapped in 1998 and 1999 in Italy, near Venice airport and in 2000 in Switzerland, near Lugano. WCR spread in Europe has continued in all directions from the original infestation point (Figure 11.5.3.1). It has become an economic pest of corn in Yugoslavia (yield losses up to 70 %). Several research projects focus on the possibility of biological control of such pests.

**Figure 11.12 Spread of the Western Corn Rootworm (*Diabrotica virgifera virgifera*) in Europe**



Source: C.R. Edwards and J. Kiss (2001) FAO WCR Network (preliminary map)

The planning of more effective strategies to deal with biological invasions has become a global conservation priority. The issue is not to ban intentional introductions but rather to assess the associated risks and benefits and implement plans for their wise use.

The loss of biodiversity caused by alien species is given high priority in the Convention on Biological Diversity and the Ramsar and the Bern Conventions. A Global Invasive Species programme has been set up under the CBD, and the 6<sup>th</sup> CBD Conference of Parties in 2002 urged Parties to implement strategies and action plans to control alien species. The Cartagena Protocol on Biosafety adopted in 2000 under the CBD seeks to protect biological diversity from the potential risks posed by living modified organisms resulting from modern biotechnology.

In the marine area, a Code of Practice for the introduction and transfer of marine organisms was set up by the International Council for the Exploration of the Sea in 1994.

At the EU level, the EC regulation for the implementation of CITES provides a basis for controlling imports of certain species that may become invasive. More recently, the EU Biodiversity Strategy calls for the application of the precautionary principle to avoid detrimental effects of invasive alien species.

### 11.7 A constantly evolving policy framework

The policy framework has considerably evolved both at international, EU, regional and national level, towards better consideration of all biodiversity aspects much beyond – but complementary to - initial instruments targeted to nature protection purposes.

**Table 11.6.1 Conventions and major instruments**

**Global**

***Conventions***

Convention on Wetlands of International Importance – Ramsar - (1971)  
Convention Concerning the Protection of the World Cultural and Natural Heritage (1972)  
Convention on International Trade in Endangered Species of Wild Fauna and Flora – CITES - (1973)  
Convention on the Conservation of Migratory Species of Wild Animals –Bonn – (1979)  
Convention on the Law of the Sea (1982)  
Convention on Biological Diversity (1992)  
Convention to Combat Desertification (1992?)  
Convention on Climate Change (1992)

***Other initiatives***

Man and Biosphere Programme  
Global Plan of Action for the Conservation and Sustainable Utilization of Plant Genetic Resources for Food and Agriculture  
International Treaty on Plant Genetic Resources (2001)

**Regional**

***Conventions***

Convention on Fishing and Conservation of the Living Resources in the Baltic Sea and the Belts (1973)  
Convention on the Protection of the Marine Environment of the Baltic Sea Area (1974)  
Convention for the Protection of the Mediterranean Sea against Pollution – Barcelona - (1976)  
Convention on the Conservation of European Wildlife and Natural Habitats –Bern – (1979)  
Convention concerning the Protection of the Alps (1991)  
Convention on the Protection of the Marine Environment of the Baltic Sea Area – Helcom – (1992)  
Convention for the Protection of the Marine Environment of the North-East Atlantic (1992)  
Convention on Cooperation for the protection and Sustainable Use of the Danube River (1994)  
Convention on the International Commission for the Protection of the Oder (1998)  
Convention on the Protection of the Rhine (1998)  
European Landscape Convention (2000)

***Other initiatives***

Environment for Europe  
Pan-European Biological and Landscape Strategy  
Pan-European Process on the Protection of forests in Europe  
Arctic Environment Protection Strategy

**European Union**

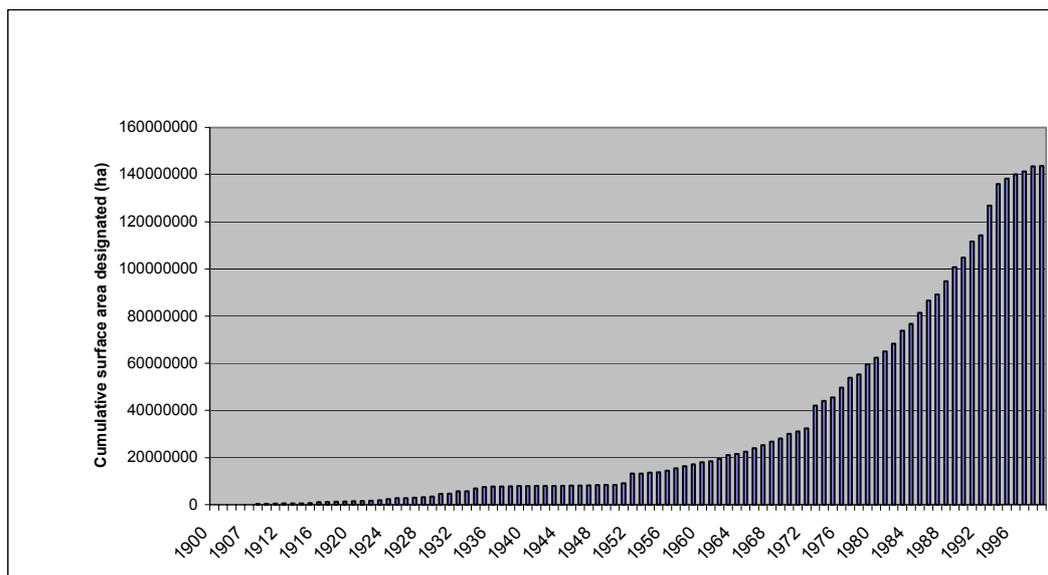
6<sup>th</sup> Environmental Action Programme  
EU Sustainable Development Strategy  
EU Community Biodiversity Strategy and associated plans  
EC Bird Directive  
EC Fauna, Flora and Habitats Directive  
Common Forestry policy measures  
Water Framework Directive  
Common Agricultural Policy including Agri-Environmental measures and Rural Development Regulation  
Common Transport Policy  
Sustainable Tourism Policy  
Environmental Impact Assessment

In addition to these legal frameworks, many initiatives are undertaken by NGOs.

**11.8 Designated areas, a tool for biodiversity conservation**

Sites of high nature value have been protected from adverse human activities for more than 100 years, the earliest protected areas being in Central and Eastern Europe. Each country developed its own system ranging from very strict nature reserves, national parks to more flexible protection such as landscape parks and areas under specific conservation management. There are nearly 600 different types of designation and more than 65 000 designated sites in Western, Central and Eastern Europe. There has been a huge increase in national designations since the 1970s (Figure 11.13) when most countries started to implement national laws on nature protection and when the Bern Convention came into force (1979).

**Figure 11.13: Total surface area designated under national designations in Pan-Europe over time.**



**Source:** Common Database on Designated Areas (EEA, Council of Europe, WCMC)

Other instruments such as the Ramsar Convention (1971) and the EC Bird Directive (1979) made it compulsory for countries to designate sites for protection, which probably also influenced the rate at which new sites were designated.

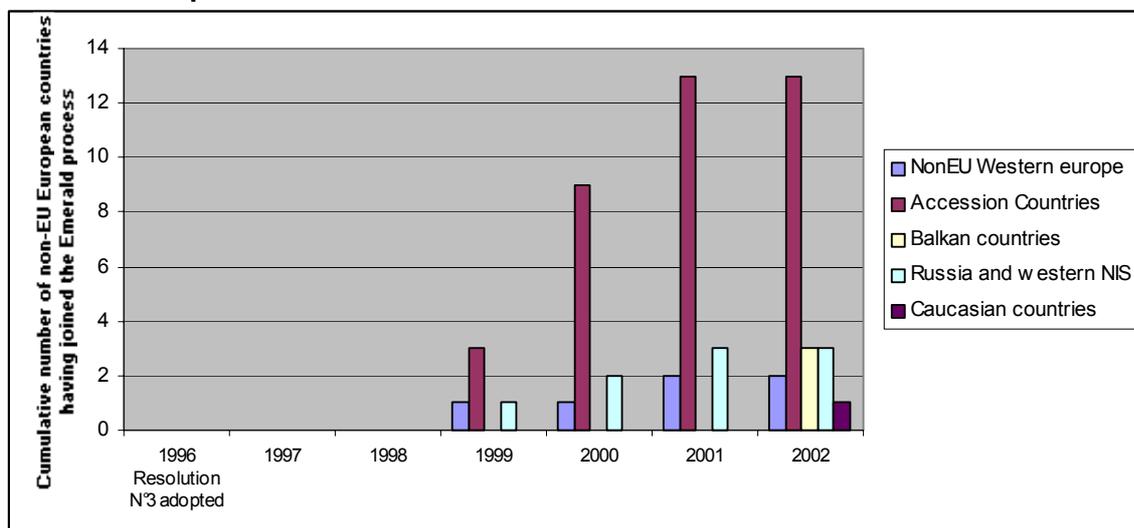
The extent of surface areas designated is likely to tail off for a number of reasons at least in Western Europe. Increasing land-use conflicts from transport, urbanisation and intensive agriculture are diminishing the remaining semi-natural remote areas. On the other hand, concern for biodiversity is more and more integrated into sectoral policies for instance with agri-environmental measures or sustainable forestry policies, not leading necessarily to new designations of sites.

In the EU, the implementation of the NATURA 2000 network demonstrates a coordinated effort to ensure the conservation of a selection of species and habitats of European concern. The ten Accession countries are preparing to join this process. The NATURA 2000 network is a key, compulsory instrument for halting the loss of biodiversity; progress is assessed periodically in the NATURA barometer. On April 2002, 2827 sites, covering 222.480 km<sup>2</sup> had been designated as Special Protection Areas under the Bird Directive and 14 901 sites, covering 436 756 km<sup>2</sup> had been proposed as Sites of Community Interest under the Habitat Directive in the European Union. (European Commission, 2002).

At the pan-European level, the Emerald Network aims to establish a network of “Areas of special conservation interest“ for the threatened and endemic species listed in the

Appendices of the Bern Convention and for the endangered habitat types which have been identified by the Standing Committee as "requiring specific conservation measures". The contribution of EU countries to the Emerald Network is NATURA 2000. A number of non-EU countries have shown great interest in joining the process, starting with a pilot phase. (Figure 11.14) .

**Figure 11.14. Progress in non-EU European countries joining the Emerald process**



Source:

In addition to the national and European designations, countries also designate sites under international and regional Conventions and programmes: World Heritage (51 sites), Biosphere Reserves (163 sites), Ramsar sites (680 sites), Biogenetic reserves (343 sites), European diploma (61 sites), Barcelona Convention (208 sites), Helsinki Convention (3 sites).

Most of the international and European designations overlap with national designations, which, in principle ensures stronger protection. Since each designation is made with a specific purpose, a site of particular high nature value can benefit from several international designations. For instance Donana in Spain and the Camargue in France enjoy 6 overlapping international/European designations.

Designated areas are not only of critical importance for protecting sites of high nature value from the impacts of large infrastructures and intensive agriculture, forestry or fishery, they are also areas where it is easier to implement coordinated biodiversity monitoring and public awareness campaigns. More and more, designated areas are laboratories where, sustainable management practices can be tested through collaboration between different actors.

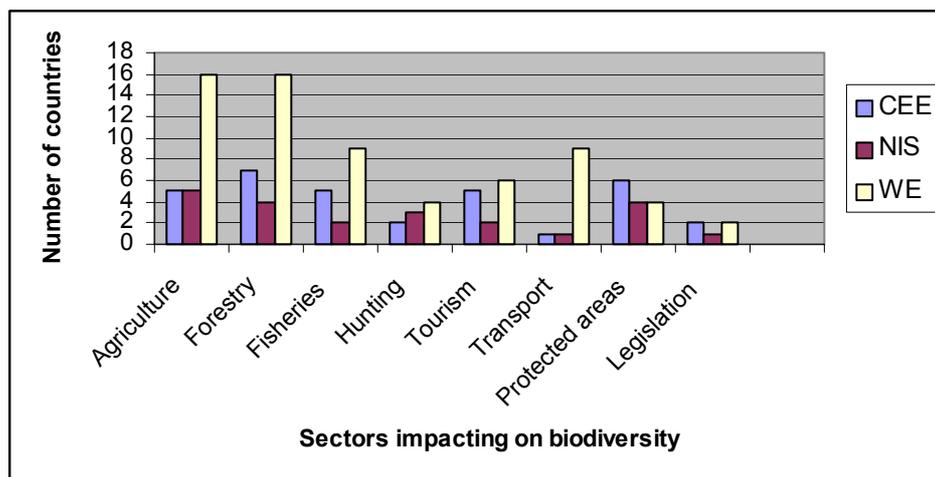
Most of these designated areas are core elements in the establishment of a pan-European Ecological Network. Several national initiatives aim at establishing ecological corridors to link these core elements, in particular for large carnivores. There is also increasing interest in developing marine ecological corridors.

## 11.9 Integrating biodiversity into sectors

Traditional nature protection instruments ensure a longer perspective for the sustainable management of species and ecosystems, and therefore remain vital. However, increasing demand for land from various sectors, and the uncertainties related to large-scale changes, demand a more integrated approach to biodiversity in all the main sectors of concern.

Main sectors that impact on biodiversity, - and therefore where integration of biodiversity concerns is needed – differ within regions. Protected areas as well as legislation are often perceived by countries as mechanisms ensuring integration with the surrounding countryside or landscape.

**Figure 11.15. Regional European differences highlighting sectorial concerns to biodiversity.**



Source: National reports to CBD secretariat, analysed by ECNC, 2000

Consistently Western European countries highlight the same sectors, in particular agriculture, forestry, fisheries and transport. By comparison, the CEE countries place emphasis on forestry and protected areas, and to a lesser extent agriculture and tourism. The NIS emphasise agriculture, forestry and protected areas. With EU enlargement to Accession countries, and therefore implementation of the Common Agricultural Policy, but also foreseen development of transport infrastructures, this picture is likely to change rapidly.

There has been some progress in integration in some of these sectors, for example through the introduction of agri-environment schemes, the EU Sustainable Development Strategy and the EU Biodiversity Strategy. In the transport sector, however, the absence of a strong policy framework and the inexorable growth in demand are likely to lead to increasing impacts on biodiversity. Though not addressed by countries as a main sector influencing biodiversity, trade has considerable impacts: it is often linked to other sectors such as hunting, tourism/recreation and agriculture. Among Central Asian countries, only Kyrgyzstan is a Party to CITES, and wildlife in Central Asia is increasingly threatened by large volumes of legal and illegal collection and hunting for trade (trophy hunting), including globally threatened species such as the North Persian Leopards, the Snow leopard and the Tien Shan Brown Bear. Hunting is also becoming an important touristic activity in Eastern Europe, while in some Western European countries (e.g. France), EC legislation such as the Bird Directive fails to be fully implemented, particularly concerning the extension of the hunting period.

Further examples of the impacts of various sectors on biodiversity and the need for a more integrated approach are given in the sectoral chapters of this report.

## 11.10 REFERENCES

## TO BE INCLUDED.