11. Biological diversity

In addition to a responsibility to reduce its ecological footprint on the rest of the world, Europe has a global responsibility to preserve the character of its varied ecosystems and landscapes, and to conserve the migratory species that cross the continent and the threatened species that it hosts. This includes responsibility for controlling the collection and trade in wildlife specimens that is occurring on a global scale.

Some areas, like the Mediterranean and Caucasus, stand out for their species and genetic 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 ecosystems continue to be at risk including forests, wetlands, species-rich agricultural habitats, several dry and arid areas and some marine areas.

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. Decline is now also perceptible in previously common species. As in other continents, the spread of invasive alien species is an increasing threat.

In applying global, European, regional or national commitments, countries are implementing plans to halt the further degradation of biodiversity. Designated areas continue to be a major instrument for such conservation strategies and constitute core elements for the establishment of a pan-European ecological network. Meanwhile, integration of biodiversity concerns into sectors is progressively becoming a reality. While at global level the Johannesburg summit agreed on 'the achievement by 2010 of a significant reduction in the current loss of biological diversity', governments at pan-European level are considering a stronger commitment, i.e. 'to halt the loss of Europe's biodiversity by 2010'. Monitoring of biodiversity trends as well as of policy effectiveness is still largely insufficient. However, promising pan-European coordinated initiatives are on the way.

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 mainly embedded in a complex network of rural landscapes, fragmented by transport and urban infrastructures (EEA, 1995; 1998; 1999). Although largely rural, Europe is the most urbanised and, together with Asia, the most densely populated continent in the world. Northern and central Asia, however, still have extensive barely utilised areas. The diversity of the continent's landscapes, which results from a marriage of nature and human settlements, is a significant part of the European heritage.

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 many pharmaceuticals, depend directly on biodiversity. It is also important for nutrient cycling and soil fertility, flood and storm protection, erosion prevention, air and climate regulation, etc.

Biodiversity is affected by major changes in land use, large-scale impacts of air and water pollution, such as eutrophication, 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 (Green *et al.* 2001; Parry, 2000). 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 biodiversity and landscapes in Mediterranean area and the dry areas of central and eastern Europe as well as central Asia.

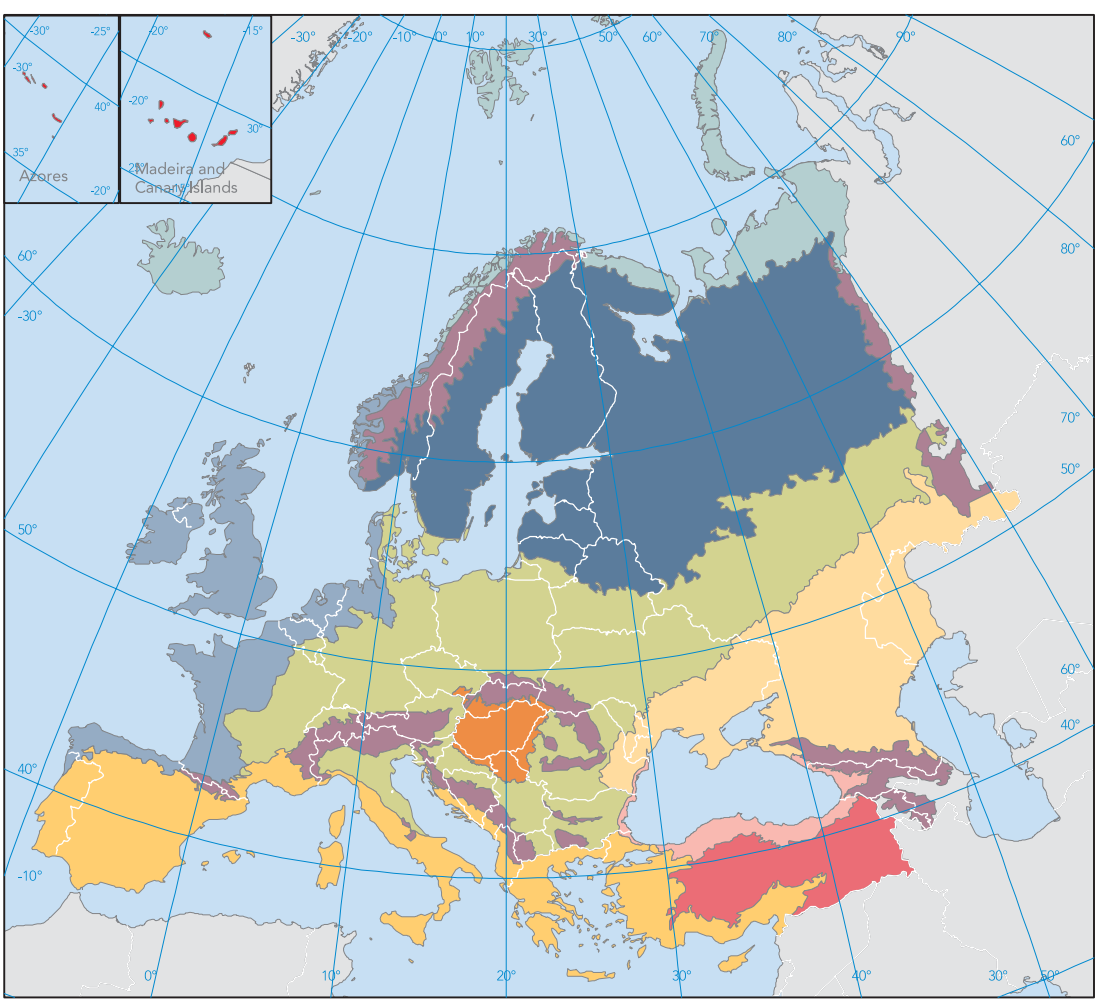
Threats to biodiversity are different in each of the 11 biogeographic regions recognised at pan-European level by the Council of Europe and the European Union (EU) (see Map 11.1) (EEA, 2002a).

11.2. Europe's responsibility for biodiversity: wild species

11.2.1. Species richness, only one side of the coin

Biodiversity is not evenly distributed in Europe and some areas harbour greater

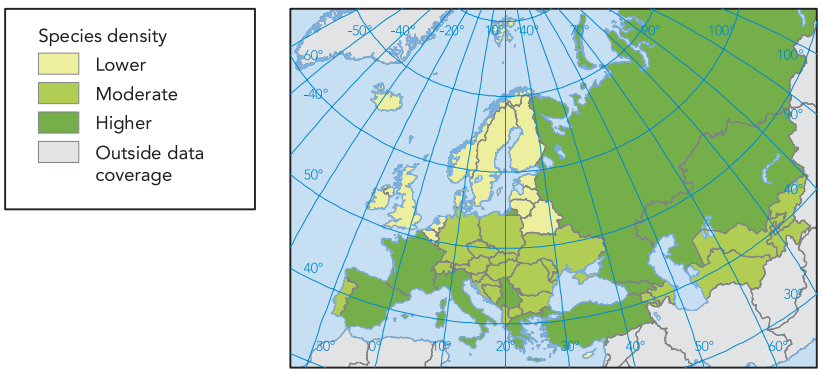
	Biogeographic region	Main threats to biodiversity
	Arctic region	Climate change may change conditions for plant and animal communities Ozone depletion
	Boreal region	Intensive forestry practices Exploitation for hydroelectric power Freshwater acidification
	Atlantic region	High degree of habitat fragmentation 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



Map 11.1.

Main threats to biodiversity by European biogeographic context (terrestrial part)

Map 11.2. **Species richness in Europe (vertebrates and vascular plants) in proportion to countries' surface area**



Notes: It is not possible to discriminate between data from the European and the Asian part of the Russian Federation. Macaronesia is not taken into account. An analysis by biogeographic region would be more relevant. However, lack of harmonised geo-referenced data on species distribution, particularly plants, does not yet allow such analysis. Despite their essential role in ecosystem functions, invertebrates and lower plants are not taken into account due to knowledge deficiency.

Source: ETC/NPB EUNIS database on Species (from various sources, including national biodiversity reports)

concentrations of species, as reflected in Map 11.2.

Species richness is not the only measure of a country's responsibility for conservation. At the global level, the notion of 'biodiversity hot spots', as defined by Conservation International (Myers *et al*, 2000), also includes richness in endemic species, i.e. species which are not found elsewhere, genetic resources and threats to habitats. Among the 25 identified 'hot spots' in the world, only two are partly in Europe — the Mediterranean basin and the Caucasus. These areas are of global concern for biodiversity (UNEP-WCMC, 2001; 2002).

Conservation International stresses that the identification of hot spots does not mean that 'focus should only be on these hot spots, ignoring everything else. ...Every nation's biodiversity is critically important to its future.' Thus species-poorer areas may have important key species; for example in the Arctic region there are often large and exceptionally productive populations of diptera and moths. Similarly, in any biogeographic region, some habitat types can be highly valuable because of their very specific ecological conditions and functions or their scarce distribution.

11.2.2. Europe as a crossroads for migratory species

Europe is the seasonal home and an important crossroads for huge populations of migratory species, sharing these species with other regions including Africa, the Near East and North America. This responsibility is ensured through the Convention on Migratory Species (Bonn convention) and its underlying agreements. This has provided a global framework for, in particular, EU nature-protection directives. Success or failure in providing sufficient resting, feeding and breeding grounds in Europe (including hunting bans) will influence biodiversity in other continents, just as successes and failures there will influence biodiversity in Europe.

11.2.3. Globally threatened species present in Europe

Among the 3 948 globally-threatened vertebrate species (IUCN categories Vulnerable, Endangered and Critically endangered) assessed by IUCN-The World Conservation Union, 335 occur in European and central Asian countries; of these 37 % are mammals, 15 % birds, 4 % amphibians, 10 % reptiles and 34 % freshwater fish. Figure 11.1 shows their occurrence in different regions and therefore the shares of responsibility for their conservation.

For the flora, analysis of threats is more difficult because of taxonomic problems. However, it is estimated that of about 32 000 globally threatened plant species, about 800 occur in Europe (excluding the Caucasus).

Figure 11.2 shows the level of protection of globally threatened species by European legal instruments e.g. the Bern convention and the EU birds and habitats directives. The EU directives include provisions from other global instruments such as the Bonn, Ramsar and CITES conventions.

Except for fish, globally threatened vertebrates are generally well covered by legal instruments, especially in EU countries with a combination of EU directives and the Bern convention. In non-EU countries, where only the Bern convention applies, gaps in protection remain. With the EU

8.5 % of the globally threatened species of vertebrates occur in Europe and central Asia. The countries of eastern Europe, the Caucasus and central Asia have a particular responsibility for the conservation of the threatened mammals and birds, western Europe and central and eastern European countries for threatened freshwater fish.

enlargement process new species, some of which are globally threatened, will be added to the habitats directive. It is important to stress, however, that both the EU habitats directive and the Bern convention (through the Emerald process) will protect a wide range of species in an indirect way by protecting their habitats.

For invertebrates, major gaps in knowledge remain and the level of protection is probably quite insufficient.

11.2.4 Trade issues

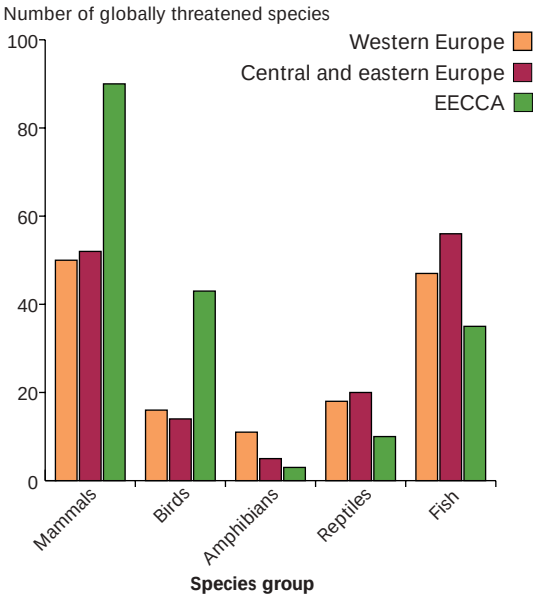
Trade has considerable impacts on biodiversity, both within Europe and at the global level. It is often linked to other sectors such as agriculture, forestry, fisheries and energy as well as hunting and tourism/recreation. Trade has a direct impact on wild species and on natural habitats (conversion into productive land for marketable goods and services, for crops, timber, resource mining and so on).

Europe is known as a supplying, consuming and re-exporting region for wildlife and wildlife products. The EU Member States constitute one of the three largest wildlife consumer markets in the world, alongside the United States and Japan.

Europe is a net importer of wildlife specimen, but is also a significant supplier of wildlife and wildlife products, for example caviar, swordfish, Saiga antelope horn, hunting trophies, dried medicinal plants and plant bulbs. Eastern European countries have wildlife resources and biological diversity of global significance, but are confronted with enormous problems in monitoring and controlling the exploitation of their wild fauna and flora. Although there are signs that it is now beginning to change, exploitation of wildlife has been at levels sufficient to endanger native species in the Russian Federation and central Asian countries (TRAFFIC Europe, 1998).

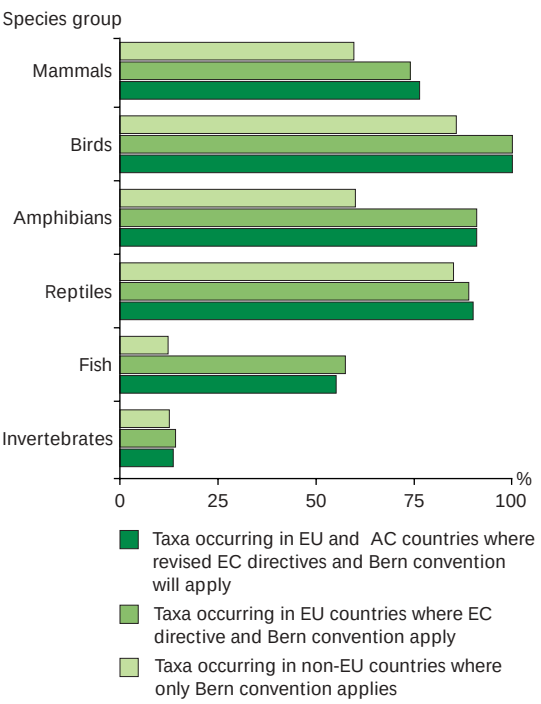
The world market for threatened wild plants and animals is regulated by the Convention on International Trade in Endangered Species of Wild Fauna and Fauna (CITES). While all western European (WE) countries are contracting parties to CITES, 2 out of 18 countries in central and eastern Europe (CEE) (Berkhoudt, 2002) and 5 out of 12 countries in eastern Europe, the Caucasus and central Asia (EECCA) are still not. However, even if awareness and regulation of wildlife trade are much improved, illegal trade remains high.

European responsibility for conservation of globally threatened vertebrates within European regions — Figure 11.1.



Source: Hilton Taylor, 2000; IUCN Red List of threatened species (database); ETC/NPB-EUNIS database

Level of protection of world threatened taxa occurring in Europe, protected by EU directives and Bern convention — Figure 11.2.



Notes: The EU birds 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, the Russian Federation, Tajikistan, Turkmenistan, Uzbekistan, and Serbia and Montenegro.

Sources: 2000 IUCN Red List of threatened species (database); ETC/NPB- EUNIS database; (EU Habitats Directive Annex II & IV, EU Bird Directive, Bern Convention Annex I & II)

Except for fish, globally threatened vertebrates are generally well covered by legal instruments, especially in EU countries with a combination of EU directives and the Bern convention.

Although progress is noticeable, exploitation of wildlife for trade is endangering native species, particularly in the Russian Federation and central Asian countries. This is partly due to demands by western European citizens.

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 Food and Agriculture Organization of the United Nations (FAO) breeds database (FAO, 2000). 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 to large-scale industrialisation of farming and globalisation of world trade in agricultural products and breeding stocks. The consequences include the destruction of the traditional farming systems associated with 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 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.

Although 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 FAO 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 some vulnerable European ecosystems

The need to monitor the state of ecosystems is now widely recognised, as reflected, for example, in the global Millennium Ecosystem Assessment 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. However, most European countries are making some progress in monitoring their main ecosystems. The data currently reflects mainly the quantity (area) of the ecosystems — information about their quality is scarce.

11.4.1. Wetlands

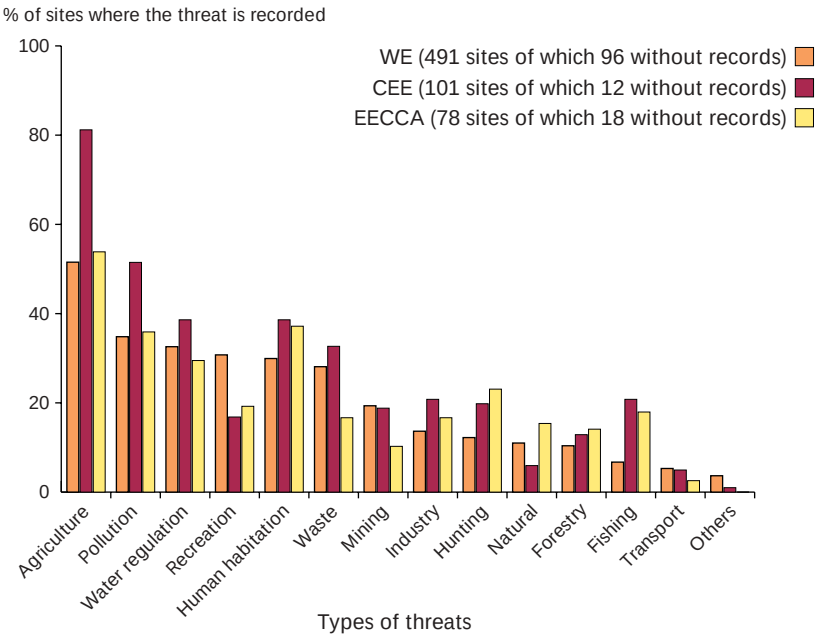
Wetlands provide multiple social, economic and environmental benefits, for example water flows regulation. They cover about 9.9 % of the whole of Europe, about 4.4 % of the EU, 4.4 % of non-EU Europe excluding the Russian Federation and 12.7 % of the Russian Federation. In southern European countries, wetlands are now scarce (0.3–2.1 % of the land area).

Wetlands have been generally declining for decades — both in area and quality — but this is still difficult to quantify with wetlands inventories in Europe developing only slowly. The intensity and the effects of pressures depend largely on the type of wetlands concerned (marshlands, bogs, floodplains and so on). An indication of the main threats to wetlands can be derived from the Ramsar database (Figure 11.3).

Ramsar sites relate mainly to wetlands that are important for waterbirds and do not fully reflect the general situation of wetlands. In boreal countries with large areas of wet forests and upland wetlands, the main

There are multiple threats to Ramsar sites and the surrounding areas. In all countries, agriculture is perceived as the main threat, followed by pollution and water regulation — both probably partly due to agriculture.

Threats to wetlands in European Ramsar sites, as reported by countries Figure 11.3.



Source: Ramsar database managed by Wetlands International (2002a)

threats to these ecosystems are forestry, with draining and clear-felling, and peat extraction. The presence of human habitations within Ramsar sites is perceived as a greater source of threat in CEE countries and EECCA than in WE countries, possibly due, among other reasons, to less well developed contractual agreements with local residents.

Estimates of loss of wetland habitats are available from a pilot project led by Wetlands International and from national reports on biodiversity (Table 11.1). Only Denmark provides recent indication of trends, showing no further loss since the 1990s.

At the EU level, the water framework directive, which sets provisions for the protection of water resources at the catchment level, will help in developing wetland conservation strategies. The European Charter on Water Resources, adopted by the environment ministers in October 2001, provides a framework at the European level.

As agreed in 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 1980s, at least in the EU countries. Rates of wetland loss resulting from the different economic conditions in eastern Europe are likely to be higher now than in the mid-1980s (Moser, 2000).

Figure 11.4 shows the level of implementation of wetlands conservation-related policies in European countries, as reported in their second national reports under the Convention on Biological Diversity (CBD). Countries in their national reports have recently made more specific and complete information available to the Ramsar convention.

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

The importance of semi-natural grasslands and low-intensity farming for biodiversity is discussed in Chapter 2.3. Establishing

Trends in wetlands loss as compiled in the European review of national wetland inventories Table 11.1.

Country	Armenia	Bulgaria	Belarus	Denmark	France	Lithuania	Switzerland	Turkey
Estimated surface area loss	20 000 ha drained	90 %	50 % wet meadows 80 % floodplains	60 % shallow wetlands	75 % wetlands	70 % wetlands	90 % of all Swiss wetlands	1 300 000 ha
Reference period	Over last 50 years	Since beginning 20th century	Meadows: since 1930–45 Floodplains: 1950-90	Since 1870 No further loss recorded for last 10-15 years	Between 1900 and 1993	Over last 30 years	Since 1800	Since 1900s, mainly since 1960

Source: Wetlands International, 2002b

Figure 11.4. **Implementation of national and/or sectoral plans for the conservation and sustainable use of inland water ecosystems**

Note: WE countries: 9 responses missing; accession countries: 5 responses missing; Russian Federation and western EECCA: 3 responses missing; Caucasian countries: 2 responses missing; central Asian countries: no response. This diagram refers only to inland water ecosystems.

Source: CBD secretariat, 2002

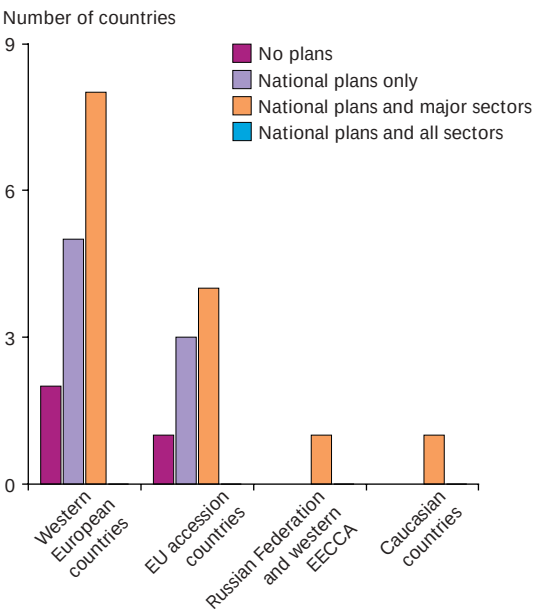
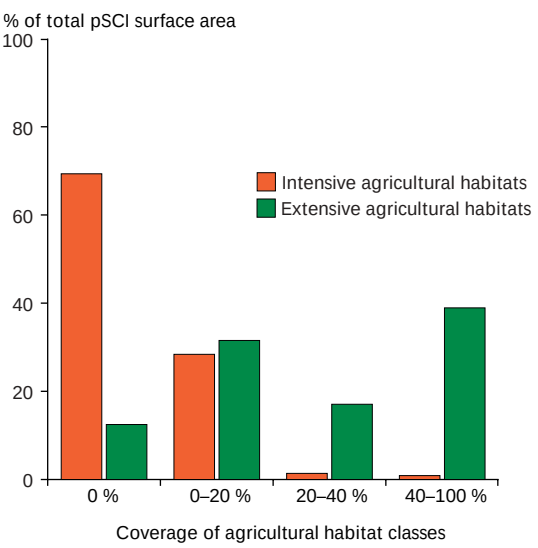


Figure 11.5. **Share of intensive and extensive agricultural habitats within proposed sites of community interest, EU**

Note: Extensive agricultural habitats include 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 include ricefields, improved grassland, other arable land.

Source: ETC/NPB, 2002a; NATURA 2000 database



Extensive agricultural habitats contribute significantly to the high nature value of sites proposed under the EU habitats directive.

A significant number of European countries are implementing national or sectoral plans for conservation and sustainable use of inland water ecosystems.

biodiversity trends for such ecosystems in Europe is even harder than for wetlands. An analysis made by the European Topic Centre on Nature Protection and Biodiversity (ETC/NPB) on proposed sites of Community interest (pSCI) under the EU habitats directive shows that extensive agricultural habitats occur much more frequently in the pSCIs than do intensive agricultural habitats. Analysis shows that 39 % of the total surface area of pSCIs relate to sites where extensive agricultural habitats occupy more than 40 % of the site and that up to 70 % of the total area of pSCIs relate to sites that have no intensive agricultural habitats at all. Extensive agricultural habitats in pSCIs are to be found mostly in the alpine, Mediterranean and Atlantic regions.

Bignal *et al.* (1996) provide an estimate of the proportion of low-intensity farming systems in various European countries on the basis of national expert judgement (see Table 11.2). Mediterranean countries and those with large upland or mountain areas show the highest proportion of low-intensity farming systems since physical conditions in these areas put strong constraints on the intensity of agricultural land use. The relatively low scores for CEE countries may result from different standards being applied by national experts in Hungary and Poland than in western countries. Data on semi-natural grasslands (see Chapter 2.3) show that CEE countries often still contain large areas of species-rich agricultural habitats that depend on low-input farming (Balazy and Ryszkowski, 1999). Time series are not available for any of these datasets, but the trends in farm structure, farm management and farmland species leave little doubt that species-rich agricultural habitats in Europe have declined considerably during recent decades.

In the European part of the Russian Federation, pastures and hayfields represent 4.6 % of the territory. The trend during recent decades has been for these areas to be converted into forest land; about 30 % of previous pastures and hayfields had become forests or other wooded land by the late 1990s (RCMC, 2000).

Large old world natural steppe areas remain in central Asia (mainly Kazakhstan, Mongolia and the Russian Federation) despite the conversion of huge areas to intensive agriculture between 1954 and 1965 when the USSR administration promoted the so-called 'upturn of virgin lands'. With the

liberalization of the economy, agriculture in Kazakhstan has rapidly decreased since 1992, and more than 50 % of ploughed steppes have returned to natural steppes (Sánchez-Zapata *et al*, 2003).

At the European level, the Bern convention and its Emerald network recognise the importance of extensive farming systems and semi-natural grasslands. So, at EU level, does Annex I of the habitats directive. Extensification of farming practices is part of the agri-environmental measures implemented in the EU (European Commission, 1998a) as well as in some accession countries.

Proportion of low-intensity farming systems as percentage of the total utilised agricultural area — Table 11.2.

Country	%
Spain	82
Greece	61
Portugal	60
Ireland	35
Italy	31
France	25
United Kingdom	25
Hungary	23
Poland	14

Source: Bignal *et al*., 1996

11.4.3. Marine and coastal biodiversity

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 marine and coastal resources (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. Chapter 2.5 provides data on fish stocks. Marine ecosystems also play a significant role in global carbon exchange.

Biodiversity in seas and oceans suffers from a number of pressures of varying intensity depending on the environmental pressures as shown in Table 11.3. These threats result in loss or degradation of biodiversity and changes in its structure, loss of habitats, contamination by dangerous substances and

Main pressures affecting biodiversity in the different seas around Europe — Table 11.3.

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

Note: XX: major impact. X: serious impact. ?: unknown.
Sources: EEA, 1998; EEA, in preparation; ETC/TE and comments by countries through EIONET

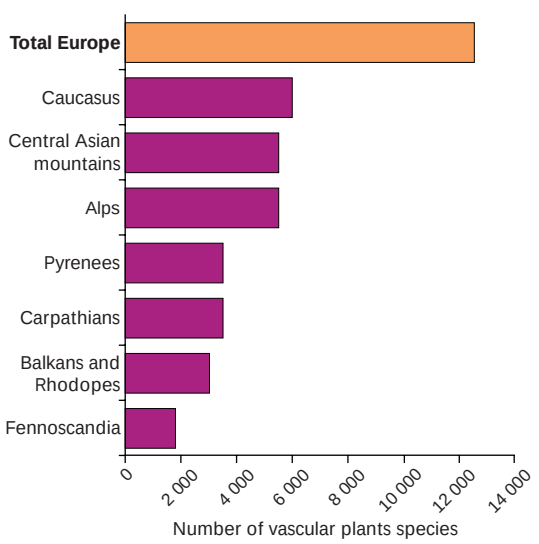
nutrients, and possible future effects of climate change.

The conservation and sustainable use of marine and coastal biodiversity are covered by regulatory frameworks at the international and regional level. These include 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.

At the EU level, the sixth environment action programme (6EAP) stipulates the development of a thematic strategy for the protection and conservation of the marine environment with the overall aim 'to promote sustainable use of the seas and conserve marine ecosystems'. It will be supported by a revision of the common fisheries policy, the general principles of which are reflected in the EU Biodiversity Action Plan on Fisheries.

Figure 11.6. **Flora richness in some main European mountain ranges**

Source: Davis *et al.*, 1994-97



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 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 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 national borders.

Coastal biodiversity is quite well covered by the birds 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 — the EU birds and habitats directives apply to offshore waters, beyond the territorial waters to the 200-mile limit of exclusive economic zones. The European strategy also enhances nature protection in coastal areas by integrated coastal zone management, adopted in September 2000 (European Commission, 2002).

Under the pan-European biological landscape diversity strategy (PEBLDS) process, the Council of Europe ministers adopted a European code of conduct for the coastal zone in April 1999 (Council of Europe, 1999a).

At the national level, all 19 countries with a coastal interface covered by this report say that they promote the conservation and sustainable use of marine and coastal biodiversity in their national strategy and action plan, 13 to a significant extent and six 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 Map 11.1). These are: the Alps, Pyrenees, Carpathians, Dinaric Alps, Balkans and Rhodopes, Scandes, Urals and Caucasus. They represent some of the oldest and the newest mountains to be found in the world. However, other major mountain chains are to be found in other biogeographic regions, for example the Mediterranean and the Anatolian regions.

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 (see Box 11.1.), including endemic species as well as large predators: large carnivores and raptors.

The mountain ranges also host an exceptional gene bank and are a natural laboratory where evolutionary processes can be studied. As a whole, mountain flora is estimated at over 7 000 species, with a maximum number in the Caucasian mountains (one of the 25 hot spots of

biodiversity in the world) (Figure 11.6). This represents more than half of the total number of European vascular plants.

The extreme physical conditions make mountains a fragile environment. Key issues, which are being addressed within different research, administrative and non-governmental organisation fora and in the context of the 2002 United Nations International Year of Mountains, include:

- international and regional agreements for cooperation on sustainable mountain development, such as the Alpine and the forthcoming Carpathian 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 decentralised 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.

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 often used for assessing biodiversity status at a particular time. There are national Red Lists in almost all European countries (ETC/NPB, 2002b) while regional Red Lists have been established under regional conventions such as the marine conventions. However, Red Lists are poor at measuring changes in biodiversity over time. No European overview is yet available, despite on-going joint efforts between the Council of Europe, the European Environment Agency (EEA) and IUCN to establish European lists of threatened vertebrates and plants; the latter also in collaboration with the Planta Europa network.

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 (Table 11.4.). 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 (Gallo-Ursi, 2001; Tucker and Heath, 1994) and the large European predatory mammals (Boitani, 2000; Brettenmoser, 2000; Delibes *et al*, 2000; European Commission, 1997; Landa, 2000).

Rare or flagship species are not alone in providing a picture of biodiversity trends. Results from surveys on common breeding bird species, based on long time series, are beginning to be available for 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 in France, the United Kingdom and the Netherlands shows the trends in the populations of common bird species, covering the 20 most declining species and the 10 most increasing ones (Table 11.5).

While some common birds have shown an important increase in their populations over the past decade, significant numbers are facing severe decline. Some of the trends can be related directly 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 (for instance up to 95 % since 1960 for the grey partridge in Hungary) due to intensification of agriculture. Other trends are more difficult to relate to one single type of pressure. It is recognised that the more a bird species is dependent on a habitat, the more significant is its current decline, because such birds are less able to adapt to other habitat types when their favourite one is degraded.

Changes in habitat can be beneficial to some species during part of their life cycle. For instance several waterbird species that winter in Europe (some ducks and geese) benefit from grasslands that are richer in nutrients as a result of the intensification of agriculture. This, combined with hunting bans, has resulted in significant increases in populations as recorded by the International Waterbird Census (Wetlands International, 2002c), one of the very few coordinated long-term monitoring programmes in Europe. Figure 11.7. shows the population trend of the wigeon (Anas penelope) in northwest Europe since 1974.

In general, European time series data are still lacking. They are scarcely available for birds though that is the best covered species

☹ Focus has long been on the most threatened and flagship species, such as large carnivores, and the population trends for these vary considerably. However, some previously common species are now facing serious decline towards very unstable populations and reduced distribution ranges, for example the skylark (as a result of agricultural intensification).

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

Species	Previous distribution in Europe	Remaining population	Current trends	Main threats
Iberian lynx	Endemic in the Iberian peninsula	No more than 150–200 Only two areas in Spain	↓↓and may disappear in the first half of the 21st century	- Decline in prey (rabbit) - Habitat deterioration (dams, afforestation, road building) - Accidental catches in traps and snares
Eurasian lynx	Originally throughout Europe, except large islands and Iberian peninsula Exterminated in western Europe in the 1950s	7 000 Reintroduced in certain areas in the 1970s	↑ in northern and eastern Europe	- Deforestation - Loss of prey species - Expansion of agriculture - Unsustainable hunting and poaching - Traffic accidents
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	At the end of 18th century, in all European countries In 1960s, numerous populations in southern and eastern Europe	Around 16 000 Largest populations in southern and eastern countries Only small remnants in Portugal, Spain, Italy, Greece, Sweden and Finland	↓ or ↑ but many small, vulnerable populations	- Persecution - Poaching - Habitat fragmentation - Poisoning - Lack of prey availability
Wolverine	European Russia, Norway, Finland, Sweden, Baltic states, northeast Poland During the 19th century, disappeared from the southernmost of these areas	2 000	↑ and remain in high altitude alpine habitats	- Too small and fragmented distribution - Conflicts with semi-domestic reindeer and livestock owners - Increased human access to the habitat

Decline :
Less than 30 %: ↓
Between 30–55 %: ↓↓
More than 55 %: ↓↓↓

Increase:
Between 30–55 %: ↑
Between 55 % and 100 %: ↑↑
More than 100 %: ↑↑↑

Source: WWF, 2002

Comparative trends in selected common bird species populations in three western European countries (France, the Netherlands and United Kingdom) between 1989 and 2001 — Table 11.5.

Bird species		Population trends in			Average population trends	
Common name	**Scientific name**	**Netherlands**	**France**	**United Kingdom**	**average**	
Wood warbler	*Phylloscopus sibilatrix*	-72 %	-73 %	-76 %	-74 %	↓↓↓
Whinchat	*Saxicola rubetra*	-83 %	-69 %	-20 %	-65 %	↓↓↓
Grey partridge	*Perdix perdix*	-63 %	-49 %	-59 %	-57 %	↓↓↓
House martin	*Delichon urbica*	-39 %	-84 %	17 %	-51 %	↓↓
Tree pipit	*Anthus trivialis*	8 %	-41 %	-75 %	-45 %	↓↓
Tree sparrow	*Passer montanus*	-35 %	-24 %	-65 %	-44 %	↓↓
Willow tit	*Parus montanus*	0 %	-47 %	-63 %	-42 %	↓↓
Turtle dove	*Streptopelia turtur*	-65 %	9 %	-45 %	-41 %	↓↓
Linnet	*Carduelis cannabina*	-20 %	-62 %	-30 %	-40 %	↓↓
Magpie	*Pica pica*	-39 %	-61 %	1 %	-38 %	↓↓
Willow warbler	*Phylloscopus trochilus*	-15 %	-56 %	-33 %	-37 %	↓↓
House sparrow	*Passer domesticus*	-41 %	-21 %	-33 %	-32 %	↓↓
Starling	*Sturnus vulgaris*	-11 %	-27 %	-51 %	-32 %	↓↓
Lapwing	*Vanellus vanellus*	-39 %	-24 %	-25 %	-30 %	↓↓
Marsh tit	*Parus palustris*	26 %	-59 %	-29 %	-29 %	↓
Reed bunting	*Emberiza schoeniclus*	29 %	-58 %	-27 %	-26 %	↓
Meadow pipit	*Anthus pratensis*	14 %	-58 %	-14 %	-26 %	↓
Cuckoo	*Cuculus canorus*	-21 %	-28 %	-26 %	-25 %	↓
Skylark	*Alauda arvensis*	-31 %	-18 %	-17 %	-22 %	↓
Bullfinch	*Pyrrhula pyrrhula*	+8 %	-47 %	-15 %	-21 %	↓
Great spotted woodpecker	*Dendrocopos major*	+62 %	+9 %	+26 %	+30 %	↑
Song thrush	*Turdus philomelos*	+ 78 %	+65 %	-12 %	+37 %	↑
Blackcap	*Sylvia atricapilla*	+80 %	+2 %	+55 %	+42 %	↑
Whitethroat	*Sylvia communis*	+75 %	+8 %	+51 %	+42 %	↑
Robin	*Erithacus rubecula*	+31 %	+79 %	+31 %	+45 %	↑
Sedge warbler	*Acrocephalus schoenobaenus*	+82 %	+117 %	+10 %	+63 %	↑↑
Collared dove	*Streptopelia decaocto*	+16 %	+188 %	+71 %	+78 %	↑↑
Goldfinch	*Carduelis carduelis*	+188 %	+31 %	+61 %	+82 %	↑↑
Stonechat	*Saxicola torquata*	+170 %	+59 %	+103 %	+105 %	↑↑↑
Buzzard	*Buteo buteo*	+212 %	+18 %	+237 %	+132 %	↑↑↑

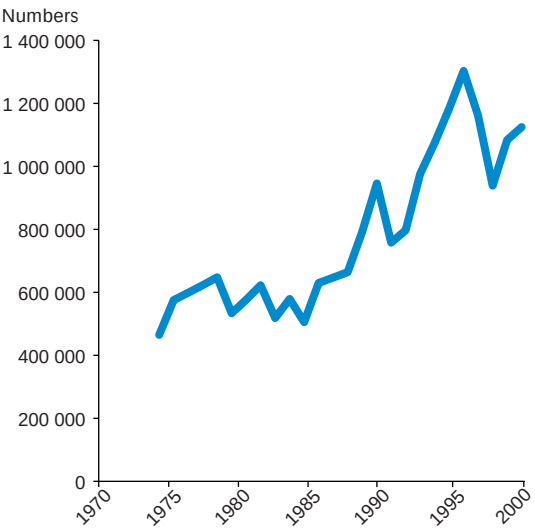
Decline:
Less than 30 %: ↓
Between 30–55 %: ↓↓
More than 55 %: ↓↓↓

Increase:
Between 30–55 %: ↑
Between 55 % and 100 %: ↑↑
More than 100 %: ↑↑↑

Sources: Baillie *et al*, 2001, Van Dijk *et al*, 2001, Julliard *et al*, 2002

Figure 11.7. **Northwest European population trends of the wigeon (Anas penelope) as recorded at wintering sites**

Source: Wetlands International database, 2002c



group. However, within the pan-European bird monitoring strategy, led by European Bird Census Council and Bird International, promising indicator-based results may be expected in the short term for important sites and for rare and common birds (Gregory *et al*, 2003).

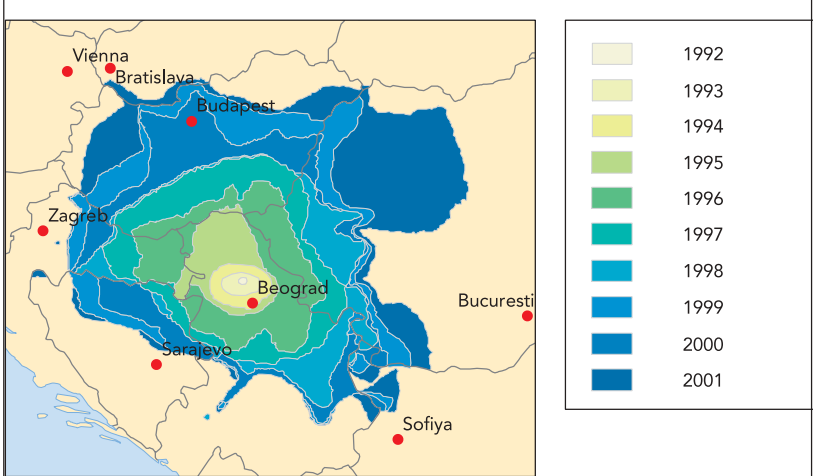
As for plants, the recently launched European plant conservation strategy, jointly led by the Council of Europe and Planta Europa (2002) as a contribution to the global plant conservation strategy under the CBD, should enhance monitoring efforts and contribute to a better knowledge of the conservation status of Europe's flora.

The recently launched European biodiversity monitoring and indicator framework (EBMI-F) (ECNC and EEA, 2002) under the pan-European biological and landscape diversity strategy should support improved coordination and ensure that the monitoring of biodiversity is better targeted.

Box 11.2. Invasive alien species: the case of the western corn rootworm

A recent invasive American pest on arable land in Europe is the western corn rootworm (*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 km² in Europe (Bulgaria, Bosnia-Herzegovina, Croatia, Hungary, Romania, Slovakia, and Serbia and Montenegro). Western corn rootworm beetles were trapped in 1998 and 1999 in Italy, near Venice airport and in 2000 in Switzerland, near Lugano. The spread of western corn rootworm has continued in all directions from the original infestation point (Figure11.8). It has become an economic pest of maize fields in Serbia and Montenegro (yield losses of up to 70 %). Several research projects focus on the possibility of biological control of such pests.

Figure 11.8. **Spread of the western corn rootworm (Diabrotica virgifera virgifera) in Europe**



Source: Prepared by FAO Network (Edwards, Kiss (2001)), based on data from Bertossa, Boriani, Festic, Furlan, Gogu, Igrc-Barcic, Ivanova, Omelyuta, Princzinger, Rosca, Sivcev and Sivicek. Government of Hungary and of United Kingdom, 2002

11.6. Invasive alien species — a serious threat to biodiversity

Alien species have been introduced intentionally or unintentionally for centuries (see Box 11.2.). 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 become 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 example wild salmon, wild boar, many plant species including trees, and recent concerns regarding genetically

There is a general consensus that the intentional introduction of species should be avoided unless detailed assessments show that the benefits of an introduction are much greater than the associated risks.

modified organisms) or the introduction of diseases. This is happening both within and outside protected areas. There is growing concern about how some of these alien species may benefit from newly created conditions resulting from climate change and become even more competitive to other species.

The planning of more effective strategies to deal with biological invasions has become a global conservation priority.

The loss of biodiversity caused by invasive alien species is given high priority in the Convention on Biological Diversity and the Ramsar, Bern and Bonn conventions. A global invasive species programme has been set up under the CBD, and the sixth CBD Conference of Parties in 2002 urged Parties to implement strategies and action plans to control alien species. This is reflected at the European level in the European strategy on invasive alien species developed by the Council of Europe (Council of Europe, 2002a). 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, the International Council for the Exploration of the Sea set up in 1994 a code of practice for the introduction and transfer of marine organisms.

At the EU level, the EU regulation for the implementation of CITES provides a basis for controlling imports of certain species that may become invasive. The recent EU biodiversity strategy (European Commission, 1998b) calls for the application of the precautionary principle to avoid detrimental effects of invasive alien species.

11.7. A constantly evolving policy framework in relation to biodiversity and its sustainable use

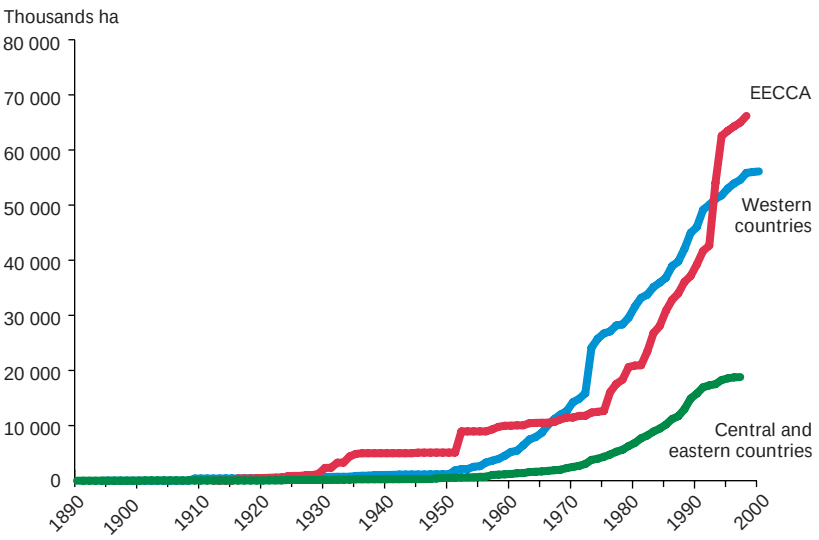
The policy framework has evolved considerably, at the international, EU, regional and national level, towards better consideration of all biodiversity aspects well beyond — but complementary to — the initial instruments targeted on nature protection (Table 11.6). These instruments should benefit from more and more synergy, with increasing cooperation between convention secretariats, leading to a more integrated and transboundary approach. As a contracting Party to most international conventions, the EU aims at integrating the provisions of such global instruments within EU policies, while also applying its specific policy objectives.

Most of these instruments call for monitoring in order to assess effective implementation. Progress in this direction remains insufficient. In addition to these legal frameworks, many initiatives are undertaken by non-governmental organisations.

11.7.1. 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 of designation types, ranging from very strict nature reserves and 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 11.9) when most countries started to implement national laws on nature protection.

Total surface area under national designations in Europe over time — Figure 11.9.



Note: Areas are overestimated due to partial overlaps between different designations within a country.

Source: Common database on designated areas (CDDA) (EEA, Council of Europe, WCMC)

Table 11.6. **Conventions and major instruments**

Global

Conventions
Convention on Wetlands of International Importance — Ramsar — (1971) (http://www.ramsar.org)

Convention concerning the Protection of the World Cultural and Natural Heritage (1972) (http://whc.unesco.org/)

Convention on International Trade in Endangered Species of Wild Fauna and Flora, CITES (1973) (http://www.cites.org/)

Convention on the Conservation of Migratory Species of Wild Animals, Bonn (1979) (http://www.wcmc.org.uk/cms/), including agreements and memoranda of understanding on: *Conservation of Seals in the Wadden Sea (1990), Conservation of Small Cetaceans of the Baltic and North Seas (1991) (ASCOBANS), Conservation of Bats in Europe (1991) (EUROBATS), Conservation Measures for the Slender-billed Curlew (1994), Conservation of African-Eurasian Migratory Waterbirds (1995), Conservation of Cetaceans of the Black Sea and Contiguous Atlantic Area (1996) (ACCOBAMS), Conservation and Management of the Middle-European Population of the Great Bustard (Otis tarda) (2001)*

Convention on Long-Range Transboundary Air Pollution (1979)

Convention on the Law of the Sea (1982) (http://www.un.org/Depts/los/convention_agreements/convention_overview_convention.htm)

Convention on Biological Diversity (1992) (http://www.biodiv.org)

Convention to Combat Desertification (1992) (http://www.unccd.int/)

Convention on Climate Change (1992) (http://unfccc.int/)

Other initiatives
Man and Biosphere Programme (http://www.unesco.org/mab/)
Global Plan of Action for the Conservation and Sustainable Utilization of Plant Genetic Resources for Food and Agriculture (http://www.fao.org/waicent/FaoInfo/Agricult/AGP/AGPS/)
International Treaty on Plant Genetic Resources (2001) (http://www.ukabc.org/iu2.htm)

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) (http://eelink.net/~asilwildlife/barcelona.html)

Convention on the Conservation of European Wildlife and Natural Habitats, Bern (1979) (http://www.nature.coe.int/)

Convention concerning the Protection of the Alps (1991) (http://www.mtnforum.org/resources/library/cpalp02a.htm)

Convention on the Protection of the Marine Environment of the Baltic Sea Area, HELCOM (1992) (http://www.helcom.fi/)

Convention for the Protection of the Marine Environment of the North-East Atlantic, OSPAR (1992) (http://www.ospar.org/)

Convention on Cooperation for the Protection and Sustainable Use of the Danube River (1994) (http://www.defyu.org.yu/E-catchment/catchment2-2-1.htm)

Convention on the International Commission for the Protection of the Oder (1998)

Convention on the Protection of the Rhine (1998) (http://www.internationalwaterlaw.org/RegionalDocs/Rhine_River.htm)

European Landscape Convention (2000) (http://www.nature.coe.int/english/main/landscape/conv.htm)

Other initiatives
Environment for Europe process (http://www.unece.org/env/europe/)

Pan-European biological diversity and landscape strategy (http://www.nature.coe.int/)

Ministerial Conference for the Protection of Forests in Europe (http://www.minconf-forests.net/)

Arctic environment protection strategy (http://www.arctic-council.org/files/pdf/artic_environment.PDF)

Strategic action plan for the conservation of biological diversity (SAP BIO) in the Mediterranean region (http://www.sapbio.net/)

European Union

Sixth environment action programme (6EAP) and seven related thematic strategies (http://europa.eu.int/comm/environment/newprg/index.htm)

EU sustainable development strategy (http://europa.eu.int/comm/environment/eussd/)

EU biodiversity strategy and associated plans (http://europa.eu.int/comm/environment/docum/9842en.pdf)

EU birds directive (http://europa.eu.int/comm/environment/nature/legis.htm)

EU habitats directive (http://europa.eu.int/comm/environment/nature/legis.htm)

Water framework directive (http://europa.eu.int/comm/environment/water/water-framework/index_en.html)

Common agricultural policy including agri-environmental measures and rural development regulation (http://europa.eu.int/comm/environment/agriculture/links.htm)

Common transport policy
Environmental impact assessment

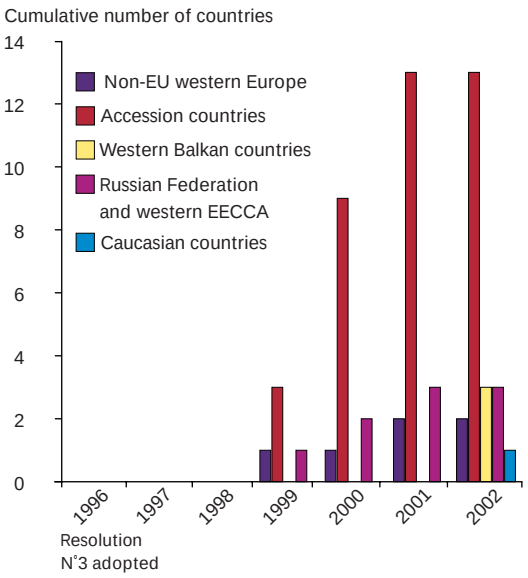
Other international and EU instruments such as the Ramsar convention (1971) and the EU birds directive (1979) made it compulsory for countries to designate sites for protection, which probably influenced the rate at which new sites were designated under national systems.

Thus, by developing their own system of nationally designated areas, countries set their own priorities for protecting local biodiversity values, while contributing to the implementation of international and Community legal frameworks.

The extent of surface area designated is likely to level off for a number of reasons, at least in WE. 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 becoming more and more integrated into sectoral policies, for instance with agri-environmental measures or sustainable forestry policies, but these do not necessarily lead to new designations of sites.

In the EU, the implementation of the Natura 2000 network demonstrates a huge effort by countries to ensure the coordinated conservation of a selection of species and habitats of European concern. The first 10 accession countries are preparing to join this process. The Natura 2000 network is a key, compulsory instrument for halting the loss of biodiversity (European Commission, undated); the Natura barometer assesses progress periodically (European Commission, 1996 to 2002). By April 2002 in the EU, 2 827 sites, covering 222 480 km^2, had been designated as special protection areas under the birds directive and 14 901 sites, covering 436 756 km^2, had been proposed as sites of community interest under the habitats directive. This represents up to 16 % of the EU territory.

At the 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 that have been identified by the Standing Committee as 'requiring specific conservation measures' (Council of Europe, 1999b). 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 Emerald process, starting with a pilot phase (Figure11.10).



Progress in non-EU European countries joining the Emerald process Figure 11.10.

Note: In 1996, by adopting Resolution N° 3, the Standing Committee to the Bern Convention resolved to „set up a network (EMERALD Network) which would include Areas of Special Conservation Interest".

Source: Council of Europe, 2002b

In addition to the national and European designations, countries also designate sites under international and regional conventions and programmes (Delbaere and Beltran, 1999): World Heritage (51sites), biosphere reserves (163 sites), Ramsar sites (736 sites), biogenetic reserves (343 sites), European diploma (61sites), Barcelona convention (208 sites) and Helsinki convention (62 sites). Most of the international and European designations overlap with national designations and sometimes among themselves, which, in principle ensures stronger protection. Since each designation is made with a specific purpose, a site of particularly high nature value can benefit from several international

15 % of the total area of western Europe is under national designation for nature protection, 9 % of central and eastern Europe and 3 % of the 12 countries of eastern Europe, the Caucasus and central Asia.

The Natura 2000 network is progressively taking shape at the EU level, with up to 16 % of the EU territory covered. The corresponding initiative for non-EU countries, the Emerald network, under the Bern convention, is at an encouraging pilot stage.

designations. For instance Doñana in Spain and the Camargue in France each enjoy six overlapping international and 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 recognised as areas where sustainable management practices and the ecosystem approach can be tested through collaboration between different actors (Council of Europe, 1998).

Most of these designated areas are core elements in the establishment of a pan-European ecological network (Bouwma *et al*, 2002; Council of Europe, 2000), one of the key objectives of the pan-European biological and landscape diversity strategy. 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.

11.7.2. Integrating biodiversity into sectors

Traditional nature protection instruments ensure a broader 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.

The main sectors that impact on biodiversity — and therefore where integration of biodiversity concerns is needed — differ from region to region, as shown in Figure 11.11.

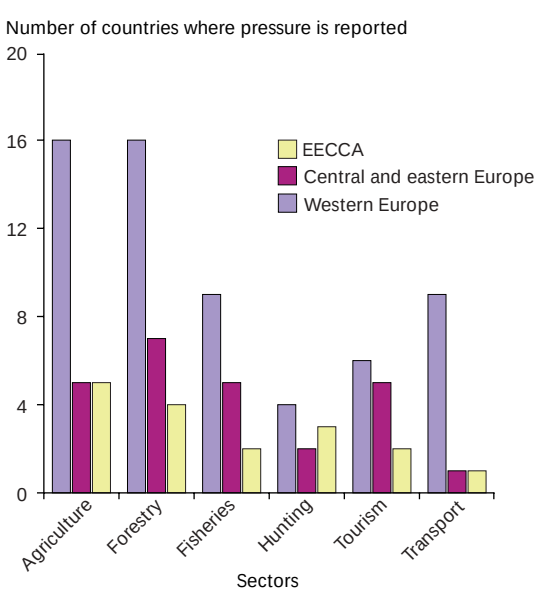
WE countries consistently highlight the same sectors, in particular agriculture, forestry, fisheries and transport. In comparison, the CEE countries emphasise forestry and to a lesser extent agriculture and tourism. The EECCA countries emphasise agriculture and forestry. This picture may change significantly with EU enlargement, and therefore implementation of the common agricultural policy in the accession countries (Donald *et al*, 2002), and also as a result of the likely development of transport infrastructures (EEA, 2002b). Other sectors, such as spatial planning and finance, although not directly addressed by countries, have an obvious influence on biodiversity.

There has been some progress in integration in some sectors, for example through the introduction of agri-environment schemes, the EU sustainable development strategy and the EU biodiversity strategy (European Commission, 1998b). At the European level, the outcomes of the high-level Conference on Agriculture and Biodiversity, held in Paris in November 2002 (Council of Europe, 2002c) and the proposal for a ministerial conference in 2005 should help by better identifying problems and areas for actions.

In the transport sector, despite the continuing development of the code of practice for the introduction of biological landscape considerations into transport sector, the absence of a strong policy framework and the inexorable growth in demand are likely to lead to increasing impacts on biodiversity.

During the World Summit on Sustainable Development in Johannesburg, the heads of state and government agreed to '...the

Figure 11.11. **Regional European differences highlighting sectoral pressures on biodiversity**



Source: National reports to CBD secretariat, analysed by Drucker and Damarad, 2000 (amended)

All major sectors influence and possibly impact on biodiversity, though with regional differences. Agriculture and forestry are the sectors reported as having such impacts in the largest number of countries.

achievement by 2010 of a significant reduction in the current loss of biological diversity.... and to actions at all levels to (a) integrate the objectives of the Convention on Biological Diversity into global, regional and national sectoral and cross-sectoral programmes and policies, in particular in the programmes and policies of the economic sectors of countries and international financial institutions'.

At the European level, the pan-European biological and landscape diversity strategy provides a coordinated framework for implementing these objectives and even suggests a stronger commitment, i.e. 'to halt the loss of Europe's biodiversity by 2010'.

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