

European Environment Agency

Europe's biodiversity

– biogeographical regions and seas

Biogeographical regions in Europe

Introduction

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Summary

The pressure on biodiversity in Europe is intense. It increased in the second half of the 20th century, both on land and in the sea, with an intensification of land-use and pollution of both air and water. The outcome was severely altered and degraded conditions for wild-living species, changes in the distribution of ecosystems and a highly fragmented landscape. The changes, however, also brought about a general awareness of the importance of the goods and services that society receives from well-functioning ecosystems. This has prompted the political goal to take action to conserve and restore biodiversity in Europe with a target to halt further biodiversity loss by 2010.

The main questions are:

- will all the efforts towards the sustainable use and protection of biodiversity in its many forms halt the decline and reverse it in time?
- will the protection of nature be effective in the light of changes in climate?

Europe's biodiversity is characterised by the key features as:

- The natural number of species is low compared with the rest of the world, but Europe has a wide variety of habitat types and ecosystems. There are only a few European areas that are of globally importance for species. However, there are many centres with endemic species and strong links to other continents and seas through migratory species such as birds and fish.
- There is a long history of cultivation resulting in intimate interlinkages between natural and cultural biodiversity.
- Europe has an increasing influence, direct and indirect, on global biodiversity both in Europe and in the rest of the world through impacts on the environment, on biodiversity including genetic resources, through impacts on human living conditions, through trade in biodiversity products and genetic material as well as through tourism.
- The pressures and impacts on biodiversity vary between biogeographical regions but in general the following are of importance:
 - The destruction of habitats and the increasing uniformity of rural areas on land and physical disturbance at sea continue to impair the living conditions of wild species.
 - Habitat quality and the connectivity between areas where wild-living species can survive is steadily decreasing and becoming more and more fragmented, making survival more difficult.
 - Most protected areas are close to or influenced by infrastructure. It will be increasingly difficult to designate new areas for protection without influence from transport infrastructure, urbanisation or tourism. An increase in marine protected areas is needed.
 - There is a continual change in habitats, which in general become less rich in species and more uniform. Wetland decline appears to have halted in many countries, but permanent grasslands and old forests continue to decline, while intensively managed forests increase in cover. New man-made habitat types have taken over large areas such as in the suburban zones (garden belts), around transport infrastructure and in land reclamation areas. With care their nature function can be significant, but mostly they have low biodiversity value.
 - Agriculture, forestry, hunting, fisheries and aquaculture are at the same time the main activity and the main managers of natural, semi-natural and cultivated biodiversity. Future conditions depend on the possibility of land or resource users being able to contribute to sustainable development and conservation. This applies not only to highly cultivated areas but also for semi-natural areas, including protected areas.

- Competition from alien species (by ballast water, aquaculture, active species introduction and spread from crops, forestry, horticulture, fishing, hunting or nature restoration) is becoming severe.
- Continued eutrophication on land and in fresh and salt waters will support the spread of robust species, replacing fragile specialist species.
- Climate change can be expected to induce changes to all levels of biodiversity, natural and cultivated. The changes will affect all European habitat types and their species, in protected areas as well as outside them. Different species will be affected differently and the habitat types known today are likely to shift to other species combinations in the future. Alpine and arctic areas and species will suffer most. Mediterranean areas will become drier, caused by climate and by water use, and see more African and Asian species arrive, while present Mediterranean species can be expected to move northwards.

As regards the European marine environment several of the above points apply but additionally e.g.:

- Overexploiting of a number of economically important fish stocks must be controlled and ecologically important community structures be restored.
- Destruction of bottom habitats by trawling and other human activities must be halted.

In Europe, the following main actions to conserve biodiversity should be mentioned:

- Schemes for protection and restoration of species and habitats as well as for controlling the reintroduction of species are increasing.
- Habitat protection is increasing in order to protect nature and to protect environmental resources (water, fish). Habitat protection consists of traditional site protection and restoration, but increasingly, too, of the generic protection of habitat types wherever they occur. However, the disturbance of protected areas for tourism and recreation or by destruction for infrastructure is growing.
- The use of certification to attest to sustainable management, such as of forests, is spreading.
- The involvement of concerned citizens and of non-governmental organisations in the discussion of biodiversity problems, in restoration and in creating awareness and collecting information is very significant.

Foreword

This report 'Europe´s biodiversity' from the European Environment Agency (EEA) for the first time describes both the eleven biogeographical regions and the seven regional seas around Europe in comparable chapters (Box 1). The main focus of the chapters is on wild-living species, on the major ecosystems and some selected natural or semi-natural habitat types. The geographical coverage of the report is Europe to the Urals with surrounding regional seas. Because information is not evenly available, not all regions and seas are treated at the same level of detail.

The collection of information, writing storylines and editing of this report has been carried during several years. The chapters on the regional seas were published already by 2002 while the biogeographical region chapters have been successively published 2002-2008¹. Thus the information presented in the different chapters is not equally up to date. In particular the strategies and policies to protect biodiversity is continuously developing as

¹ http://reports.eea.europa.eu/report_2002_0524_154909/en

well as the implementation in e.g. the the European Union (which expanded from 15 to 27 member states during recent years). For example the data collection e.g. on areas and species protected according to the EU Habitats and Bird Directives largely refer to the EU-15 states, i.e. relate to the state of 2002 or before.

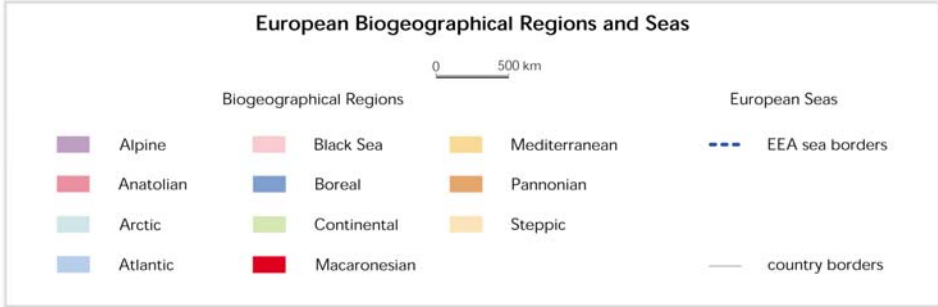
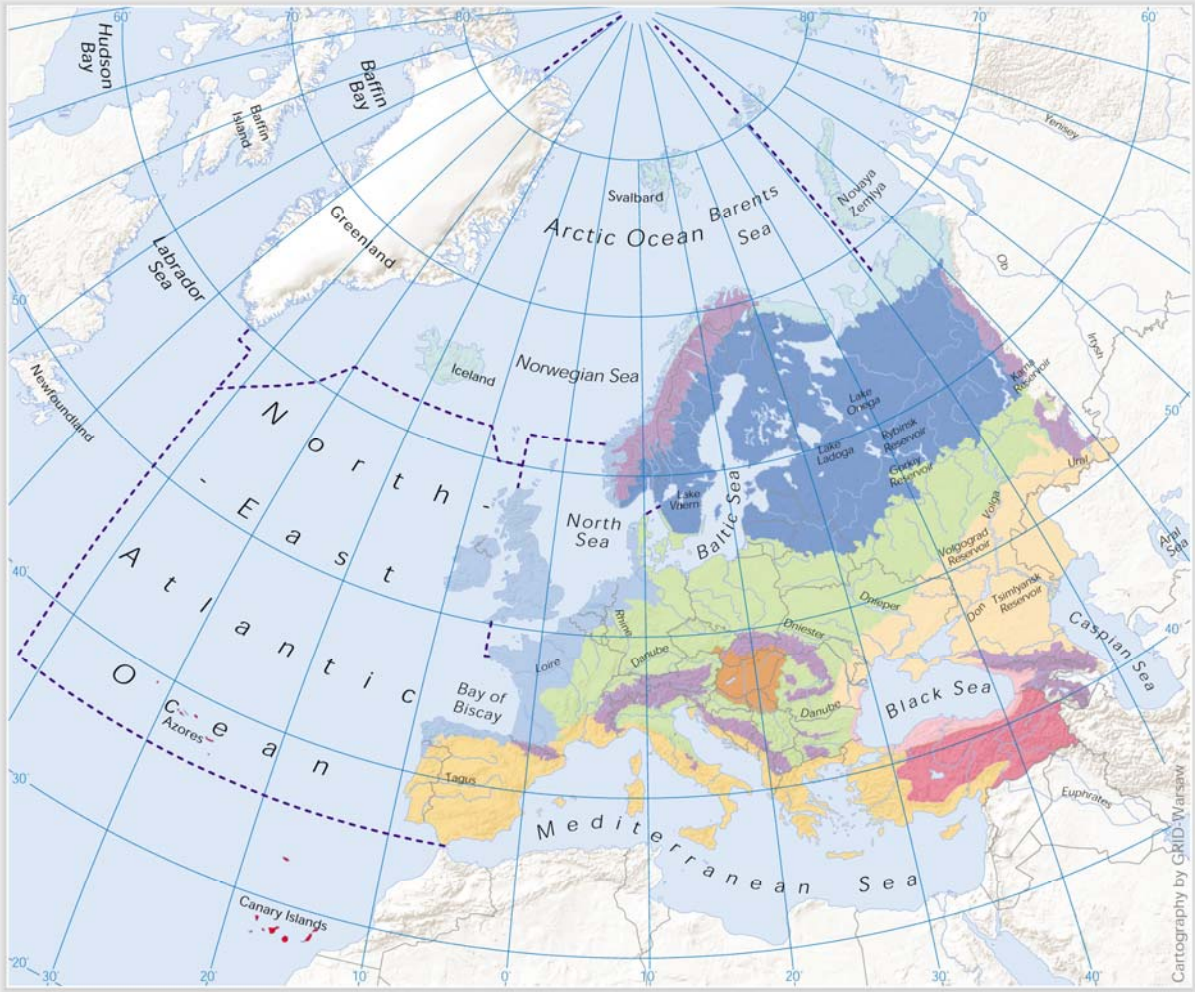
A plan for updating of the report is currently being discussed within the European Environment Agency.

Box 1. The report covers eleven biogeographical regions and seven regional seas.

<p>Biogeographical regions (terrestrial and freshwater): <i>Published 2002-2008</i></p> <ul style="list-style-type: none"> • Arctic region • Boreal region • Continental region • Atlantic region • Macaronesian region • Mediterranean region • Alpine region • Pannonian region • Steppic region • Black Sea region • Anatolian region 	<p>Regional seas: <i>Published 2002 or earlier</i></p> <ul style="list-style-type: none"> • Arctic Ocean • North-east Atlantic Ocean • North Sea • Baltic Sea • Mediterranean Sea • Black Sea • Caspian Sea
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All chapters follow the same general structure. Because of the close relationships between e.g. seas and regions there is some overlap and cross-referencing between chapters. Map 1 shows the biogeographical region and regional sea boundaries of the report.

Map 1. European biogeographical regions and the regional seas.



Source: UNEP/GRID Warsaw, final map production

1. The dependence on biodiversity and biological resources

1.1 Society depends on and influence biodiversity

Human society depends for life and livelihood on the combined productivity and the environmental and social functions of the biosphere, with its diversity of biological elements: plants and animals with their gene pools and the ecosystems and habitats that the species form. Human beings cannot live without a well-functioning biosphere. People have always used elements of biodiversity: seed and timber, fruit, and fish and fowl, and have always been dependent on it for functions such as supplying the oxygen they breathe. However, the unifying concept of 'biological diversity' or 'biodiversity' only became broadly accepted during the 1970s and 1980s, when it became clear that society could not go on increasing or intensifying the use of natural resources, not unless it were to be done wisely and in a sustainable way. The Brundtland report 'Our Common Future' published in 1987 made that clear to the world.

Box 2. Biodiversity definition agreed in the Convention on Biological Diversity

Biological diversity means the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems.

Society depends on ecosystems and species for goods such as food, material, medicine and genetic resources, as well as for all or parts of such environmental functions or services as oxygen production, carbon dioxide (CO₂) sinks, and flood and erosion control. Society also needs documentation of what happens to our living environment and what makes it good and healthy to live in.

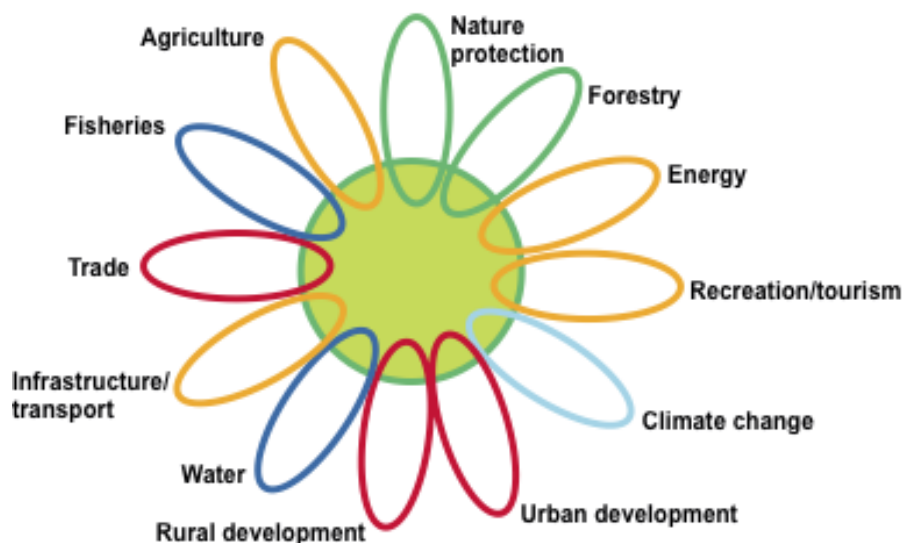
It was estimated for the World Summit on Sustainable Development in Johannesburg in 2002 that around 40 % of the global economy is based on biological products and processes. Trade and marketing of these products exert strong influence on their production and thus on local biodiversity. Human beings have an ethical responsibility to preserve biodiversity for its own intrinsic value, as a genetic stock for the future and to ensure ecological balance.

Human beings live directly with and from a relatively limited number of animal and plant species, but also share and compete for land and for the waters with a multitude of other species. Wild species, cultivated and domesticated species participate in the same environmental functions and are influenced in the same ways by chemical elements and climate, though the degree to which they participate or are influenced varies.

As the European public's demands on space and resources continue to rise, so does society's influence on the ecosystems and species populations that it lives with and is part of.

Figure 1.

Many sectors and environmental issues influence biodiversity



What happens to biodiversity and how it is used depends on people and their behaviour. There may be variations, therefore, even within the same area or region when policies, subsidies or behaviour change:

- Some farmers intensify their farming practise, others abandon the land while some become nature protectors or environment managers.
- Some foresters shift to intensive and exotic tree production, while others change to sustainable forestry with certification, while ancient forests become protected and new ones are planted or allowed to grow for environment protection or recreation.
- Hunting grounds or angling waters are actively stocked both with alien and indigenous species.
- Recreational interest in the natural environment and in seeing wildlife is increasing steeply in protected and so far undisturbed areas, and even in the most remote parts; this contradicts the need to keep disturbance low in many places.
- Species and habitat conservation and nature restoration efforts are increasing in most countries, with some positive benefits, although sometimes with problematic and unforeseen effects.

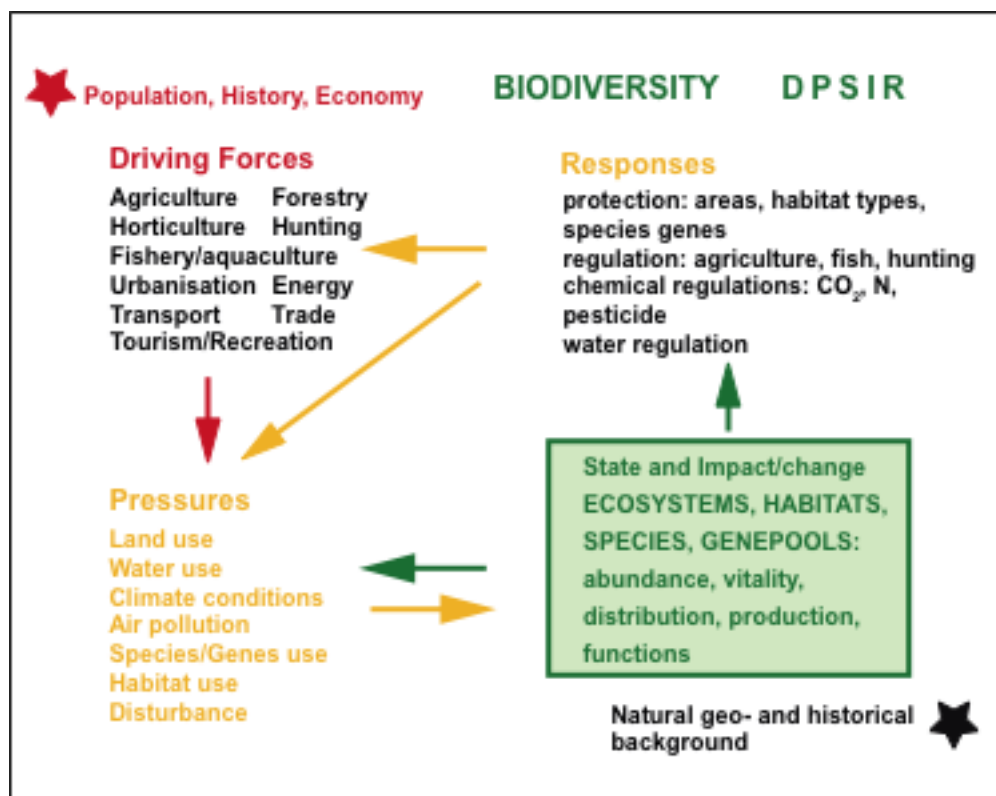
As highlighted in Fig. 1, different sectors and influences affect European biodiversity:

- climate change
- chemicals, including the effects of eutrophication and pesticides
- use of land and sea, fragmentation
- protection and management of habitats and species populations
- invasion of alien species
- change in genetic resources.

The socio-economic conditions of sectors are the driving forces (D) which influence, use and exert pressure (P) on the status (S) of habitats, species, crops, forests, fish stocks. The impacts (I) of such pressures are seen in wild-living or domesticated biodiversity as positive or negative changes in status, which in turn may lead to political or behaviour responses (R) to regulate and mitigate conditions. This DPSIR chain (Fig. 2) serves in a very simplified way to help understand better the inter-linkages of sectors with what actually happens to biodiversity. It shows that a decision not initially directed at

biodiversity but at, for example, production of milk or meat, timber or fish may in the end impact strongly on the total biodiversity of ecosystems such as grasslands or forests and fishing grounds. This is why integrated environment assessments of major plans and developments are needed.

Figure 2. Biodiversity is the result of many diverse conditions and pressures – the DPSIR chain of inter-linkages



1.2 Biodiversity is political

Because human influence is so strong and widespread, many elements of biodiversity today and in the future depend on society's choices, behaviour and policies both throughout the continent and locally. Though there are large regional differences – caused mostly by a combination of climate and natural and cultural history including economic development – the total biodiversity with crops and cattle, forests and scrubs, alpine and arctic habitats, pastures and meadows, wetlands and heathlands, gardens, parks and road verges are influenced by the way they are used and lived in, whether wild or cultivated. The same influence is exerted on rivers and lakes and increasingly, too, on marine areas with their deep-sea coral reefs, seagrass beds, mussel beds, rocky-bottom and soft-bottom communities as well as the pelagic communities in the free water masses.

The same issues of concern emerge for the need to protect biodiversity from national and as well from international environmental assessment reports. The overarching goal is to safeguard biodiversity in all its elements against loss and irreversible changes, and to maintain and support on a long-term basis a healthy, well-functioning and naturally varied nature as well as a healthy, well-functioning biodiversity for production. However,

this is a general and fundamental goal, leading to and building on a myriad of underlying targets. It does not mean that all current biodiversity, wild and cultivated, has to be or can be maintained in the status quo forever. That is not possible. Biodiversity is naturally changing and constantly adjusting.

Decisions influencing biodiversity issues are dealt with in many different fora and under different major policies with goals that vary and are often not primarily directed towards biodiversity, although affecting it greatly. For instance, it is a major task at present to reconcile the needs and management of CO₂ sink functions in forestry and other ecosystems with concerns such as to protect old forest types against cutting and low-yielding species-rich permanent grasslands against afforestation. Which goals take precedence? This is the background for the concern not to create contradictory solutions but to create win-win situations by implementing, for example, the Conventions on Biological Diversity, Climate Change and Desertification in synergy.

Of emerging interest are also concerns about the liability for damage to biodiversity, not only to sites but also to populations and habitat types, such as can be seen in the preparation for an EU Environmental Liability directive (European Commission, 2004)

The UN Convention on Biological Diversity (CBD) of 1992 brought the term biodiversity into political discussion to explain in a unifying concept the understanding that our society depends on both wild and cultivated plants, and animals, and on the ecosystems of which they form a living part (from natural to cultivated), and on the genetic (resources) variation of the species (Box 3). In all countries these principles are becoming better recognised and less resisted against, just as the need for sustainable development and management of natural resources has been recognised since the 1970s. However, they have to be implemented and integrated in all relevant sectors effectively.

In 2001 at the Gothenburg Summit the European Community set a target to halt and reverse the current loss of natural resources and biodiversity and to manage natural resources in a sustainable and integrated manner. The target year proposed for the EU was 2010. For the European Community this global responsibility in relation to the CBD is expressed already in the European Community Biodiversity Strategy (1998) and its accompanying biodiversity action plans (natural resources, agriculture, fisheries, development from 2001) as well as in the sixth European environmental action programme 'Our future, our choice'. The Communication from the Commission on "Halting the loss of Biodiversity by 2010 — and Beyond, Sustaining ecosystem services for human well-being" strengthens this commitment (Box 3).

The UN World Summit for Sustainable Development (WSSD) in Johannesburg 2002 was held 10 years after the biodiversity convention was adopted in Rio. The Summit 'recognised that poverty eradication, changing consumption and production patterns, and protecting and managing the natural resource base for economic and social development were overarching objectives of, and essential requirement for sustainable development' (United Nations, Johannesburg Declaration on Sustainable Development, par. 11). In Johannesburg biodiversity was not a front issue in itself, but the urgent and long-term need to use sustainably and safeguard the future of natural resources and ecosystems, their functions and genetic resources was expressed in the commitments set out in the implementation plan adopted by governments at the close of the Summit, and the main general target became a significant reduction in current loss of biological diversity by 2010 (Box 3).

At a pan-European level biodiversity is the main focus of the work of the pan-European Biological and Landscape Diversity Strategy (PEBLDS), since 2001 with a focus on serving the CBD as a pan-European forum. The recent pan-European ministerial conferences 'Environment for Europe' in Kiev and Beograd in 2003 and 2007 resolutions

on biodiversity approved respectively reinforced the goal to stabilise biodiversity by 2010, calling for halting the loss at all levels of biodiversity (Box 3).

The Convention on Biological Diversity regularly calls to Conferences of the Parties. In 2004 the seventh COP to CBD was held in Kuala Lumpur. The decisions and the Kuala Lumpur Declaration were based on the Johannesburg meeting results and brought new focus to the CBD work and set clearer targets for the national and international work (Box 3).

Box 3. Recent declarations and implementation plans

A. The implementation plan of the Johannesburg Summit 2002 – selected biodiversity-related commitments

Biodiversity

- Reduce significantly the current loss of biological diversity by 2010 by, among others, promoting sustainable use of biological diversity, including sustainable tourism
- reverse the current trend in natural resource degradation
- promote conservation of ecosystems, World Heritage sites, endangered species, hot-spot and other essential areas, and development of national and regional ecological networks and corridors
- control invasive alien species.

Fisheries and marine areas

- Maintain or restore fish stocks to maximum sustainable yield levels, and to achieve this for depleted stocks where possible not later than 2015
- establish a representative network of marine protected areas by 2012
- prevent illegal and unregulated fishing by 2004
- support sustainable development of aquaculture
- accelerate development of measures to address invasive alien species in ballast water.

Agriculture, forestry and genetic resources

- Promote sustainable productivity of the land and efficient use of water resources in agriculture, forestry, wetlands, artisanal fisheries and aquaculture
- promote conservation and sustainable use and management of traditional and indigenous agricultural systems
- promote sustainable forest management and combat illegal international trade
- promote safeguarding of and access to genetic resources (Biosafety Protocol).

Mountains

- Promote sustainable mountain development and address deforestation, erosion, land degradation, loss of biodiversity, disruption of water flows and the retreat of glaciers.

Other issues

- Reduce the risks of flooding and drought by promoting wetland and watershed protection and restoration
- improve developing countries' access to environmentally sound alternatives to

ozone depleting chemicals by 2010

- take initiatives by 2004 to implement the global programme of action for the protection of the marine environment from land-based sources of pollution activities
- give better access to sanitation and clean drinking water
- increase use of renewable energy (including better use of energy, less pollution and more use of biofuel)
- continue to combat desertification.

B. The Kuala Lumpur Declaration and the decisions from the seventh Conference of the Parties to the Convention on Biological Diversity from 2004 has even more focused the targets:

- that biological diversity is being lost at an unprecedented speed due to human activities
- to underline the role of indigenous and local communities in the conservation and sustainable use of biological resources
- to commit governments to establish a network of protected areas

The following eighth and ninth Conferences of the Parties (COP-8 and COP-9) to the Convention on Biological Diversity were held in Curitiba, Brazil (2006) and Bonn, Germany (2008) respectively. Among the 32 decisions of the COP-8 can be noted:

- a number of actions to strategically review the implementation of the Convention and its major thematic areas (forest, marine etc).
- guidance to promote synergy among activities for biodiversity conservation, mitigating or adapting to climate change and combating land degradation

The COP-9 decisions (36 in number) reflect e.g.

- in-depth reviews of the program of work for forest biological diversity and of on-going work on alien invasive species
- as a follow-up of the Millennium Ecosystem Assessment an invitation to parties to carry out national, regional and subglobal ecosystem assessments

For an update on CBD decisions and declarations see

<http://www.cbd.int/convention/cops.shtml>

C. The Kiev declaration from the 'Environment of Europe ministerial process' incl. the PEBLDS Strategy presented e.g. the following key targets:

- by 2006, to identify all high nature values areas in agricultural ecosystems in the pan-European region and in 2008 a substantial proportion to be under biodiversity-sensitive management
- by 2006, the Pan-European Ecological Network (PEEN) will be identified to contribute towards a global ecological network, and by 2008 all core areas of PEEN will be adequately conserved
- by 2008, the pan-European Strategy on Invasive Alien Species under the Bern Convention will be implemented by at least half of the countries through their biodiversity Strategies and Action Plans
- by 2006, an agreed core set of biodiversity indicators and by 2008 a coherent European programme on biodiversity monitoring and reporting will be operational

The following 'Environment for Europe ministerial process' meeting in Beograd 2007 discussed progress since the Kiev Conference. The Ministerial declaration noted e.g. that the loss of biodiversity remains an environmental challenge and the Ministers reaffirm the commitment to the goal to significantly reduce the rate of loss of biological diversity by 2010. The Ministers further endorsed a specific statement on biodiversity which specifies a number of (general) commitments for the way forward.

D. The Communication from the EU Commission on "Halting the loss of Biodiversity by 2010 — and Beyond, Sustaining ecosystem services for human well-being" addresses 10 priority objectives across 4 key policy areas, see further http://ec.europa.eu/environment/nature/index_en.htm

Time is very short to reach the 2010 target and since reactions in ecosystems and species populations normally take time, sometimes long, all countries need to improve their commitment and actions to effectively implementing measures to achieve the target. It is necessary to break down the general 2010 target into specific targets that are simple to identify, manage and measure and communicate in practice. Countries must set such specific targets for how much wetlands, how much heathlands, forests etc. of a certain type, content and function should be maintained in or restored to a favourable condition, and when, and for which species populations and genetic resources specific or general measures must be taken. Unless targets are clear the success in reaching the 2010 target cannot be estimated. This is the reason why there is a wide interest in establishing monitoring and indicators that can support assessment of the distance to the general and specific targets.

1.3 Footprints

Europe impacts more than ever on the rest of the world and on its biodiversity. Such impacts or footprints have in the past largely been ignored but are now gradually being analysed. Though some footprints may be positive (e.g., restoration of wildlife), most are considered harmful to local biodiversity:

- effects of trade in biological products
- tourism
- introduction of European species to other continents, where they are alien
- European use of the world's biodiversity resources (WWF, *Living Planet Report 2002*), including genetic resources.

1.4 Goods and services

With the recognition of the integrated importance of biodiversity, it is becoming conceptually simpler to understand it, because it can be expressed partly in terms of the value of goods and services related to:

- nature conditions
- socio-economic conditions
- environmental functions
- scientific importance.

The UN-supported Millennium Ecosystem Assessment project is bringing this concept forward in a global assessment of ecosystem goods and services such as food and

products, health, water and climate, which since 2003 is linked closely to the CBD process.

Although the understanding of the importance of biodiversity is thus finding its way into many policies and practices, this does not by itself solve problems and can create widely contradictory views and wishes. Many questions cannot be answered with a yes or no. They will remain in focus, the focus may change and there will be a need for continued deliberation (Box 4). To put it strongly: Europe will in the future have the biodiversity it decides to have now. It is 'Our future, our choice'.

Box 4. Some of the main questions on biodiversity

Protecting biodiversity

- When is nature protection taken far enough to ensure a long-term future for wild-living species and habitats?
- What is more effective in protecting biological diversity: the integration of biodiversity issues into sectoral and resource-based policies or specific nature protection policies?
- Will there be increased geographical differences between intensively used production areas and areas with nature and environment protection functions or will it be possible to have mosaic cohabitation of land use?
- How do the new man-made habitats and nature restorations contribute to protecting biodiversity?
- How should nature areas be used for recreation and tourism while at the same time protecting vulnerable species or formations?

Agriculture, forestry, fisheries, hunting

- How do agricultural, forest and fisheries policies impact on biodiversity? Is intensification of land use going to end and land take to stop? What ensures most wild-living species a future: for example certification of forests, subsidies to grazing of permanent grasslands etc.
- What will be the result of the opposite development, land abandonment, in the short and long term?
- Will land continue to be fragmented into smaller and smaller units?
- How do the choices and management of crops and cattle breeds and numbers influence wild-living biodiversity? What will be the result of using bio-controlling organisms?
- How do demands for wood change the forest composition and distribution?
- How should the import or development of new species or variants be controlled against invasiveness and the transfer of genes to wild and cultivated species?
- How will hunting and game management influence biodiversity?
- Which plants and animals can still be taken into economic use?
- What are the best ways to safeguard effectively over a long time the genetic resources both of wild species and of cultivated and domesticated organisms?



A traditional pig breed (Linderödssvin)

Photo: Tor-Bjorn Larsson

Urban and infrastructure area biodiversity

- How can urban area habitats, both in inner cities and garden belts, be developed to function positively for better climate and pollution reduction and for recreation and ecological awareness raising?
- How can those areas at the same time also be developed to house viable species populations and habitats?
- How can infrastructures be developed to ensure safety for traffic and wild animals?
- How to avoid severing animal populations and animal migration routes through infrastructures and through the security measures, set up to avoid traffic problems with animals?

Climate

- How will climate policies influence both endangered and common species, the forests and the other ecosystems?
- Will species continue to use the protected areas or will they disappear or move?
- Will the Kyoto Protocol be the most important policy instrument for forest composition and coverage in the future?

International perspective

- Does Europe protect its own biodiversity at the expense of other global regions?



Infrastructure and biodiversity frequently collide.

Photo: Linus Svensson

2. Characteristics of Europe's biodiversity – a background

2.1 Land and climate

Europe stretches from the Arctic over the temperate and just into the subtropical climatic zone of the Northern hemisphere: the continent covers about 3 850 km from north to south and more than 5 000 km from west to east, not including the smaller Atlantic islands. Much of Europe was radically influenced by the glaciations. As a continent, Europe is highly indented and has a long and complex coastline, with many islands and peninsulas of all sizes. This means that there is a large oceanic influence from the surrounding seas in north, western and southern Europe, but the seas are also very different, ranging from enclosed to totally open seas (Map 2).

The soils of Europe vary greatly, even over short distances, but are represented by a limited number of types compared with the rest of the world. The basic morphology was formed during four mountain-building phases, which left mountains or high-lying areas all along the southern, eastern and north-western rims while contiguous lowlands from the west, fanning out to the centre and the east and north, were opened up. These structures set the scene for the glaciations and for the subsequent mosaic landscape pattern and for the overall and local climates (Map 3).

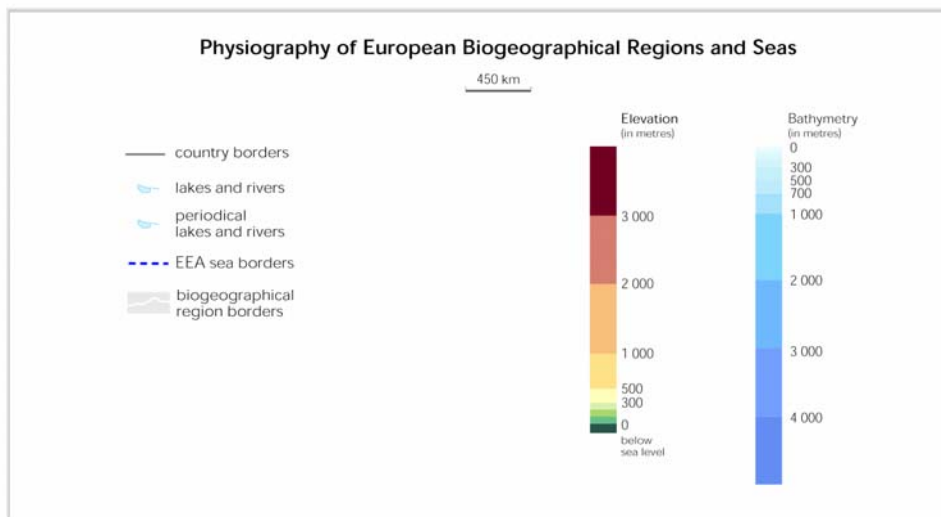
Europe's climate is generally predicted to change in the coming century despite ongoing

climate controlling efforts:

- general temperature increases are foreseen at around 1–2 degrees C, higher in south and eastern Europe
- sea levels rising from 0.1 to 0.9 m
- increased precipitation in the north and decreases in the south and west (EEA, 2003).

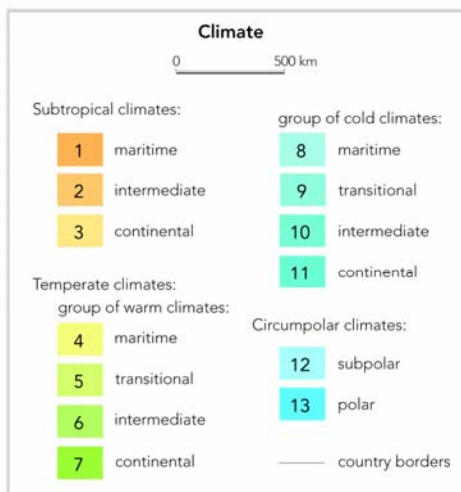
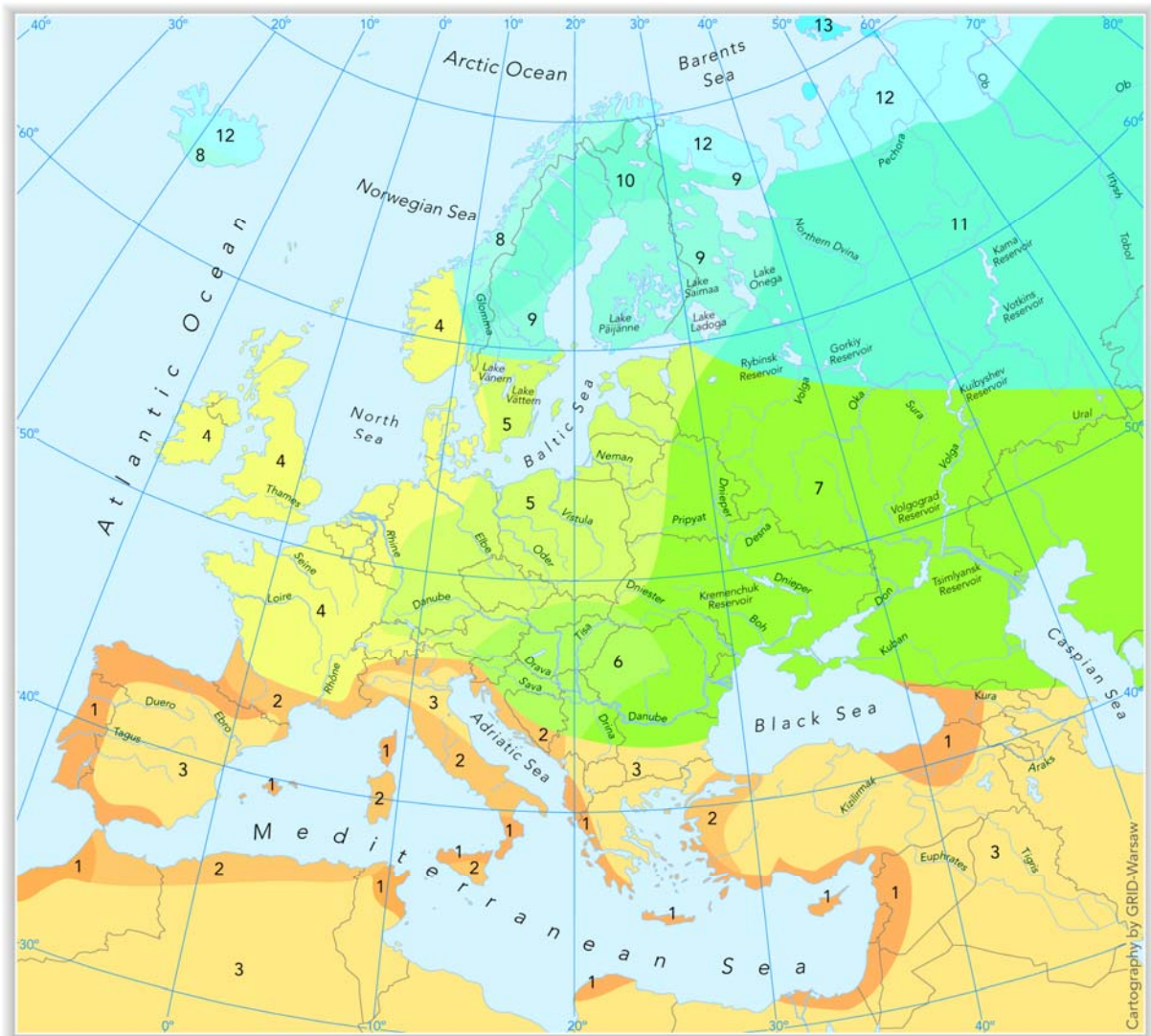
Already saltwater fish and plankton are reported to move northwards along the Atlantic coasts of Europe with an average speed of 50 km per year. This means for instance that fish such as the anchovy once mostly known in Portugal is now appearing in the North Sea and the cod is moving northwards, maybe out of the North Sea (see marine chapters).

Map 2. The physiography of Europe.



Source: UNEP/GRID Warsaw, final map production.

Map 3. Main climates of Europe.



Source: UNEP/GRID Warsaw, final map production.

2.2 The most cultivated and fragmented continent

Europe is the most cultivated continent in the world, deeply influenced by a long history of cultivation and use, by dense population in many parts and hence by an old and ever-growing need and competition for land. Europe is the continent with overall the largest urbanised area, the densest infrastructure and the most converted surface.

In virtually every area – small or large – human activity or the effects of human activity are seen directly or indirectly in land and sea use and management, in the use of species or species compositions, in influences from urbanisation and infrastructure and the influx of chemicals and in disturbance even in the most remote places. Climate change is now expected to have a strong influence on many parts of the continent and its seas, whether they are protected or not. The landscape has never been so fragmented as now. Nature and consequently many populations are confined to an ever smaller area and many of the species that cannot move over large distances are becoming more and more isolated.



*A landscape of long-time cultural influence. Umbria, Italy
Foto: Tor-Bjorn Larsson*

In the EU-15 countries of Europe 80 % of the population lives in urban areas, less in other parts of the continent, but overall the demographic movement is from rural to urban areas. This means changes in attitudes to environment and to biodiversity, which may seem contradictory. The self-experienced knowledge, understanding and awareness of environmental and biodiversity conditions outside urban areas is thereby decreasing. For a majority, the common and wide spread biodiversity is not familiar, while biodiversity hotspots and biodiversity experience tourism are in focus, not the least through television information and during the last decade also through tourism operators. This may in vulnerable areas induce a tourism pressure, which can be a threat to the sites, but which can also lead to an enlarged awareness. In urban everyday life the green neighbouring areas are the most used for daily recreation, though the biodiversity is not much known. In several cities throughout Europe, however, green guides are now offering local nature tours. Such areas may be of all kinds and often harbour rich, but

very mixed biodiversity of local and introduced origin: old and new managed parks, natural lakes and water reservoirs, bits of old forests and areas which have gone wild such as abandoned harbour or railroad areas or building sites. Many people and especially children in the European urban areas find their first 'wilderness' experience in those areas.



*The touristic pressure is high in some parts of Europe. Gran Canaria, Spain
Photo: Tor-Bjorn Larsson*

Europe has still some very large wilderness areas, which are truly natural and largely undisturbed in both terrestrial and aquatic habitats, but they now only occur in limited and decreasing areas:

- in high mountains
- on remote islands
- in the upper reaches of river systems
- in old unmanaged forest areas (natural forests)
- in unexploited clean sea areas.

Europe's wildlife is linked directly to the conditions of Europe's neighbouring continents and seas by the exchange of migratory birds (Box 5) and fish (often in large numbers of individuals), and other species groups such as marine mammals (seals, whales) and insects such as some butterflies. Living conditions in Europe influence the survival of many of these species on other continents and vice versa.

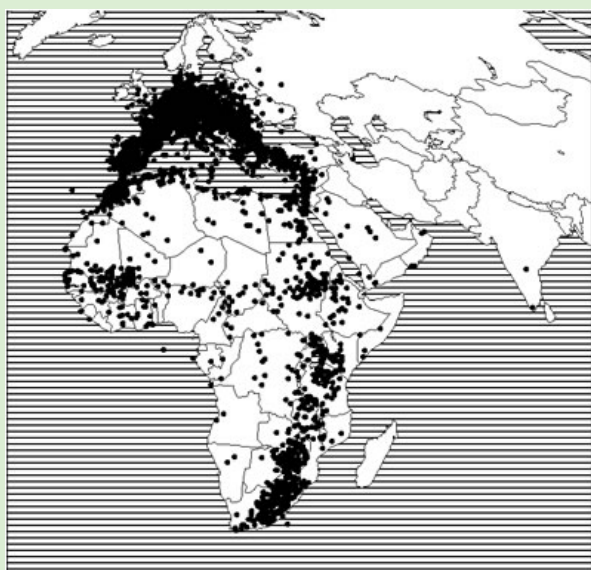
Within Europe large migratory processes take place between regions and countries, including as well as birds and fish also such groups of species as bats, carnivores and large herbivores. The migration of domesticated animals – transhumance– was once much more important than now and covered cattle, sheep, goats, horses and reindeer. It is still maintained in parts of some countries and regions, for example Austria, France, Germany, Iceland, the Russian Federation, Scandinavia, Spain and the United Kingdom, and is now often supported by modern equipment, and concentrated mostly on animals not needing milking such as sheep, reindeer and horses.

Box 5. Migrating birds link the continents

Bird migration routes differ according to the species and their strategies for survival, their habitat and food needs and the distance they can cover. Success depends on the availability of a favourable pattern of sites along the route from winter to summer quarters and back.

There are many small and large migration routes for different species, but the most spectacular are the two main migration routes connecting Europe with Africa, in the west directly and in the east via Asia Minor. The white stork (*Ciconia ciconia*) illustrates this (Map 4).

Map 4. Recovery of ringed white storks (*Ciconia ciconia*).



Source: EURING (European Union for Bird Ringing). White stork photo & copyright: Linus Svensson, ZooBoTech.

3. Acknowledgements

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All published final versions of chapters have comments made by experts from the countries relevant to the particular biogeographical region or regional sea incorporated.

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The report has been written and edited using an extensive amount of information obtained via the Internet. However, web sites are not stable and even after a relatively short time much information (databases, documents) is no longer accessible or has been updated. Internet links were last checked as indicated in the bibliographies for each chapter.

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