EU 2010 Biodiversity Baseline

Post-2010 EU biodiversity policy

European Environment Agency

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Post-2010 EU biodiversity policy

The vision

'By 2050 European Union biodiversity and the ecosystem services it provides – its natural capital – are protected, valued and appropriately restored for biodiversity's intrinsic value and for their essential contribution to human wellbeing and economic prosperity, and so that catastrophic changes caused by the loss of biodiversity are avoided'.

The headline target

'Halting the loss of biodiversity and the degradation of ecosystem services in the EU by 2020, and restoring them in so far as feasible, while stepping up the EU contribution to averting global biodiversity loss'.

In January 2010, the Commission presented a series of options for an EU biodiversity policy vision and target beyond 2010 (EC, 2010). Recognising the urgent need to reverse the trends of biodiversity loss and ecosystem degradation, on 26 March 2010 the European Council endorsed the long-term biodiversity vision and the 2020 headline target adopted by the Environment Council on 15 March 2010 (European Council, 2010).

Unlike other EU policy areas, for example climate change, the complexity of biodiversity and ecosystems mean that their status cannot be expressed with a single measure or indicator. The Council therefore called on the Commission to define a limited number of ambitious, realistic, achievable and measurable sub-targets.

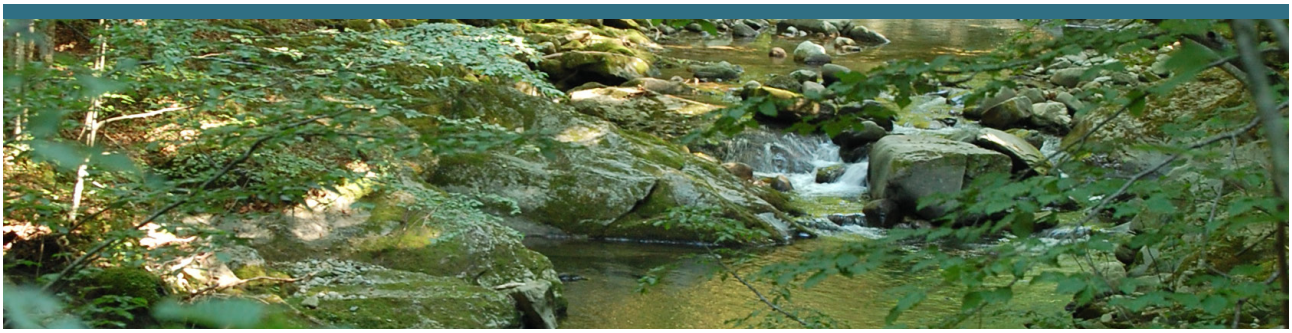
The EU 2010 Biodiversity Baseline provides facts and figures on the state and trends of the different biodiversity and ecosystem components. It thereby supports the EU in developing the post-2010 sub-targets and provides factual data for measuring and monitoring progress in the EU from 2011 to 2020. The baseline is not a target, but rather a reference point.

The main concern building the baseline was ensuring that the facts and figures are scientifically robust and validated or peer reviewed by Member States. It was a priority to make full use of data already reported pursuant to the Birds and the Habitats Directives and other relevant directives, as well as existing indicator sets such as SEBI 2010. Preference was given to data sets that are subject to continuing monitoring and reporting. What is known in 2010 must also be measured up to 2020.

The focus was on the EU-27 but several data sets extended to other geographical scopes. The most recent available data were used, meaning some variance in the time periods used for different indicators (as detailed in the baseline technical report to be published by the EEA in September 2010).

'Baseline: the starting point (a certain date or state) against which the changes in the condition of a variable or a set of variables are measured.' This definition from the Convention on Biological Diversity (1997) was used to develop the EU baseline.

Biodiversity and ecosystems



Biodiversity includes all living organisms found on land and in water. All species have a role and provide the 'fabric of life' on which we depend: from the smallest bacteria in the soil, to the largest whale in the ocean. The four basic building blocks of biodiversity are genes, species, habitats and ecosystems.

The distribution of wildlife and the variety of landscapes in Europe are the product of complex interactions. The basic physical qualities of the rock, soil and climate provide underlying structure and continuing influence. But the majority of the detail has been shaped through millennia of natural processes and human activity, the history of land use and management and its associated impacts. Human activities are themselves driven by economic, social, and environmental forces.

As a result of these interactions, which are particular to Europe, 'multifunctional landscapes' have developed in which traditional cultural practices sustain a range of economic, social and environmental services. Significantly, these practices support a diversity of characteristic plants, animals and habitats. Europe's influence also extends well beyond its geographical boundaries, however, so that it can truly be said to have a global influence. As well as its own landscapes, Europe must concern itself with the coral reefs and rain forests of dependent territories and beyond.

Genes. Genes are the basic building blocks of life. They determine the characteristics of all living organisms. Maintaining genetic diversity by conserving species and varieties is a cornerstone of nature conservation.

Species. Nearly two million species have been identified worldwide and it is estimated that these may represent only 20 % of the total currently existing on Earth. Soils alone host over one quarter of all species. Apart from micro-organisms, insects are the biggest and most varied group. Other large groups include fungi, plants, lichens and mosses. Compared to other continents, Europe and the EU have a relatively few species, although many are only present in the region (i.e. they are endemic).

Habitats. Different species of plant and animal come together to form ecological communities in a given area or natural environment called habitats. A habitat includes physical factors such as soil, moisture, temperature and light. Habitats are formed in response to local environmental conditions such as soil type and climate. In Europe human activities have played a major part in shaping and creating habitats that are of high biodiversity value (e.g. meadows).

Ecosystems. An ecosystem can include one or many different habitats. Healthy ecosystems help to maintain species and habitats as well as providing critical 'goods and services' to human beings.

Why does biodiversity matter?

Ecosystems provide a number of basic functions that are essential for using the Earth's resources sustainably. They include **provisioning** in the form of harvestable products such as food, drinking water and raw materials; **regulating** functions such as carbon sequestration, waste treatment or slowing the passage of water; **cultural** services that directly involve people; and **habitat or supporting** services that are needed to maintain other services, and which include genetic diversity and maintenance of all life cycles.

The serious and continuing loss of Europe's biodiversity reflects the continuing decline in the ability of ecosystems to sustain their natural production capacity and perform regulating functions. For instance, healthy soil biodiversity is fundamental to maintaining and ensuring soil fertility and therefore production potential.

The importance of maintaining these goods and services has been widely recognised. As the Secretariat to the Convention on Biological Diversity (CBD) has observed:

'The loss of biodiversity often reduces the productivity of ecosystems, thereby shrinking nature's basket of goods and services, from which we constantly draw. It destabilizes ecosystems, and weakens their ability to deal with natural disasters such as floods, droughts, and hurricanes, and with human-caused stresses, such as pollution and climate change. Already, we are spending huge sums in response to flood and storm damage exacerbated by deforestation; such damage is expected to increase due to global warming' (CBD, 2010).

The World Bank estimates, for example, that the difference between the potential and actual net economic benefits from global marine fisheries is as much as EUR 40 billion annually (TEEB, 2009).

Animal and plant life has always provided inspiration to humankind. This is evident in the startling and awe-inspiring paintings discovered deep in European caves, depicting a range of now extinct animals that provided food for the early hunter gatherers. It is also apparent in the philosophical lessons in Aesop's fables and the iconic images of power, grace and beauty that have provided symbols to convey national pride and identity; and which are now so frequently used by the advertising industry to promote every product imaginable.

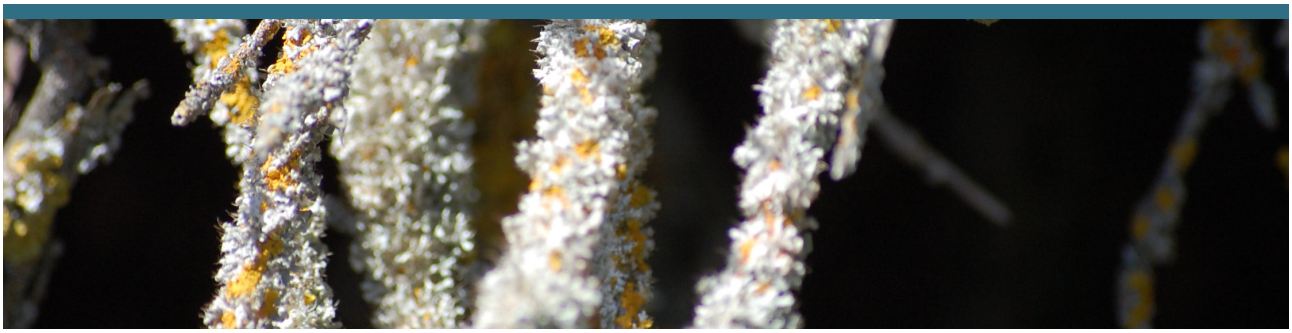
The effects of industrialisation across Europe have led to rural depopulation and people everywhere have lost partially or completely their traditional relationship with nature. Nevertheless we have continual evidence of the value of the natural world to human well-being. Patients that can see green trees and grass from their hospital windows heal quicker than those that cannot. Ecotourism is at an all time high. Public interest in biodiversity has never been higher.

The contribution of biodiversity to human well-being is becoming more explicit. Increasingly we associate the food we eat, our clothes and building materials, our domestic animals and plants with 'biodiversity', and see it as a vital resource that needs to be managed sustainably and provided with protection. In an era of increasing environmental extremes, of floods, hurricanes and landslides, there is a growing recognition that biodiversity mitigates these impacts — from natural flood and erosion control to carbon sequestration and pollution management.

According to the RUBICODE project (2009), most ecosystem services in the European Union are 'degraded' — no longer able to deliver the optimal quality and quantity of basic services such as crop pollination, providing clean air and water, or controlling floods and erosion.

Finally, as an example of the importance of biodiversity, we need look no further than the honey bee. This small and often undervalued organism has declined alarmingly as a result of several factors including the widespread use of pesticides. As its numbers and those of other pollinators have declined, so have the yields of some crops depending on them. It turns out to be a key link in a complex web of ecological relationships that provide us with food. Without action to reverse its decline and the decline of all other pollinators we stand to lose much more than a friend to beekeepers, gardeners and farmers.

Progress in the last decade



The European Union responded comprehensively to the United Nations Convention on Biodiversity (CBD), adopting a Biodiversity Strategy in 1998, which provided a wider framework for the nature directives — the Birds Directive (EC, 2009a) and the Habitats Directive (EC, 1992). The Strategy led to the adoption of four Biodiversity Action Plans addressing major policy sectors impacting biodiversity: conservation of natural resources, agriculture, fisheries and economic and development cooperation.

In 2001, EU Heads of State and Governments took the decision to halt biodiversity loss by 2010. The objective to achieve a significant reduction in the rate of biodiversity loss at the global, regional and national level by 2010 as a contribution to poverty alleviation was subsequently adopted by the World Summit on Sustainable Development in 2002.

In 2004, the Conference of the Parties to the CBD adopted a global framework for evaluating progress, including a first set of indicators grouped into focal areas ([1]). These were taken up within the European Union later that year and were subsequently adopted at pan-European level in 2005.

A set of 26 biodiversity indicators was agreed under the Streamlining European 2010 Biodiversity Indicators process (SEBI 2010) a partnership led by the European Environment Agency and involving country representatives and experts from across the European Union and beyond (EEA, 2007).

At the end of 2008 the European Commission published a first assessment of EC Biodiversity Action Plan implementation using the SEBI 2010 indicators (EC, 2007). This showed that some progress was being made in relation to certain Action Plan objectives, targets and actions. Much of the observed progress relates to existing commitments, especially in implementing environmental legislation.

([1]) Decision VII/30 on Strategic Plan: future evaluation of progress.

Where do we stand in 2010?

A summary of the main 'facts and figures' on the status and trends of EU biodiversity is given in the annex to the present document. The information is extracted from a series of papers compiled by the European Environment Agency and its European Topic Centre on Biological Diversity, which will be published later in the year as an EEA Technical report.

Although species extinction in the EU is not occurring nearly as rapidly as in other regions and continents, the percentage of species threatened with extinction is still a matter of concern, as demonstrated in recent IUCN assessments.

The percentage of threatened species in the EU is presented below:

Marine mammals	25 %
Amphibians	22 %
Reptiles	21 %
Dragonflies	16 %
Terrestrial mammals	15 %
Birds	12 %
Butterflies	7 %

The first comprehensive health check — a summary of the conservation status of EU habitats and species targeted by the Habitats Directive — was published in 2009 (EC, 2009b). Its core findings were as follows:

Conservation status	Favourable	Un-favourable	Unknown
Habitat types	17 %	65 %	18 %
Species	17 %	52 %	31 %

- Biogeographical assessments revealed that only 17 % of habitats and species examined are in 'favourable' condition. This may not be surprising given that the poor condition of most of the habitats and species was the main reason for their inclusion in the Annexes of the Habitats Directive
- The percentage of habitats and species whose status is 'unknown' is relatively high: 31 % for all species but reaching 59 % for marine species; 18 % for all habitats but reaching 40 % for marine habitats. This is an indication of the lack of appropriate monitoring in many parts of Europe, particularly in the marine environment.
- Recent data from the last available Corine Land Cover inventory (EEA, 2010) indicate that areas of extensive agriculture, grasslands and wetlands continue to decline across Europe. The biggest changes in ecosystems between 1990 and 2006 are as follows:
  - 5.0 % decline in wetland areas (marshes and bogs);
  - 2.6 % decline in extensive agriculture land;
  - 2.4 % decline in natural grassland area;
  - 4.4 % growth in water bodies (artificial reservoirs);
  - 7.9 % growth in artificial surfaces (urban, industrial, infrastructures);
  - 12.0 % growth in transitional land (woodland degradation, forest regeneration and recolonisation).

Analysing conversions between land uses in recent years, a continued increase in land abandonment, urban sprawl and other artificial infrastructures is apparent. This continues to fragment and place pressure on natural and semi-natural areas. The EEA estimates that nearly 30 % of EU land is highly fragmented.

Other important indicators of the state and trends of biodiversity and ecosystems include the following:

- Invasive alien species remain a threat, increasingly so in marine systems and in the context of a changing climate.
- The impacts of changing climate are just beginning to emerge and the wider ecosystem implications have not yet been fully recognised. However, many ecosystems have been degraded, thereby reducing the capacity to respond to future shocks such as the effects of climate change.
- Agriculture still exerts considerable pressure on the environment despite agricultural mitigation measures and steadily increasing organic farming (whose area has increased by 21 % between 2005 and 2008).
- In marine systems many fishery resources are still not being managed sustainably, with some 46 % of assessed European stocks falling outside safe biological limits and 88 % of species overfished.
- Europe cannot sustainability meet its consumption demands from within its own borders and the gap between demand and production capacity has grown steadily since 1960. In addition, pressures that occur outside the European territory but have an impact in Europe (for example on migratory bird species or within dependent territories) need to be addressed.
- Estimates of EU actual spending on biodiversity are not widely available. The financial perspectives for 2007–2013 opens opportunities for co-financing of biodiversity under the European Agricultural Fund for Rural Development (EAFRD), the Cohesion and Structural Funds, LIFE+ and the 7th Framework Research Programme. However, the best estimates on expenditure are those of the LIFE programme, which amounts to less than 0.1 % of the EU budget in any year.
- Public support and awareness to promote and fund biodiversity conservation has increased with opinion polls across the EU showing that in 2007 two thirds of citizens did not understand the word biodiversity, but by 2010 this had reduced to one third.

However, progress is being made in some areas. For example, the establishment of Natura 2000 has progressed well in the terrestrial environment, with nearly 18 % of the EU land designated, and there is some (still insufficient) progress in the marine environment.

Specific EU legislation in the following areas has also reduced pressure on biodiversity:

- atmospheric emissions, freshwater quality and wastewater treatment;
- pressures from agriculture, addressed directly by reducing nitrogen losses and indirectly by increasing organic farming, with varying success;
- acidification and eutrophication from excessive nitrogen accumulation are declining and nitrogen balances of farmlands are decreasing;
- water quality has improved in freshwaters and, indeed, the state of freshwater systems is improving generally and the marine environment is stable;
- forest cover is still slightly increasing in Europe and timber harvest from European forests is generally sustainable in terms of wood volume harvested.

Natura 2000	**No. of sites**	**Surface area (km²)**
Total	25 828	922 271
Special protection areas (birds)	5 242	574 819
Special areas of conservations (habitats)	22 419	716 992
Terrestrial surface area		754 710
Marine surface area		167 561

Future developments

Setting a post-2010 EU vision and target for biodiversity in March 2010 marked the beginning of a process to put a new EU biodiversity strategy in place. According to the European Commission, further preparatory work is planned in the course of 2010, including additional stakeholder consultations. These efforts will underpin the future EU policy framework and the strategy and objectives at the global level, which are to be addressed by the Conference of the Parties to the Convention on Biological Diversity at its tenth meeting in October 2010.

Important new initiatives being prepared include developing an EU framework on invasive alien species, a draft soil framework directive, addressing biodiversity issues in a wider territorial context (e.g. the Green Infrastructure initiative), strengthening partnerships on business and biodiversity, communicating biodiversity ([2]) and finalising the review of The Economics of Ecosystem and Biodiversity loss (TEEB).

Reinforced integration of biodiversity and ecosystem options and priorities into other policies in the coming years will continue to be a priority. Reform of the Common Agriculture Policy and the Common Fisheries Policy and of regional and cohesion policy presents unique opportunities.

Concerning existing legislation, the full implementation of the nature directives can still deliver a lot in terms of maintaining and restoring biodiversity and ecosystems, namely through appropriate management of Natura 2000. The LIFE+ programme has considerably enlarged the possibility of cofinancing biodiversity projects, not only through the nature and biodiversity strand but also the part on environment policy and governance, including green infrastructures, soil biodiversity in farmland, water bodies, urban, and coastal areas.

Other opportunities will appear from continued implementation of the Water Framework Directive, which takes an ecosystem-wide approach to water catchment management including a requirement to reach good ecological status.

The Marine Strategy Framework Directive will also provide a significant opportunity to redress some currently biodiversity problems within the marine environment. Work on 'marine no-take zones' is already beginning to show the benefits that this approach can have for biodiversity and fisheries. Furthermore, the Directive target 'good environmental status' in all EU marine regions by 2020.

Several initiatives are under way to help collecting, harmonising and providing access to data needed for appropriate assessments (biological, remote sensing, geographical, etc.). These include the Shared Environmental Information System (SEIS), the Inspire Directive, Global Monitoring for Environment and Security (GMES), the Global Earth Observation System of Systems (from the international Group on Earth Observation).

Closely linked to the EU vision and headline target is the EU 'overseas dimension'. These territories are located in important biodiversity hotspots (e.g. hosting some 10 % of global tropical coral reefs), major wilderness areas (e.g. tropical rain forests) and key regions (e.g. polar ecosystems and fish stocks).

Efforts are under way to promote conservation and sustainable use of biodiversity and ecosystem services in European overseas entities, inspired by the experience with EU nature conservation legislation.

Europe's demand for natural resources has impacts far beyond its geographical boundaries. In addition

([2]) Awareness raising on biodiversity includes the European Commission biodiversity campaign (http://ec.europa.eu/environment/biodiversity/campaign) and the EEA 10 messages for 2010 (www.eea.europa.eu/publications/10-messages-for-2010).

to its impact on and around the continent, Europe needs to address the global dimension of its consumption, which affects a wide range of ecosystems across the planet from tropical coral reefs to rainforests. In this context, the following indicators are particularly relevant:

- between 12 % and 55 % of selected vertebrate, invertebrate and plant groups are threatened with extinction globally; the decline of wild vertebrate species between 1970 and 2006 is especially severe in the tropics (59 %) and in freshwater ecosystems (41 %) (GBO3, 2010);
- the rate of tropical deforestation decreased near 20 % in the last decade (2000–2010); however, 13 million hectares are still lost each year (equivalent to the surface of Greece) (FAO, 2010);
- nearly 20 % of the world's tropical coral reefs are already lost and an additional 50 % is at risk; more than 10 % of coral reefs are located in the overseas territories of EU Member States (IUCN, 2010);
- only 0.7 % of the oceans are protected (WDPA, 2010);
- globally, ocean acidity increased by 30 % in the last 150 years, mainly due to increased CO_2 emissions (UNEP, 2009);
- Europe is currently consuming twice what its land and seas can produce; the European Ecological Footprint increased by 33 % in the last 40 years (Global Footprint Network, 2008).

Finally, further development of biodiversity research and of science-policy interfaces would strengthen the knowledge base underpinning biodiversity policy and its monitoring.

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Annex

Summary of statistics and indicator data

Species threatened with extinction (EU Regional Red Lists)

Group/IUCN category	Threatened (CR, EN, VU)	Data Deficient (DD)	Stable and increasing trend
Mammals — marine	25 %	44 %	40 %
Mammals — terrestrial	15%	5%	
Birds	12 %	0 %	62 %
Amphibians	22 %	1 %	38.5 %
Reptiles	21 %	2 %	44.6 %
Dragonflies	16 %	2 %	64 %
Butterflies	7 %	1%	59 %
There is no assessment at EU level yet but at European level 38 % of freshwater fish are threatened.			

Source: IUCN (2007, 2009, 2010); BirdLife International (2004).

Changes in ecosystems between 1990 and 2006 — based on Corine Land Cover ([3])

Ecosystem	Surface change (km²)	Change in %	Mainly due to
Agro-ecosystem (intensive and heterogeneous, agro-forest)	– 12 611	– 2.0	Economic sites and infrastructures sprawl Urban diffuse residential sprawl
Agro-ecosystem (extensive)	– 4 476	– 2.6	Creation of forests and afforestation Conversion to agriculture
Grasslands (pastures)	– 2 553	– 0.9	Conversion into arable and permanent crops Economic sites and infrastructures sprawl
Grasslands (natural)	– 1795	– 2.4	
Heath and scrubs	+ 13 245	+ 5.9	Abandonment of agro-ecosystems and grassland
Forests	+ 5 378	+ 0.6	Afforestation of agro-ecosystems and wetlands
Wetlands (marshes/bogs)	– 1 266	– 5.0	Creation of forests and afforestation Conversion into agriculture

Source: EEA-ETC/LUSI-ETC/BD (2010).

Artificial surfaces increase: + 12 535 km² (+ 7.9 %)

([3]) EU-27 except Greece, Finland, Sweden and the United Kingdom for which one or more of the data sets are missing.

Habitats, species and sites from nature directives

Conservation status	Favourable	Unfavourable	Unknown
Habitat types	17 %	65 %	18 %
Species	17 %	52 %	31 %

Source: EEA-ETC/BD, 2008.

Natura 2000	Number of sites	Surface area (Km²)
Total	25 828	922 271
SPAs (Birds Directive)	5 242	574 819
SCIs/SACs (Habitats Directive)	22 419	716 992
Terrestrial surface area (17.6 %)		754 710
Marine surface area		167 561

Source: EC, 2010.

Ecosystems

Agro-ecosystem

Conservation status	Favourable	Unfavourable	Unknown
Habitat types	7 %	76 %	17 %
Species	3 %	70 %	27 %

- Common farmland bird index (1990 = 100): 2007 = decline of 20 to 25 %
- Percentage of threatened agro species from nature directives

Mammals	Birds
25 %	42 %

- Organic farming — proportion of total agricultural area: 4.5 %
- Change in surface (1990–2006):
  – intensive/irrigated/heterogeneous cultures: – 12 611 km² (– 2.0 %)
  – extensive agriculture: – 4 476 km² (– 2.6 %)

Grasslands

Conservation status	Favourable	Unfavourable	Unknown
Habitat types	5 %	76 %	19 %
Species	15 %	56 %	29 %

- Percentage of threatened grassland species from nature directives

Amphibians	Reptiles	Mammals	Birds
28 %	12 %	16 %	23 %

- Grassland butterflies index (1990 = 100): 2007 = 40 (60 % decline)
- Change in surface (1990–2006):
  – pastures: – 2 553 km^2 (– 0.9 %)
  – natural grasslands: – 1 795 km^2 (– 2.4 %)

Heath and scrub

Conservation status	Favourable	Unfavourable	Unknown
Habitat types	14 %	60 %	26 %
Species	13 %	47 %	40 %

- Percentage of threatened heath and scrub species from nature directives

Amphibians	Reptiles	Mammals	Birds
none	8 %	21 %	19 %

- Change in surface (1990–2006):
  – heath and sclerophyllous vegetation: – 2 682 km^2 (– 2.9 %)
  – transitional land: + 15 927 km^2 (+ 12.0 %)

Forests

Conservation status	Favourable	Unfavourable	Unknown
Habitat types	21 %	63 %	16 %
Species	15 %	52 %	33 %

- Percentage of threatened forest species from nature directives

Amphibians	Reptiles	Mammals	Birds
8 %	10 %	27 %	11 %

- Saproxylic beetles: 14 % of species are threatened and declining
- Area of exotic forest dominated by invasive tree species: 13 %
- Increase of deadwood 1990–2005 = + 4.3 %
- Change in surface (1990–2006): + 5 378 km^2 (+ 0.6 %)

Wetlands

Conservation status	Favourable	Unfavourable	Unknown
Habitat types	10 %	73 %	17 %
Species	14 %	64 %	22 %

- Loss of wetlands until mid-90s: > 60 %
- Percentage of threatened wetland species from nature directives

Amphibians	Reptiles	Mammals	Birds
15 %	25 %	15 %	16 %

- Change in surface (1990–2006):
  – marshes and bogs: – 1 266 km^2 (– 5.0 %)

Rivers and lakes

Conservation status	Favourable	Unfavourable	Unknown
Habitat types	15 %	64 %	21 %
Species	13 %	64 %	23 %

- Alien species — total number in freshwater: ca. 140
- Percentage of threatened river and lake species from nature directives

Amphibians	Reptiles	Mammals	Birds
15 %	33 %	22 %	15 %

- Dragonflies: 16 % of species are threatened
- Change in surface (1990–2006): + 1 581 km^2 (+ 4.4 %)
- Nitrate concentration in rivers — average: 2.5 mg N/l, 10 % lower than 1998

Coastal ecosystem

Conservation status	Favourable	Unfavourable	Unknown
Habitat types	8 %	70 %	22 %
Species	11 %	56 %	33 %

- Artificial areas – increase of surface in the coastal zone: + 8 % (1990–2000)
- Percentage of threatened coastal species from nature directives

Amphibians	Reptiles	Mammals	Birds
none	16 %	20 %	12 %

- Change in surface (1990–2006):
  – dunes, saltmarshes, salines: – 34 km^2 (– 0.6 %)
  – intertidal flats, lagoons, estuaries: + 43 km^2 (+ 0.3 %)

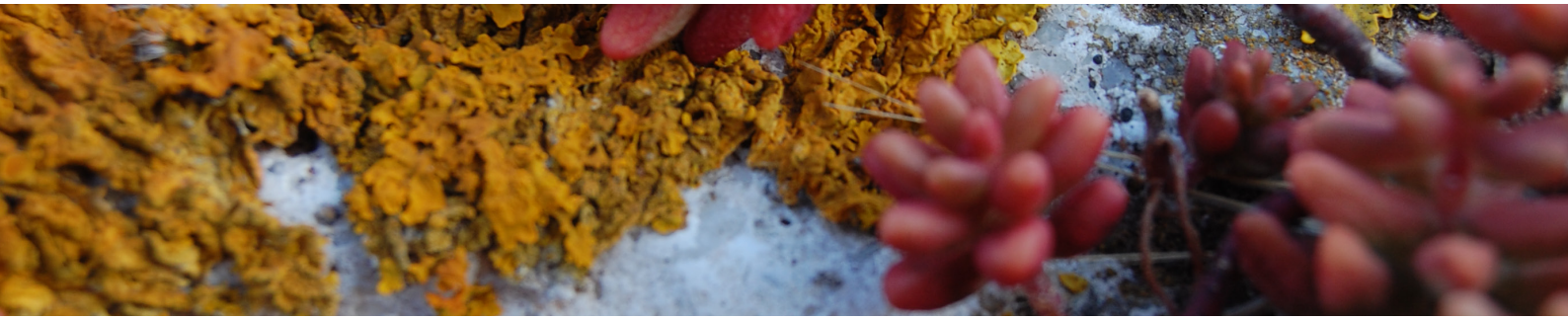
Marine ecosystem

Conservation status	Favourable	Unfavourable	Unknown
Habitat types	10 %	50 %	40 %
Species	2 %	24 %	74 %

- Percentage of threatened marine species from Nature Directives (marine turtles not assessed at EU-27 level)

Mammals	Birds
15 %	12 %

- Alien species — total number in marine/estuarine waters: ca. 1 400
- Marine Trophic Index: declining in all European seas
- Percentage of stocks overfished (Maximum Sustainable Yield): 88 %
- Commercial fish stocks outside safe biological limits: 46 %.



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