



Scientific Facts on **Biodiversity** A Global Outlook

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GreenFacts

Level 2 - Details on Biodiversity

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This Digest is a faithful summary of the leading scientific consensus report produced in 2006 by the Convention on Biological Diversity (CBD):
"Global Biodiversity Outlook 2"

The full Digest is available at: <https://www.greenfacts.org/en/global-biodiversity-outlook/>



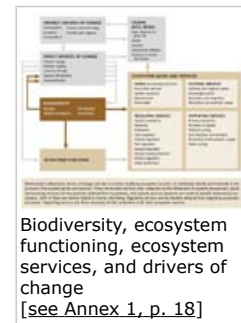
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1. Why is biodiversity loss a concern?

Biological diversity, or biodiversity, is the term given to describe the variety of life on Earth. It reflects the number, variety and variability of living organisms and how these change from one location to another and over time. Biodiversity includes diversity within species (genetic diversity), between species (species diversity), and between ecosystems (ecosystem diversity).



Ecosystems, whose functioning depends on biodiversity, provide the basic necessities of life (e.g., food, clean water and air), offer protection from natural disasters and disease (e.g., by regulating climate, floods and pests), and shape human cultures and spiritual beliefs. Besides those provisioning, regulating and cultural services they provide, ecosystems also support and maintain life processes such as biomass production and nutrient cycling (supporting services) which are essential to human well-being.

Out of the 24 ecosystem services that make direct contributions to human well-being, 15 are in decline.

The impact of humans on the natural environment is significant and growing, causing changes in biodiversity that have been more rapid in the past 50 years than at any time before in human history. As demographic pressures and consumption levels increase, biodiversity decreases, and the ability of the natural world to continue delivering the goods and services on which humanity ultimately depends may be undermined.

Biodiversity loss disrupts the functioning of ecosystems, making them more vulnerable to perturbations and less able to supply humans with needed services. The consequences are often harshest on the rural poor, who depend most immediately upon local ecosystem services for their livelihoods, and biodiversity loss poses a significant barrier to meeting the Millennium Development Goals.

To stop ecosystem degradation, the full contribution made by ecosystems to both poverty alleviation efforts and to national economies must be clearly demonstrated.

2. What are the Convention on Biological Diversity and its 2010 Biodiversity Target?

2.1 What is the Convention on Biological Diversity (CBD)?

Deep concern over the rapid loss of biodiversity and the recognition of its important role in supporting human life motivated the adoption, at the Rio Earth Summit in 1992, of the Convention on Biological Diversity, a legally binding global treaty.



The Earth Summit in 1992 led to the creation of the CBD. Source [see <http://www.mtholyoke.edu/~danov20d/site/history.htm>]

The Convention has three main objectives:

- the conservation of biodiversity,
- the sustainable use of its components, and
- the fair and equitable sharing of benefits arising out of the utilization of genetic resources.

Participation in the Convention is nearly universal, with 187 countries* currently members, a sign that the whole world is well aware of the need to work together to ensure the survival of life on Earth.

* In 2007, the CBD was signed by 190 parties, including 189 countries and the European Community.

2.2 What worldwide target has been set for biodiversity?

In 2002, the Conference of the Parties to the Convention adopted a Strategic Plan, with the mission "to achieve, by 2010, a significant reduction of the current rate of biodiversity loss at the global, regional and national level, as a contribution to poverty alleviation and to the benefit of all life on Earth"

This 2010 target was subsequently endorsed by the Heads of State and Government at the 2002 World Summit on Sustainable Development in Johannesburg, South Africa, and world leaders meeting at the 2005 World Summit of the United Nations reiterated their commitment to meeting the 2010 target.

In order to assess progress towards the 2010 Biodiversity Target, the Conference of the Parties adopted a framework of seven focal areas to guide action. For each of these seven focal areas, the Conference identified indicators for evaluating biodiversity status and trends, and outcome-oriented goals and targets, which act as sub-targets to the overall 2010 Biodiversity Target.

3. What is the role of biodiversity indicators?

3.1 What indicators are being used?

Parties to the Convention have established a number of indicators which summarize data on complex environmental issues to be addressed through policy or management interventions.

Indicators are important for monitoring the status and trends of biological diversity and for providing information on ways to improve the effectiveness of biodiversity policies and management programmes.

The indicators for assessing progress towards the 2010 Biodiversity targets cover seven focal areas which include:

- Reducing the rate of loss of the components of biodiversity, at the ecosystem, species and genetic levels. (See Question 4)
- Maintaining the integrity of ecosystems and their ability to provide goods and services, which support human well-being. (See Question 5)
- Addressing the major threats to biodiversity such as habitat change, invasive alien species, pollution and climate change. (See Question 6)
- Promoting the sustainable use of biodiversity. (See Question 7)
- Promoting traditional knowledge and practices. (See Question 8)
- Ensuring the fair sharing of the benefits of genetic resources. (See Question 8)

- Mobilizing financial and technical resources for the implementation of the Convention. (See Question 8)

3.2 Are those indicators suitable for assessing progress towards the 2010 Biodiversity Target?

The set of headline indicators developed under the Convention has been used to assess and communicate trends in biodiversity for the first time in the Global Biodiversity Outlook 2.

Some indicators can rely upon data that is already available to describe current trends in biodiversity, the drivers of change, and some response options.

However, only for some of those indicators are the data sufficient to determine a change in the rate of biodiversity loss by 2010. Such indicators might include among other things trends in habitat condition in certain types of ecosystems and trends in abundance and distribution of selected species.

For a number of indicators, however, available data cover too short a time period to determine current trends at the global level, or further development work is required.

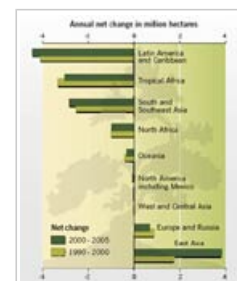
In conclusion, while comprehensive global scale measures to assess progress towards the 2010 target are still lacking, it is possible to describe trends in the status of biodiversity using those indicators together. More research is needed to improve the data and related indicator methodologies in order to be able to determine, with confidence, the general change in the rate of biodiversity loss by 2010, which is linked to the likelihood of reaching this target.

4. At what pace is biodiversity lost?

The first focal area of the 2010 framework consists in reducing the rate of loss of the various components of biodiversity at ecosystem, species, and genetic levels. Indicators under this focal area also include trends in protected area coverage and status of threatened species.

4.1 How is the extent of forests and other ecosystems changing?

Over the past 50 years, humans have changed ecosystems more rapidly and extensively than in any comparable period of time in human history. For most of the world's main habitats and ecosystems, the current global extent and rates of change are not known with high certainty, due partly to measuring difficulties. Forests are the exception since they often have direct commercial and/or scientific value. They are thus regularly inventoried and assessed in most countries.



Annual net change in forest area by region (1990-2005)
[see Annex 2, p. 18]

Forests currently cover about 30% of total land area, compared to about 50% before human influences became so extensive. This figure continues to decline due to deforestation, mainly conversion of forests to agricultural land and pasture, which continues at an alarmingly high rate, especially in the tropics. Tree planting, landscape restoration and natural expansion of forests have significantly offset the loss of primary forest area, especially in the temperate parts of the world, but the

biodiversity value of forest plantations and secondary forests is generally much lower than that of primary forests. Over the last 15 years, primary forest has been lost or modified at a rate of approximately six million hectares a year and currently make up only one third of total forest area.

General patterns of change in the extent of ecosystems across other biomes besides forests show similar negative trends. For instance, almost 70% of Mediterranean forests, woodlands and scrub, 50% of tropical and sub-tropical grasslands, savannas and shrublands and 30% of desert ecosystems had already been lost by 1990. Coastal and marine ecosystems have also been heavily affected by human activities, with degradation leading to a reduced coverage of kelp forests, seagrasses, mangroves and corals. In the Caribbean, for example, average hard coral cover declined from about 50% to 10% in the last three decades. In addition, there has been a widespread retreat of mountain glaciers in non-polar regions during the 20th century, and decreases of about 10% in the extent of snow cover since the late 1960s. In the Arctic, the average annual sea ice extent has declined by about 8% in the past 30 years.



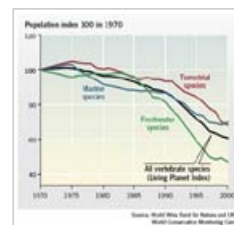
See also our Digest on Arctic Climate Change [see <https://www.greenfacts.org/en/arctic-climate-change/index.htm>]

Achievement of the 2010 Biodiversity Target requires significant slowing of the current rate of reduction of the extent of ecosystems. With regard to forests, a reduction in the current rate of net loss of forest extent would imply increased efforts in re-establishing forests, along with a reduction in the harvesting of forests. At the same time, efforts would need to focus on conserving natural forest area, rather than replacing natural forests with plantations of low biodiversity value.

4.2 How is the abundance and distribution of selected species changing?

Trends in abundance and distribution of selected species is an indicator of ecosystem quality and complements information on ecosystem extent. Several assessments have revealed that the population size and/or geographic range of the majority of species assessed is declining.

Trends in some 3,000 wild populations of species show a consistent decline in average species abundance of about 40% between 1970 and 2000; inland water species declined by 50%, while marine and terrestrial species both declined by around 30%. Studies of amphibians globally, African mammals, birds in agricultural lands, British butterflies, Caribbean and Indo-Pacific corals, and commonly harvested fish species show population declines in the majority of species assessed. Exceptions include species that have been protected through specific measures, those that have had their specific threats reduced, and those that tend to thrive in modified landscapes.



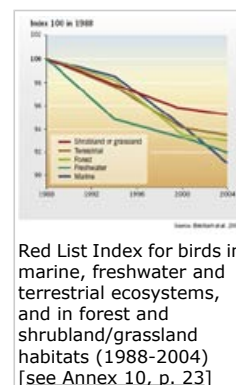
The Living Planet Index: trends in populations of terrestrial, freshwater, and marine species worldwide [see Annex 9, p. 22]

Wild populations of species declined on average by about 1.7% per year between 1970 and 2000, and similar trends have been observed for abundant and widespread farmland and forest-dependent bird species throughout Europe.

These studies focus on well-studied groups, mainly vertebrates, and tropical areas, which are rich in species, tend to be underrepresented. Efforts are underway to expand the dataset to include a greater variety of species, especially of plants.

4.3 What proportion of species is threatened?

Over the past few hundred years, it is estimated that humans have increased the extinction rate of species by as much as a 1000-fold over the natural rate. Between 12% and 52% of species within well-studied groups such as birds or mammals are threatened with extinction, according to the IUCN Red List of Threatened Species. From this list, an index can be calculated to evaluate the number of species that would remain if no further conservation actions are taken. This index shows a continuing deterioration in the status of bird species, the group for which the most data are available. Preliminary data show that the situation is likely even worse for other major groups, such as amphibians and mammals.



4.4 How is genetic diversity of cultivated and domesticated species changing?

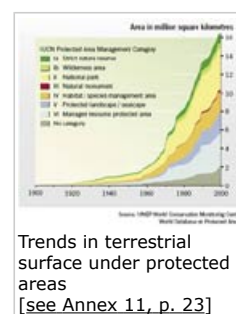
The genetic diversity of cultivated and domesticated species is of great importance from a human perspective. Humans use only a very small number of species, and the continuing survival and adaptation of these species to new and changing environmental conditions depends in part on their genetic diversity. In turn human well-being and food security depend on those few species, and failure of a single crop through a plant disease, for example, can have dramatic consequences. Loss of genetic diversity is difficult to quantify, but it is estimated that one third of the 6,500 recognized domesticated animal breeds are threatened with extinction.

In non-cultivated systems, the harvesting of wild species, through logging, fishing, or hunting, can contribute to the loss of genetic diversity. Generally, however, loss of genetic diversity is associated with the decline in population abundance and distribution brought about by habitat destruction and fragmentation.

4.5 How large are protected areas?

A key tool to counter the continuing loss of ecosystems and species is the establishment of protected areas. They currently cover about 12% of the Earth's land surface. There are substantial differences in coverage between different biomes, ecosystems and habitats. For instance, the total surface of protected areas covers only 5% of needle-leaf forests and woodlands, 4.4% of temperate grasslands, 2.2% of lake systems, 1.4% of coastal shelves and 0.6% of oceans.

In about 475 of the planet's 825 terrestrial ecoregions, less than 10% of the surface is protected. In about 140 ecoregions, it is even less than 1%.



The growth in number and area of protected areas is a fairly crude indicator in itself, and needs to be complemented by further information on the level of protection afforded to biodiversity and the effectiveness of management. The role of protected areas in reducing the rate of loss of biodiversity is not yet fully understood because systematic data are lacking.

5. Are ecosystems healthy enough to provide resources and essential services?

The second focal area of the 2010 framework is maintaining the integrity of ecosystems and their ability to support human livelihoods through the provision of the goods and services they guarantee.

5.1 How is fishing affecting marine species?

Oceans cover over 70% of the globe. The primary source of food from the oceans is capture fisheries, and the preferred species for capture are large predatory fish such as tuna and cod. Intense fishing has led to the decline of these species. In the North Atlantic, for instance, large fish have declined by two-thirds in the last 50 years. As a result, the relative number of small fish and invertebrates lower on the food chain increased, and the average position in the food chain (mean trophic level) of the fish captured has declined as a reflection of this. This measure has been declining globally since the 1970s. The preferred fish for human consumption are becoming increasingly rare, forcing a shift in fisheries and human consumption patterns to smaller fish and invertebrates, and eventually reducing the overall supply of wild fish for human consumption. Despite an increase in fishing effort, marine fisheries decreased throughout the 1990s.

The Marine Trophic Index, which measures the change in mean trophic level, can be calculated from existing data on fish catch and is therefore a widely applicable indicator of ecosystem health and sustainable use of its living resources. If action were taken to better manage fisheries, declines in the Marine Trophic Index could be halted, as seen in Alaska, where the Index has stabilized with the sound management of most Alaskan fish stocks.



See also our Digest on Fisheries [see <https://www.greenfacts.org/en/fisheries/index.htm>]



Based on aggregation of data from over 180,000 half-degree latitude/longitude cells. Data for the North Atlantic are shown in red and for coastal waters in blue. Note strong decline, particularly in the North Atlantic.

Source: Pauly and Watson (2003)

Trends in mean trophic levels of fisheries landings (1950-2000) [see Annex 3, p. 19]

5.2 How are human activities fragmenting forests and inland waters?

In many terrestrial and inland water ecosystems, human activities lead to the fragmentation of habitats. The resulting smaller patches of habitat support smaller populations of species, which then become more vulnerable to local extinction. Forests and river systems are two systems where fragmentation can be relatively easily assessed, and both show high levels of fragmentation.



Estimates of forest fragmentation due to anthropogenic causes [see Annex 4, p. 20]

In river systems, for instance, reservoirs have significant effects on the flow of water and its quality, as well as on its biodiversity, particularly that of migratory species. The impacts of dams on ecosystems include the destruction of terrestrial ecosystems through inundation, greenhouse gas emissions, and extensive modification of aquatic communities. A global overview of dam-based impacts assessed fragmentation and flow regulation in 60% of the world's river runoff. Over half of the assessed large river systems were shown to be affected by dams, and more than one-third are strongly affected by river fragmentation and flow regulation. Only 12% of the area is unaffected.

5.3 How is freshwater quality changing?

Pollution, increased sedimentation, climate change, the extraction of fresh water for agricultural, industrial and human consumption, and the physical alteration of the ecosystem, for example through the diversion and canalization of watercourses, have all affected the quality of inland waters. For instance, nitrogen pollution of inland waterways, coming mainly from the use of fertilizers, has more than doubled since 1960 and has increased tenfold in many industrial parts of the world.

While water quality in rivers in Europe, North America, and Latin America and the Caribbean has improved since the 1980s, it has deteriorated over the same period in Africa and in the Asia and Pacific region.

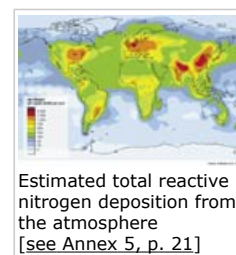
Water quality monitoring indicates both major direct threats to the sustainability of inland waters and the effects of unsustainable activities outside that ecosystem. The health and integrity of inland waters is an excellent indicator of the health of terrestrial ecosystems. Improving water quality in all regions appears to be a tangible, though challenging, contribution to the achievement of the 2010 Biodiversity Target.

6. What are the main threats to biodiversity?

The third focal area of the 2010 framework concerns the five major threats to biodiversity: invasive alien species, climate change, nutrient loading and pollution, habitat change, and overexploitation. Unless we successfully reduce the impacts of these threats, they will contribute to the loss of biodiversity components, negatively affect ecosystem integrity and progress towards sustainable use.

6.1 How are human activities affecting the amount of nitrogen in the environment?

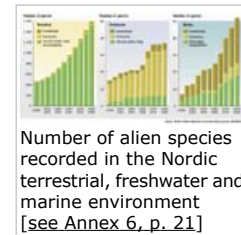
The growing productivity of agriculture can be attributed to a number of factors, including the availability and use of fertilizers on a commercial scale. However, nitrogen and phosphorus from those fertilizers are now causing concern. The deposition of airborne nitrogen from human activities changes the balance of ecosystems, mainly where slow growing species that thrive in nitrogen-poor environments cannot compete with faster-growing species that depend on higher nutrient levels. Temperate grasslands are particularly vulnerable in this respect. Moreover, soluble nitrogen can find its way into lakes and coastal environments, resulting in increased eutrophication, algal blooms and the creation of oxygen-depleted zones in inshore marine areas. These impacts greatly reduce the populations of fish and other aquatic species.



The rate of increase in the human production of nitrogen has accelerated sharply since 1960, and in order to continue to meet global demand for food and fibre and minimize environmental problems, significant improvements are required in the efficiency with which nitrogen fertilizer is utilized.

6.2 How serious is the threat to biodiversity posed by invasive alien species?

Invasive alien species can have devastating impacts on native species, causing extinctions and affecting natural and cultivated ecosystems. It has contributed to the loss of 40% of all animal extinctions for which the cause is known since the 17th century and, in one area of South Africa, it is threatening 80% of the local native species. In the recent past, the rate and risk associated with alien species introductions have increased significantly because human population growth and human activities altering the environment have escalated rapidly, combined with the higher likelihood of species being spread as a result of increased travel, trade and tourism.



A major source of marine introductions of alien species is hull fouling and the release of ballast water from ships. Of the 150 species that have recently arrived in the Great Lakes of North America, for example, 75% originated from the Baltic Sea, through well-used shipping lanes. Communicating the challenges posed by invasive alien species effectively will require a methodology for quantifying the threat to develop a coherent indicator of its impacts on biodiversity.

7. To what extent are ecosystems used sustainably?

7.1 What proportion of ecosystems are managed sustainably?

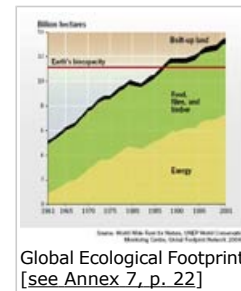
The fourth focal area in the 2010 framework looks at sustainable use of biodiversity. Assessing whether a resource is being used sustainably or unsustainably requires consideration of a number of factors, including the status of the resource in question, the impact of use on the ecosystem of which that resource is a part, and the socio-economic context of the resource use.

Assessing the sustainability of human use of biodiversity would require looking at the proportion of the area of forest, agricultural and aquaculture ecosystems under sustainable management, but global data for all these areas are currently not available.

Another possible measure for assessing sustainable use consists in looking at the proportion of production lands that have been certified as meeting certain criteria for sustainability. Although figures on certified area and products show positive trends, these should not be interpreted as significant progress towards sustainable use in general because only a small portion of production areas are certified as being under sustainable management.

7.2 How is our ecological footprint changing?

The ecological footprint is a concept that calculates the area of land and water needed to sustain a defined human population, based on the population's use of energy, food, water, building material and other consumables. Although it does not provide a comprehensive assessment of demands on nature, it is a useful accounting tool whose purpose is to demonstrate the effect of human consumption on the productive capacity of the Earth.



Currently, two-thirds of the global ecological footprint is caused by the United States, members of the European Union, China, India and Japan. The per capita footprint is much greater in developed countries than in developing countries.

Globally, humanity has moved from using, in net terms, about half the planet's biocapacity in 1961 to 1.2 times the biocapacity of the Earth in 2001. The global demand for resources thus exceeds the biological capacity of the Earth to renew these resources by some 20%, and this overuse is still growing.

In the long run, humanity's footprint needs to be significantly lower than global biocapacity, in order to provide a biodiversity buffer.

8. Are other objectives of the Convention on Biological Diversity being met?

8.1 Are indigenous languages and knowledge protected?

The fifth focal area covers the traditional knowledge and management practices of indigenous people and local communities are relevant to the conservation and sustainable use of biodiversity. This knowledge is often transmitted using indigenous languages. An analysis carried out by the United Nations Educational, Scientific and Cultural Organization (UNESCO), and covering some 250 indigenous languages, reveals that, in the period between 1980 and 2003, the number of speakers of 149 indigenous languages had increased while 104 languages had lost speakers. Because the majority of these indigenous languages are only spoken by a small number of people there is great concern over their continuing survival.

8.2 Are the benefits of the use of genetic resources shared fairly and equitably?

The fair and equitable sharing of the benefits arising out of the utilization of genetic resources is the sixth focal area and one of three objectives of the Convention. This covers, among other things, information on the use of genetic resources in developing medicines, cosmetics, industrial products and new crops. Returning a share of the economic benefits from marketing such products would provide incentives to conserve and sustainably use biodiversity. Although some countries have implemented laws to control access to genetic resources, no reliable global central depository of information on national access and benefit-sharing measures has yet been established.

8.3 Have sufficient financial and technical resources been mobilized?

Implementation of the Convention requires mobilizing financial and technical resources, and this is covered by the seventh and last focal area. The signing Parties to the Convention have agreed that developing countries require particular support to enable them to carry out measures required to conserve biodiversity and reach the 2010 target, in particular least developed countries, small island developing states, and countries with economies in transition. It is estimated from the available data that the total funds set aside as aid to developing countries for biodiversity had declined since 1998 from about US\$ 1 billion per year, to about US\$ 750 million.

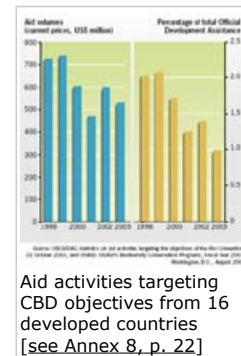


Figure 2.20 Aid activities targeting CBD objectives from 16 developed countries [see Annex 8, p. 22]

9. How is the Convention on Biological Diversity being implemented?

Translating the content of the Convention into policy and practice at the national and local level is extremely challenging. In the first ten years following the creation of the Convention a comprehensive body of guidance relating to the goals of the Convention was developed. In 2002, the Conference of the Parties adopted a Strategic Plan, including the 2010 target, and, in 2004, a framework for assessing progress towards the 2010 target.

9.1 What are the tools provided by the Convention (CBD)?

Policy instruments and other tools developed by the Convention include:

- thematic programmes of work of the Convention, covering seven major biomes;
- programmes of work on technology transfer, protected areas and classification of organisms (taxonomy); and
- principles and guidelines developed on issues considered to be of relevance to all thematic areas, including biodiversity monitoring, impact assessment, incentive measures, and invasive alien species.

The Conference of the Parties has also adopted a Global Strategy for Plant Conservation which encompasses 16 outcome-oriented targets aimed at achieving a series of measurable results by 2010. The Strategy provides a framework for concerted action by all stakeholders towards these targets.

In addition, the Cartagena Protocol on Biosafety, adopted as a legal instrument in its own right in 2000, aims to ensure that biotechnology does not adversely affect biodiversity or human health.

At the national level, provisions of the Convention and the policy decisions of the Conference of the Parties are translated into actions through national biodiversity strategies and action plans.

9.2 What progress has been made towards the convention's Goals?

Ten years after entry into force of the Convention, the Conference of the Parties adopted, in 2002, a Strategic Plan. The mission of this Strategic Plan is for Parties to commit themselves to a more effective and coherent implementation of the three objectives of the Convention, in order to achieve by 2010 a significant reduction of the current rate of biodiversity loss at the global, regional and national level as a contribution to poverty alleviation and to the benefit of all life on Earth. In the context of this mission, the Plan encompasses four goals. Progress towards these goals is mixed.

9.2.1 Reasonable progress is being made towards promoting international cooperation in support of the Convention (**Goal 1**). The Convention is playing a major role in setting the agenda among biodiversity-related conventions and organizations. However, opportunities remain to increase policy coherence with other international instruments, particularly under the trade regime.

9.2.2 Despite major efforts, progress remains limited towards ensuring that Parties have improved financial, human, scientific, technical, and technological capacity to implement the Convention (**Goal 2**).

9.2.3 Most Parties have developed national biodiversity strategies and action plans but implementation of these to achieve the objectives of the Convention (**Goal 3**) is far from sufficient, and there has been insufficient attention to the integration of biodiversity concerns into sectoral policies and programmes (eg agriculture, forestry, fisheries, tourism), poverty reduction strategies and planning and development strategies more generally.

9.2.4 Progress is mixed towards achieving a better understanding of the importance of biodiversity and of the Convention, which would lead to broader engagement across society in implementation (**Goal 4**). Current communication, education and public-awareness programmes are not sufficient. Despite some progress, additional efforts are required to engage key actors and stakeholders in all sectors of society.

9.2.5 It is apparent that, while advancement can be seen in some areas, more actions are urgently needed. Implementation of the Convention must be focused at the national level and this is where more actions are needed. In particular, it appears essential to integrate biodiversity into all relevant policies and plans and not restrict the biological basis of human well-being to the environment domain.

10. Are we on track for meeting the 2010 Biodiversity Target?

On the basis of both an analysis of current trends and different plausible scenarios explored, it is projected that biodiversity loss, and in particular the loss of species diversity and transformation of habitats, is likely to continue for the foreseeable future, and certainly beyond 2010. This is largely due to inertia in ecological and human systems and to the fact that the drivers of biodiversity loss are themselves broadly constant or increasing.

“Unprecedented additional efforts” will be needed to achieve the 2010 Biodiversity Target at national, regional and global levels. Meeting the 2010 Target is a considerable, but not impossible, challenge. For the most part, the tools needed to achieve the 2010 target, including programmes of work, principles and guidelines, have already been developed within the framework of the Convention, and will have to be used more effectively if progress is to be made towards achieving the target.

10.1 How good are prospects for achieving the different sub-targets?

It is too soon to assess progress towards the goals and targets set by the Convention. However, the prospects for achievement can already be analysed on the basis of current trends and through consideration of plausible future scenarios, as was done as part of the Millennium Ecosystem Assessment. Prospects for achievement are better for some targets than others. The Assessment confirms that it is possible to achieve many of the targets aimed at protecting the components of biodiversity if the response options that are already incorporated into the Convention on Biological Diversity are implemented. However, it appears highly unlikely that all the targets aimed at addressing threats to biodiversity could be achieved globally by 2010, although some may be achieved at smaller scales.

Table 4.1: Prospects for achieving the targets of the framework for assessing progress towards the 2010 Biodiversity Target [see Annex 12, p. 25]

10.2 How well are the factors causing the loss of biodiversity being addressed?

Most of the direct drivers of biodiversity loss—habitat change, climate change, invasive alien species, overexploitation, and pollution—are projected to either remain constant or to increase in the near future. Progress in addressing biodiversity loss will require additional actions to address the main direct drivers of biodiversity loss, and the programmes of work of the Convention on Biological Diversity could be better prioritized and refocused to better address drivers of biodiversity loss.

Issues of **land-use change** arising from agriculture need to be addressed more directly, including in the context of the programme of work on agricultural biodiversity. Degradation in drylands, another major concern for terrestrial ecosystems, is squarely addressed by the Convention's programme of work on the biodiversity of dry and sub-humid lands.

Some response measures to **overfishing** identified by the Millennium Ecosystem Assessment, such as the establishment of marine protected areas, are already included in the programme of work on marine and coastal biodiversity, but must be put into practice as a matter of urgency. The programme of work also calls for activities to eliminate destructive fishing practices, and restore and maintain fisheries stocks to sustainable levels by the year 2015, but this is not a primary focus.

The **nutrient loading issue** is not fully integrated into all of the relevant programmes of work (including, notably, the programme of work on agricultural biodiversity). Addressing nutrient loading will require both the promotion of increased efficiency of nitrogen use and the conservation of wetlands to maintain or increase their capacity to filter and remove excess nutrients.

Climate change is a threat that must be addressed urgently, including through commitments under the United Nations Framework Convention on Climate Change and the Kyoto Protocol, in order to lessen dangerous impacts on ecosystems. At the same time, activities aimed at the conservation and sustainable use of biodiversity need to take climate change fully into account.

Whereas the various programmes of work already consider the impacts of **invasive alien species** once introduced, further work is needed to strengthen preventative measures.

10.3 How well is biodiversity integrated in economic and development planning?

The imperative to integrate biodiversity concerns into economic and development planning, programmes and policies is clearly stressed in the Convention, highlighted in the Strategic Plan, and reinforced by the findings of the Millennium Ecosystem Assessment. Engaging the main actors in key economic sectors will not only serve to directly address the drivers of biodiversity loss, but will also ensure wider awareness of biodiversity issues. With wider awareness will come the increased political will and additional resources necessary to bring about positive change.

10.3.1 It is important to integrate biodiversity concerns into the **energy sector**, given that climate change is an increasingly significant driver of biodiversity loss and that the conservation and sustainable use of biodiversity can contribute both to mitigation and adaptation measures.

10.3.2 The **food and agriculture sector** contributes to pressures on biodiversity primarily through land-use change – which is expected to remain the the largest driver of biodiversity loss beyond 2010 and at least to 2050 – but also through nutrient loading and overexploitation of wild resources.

These pressures point to an approach to minimizing biodiversity loss which includes:

- sustainably improving agricultural efficiency;
- planning agricultural expansion more effectively to avoid reducing habitats of high biodiversity value;
- moderating the demand for food, especially meat, and reducing waste;
- halting over-fishing and destructive fishing practices; and
- protecting critical ecosystems and habitats.

To implement these approaches, a mix of planning, regulations and incentive measures will be required. Improved public understanding and better valuation of biodiversity and ecosystem services will also be an important part of the necessary actions.

10.3.3 Since economic development, including food and agricultural production, is strongly affected by policies on **trade**, biodiversity concerns need to be integrated into trade discussions. Trade liberalization is projected to lead, in the short term, to acceleration in the rate of biodiversity loss in some regions and countries, unless accompanied by proactive measures to conserve biodiversity.

10.3.4 Economic development is essential to meeting the Millennium Development Goals, yet long-term sustainability will be undermined if biodiversity issues are not taken into account. Furthermore, many of the actions that could be taken to eradicate **extreme poverty** are likely to accelerate biodiversity loss in the short term. The existence of trade-offs, but also of potential synergies, implies that environmental considerations, including those related to biodiversity, should be integrated into the implementation of all of the relevant Millennium Development Goals.

11. Conclusion: What actions are needed?

Biodiversity is continuing to be lost, and these losses may undermine achievement of the Millennium Development Goals. While much progress has been made towards developing policy and tools for implementing the Convention, national-level implementation to date has been limited. Urgent and unprecedented actions are required to achieve the 2010 Biodiversity Target at the global, regional and national levels.

11.1 What actions are needed from the members of the Convention?

As those responsible for meeting the 2010 target, all Parties to the Convention should:

- develop and implement comprehensive national biodiversity strategies and action plans (NBSAPs) that include clear national targets for 2010;
- ensure that their NBSAPs are implemented, and do not merely remain as good ideas on paper, through appropriate policy, legislative measures, and practical activities;
- translate biodiversity-related concerns beyond the environment sector, integrating them into national policies, programmes and strategies on trade, agriculture, forestry and fisheries, and development planning;
- ensure that sufficient human, financial, technical and technological resources are available for implementation of their NBSAPs; and
- promote greater awareness of the importance of biodiversity, and of national actions taken under the Convention for its conservation and sustainable and equitable use.

11.2 What actions are needed from the International Community?

The Convention on Biological Diversity offers an opportunity for the international community to agree upon an agenda and necessary actions for addressing threats to biodiversity.

Decisions taken at the Convention level should be informed by the best available knowledge and experience surrounding biodiversity issues, and contribute to setting standards for action at the national level.

The Conference of the Parties must continue its important work of reviewing progress in implementation of the Convention and of considering actions necessary for achieving the Convention's objectives. Some key issues of policy, such as the completion of a regime on access and benefit-sharing, still have to be resolved and will require agreement and concerted action by the international community.

Meeting the objectives of the Convention requires concerted action from all nations of the world. To this end, the international community should aim to achieve universal membership to the Convention as no country can afford to adopt an observer status on matters as critical as sustaining life on Earth.

11.3 What actions are needed from individuals and other stakeholders?

Individuals have an essential part to play in promoting biodiversity conservation and sustainable use.

As citizens and actors in our own right, we can demand action from all levels of government and strive to hold them accountable to their commitments.

We can also combine our efforts to greater effect by becoming involved in community groups, non-governmental organizations, or other civil society organizations, through donations of our time, expertise and/or money.

Moreover, in our everyday choices, we all have direct impacts on biodiversity and the state of our planet's ecosystems. What we eat, wear and buy, where we live, work and travel, are not neutral choices. Options for sustainable consumption are available and increasing

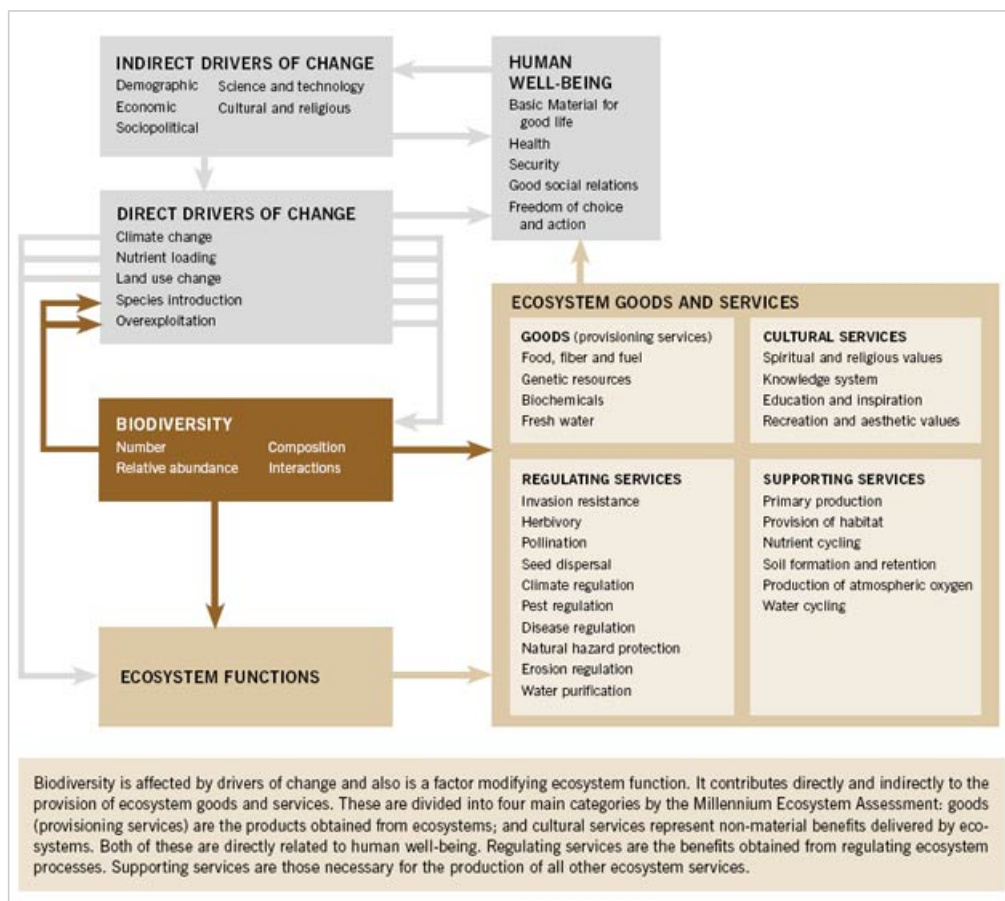
(e.g., organic foods, cleaner technology), and many of us have the additional possibility of reducing waste in our daily consumption of resources.

Corporations should also assume responsibility for the environmental impacts of their activities, including by choosing to buy from suppliers that adopt sustainable practices. The Convention is increasing efforts to engage the private sector in biodiversity issues through the “Business and the 2010 Biodiversity Challenge” initiative.

Annex

Annex 1:

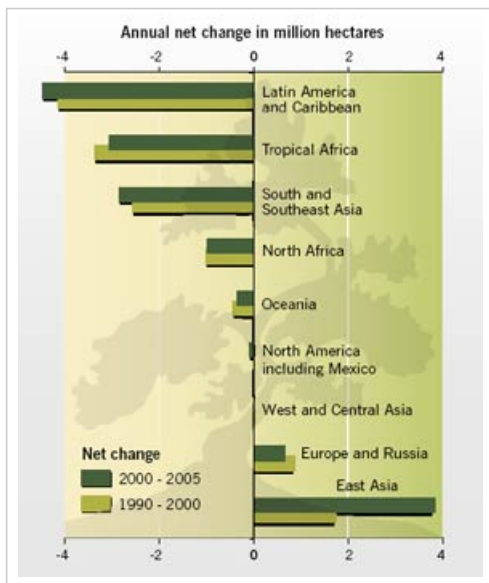
Figure 1.1 Biodiversity, ecosystem functioning, ecosystem services, and drivers of change



Source: CBD Global Biodiversity Outlook 2 [see <http://www.biodiv.org/doc/gbo2/cbd-gbo2.pdf>] (2006), Chapter 1: The Essential role of Biodiversity, p.14

Annex 2:

Figure 2.1 Annual net change in forest area by region (1990–2005)

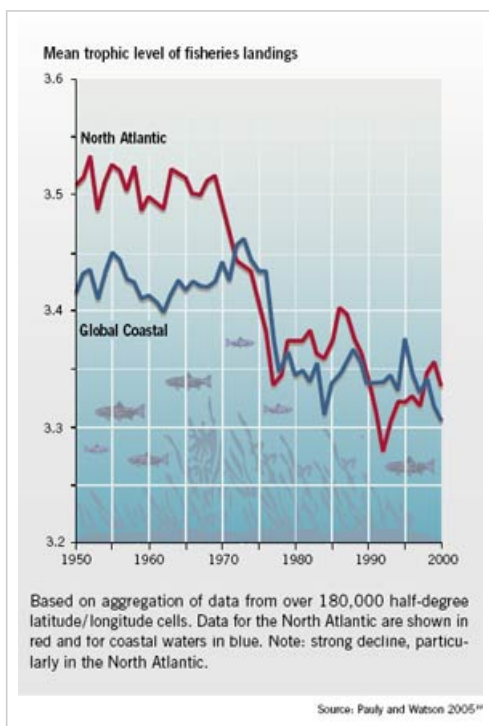


Forest area includes primary forests, modified natural forests, semi-natural forests, productive forest plantations and protective forest plantations. Net change in forest area takes into account afforestation efforts and natural expansion of forests.

Source & © CBD Global Biodiversity Outlook 2 [see <http://www.biodiv.org/doc/gbo2/cbd-gbo2.pdf>] (2006), Chapter 2: The 2010 Biodiversity Target: Establishing current trends, p.23

Annex 3:

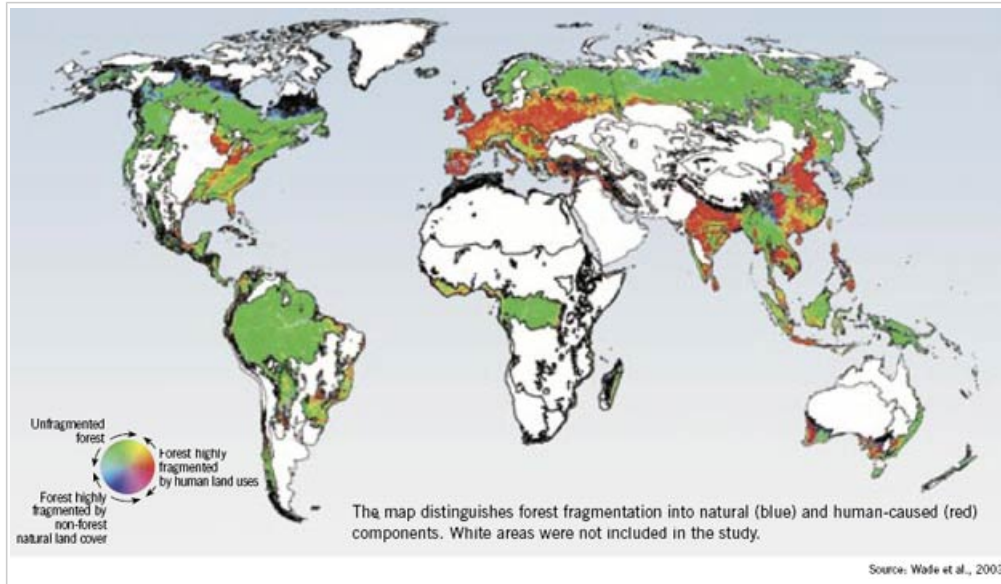
Figure 2.10 Trends in mean trophic levels of fisheries landings (1950-2000)



Source & © CBD Global Biodiversity Outlook 2 [see <http://www.biodiv.org/doc/gbo2/cbd-gbo2.pdf>] (2006), Chapter 2: The 2010 Biodiversity Target: Establishing current trends, p.29

Annex 4:

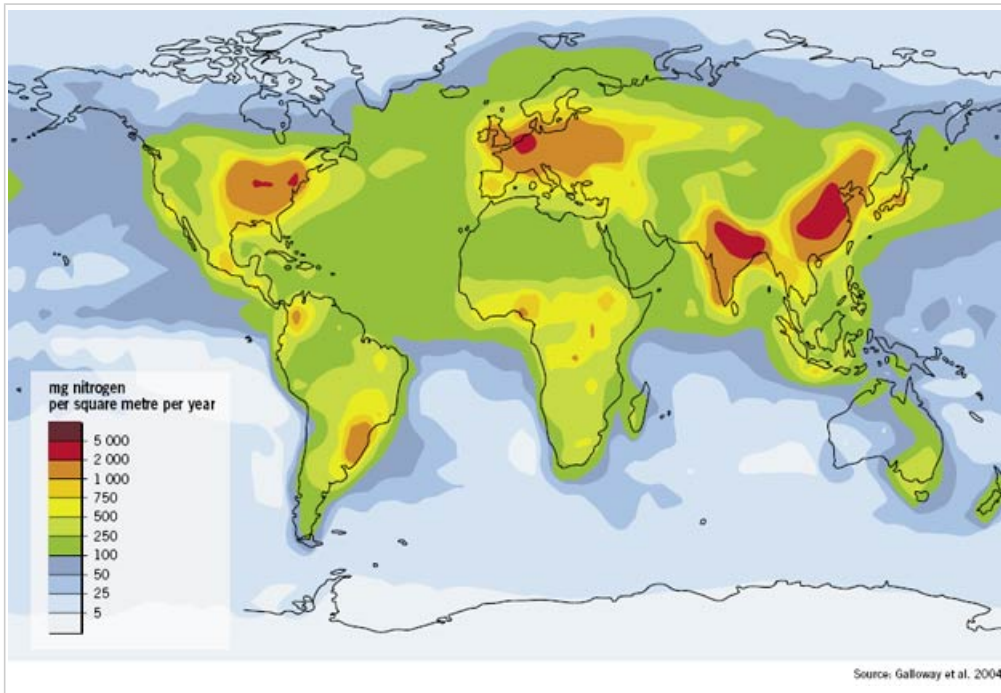
Figure 2.13 Estimates of forest fragmentation due to anthropogenic causes



Source: CBD Global Biodiversity Outlook 2 [see <http://www.biodiv.org/doc/gbo2/cbd-gbo2.pdf>] (2006), Chapter 2: The 2010 Biodiversity Target: Establishing current trends, p.32

Annex 5:

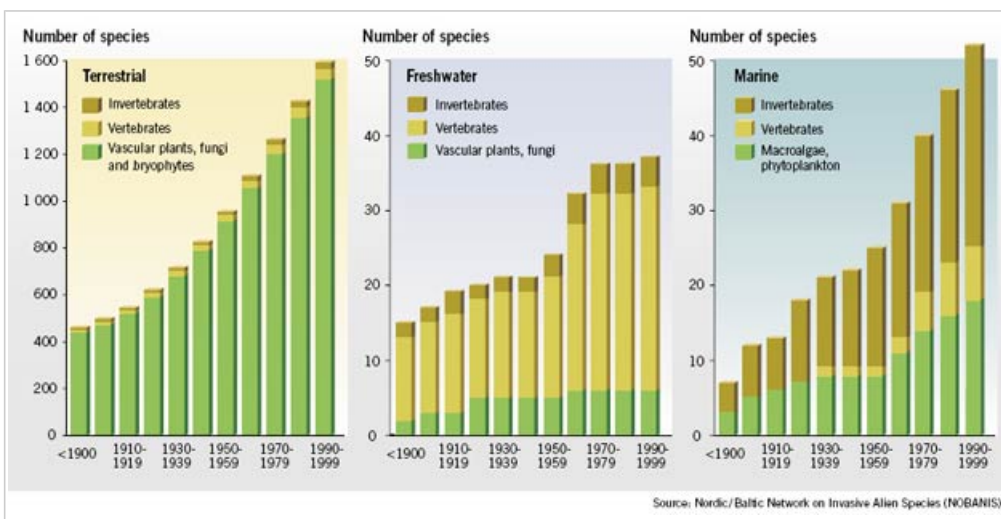
Figure 2.16 Estimated total reactive nitrogen deposition from the atmosphere (wet and dry) (early 1990s)



Source: CBD Global Biodiversity Outlook 2 [see <http://www.biodiv.org/doc/gbo2/cbd-gbo2.pdf>] (2006), Chapter 2: The 2010 Biodiversity Target: Establishing current trends, p.35

Annex 6:

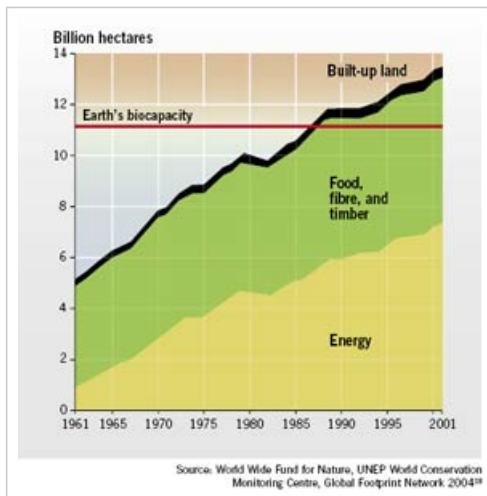
Figure 2.17 Number of alien species recorded in the Nordic terrestrial, freshwater and marine environment



Source: CBD Global Biodiversity Outlook 2 [see <http://www.biodiv.org/doc/gbo2/cbd-gbo2.pdf>] (2006), Chapter 2: The 2010 Biodiversity Target: Establishing current trends, p.36

Annex 7:

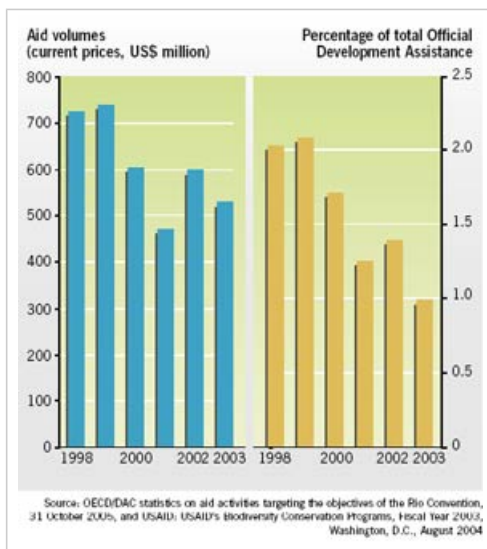
Figure 2.18 Global Ecological Footprint



Source & © CBD Global Biodiversity Outlook 2 [see <http://www.biodiv.org/doc/gbo2/cbd-gbo2.pdf>] (2006), Chapter 2: The 2010 Biodiversity Target: Establishing current trends, p.37

Annex 8:

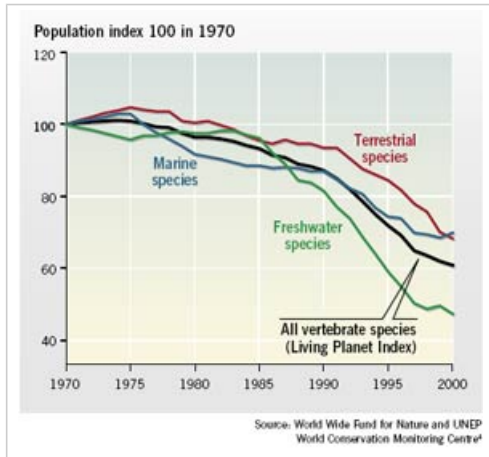
Figure 2.20 Aid activities targeting CBD objectives from 16 developed countries (1998-2003)



Source & © CBD Global Biodiversity Outlook 2 [see <http://www.biodiv.org/doc/gbo2/cbd-gbo2.pdf>] (2006), Chapter 2: The 2010 Biodiversity Target: Establishing current trends, p.38

Annex 9:

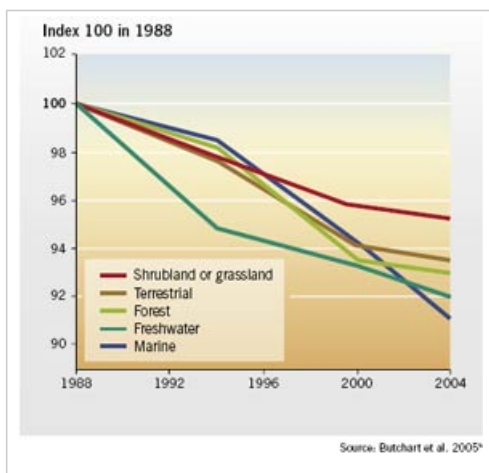
Figure 2.4 The Living Planet Index: trends in populations of terrestrial, freshwater, and marine species worldwide



Source & © CBD Global Biodiversity Outlook 2 [see <http://www.biodiv.org/doc/gbo2/cbd-gbo2.pdf>] (2006), Chapter 2: The 2010 Biodiversity Target: Establishing current trends, p.25

Annex 10:

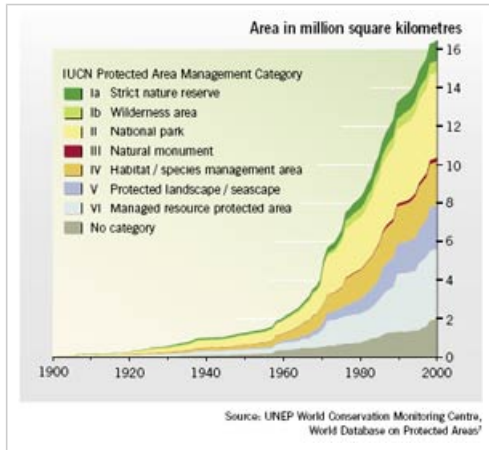
Figure 2.6 Red List Index for birds in marine, freshwater and terrestrial ecosystems, and in forest and shrubland/grassland habitats (1988-2004)



Source & © CBD Global Biodiversity Outlook 2 [see <http://www.biodiv.org/doc/gbo2/cbd-gbo2.pdf>] (2006), Chapter 2: The 2010 Biodiversity Target: Establishing current trends, p.26

Annex 11:

Figure 2.7 Trends in terrestrial surface under protected areas



Source & © CBD Global Biodiversity Outlook 2 [see <http://www.biodiv.org/doc/gbo2/cbd-gbo2.pdf>] (2006), Chapter 2: The 2010 Biodiversity Target: Establishing current trends, p.27

Annex 12:

Table 4.1 Prospects for achieving the targets of the framework for assessing progress towards the 2010 Biodiversity Target

The Conference of the Parties has adopted a framework of goals and targets for assessing progress towards the 2010 Biodiversity Target. In this table, the prospects of achieving these targets- which may be considered as sub-targets of the overall 2010 Biodiversity Target- are assessed, taking into account the current status and trends revealed by the Convention's indicators and the Millennium Ecosystem Assessment, and the scenarios of plausible futures examined in the Assessment. For many targets, measurable progress can be envisaged, even though full achievement is unlikely. This partial progress underlines the importance of developing quantitative targets. Where a target is identified as "achievable", this means only that it is achievable, if appropriate actions are taken; it does not imply that progress is likely in the absence of such actions. "GSPC Targets" are those of the Global Strategy for Plant Conservation.

PROTECT THE COMPONENTS OF BIODIVERSITY		
GOAL 1: Promote the conservation of the biological diversity of ecosystems, habitats and biomes.		
	<i>Target</i>	<i>Target Prospects for Progress by 2010</i>
1.1	At least 10% of each of the world's ecological regions effectively conserved.	Whereas some 12% of terrestrial areas are protected overall, the proportion varies among biomes, and even more so among ecoregions. Moreover, not all of these areas are "effectively conserved". Only about 0.6% of marine areas are protected. Reaching the target is thus challenging but achievable.
1.2	Areas of particular importance to biodiversity protected.	Sites of importance to birds are well documented, and those for plants becoming so. Progress is being made towards protecting these two sets of sites. Progress in other key biodiversity areas is variable. GSPC Target 5: "Protection of 50% of the most important areas for plant diversity assured" is challenging but achievable.
GOAL 2: Promote the conservation of species diversity.		
2.1	Restore, maintain, or reduce the decline of populations of species of selected taxonomic groups.	Many species will continue to decline in abundance and distribution, but restoration and maintenance of selected species is possible.
2.2	Status of threatened species improved.	More species will become threatened, but species-based conservation measures will improve the status of some.
GOAL 3: Promote the conservation of genetic diversity.		
3.1	Genetic diversity of crops, livestock, and harvested species of trees, fish, and wildlife and other valuable species conserved, and associated indigenous and local knowledge maintained.	Good prospects for ex situ conservation. Overall, agricultural systems are likely to continue to be simplified. Significant losses of fish genetic diversity likely. Genetic resources in situ and traditional knowledge will be protected through some projects, but are likely to decline overall.
PROMOTE SUSTAINABLE USE		
GOAL 4: Promote sustainable use and consumption.		
4.1	Biodiversity-based products derived from sources that are sustainably managed, and production areas managed consistent with the conservation of biodiversity.	Progress expected for some components of biodiversity, and increased take-up of various certification schemes likely to continue. If more general "good practices" for sustainable management of agriculture and forestry are applied, the GSPC Targets 6 and 12 are achievable ("30% of production lands managed for conservation" and "30% of products derived from sustainable sources"). More stringent and urgent action is needed for marine fish stocks. Overall, although substantial progress is possible, it is unlikely that the majority of products and production areas will be sustainable by 2010.
4.2	Unsustainable consumption of biological resources, or consumption that has an impact on biodiversity, reduced.	Total consumption is projected to increase due to demographic change and economic growth. However, these increases could be moderated by reduced waste and luxury consumption.
4.3	No species of wild flora or fauna endangered by international trade.	Progress is possible, for example through enhanced implementation of the Convention on International Trade in Endangered Species of Wild Fauna and Flora.
ADDRESS THREATS TO BIODIVERSITY		
GOAL 5: Pressures from habitat loss, land-use change and degradation, and unsustainable water use reduced.		
5.1	Rate of loss and degradation of natural habitats decreased.	Land-use change is projected to continue to be the largest driver of ecosystem change and biodiversity loss. However, rates of change could be decreased and, through landscape-level planning, pressures on regions of high conservation value could be further reduced.
GOAL 6: Control threats from invasive alien species.		
6.1	Pathways for major potential alien invasive species controlled.	While pressures are likely to increase from greater transport, trade, and tourism, measures to address these major pathways could be enhanced, including through the implementation of existing international agreements (e.g., the International Plant Protection Convention, the International Ballast Water Convention).

Source: CBD Global Biodiversity Outlook 2 [see <http://www.biodiv.org/doc/gbo2/cbd-gbo2.pdf>] (2006), Chapter 4: Prospects and challenges for achieving the 2010 biodiversity target, p.60

Partners for this publication

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