



ENFO
17 St. Andrew St.
Dublin 2
Ireland

Phone: 00353 1 888 3911/3910
Fax: 00353 1 888 3946
Email: info@enfo.ie
Web: www.enfo.ie

Useful References

Millennium Ecosystem Assessment
www.millenniumassessment.org

Convention on Biological Diversity
www.cbd.int

World Conservation Union (IUCN)
www.iucn.org
www.countdown2010.net

EU nature and biodiversity websites
http://ec.europa.eu/environment/nature_biodiversity/index_en.htm
http://ec.europa.eu/environment/nature/index_en.htm

EU Biodiversity Strategy
<http://europa.eu.int/comm/environment/docum/9842sm.htm>

Details of international agreements to which Ireland is a party are contained in the website of the National Parks and Wildlife Service www.npws.ie.

Biodiversity

What is Biodiversity?

Biological diversity, or biodiversity, means **the variety of life on Earth**, the wide range of living things from the smallest insect to the largest whale. It reflects the number, variety and variability of living organisms and how these change from one location to another and over time. It includes our rare species as well as common plants and animals indicating the richness of our local environment. The term biodiversity was originally coined as a collective term for the species-rich community of life. It now **encompasses not only the diversity of species but the diversity of ecosystems** as well as genetic diversity within species.

Species are the basic units of diversity. A species is a group of organisms with a unique set of characteristics, such as shape or behaviour, distinguishing them from all other organisms. Individuals within the same species produce offspring. Each species has a particular role within an ecosystem and hence the addition, or loss, of single species may have consequences for the whole system.

About 1.8 million species have been described and named by scientists. Excluding the microbial world it is estimated that in the region of between 7 and 15 million species are yet to be discovered.

"One of the great unknowns in science today is how much biological diversity there is on earth" E.O. Wilson .

Importance of Biodiversity

Biodiversity is vital to human health and well-being and provides us with food, water, raw materials and even the genetic material for most modern prescription medicines. **Ecosystem functions are dependent upon biodiversity.** Ecosystems provide the basic necessities of life (e.g. food, clean water and air) and offer protection from natural disasters and diseases (e.g. by regulating climates, flooding and pest control).

Ecosystems also support and maintain life processes such as biomass production and nutrient cycling (e.g. the nitrogen cycle), which are essential to all species. **Healthy ecosystems provide the conditions and processes that sustain human life.** In addition to providing goods such as foods and medicines, ecosystems also provide us with services such as purification of air and water, the binding of toxins, decomposition of wastes, mitigation of floods, moderation of storm surges, stabilization of landscapes as well as regulation of climate and environments for the continued development of species.

We tend to take these services for granted and do not generally recognise that we cannot live without them, nor can other life on this planet. It has been estimated that ecosystem services are approximately equal in monetary value to the entire GDP value of the world. Biodiversity also has a very high value in terms of its aesthetic value

In summary, biodiversity underpins ecosystem functioning. The services provided by healthy ecosystems, in turn, are the foundation for human well-being. These ecosystem services not only deliver the basic material needs for survival but also underlie other aspects of a good life including health, security, good social relations and freedom of choice.

State of Biodiversity

The Millennium Ecosystem Assessment is a detailed study which was sought by the United Nations. The objective of the study was to assess the **consequences** of ecosystem change for human well-being and the scientific basis for actions needed to enhance the conservation and sustainable use of those systems and their contribution to human well-being. The assessment involved more than 1,360 experts worldwide.

The Millennium Ecosystem Assessment study found that over the past 50 years, humans have changed ecosystems more rapidly and extensively than in any comparable period of time in human history, largely to meet rapidly growing demands for food, fresh water, timber, fibre, and fuel. This has resulted in a substantial and largely irreversible loss in the diversity of life on Earth.

The changes that have been made to ecosystems have contributed to substantial net gains in human well-being and economic development. However, these gains have been achieved at growing costs in the form of the degradation of many ecosystem services and the exacerbation of poverty for some groups of people. These problems, unless addressed, will substantially diminish the benefits that future generations obtain from ecosystems.

The degradation of ecosystem services could grow significantly worse during the first half of this century and may be a barrier to achieving the UN's Millennium Development Goals.

The challenge of reversing the degradation of ecosystems while meeting increasing demands for their services can be partially met under some scenarios considered in the Millennium Assessment. Doing so however, will involve significant changes in policies, institutions, and practices that are not currently underway.

Factors Threatening Biodiversity

Habitat Loss

Habitat loss and fragmentation can have grave consequences for animal welfare and conservation. The changes come about when one habitat type is removed and replaced by another. Examples include forest removal for agriculture lands.

Invasive species

These species are generally non-native species that become introduced into an area, spread quickly and often push out the existing species. This can have a destabilising effect on the entire system.

Population Growth

Rising human population numbers means more changes in land use to feed the larger population. More carbon dioxide is emitted and more pressure is placed on species.

Pollution

Pollution is the introduction by humans of contaminants that cause harm to humans and other living organisms. Pollution can have short and long term health effects on individuals and species.

Over-Harvesting

Over-harvesting of limited natural resources can have devastating impacts on species. The collapse of Cod fishing stocks is a very recent example of the severe deterioration that can result from over harvesting practices.

Climate Change

On average plants are flowering earlier than they were 30 years ago. This is one of the many biological indicators of climate change. Plants and animals cannot all adapt to the pace of human-caused climate change and so this is a further threat to many species.

The current loss of biodiversity and the related changes in the environment are now faster than ever before in human history and there is no sign of this process slowing down. Many animal and plant populations have declined in numbers and geographical spread.

Species extinction is a natural part of Earth's history. However, over the past 100 years humans have increased the extinction rate by at least 100 times compared to the natural rate. The current extinction rate is much greater than the rate at which new species arise, resulting in a net loss of biodiversity.

Within well-studied groups (conifers, cycads, amphibians, birds, and mammals), between 12% and 52% of species are threatened with extinction, according to the World Conservation Union - IUCN Red List. In general the most threatened species are those that are higher up the food chain, have a low population density, live long, reproduce slowly, and live within a limited geographical area. Within many species groups, such as amphibians, African mammals, and birds in agricultural lands, the majority of species have faced a decline in the size of their population, in their geographical spread, or both. Exceptions are almost always due to human interventions, such as protection in reserves, or to species that tend to thrive in human-dominated landscapes.

International Agreements

It is clear that no period has experienced interference with the biological machinery of the planet on the scale witnessed in the second half of the twentieth century.

The global scale of the biodiversity issue demands concerted international action. The framework for this action is the United Nations Convention on Biological Diversity which was signed in 1992. Its objectives are the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of genetic resources.

EU Biodiversity Legislation

EU biodiversity policy is based on two main pieces of legislation — the 1979 **Birds Directive** and the 1992 **Habitats Directive**. Its priorities are to create the European ecological network of special areas of conservation, called Natura 2000, and to integrate nature protection requirements into other EU policies such as agriculture, fisheries, regional development and transport.

The Natura 2000 network of sites consists of Special Areas of Conservation (SAC) designated by Member States under the Habitats Directive. It also incorporates Special Protection Areas (SPAs) designated by the Member States under the Birds Directive. Over 20,000 sites have been included in the network so far, covering altogether almost a fifth of Europe's land and water – equivalent to the size of Germany and Italy put together. As part of Natura 2000, **the selected areas benefit from increased protection: Member States must take all the necessary measures to guarantee their conservation and avoid their deterioration.**

EU Heads of State of Government agreed in 2001 to halt biodiversity loss in the EU by 2010 and to restore habitats and natural systems. In 2002, they joined some 130 world leaders in agreeing to significantly reduce the rate of biodiversity loss globally by 2010.

In May 2006 the EU issued a communication, 'Halting the loss of biodiversity by 2010 and beyond - Sustaining ecosystem services for human well-being'. In this Communication the Commission established an action plan which includes objectives for halting the decline of biodiversity and measures enabling these objectives to be met by 2010. The action plan is based on an assessment of biodiversity loss, both in the EU and globally and the measures taken to date by the European Union to deal with the problem.

The protection of biodiversity is one of the key objectives of the Sixth Environment Action Programme.