EUROPEAN RESEARCH
IN ACTION

EN

BIODIVERSITY

Understanding the living world

What is biodiversity?

Biodiversity - short for biological diversity - is the complex web of life on Earth. Biodiversity means the diversity of life in all its forms: the diversity of species, of genetic variations within one species, of ecosystems – and of the often complex and ever-changing interaction between them. Human beings, animals, plants and micro-organisms are all part of this **great web of life**. The number of life-forms on Earth is unknown, but it may be some 20–30 million species, of which only about 1.8 million are known to science, and far, far fewer have common names in any language.

Why is biodiversity important? What is its value?

Even though only a marginal number of species are known to us, we do know the important role they play for our society. Life on Earth is a web of interconnected ecosystems. These ecosystems exist and work because of biodiversity: each element whether animal or plant, fungus or microbe, contributes to the functioning and well-being of the ecosystem it lives in. Humans benefit from a multitude of **resources and processes provided by healthy ecosystems**. Living nature supplies us with food, building materials (fibres, wood), energy (fire wood, biofuels, hydropower) and medicines. Plants provide the oxygen we breathe and absorb CO_2, thus helping to stabilise our climate. Their roots help prevent erosion. Micro-organisms help clean our water and break down organic material to fertilise the soil.

Some experts estimate the **value** of the resources and services provided by ecosystems at **€26 trillion** a year - twice the value of what humans produce each year!

What does the EU do?

The EU is calling for reinforced action to **halt biodiversity loss**. In its long term vision, biodiversity and ecosystems are preserved, valued and, if possible, restored. The Europe 2020 strategy calls for a more **resource-efficient low carbon economy**.

The EU acts through different policies and legislative tools. For example, Natura 2000 is one of the world's biggest networks of protected areas. The Common Agricultural and Fisheries Policies promote sustainable use of agricultural land and fish stocks. The Water Framework Directive aims to improve the quality of all freshwater systems in Europe. EU-funded research is part of the EU's toolbox.

Why do we need European research?

The problems arising from a decline in biodiversity do not have borders. The EU therefore supports its **best scientists** to **work together** with international colleagues on understanding the many intricacies and roles of biodiversity. Their research helps us **understand** and **assess** the dynamics of ecosystems and changes in biodiversity with greater accuracy. Newly developed monitoring and rehabilitation techniques as well as risk assessments allow us to **better manage**, **conserve and rehabilitate our ecosystems** in a sustainable manner for future generations. Biodiversity research is essential if we are to find ways to bring human activities into a sustainable relationship with the living world. It is at a crossroads between disciplines, integrating the natural and social sciences, law and economics into new and **sustainable policies**.

Close-up of research contributions

Current biodiversity research supported by the EU focuses on issues that need more attention, especially the relationship between biodiversity and livelihoods, how humans relate to and value biodiversity. The EU supports research on forest biodiversity, freshwater and marine ecosystems as well as the role of soil biodiversity in ecosystem functioning. EU-funded research aims at strengthening biodiversity research **co-operation** in Europe and at creating **a knowledge network** to aid **policy-makers** and **economic actors**.

Research into the state of biodiversity within ecosystems is not the only angle being tackled. Here are some examples which show the high variety of the topics being studied.

To maintain rich biodiversity and to match it with economic needs, the project **SCALES** (www.scales-project.net/) is developing innovative management plans to improve conservation efforts. The aim of the project **SOILSERVICE** (www.kem.ekol.lu.se/soilservice/index.html) is to understand how economic drivers will change current and future use of soil ecosystems and how these drivers affect diversity and sustainability of agricultural soils. The project **TESS** (www.tess-project.eu/) is developing innovative ways to assist policy makers and involve local communities in maintaining and restoring ecosystems. Economic instruments to aid biodiversity conservation are being tested by the project **Policy Mix** (www.policymix.eu/policymixtool/index.cfm).

Results from the project **ALARM** (www.alarmproject.net/alarm/) help us understand the changes in biodiversity due to climate change, environmental chemicals, the loss of pollinators and biological invasions.

Why do we have to act in Europe?

We are currently witnessing a steady loss of biodiversity. **Unsustainable exploitation** of natural resources to supply human demands as well as **pollution** and a **changing climate** endanger numerous species. Changes in **land use** endanger others, and yet more are menaced as humans divert fresh water to their own uses. International transport and tourism make native species compete with "newcomers". As one example among many, the grey squirrel, originally imported as a novelty from North America, has caused the local extinction of the red squirrel in parts of the UK and Italy. It out-competes the native red squirrel for resources and also carries a disease to which it is resistant, but which is deadly for the red squirrel. Across the European continent, 42% of mammals are threatened with extinction, 15% of birds, 45% of butterflies, 30% of amphibians, 45% of reptiles and 52% of freshwater fish. A sample of 23 common farmland birds and 24 common woodland birds monitored in 18 European countries shows a decline in numbers by 71% between 1980 and 2002.

Human activity is increasingly **breaking down the interactions** that keep ecosystems functioning. If one of the building blocks trembles or disappears, this inevitably impacts on the others. For instance, if bees and butterflies are not around to pollinate flowers, fruit production will be affected. If earth worms start dying due to polluted soil, they can no longer help digest rotten leaves and fertilise the soil. If worms disappear, birds will find less food. A declining bird population in turn means that a natural insecticide needs replacing.

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Biodiversity research is part of the current European Union's 7th Framework Programme for Research (2007-2013). Nearly € 2 billion are earmarked for environmental research.

European Commission - Environmental Research
www.ec.europa.eu/research/environment/index_en.cfm

Joint Research Centre - Institute for environment and sustainability
www.ies.jrc.ec.europa.eu

Background information and more on how to get involved in biodiversity protection :

European Commission - Nature & Biodiversity
www.ec.europa.eu/environment/nature/index_en.htm

Directorate-General Environment
www.ec.europa.eu/dgs/environment/index_en.htm

European Environment Agency
www.eea.europa.eu

IUCN – International Union for Conservation of Nature
www.iucn.org/

UN Convention on Biological Diversity
www.cbd.int

WWF International
www.panda.org

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