

BIODIVERSITY



What is biodiversity?

Biodiversity is the variation of living organisms from all sources, terrestrial, marine and other aquatic ecosystems and all the habitats of which they are part; this includes diversity within species, between species and of ecosystems. Imagine life without all this diversity! Life on earth would cease to exist!

Species - a group of organisms capable of interbreeding and producing fertile offspring. For example, the ash is a species of tree and the squirrel is a species of mammal.

Habitat - the natural environment in which an organism lives, or the physical environment that surrounds, influences and is used by a species population. For example, a woodland or a bog is a habitat.

Ecosystem - the physical and biological components of an environment which is considered a unit, for example; a freshwater ecosystem includes animal, plant and microbial (minute organisms) life in lakes, rivers and ponds. For example, a valley with some woodlands and a river, and all the life they contain, make up an ecosystem

The world's biological diversity is an essential natural resource which humans have used and benefited from for thousands of years. Biodiversity keeps us alive! Therefore, it is vital we conserve it!

Why is biodiversity so important?

Ecosystems and their species perform important biological services, for example, green plants remove carbon dioxide and release oxygen into the atmosphere, which helps keep the environment healthy and fit for human life. Although we still have much to learn about the often complex function of ecosystems, and about which species perform critical roles, we know that if an ecosystem is altered in any way, it might not be able to perform some of its important services. Economic arguments also provide compelling reasons for conserving species. Different species of plants, animals, fungi and micro-organisms provide us with food, medicines, fuel, building materials, fibre for clothing and industrial products.

Biological Services Performed by Ecosystems

Protecting areas from soil erosion, floods and other harmful weather conditions: Vegetation cover helps to protect soils from erosion. Woodlands and hedges provide useful windbreaks in farm areas, and the vegetation on mudflats and sand dunes can help protect coastal areas from erosion by the sea and wind.

Reducing the risk of local and global climate change: Ecosystems help maintain a healthy balance of gases in the atmosphere. Trees and other plants store carbon and help prevent the build-up of carbon dioxide in the atmosphere, reducing the risk of global warming.

Recycling nutrients: Bacteria and fungi play a crucial role in recycling nutrients in ecosystems. Some plants play a crucial role in the fixation of nitrogen in the soil. Nitrogen fixation is the process of converting atmospheric nitrogen into ammonia.

Developed by:



BIODIVERSITY



Pollination and biological control: Some animals, especially birds, bats and insects perform important functions as pollinators of food plants such as vegetables and fruit, and are also often the natural enemies of weeds, pests and diseases that can harm crops.

Controlling pollutants: Plants like reeds act as natural filters, helping to remove waste from surface waters and many bacteria can help break down low level pollutants.

Monitoring the health of the environment: Some species can indicate a change in the environment. For example, the breeding failure among birds of prey can point to a build-up of pesticides in the system. Lichens such as those found growing on your school walls and on the trees may be sensitive indicators of levels of air pollution.

Economic Value

Food: The provision of food is the most fundamental benefit that humans get from other life forms, and humans have always depended on animals and plants for meat, fruit, vegetables, nuts, and other natural products.

Medicines: Wild species have been used as sources of drugs for thousands of years. The medicinal potential of plants and animals is often considered a compelling reason to conserve biodiversity as some species are highly valued for their medicinal properties.

Commercial uses: Human societies have traditionally used plant and animal products like wool and fur for clothing, and wood for building construction and fuel. Other plant and animal products used in industry include feathers, skins, glues, rubber, oils, waxes, starches and dyes.

Cultural and aesthetic values: Historically, some species have played an important role in the folklore and traditions of many cultures. Species may also have heritage value as national symbols: for example, in Ireland, the three leafed clover (*Trifolium*) symbolises the nation's identity and heritage. Biodiversity also has important recreational and aesthetic values. Biodiversity also has educational and inspirational value.

Intrinsic values: For example, knowing that something exists is satisfying in itself, and the loss of a charismatic species, such as giant pandas and blue whales, represents a considerable loss of 'existence value'. However, it is impossible to quantify and, unfortunately, many species, such as slugs and slime moulds, will never enjoy 'existence value'. Many people also hold strong personal beliefs, feeling a great respect for the whole of nature and a responsibility to hand on to the next generation a world that is as rich in life as the world we live in today.

Developed by:



BIODIVERSITY



Threats to biodiversity

Habitat Loss/Destruction/Fragmentation

These are the main threats to biodiversity around the world and here in Ireland. Very often large scale construction occurs in 'fragile areas', for example, wetland drainage and infilling. Habitat destruction changes the conditions needed for particular plants and animals to survive.

Invasive Non-Native Species

Species that are non-native to a particular area can sometimes spread very quickly, for example the zebra mussel and Japanese knotweed have spread rapidly in Ireland in the past two decades. As a result, these species can destabilise an ecosystem by altering habitats affecting food webs.

Pollution/Litter

As you will remember from the Litter and Waste theme, pollution is always caused by humans. Pollution can have a huge impact, altering the balance within ecosystems, and is the cause of death for millions of animals and plants around the world every year.

Land Use Change/Increased Infrastructure Development

This is the alteration of natural areas by humans, for example, the clearing of huge areas of rainforest in South America for farming. In Ireland, upland open habitats, such as rough grassland, scrub and heath, have been changed by agriculture and afforestation.

Intensive Farming Practices

Extensive use and concentrations of chemical and/or biological pesticides and the removal of hedgerows are typical practices in modern-day intensive farming. Often large areas of land are planted with a single crop (monocultures) which greatly reduces the level of biodiversity in that area.

Climate Change

It is now widely accepted that the current global rate of change in climate is as a result of human activity. As global air or sea temperature changes, even by just 1 or 2 degrees, the habitats in which species live will also change and may even become uninhabitable to some species.

Developed by:

