

Chapter 17: Biodiversity and ecosystems

Knowledge organiser

Biodiversity

Biodiversity is the variety of all the different species of organisms (plant, animal, and microorganism) on Earth, or within a specific ecosystem.

High biodiversity ensures the stability of an ecosystem, because it reduces the dependence of one species on another in the ecosystem for food or habitat maintenance.

The future of the human species depends on us maintaining a good level of biodiversity. Many human activities, such as **deforestation**, are reducing biodiversity, but only recently have measures been taken to try to prevent this.

Global warming

Levels of carbon dioxide and methane in the atmosphere are increasing due to human activity, contributing to global warming and climate change. Global warming is the gradual increase in the average temperature of the Earth.

This scientific consensus is based on systematic reviews of thousands of peer-reviewed publications.

Global warming has resulted in

- large-scale habitat change and reduction, causing decreases in biodiversity
- extreme weather and sea level changes
- migration of species to different parts of the world, affecting ecosystems
- threats to the security and availability of food.

Maintaining biodiversity

Many habitats are currently under threat due to human activities such as deforestation, climate change, and habitat destruction.

There are a number of ways in which scientists and concerned citizens are trying to maintain biodiversity and reduce the negative impact of humans on ecosystems, including

- breeding programmes in zoos for endangered species
- protection and regeneration of rare habitats (e.g., national parks)
- reintroduction of hedgerows in agricultural areas where single crop species are grown, as hedges provide habitat for many organisms
- government policies to reduce deforestation and carbon dioxide emissions
- recycling resources rather than dumping waste in landfill.

Waste management

Rapid growth of the human population and increases in the standard of living mean humans are using more resources and producing more waste.

Waste and chemical materials need to be properly handled in order to reduce the amount of **pollution** they cause. Pollution kills plants and animals, and can accumulate in food chains, reducing biodiversity.

Pollution can occur

- in water, from sewage, fertiliser run-off, or toxic chemicals (e.g., from factories)
- in air, from smoke and acidic gases
- on land, from landfill and toxic chemicals.

Deforestation

Large-scale deforestation in tropical areas has been carried out to provide land for cattle and rice fields, and to grow crops for **biofuels**.

This has resulted in

- large amounts of carbon dioxide being released into the atmosphere due to burning of trees
- extinctions and reductions in biodiversity as habitats are destroyed
- climate changes, as trees absorb carbon dioxide and release water vapour.



Land use

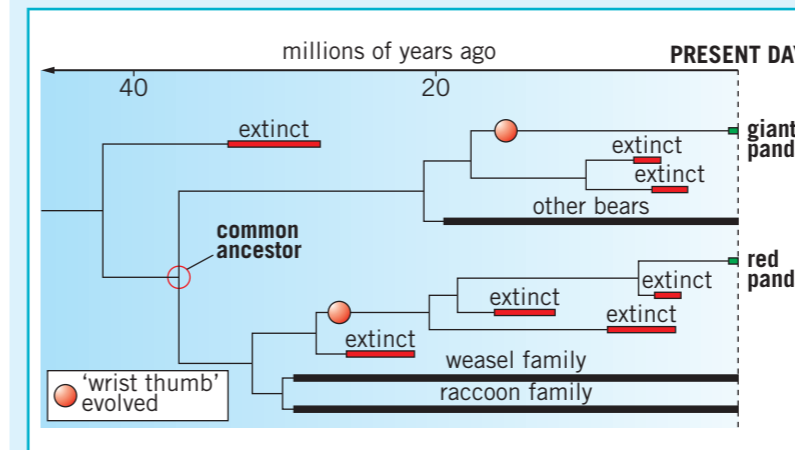
Rapid population growth has led to humans using much more land for building, quarrying, farming, and dumping waste. This reduces the area in which animals can live and can further destroy habitats through pollution.



For example, the destruction of **peat bogs** (areas of partially decayed vegetation) to produce garden compost has decreased the amount of this important habitat, and the biodiversity it supports. The decay or burning of peat for energy also releases carbon dioxide into the atmosphere, contributing to **global warming**.

Evolutionary trees

Evolutionary trees use current classification data for living organisms and fossil data for extinct organisms to show how scientists believe organisms are related.



Key terms

Make sure you can write a definition for these key terms.

biodiversity

deforestation

global warming

peat bog

pollution

Chapter 17: Biodiversity and ecosystems

Retrieval questions

Learn the answers to the questions below then cover the answers column with a piece of paper and write as many as you can. Check and repeat.

B17 questions

Answers

1	What is biodiversity?	Put paper here	the variety of all the different species of organisms on Earth, or within an ecosystem
2	What is the advantage of high biodiversity?	Put paper here	ensures stability of ecosystems by reducing the dependence of one species on another
3	How are humans trying to maintain biodiversity?	Put paper here	<ul style="list-style-type: none">• breeding programmes• protection of rare habitats• reintroduction of hedgerows• reduction of deforestation and carbon dioxide emissions• recycling resources
4	Why are more resources being used, and more waste produced, by humans?	Put paper here	rapid growth in human population, and increase in the standard of living
5	Where does pollution occur?	Put paper here	water, air, and land
6	How are humans reducing the land available for other organisms?	Put paper here	building, quarrying, farming, and dumping waste
7	What are the negative impacts of the destruction of peat bogs?	Put paper here	<ul style="list-style-type: none">• reduces amount of available habitat, causing decreases in biodiversity• burning or decay of peat releases carbon dioxide into the atmosphere
8	Why have humans carried out large-scale deforestation in tropical areas?	Put paper here	<ul style="list-style-type: none">• provide land for cattle and rice fields• grow crops for biofuels