

What is biodiversity?



Biodiversity is the variety of life.

"Endemic species are found nowhere else in the world e.g., Kivi."

"Native species occur in other countries as well as New Zealand e.g., harrier hawks are found naturally in both Australia and New Zealand."

Biodiversity has several components

- ecosystems or environments e.g., rainforest, tussock grassland, estuaries, wetlands, soil – these all have groupings of species (communities) adapted to the particular location, soil types, water availability, salinity, climate etc.
- species in each ecosystem – generally this refers to naturally-occurring native species i.e., desirable biodiversity. Some people also include exotic planted and invasive species
- genetic diversity within species – a wider gene pool provides greater adaptive flexibility and resilience supporting long-term survival
- ethno-biodiversity – the indigenous knowledge, naming and traditional management of species and naturally occurring genetic variation within species. For example, while conventional scientific taxonomy identifies 2 species of flax, Maori recognised and named dozens of varieties according to its appearance, properties and cultural use.



Several components



New Zealand is unique

New Zealand has an amazingly high number of unique species (endemism) because of our long isolation from other land masses, landscape, and geological history.

- 90% of insects are endemic
- 40% of fungi are endemic
- 25% of birds are endemic
- all our bats, frogs and reptiles are endemic
- 80% of plant species are endemic
- Our temperate forests are almost entirely endemic, and we have more tree species than the whole of Europe in less than 3% of the land area

By comparison, Great Britain has only 2 endemic species: 1 plant and 1 animal.

Many of our endemic and native species have not been properly described (more than 1500 species of fungi are known from only a single location) and new species are being discovered all the time (e.g., 90% of the New Zealand mite species are still waiting to be discovered; 15-20% of vascular plants are still undescribed).



New Zealand is unique

Why is biodiversity so important?



Biodiversity is life and supports life.
Biodiversity is complex and dynamic.
Biodiversity is the interlinked and inseparable mix of life forms and processes that have evolved over millions of years.

Free services

Biodiversity provide us with many free services that we take for granted (at least until these services fail) ... you name it and biodiversity does it!

- clean naturally-filtered water
- healthy soils
- nutrient cycling
- resistance to outbreaks of pests & pathogens
- clothing
- slowing flooding & runoff
- decomposing rubbish
- slowing climate change
- good air to breathe
- pollination
- food & drink
- building materials
- reducing erosion
- recreation
- medicine
- removing contaminants & pollutants



Free services



Hidden biodiversity

Many essential biodiversity processes and services are at the microscopic level and hidden from view. These are fundamental to supporting food chains and the web of life. Fungi and bacteria are essential to decomposing fallen wood and litter returning nutrients to the soil. Nitrogen-fixing bacteria and mycorrhizal fungi assist plants to obtain nutrients from the soil.

- A teaspoon of soil rich in organic matter may contain 100 million bacteria and 15 km of fungal threads.
- Organic matter in soils underpins our economy.
 - Soils with high organic matter are worth an estimated NZ\$30-\$150/ha/yr to farmers in terms of increased milk solids production.
 - Soils depleted in organic matter took 36-125 years to recover, and the accumulated lost production was worth NZ\$500-\$1250 per hectare



Hidden biodiversity