

Name:

Date:

# What is Biodiversity? Why is It Important?

Biodiversity is the variety of living things on Earth.<sup>1</sup>

If you add up the number of species - types of living things - on Earth, you will have a measure of Earth's biodiversity. The number of species on Earth is probably somewhere in the neighborhood of 9 million. This number is an estimate, because there are many species that have yet to be discovered and named. Tropical rainforests, for example, host species of insects at the top of tall trees that may never come down out of those trees! The deep oceans also hold undiscovered living things. Voyages to the oceans' deep regions always yield discoveries of bizarre new forms of life.



Biodiversity is also a measure of the number of different organisms in specific ecosystems.

An ecosystem is a place and all the living and non-living components or parts of that place. An ecosystem can be as small as a rotting log or as large as a forest. Each ecosystem is a set of connections between all the living things in it and all the non-living parts of their environment. The biodiversity of the ecosystem - the number of living things in it and the number of different *kinds* of living things in it - is important to the function of the ecosystem.

One measure of the health of an ecosystem is its stability. Stability means the ability of the ecosystem to keep a "steady state" - to keep on functioning as it always has. Stability is important to ecosystems. When more than a few parts of an ecosystem stop functioning, the entire ecosystem can collapse. When an ecosystem collapses, it ceases to function effectively. This is important to the living organisms in the ecosystem, but it can also matter to people. Coral reefs, for example, are a source of food and income for people in tropical islands. They also form a barrier that protects people on islands from storms.

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<sup>1</sup> Leopard photo is public domain and may be found at <https://www.maxpixel.net/Big-5-Leopard-Eyes-Green-Intense-Africa-Kruger-2798929>

# How does biodiversity affect the health of the planet, and of ecosystems?

Have you ever heard the saying “Everything is connected”? That saying is true, in many ways, in Earth’s ecosystems. It means that if one thing changes in an ecosystem, if one organism’s population decreases, the whole ecosystem might be affected. If we were to reduce the number green living things such as plants, we would see a reduction in the number of plant-eaters, herbivores, that depend on those plants for food. Then, the number of meat-eaters, carnivores, would also decrease.

## The story of the sea stars.

Biologist Robert Paine conducted a simple experiment. On a rocky shoreline in Washington State, Paine found that predators, the “top of the food chain,” also affect the health of ecosystems. Paine walked the shoreline removing starfish and throwing them into deeper water. Starfish eat smaller organisms such as snails that eat seaweed.

Three months after nine began the experiment, the total ecosystem had changed. The number of species in the area was reduced from 15 species to eight. Why? When he removed the starfish, populations of the starfish’s prey increased. Four species of algae the producers of the ecosystem, disappeared completely. With them went the herbivores that depended on the algae for food. Populations of a predatory snail that competed with starfish for food exploded. What was the most interesting thing about this experiment? It showed that the starfish was affecting the populations of the species that it ate but also affecting populations of species that it did NOT eat. Paine showed that the connections between organisms in an ecosystem are complex, and that reducing the biodiversity of an ecosystem by removing just one of its members can affect the entire ecosystem.

## What to do:

A recent report found that one million of our planet’s species are currently under threat of extinction. The U.N. Committee’s co-chair Josef Settele said “The essential, interconnected web of life on Earth is getting smaller and increasingly frayed.”

Write a paragraph in which you explain why this loss of species is likely to affect the remaining species. In your paragraph, please also state ways in which this loss of biodiversity might affect human beings. Consider ways in which people depend on the natural world for food, shelter, recreation, and clean air and water.