

THE ECOSYSTEMS

WHAT ARE ECOSYSTEMS?

An Ecosystem is made up of all the living things and non-living things that interact together in a specific place.

Living Things: these are all the plants and animals. Living things in an ecosystem depend on each other.

Non-living things: these are all the elements that affect the plants and animals, such as the type of soil, the climate, water, rocks, etc.

Ecosystems vary in size: they can be as large as a rainforest, or as small as a pond. The Earth can be seen as a giant ecosystem. Within ecosystems, there are different habitats. These are the places where plants and animals find what they need to survive.

FOOD RELATIONSHIPS IN ECOSYSTEMS

Living things in an ecosystem depend on each other for food. They get their food in different ways.

Producers are living things that make their own food. Plants are producers.

Consumers are living things that eat other living things. They cannot make their own food.

Animals are consumers. Carnivores only eat other animals. Herbivores only eat plants.

Omnivores eat both animals and plants.

To represent how living things depend on each other for food in an ecosystem, we can draw a food chain. A food chain always begins with a producer.

RELATIONSHIP IN ECOSYSTEMS

Living things in an ecosystem depend on each other for food, but they also depend on each other for shelter, protection, and transportation. We call this cooperation.

- Many birds need trees to build their nest in.
- Many animals live in groups to provide protection from predators. For example, elephants live in groups to protect their babies from lions.
- Many plants need insects to transport pollen to other flowers.

Sometimes living things have to compete to get what they need. We call this competition.

- Predators compete with each other. For example, lions and cheetahs hunt the same herbivores.
- Plants in forests compete for sunlight, whereas cactuses in deserts compete for water.

TYPES OF ECOSYSTEMS

Ecosystems can be divided into two main groups.

Terrestrial ecosystems include forests, deserts and grasslands.

Aquatic ecosystems can be freshwater, like rivers, lakes and ponds, or *saltwater*, like seas and oceans.

FOREST

A forest ecosystem is a large area of land that is covered in trees and other woody plants and is filled with living animals. There are three main types of forests: tropical rainforests, deciduous forests, and coniferous forests.

Tropical rainforests are found near the equator (the center of Earth), where they are warm all year round. It usually rains in rainforests every day, and there are many different species of animals that live in the different levels of the rainforest.

Deciduous forests are forests made up of trees shed that their leaves in autumn. Worms, snails and spiders enjoy their rich soil, and they have warm summers and cold winters. In the winter, animals that live in deciduous forests hibernate, or sleep through the winter, and birds migrate to warmer areas in the world. Raccoons, rabbits, and squirrels are common animals found in deciduous forests.

Coniferous forests are the coldest and driest of the three types of forest; they have mild summers, but very long, cold winters. The trees in coniferous forests are evergreens and grow cones - that's why they're called 'cone'-iferous! Animals that live in coniferous forests include deer, bears, moose, lynxes, beavers, and birds like gray owls and warblers.

DESERTS

When people think of a desert, they usually think of a sandy, hot, and dry place. But there are other types of deserts as well. A desert is any large region that gets very little rain each year. Very few plants or animals live in desert areas.

Deserts cover about 20 percent of Earth's land surface. All the continents have them. Deserts differ greatly in their land features. They may include dunes of shifting sand, mountains, bare rock, and plains of gravel and boulders. Sand dunes are not as common in deserts as many people think. For example, they make up only about 10 percent of the Sahara of northern Africa. Some deserts are not sandy at all.

Deserts may be hot or cold. In hot deserts, daytime temperatures are often above 100 ° F (38 ° C) in summer. The temperature drops sharply at night. The Sahara is the world's largest hot desert. Other hot deserts include the Kalahari in southern Africa and those in the southwestern United States. Most hot deserts are in the region known as the tropics. This is a band of Earth on either side of the Equator.

Desert plants and animals have features that help them survive in the dry climate. Some plants have special roots that help them absorb the small amount of water that is available. Cacti and yuccas are common desert plants. Desert animals include camels, gazelles, snakes, lizards, and small rodents.

GRASSLAND

Grasslands are wide expanses of land filled with low growing plants such as grasses and wildflowers. The amount of rain is not enough to grow tall trees and produce a forest, but it is enough to not form a desert. The temperate grasslands have seasons including a hot summer and a cold winter.

Grasslands are generally located between deserts and forests. The major temperate grasslands are located in central North America in the United States, in Southeast South America in Uruguay and Argentina, and in Asia along the southern portion of Russia and Mongolia.

Each major area of grasslands in the world has its own characteristics and is often called by other names:

- Prairie. Grasslands in North America are called the prairies.
- Steppes. The steppes are grasslands that cover southern Russia all the way to the Ukraine and Mongolia.
- Pampas. The grasslands in South America are often called the pampas.

A variety of animals live in the grasslands. These include prairie dogs, wolves, turkeys, eagles, weasels, bobcats, foxes, and geese. A lot of smaller animals hide down in the grasses such as snakes, mice, and rabbits.

Also, different kinds of grass grow in different areas of the grasslands. There are actually thousands of different kinds of grasses that grow in this biome. Where they grow usually depends on the amount of rain that area gets. In wetter grasslands, there are tall grasses that can grow up to six feet high. In dryer areas the grasses grow shorter, maybe only a foot or two tall.

FRESHWATER: RIVERS, LAKE AND PONDS

Freshwater ecosystems include lakes, ponds, rivers, streams, springs, and wetlands. You will find them in many different sizes, from very small to very large. The water within the ecosystem can be still (not moving), like in a pond, or it can be running (moving), like a river or stream.

Freshwater ecosystems are broken into three zones: littoral, open water and deep water. The plants and animals within the ecosystem interact with light, food, oxygen, weather, and climate in different ways. Plants and animals grow in different zones in freshwater ecosystems.

The littoral (or marsh) zone refers to the plants and animals that grow closest to the edge of the water. The plants in this area can make great hiding spots for animals to hide from predators. You might find snails, clams, or even eggs and larvae from reptiles and insects in this area. Common predators (animals who prey, or feed, on other animals) in this zone include snakes, ducks and swans.

The open water zone refers to plants and animals that live near the top of the water. Some float on top of the water and have tiny roots that go down into the water, like duckweed. Others have their roots down in the mud at the bottom of the pond and leaves that float at the top of the pond, like water lilies. These plants get lots of sunlight, which makes them the top energy producers for the animals in the water. Many fish also swim in this open water zone.

SALTWATER: SEAS AND OCEANS

The ocean ecosystem covers most of the earth's surface and is home to millions of plants and animals. It influences the weather all over the earth and produces about 70 percent of the oxygen we breathe. While there are five different named oceans – the Arctic, Atlantic, Indian, Pacific and Southern oceans – they are all actually the same body of water. The oceans cover

about 70 percent of the earth's surface and have an average depth of 2.4 miles. It is home to the smallest organisms like plankton and bacteria, as well as the world's largest living structure – the Great Barrier Reef, which can even be seen from the moon.

Marine plants live in the euphotic zone of the ocean, because they need sunlight to create food through photosynthesis. These plants include seaweeds, marine algae and sea grasses. Mangrove trees, which live on muddy tropical shores, are also part of the ocean ecosystem. These plants absorb carbon dioxide and turn it into oxygen through