



## **General habitat information**

### What is a habitat?

A habitat is basically the environment in which anything – plant or animal – lives. Habitats have both living and non-living things often in different quantities. For instance a desert is a harsh environment and therefore the non-living parts of the habitat dominate. In a tropical rainforest however there are so many living things that they far outnumber the non-living elements.

Species of both animals and plants can survive in a wide range of habitats in the air, on the ground, in water or even in rocks. Taken together the world's habitats make up the biosphere, every region on the earth where living things are found.

### What makes habitats different?

Although the land that the habitat is found in will play a part in shaping that environment, for instance the nature of the bed rock, the presence of mountains and so on the most important factor in creating different habitats is climate. Rainfall, temperature, seasonality and so on have a huge effect on the habitat and the things that live there.

Although the various types of habitats are spread over the world, for instance tropical rainforests are found in a belt along the equator across many different continents and countries, the animals tend to be different between continents. Animals have quite specialised distributions. This is partly due to evolution and also due to their way of life.

### Do habitats always stay the same?

In short, habitats are constantly changing with small changes occurring on a daily basis to massive changes taking place over thousands or hundreds of thousands of years. Daily changes include local weather conditions or fire, flood or storm.

Habitats can also undergo massive change over much longer periods of time. This is usually due to climate change which can be triggered by different factors.

In the planet's history there have been ice ages, forests have covered most of the planet and receded again and so on. These long term changes have a much more profound effect on the species that live in a habitat. Animal and plant species are adapted to survive in their particular habitat with its particular composition. As habitats change naturally over long periods of time, some species die out while others survive. Species either have to move to areas that still suit them and their lifestyle or adapt along with the changes in the habitat to take advantage of the new conditions under which they live. Prior to the evolution of humans, this habitat change process was a natural one, now however humans are having a much greater impact.

### Natural habitat cycles

Within habitats and the biosphere the things that make life possible, energy and nutrients, are always on the move.

Most life on earth gets its energy directly or indirectly from the sun. Plants use the sun's energy to create their own food and to grow. When plants are eaten, that energy is passed on to other living things. Even if the plant is not eaten, when it dies it will be broken down and its energy, in the form of food and nutrients will be used by other species.

There are about 90 natural elements on Earth and of these about 20 are essential for life on earth. Some, the macronutrients are used in large amounts such as the oxygen that we breathe, the micronutrients are only needed in tiny quantities. These elements are found in food or the natural environment, when the living thing dies these elements are returned to the soil or water to be used again by another living organism. So these elements are constantly passing between species.

Water is also essential to living things. The sun evaporates water in the sea, which cools as it rises forming clouds. When these clouds cross over land it cools further, condenses into water droplets and falls as rain. Once the rain hits the land, most of it will run off back into the sea but some will be used by living organisms. Plants and animals release that water back into the environment



through breathing and 'waste disposal' and the rest returns to the soil when they die.

In a habitat all the living things are potentially food for other species. Animals eat plants, some plants eat animals and some animals eat each other. When they die, living things are eaten by the decomposers. Decomposers break down dead matter, releasing the nutrients for use by other species and releasing the stored energy as heat.

The world's most productive habitats have the world's highest biodiversity because there are so many species that can be eaten by others. This high level of biodiversity probably helps to protect the habitat as a whole from sudden habitat change because there are still plenty of food sources for the species that live there. For instance in a tropical rain forest if a disease suddenly wiped out all of the fig trees, it is unlikely that any of the primates would die out because there are so many other fruiting trees for them to feed on. However, in a desert if all the cacti suddenly died out, a great many species could be at risk as there just aren't enough specially adapted desert plants for those species to feed on. Therefore when humans interfere with and reduce biodiversity in a habitat by hunting for instance or logging, many more species become threatened.

## **The World's Major Habitats**

### **Grassland**

Grasslands form where it is too dry for trees and too wet for desert. Grasslands are maintained by the grazing activities of animals. Grasses are unusual in that they grow from a point near the ground, whereas other plants grow at the tip. So when animals graze they bite off the growing tips of all other plants preventing them from developing and taking over. Grasslands are open habitats full of food



for those animals capable of digesting it, but they provide little in the way of shelter.

### Deserts

No two deserts are identical but true desert is defined as having less than 15cm of rain per year and semi-desert has up to 40cm annually. Rainfall in a true desert occurs in short, torrential downpours whereas semi-desert usually experiences a wet season followed by a long period of drought. Deserts therefore are dry, have intense sunshine and a huge temperature range. These characteristics combined with winds that pick up loose particles and blast them across the habitat make deserts a very difficult place to live.

### Tropical forest

The forests that are found in the tropical areas of earth have existed longer than any other forest types, which goes some way to explain the high level of biodiversity they contain. Tropical forests come in two main types, rainforest and monsoon forest. Rainforest is found in a belt around the equator and the high level of rainfall occurs year round. Monsoon forests on the other hand grow at the edges of the tropical regions and their high rainfall occurs seasonally.

### Temperate forest

These forests are found in areas that have a wide range of climates. Where cold winters are experienced, temperate forests tend to shed their leaves in the winter and have their growing season in the spring and summer. In warmer areas the trees do not shed their leaves seasonally. Although not as rich in biodiversity as the tropical forests, temperate forests are still some of the richest wildlife habitats on land.

### Coniferous forest

Where the climate is exceptionally cold, and the growing season short, trees need to be tough and well adapted in order to survive. Conifers are the perfect

solution. Their leaves are thin, needle-shaped and have a tough covering enabling them to withstand extreme cold and wind. As conifers do not spread out and grow upright they can grow close together without competing forming a dense forest that helps them to survive the worst of the weather. With all of these adaptations, conifers can grow and survive where broadleaved trees cannot in the far north and south and up mountains.

### Mountains

In most habitats conditions do not vary much however mountain habitats are very different. As you ascend the mountain the air becomes thinner so there is less oxygen and more ultraviolet light. Also for every 200m you climb, the temperature drops by approximately 1°C. Just as in woodland a mountain habitat can be divided into different layers, each one supporting different animal and plant life.

### Polar Regions

The Arctic and Antarctic may appear to be similar and in some ways they are. They are the coldest places on earth and have periods of 24 hour darkness and 24 hour light. However they are physically different – the Arctic is a frozen ocean where the sea ice grows and contracts during the winter and summer. The Antarctic is a land mass covered in ice and snow. Therefore the animals that live in the Arctic tend to be ocean based and Antarctic animals can be land based.

### Fresh Water

Fresh water in the form of streams, rivers, lakes and wetlands provide a wide range of habitats for a large variety of species. It is estimated that approximately 100,000 cubic km of water evaporates from the world's oceans, and then falls as rain or snow. This fresh water is essential for all life forms.



## Oceans

Oceans and seas form the largest of all habitats on earth and are the birth place of life itself. Oceans cover over three quarters of the planet's surface yet, because of the difficulty of exploring this vast habitat, scientists know very little about the life forms that live there.

## Coasts and coral reefs

Coast lines are very specialised habitats as this is where the land meets the sea and the species that live there must be able to cope with both environments even if only for a short time. The wildlife can vary between coasts due to local conditions. Coral reefs are often referred to as the tropical forests of the sea. They support a huge biodiversity and require both warm water and year round sunshine. Therefore they are generally only found in the tropics.

## Urban areas

In the 1800s only about 3% of the human population lived in cities, that figure is now closer to 50%. The huge growth in urban areas have changed a great many natural habitats and created new ones. A great many species around the world have taken advantage of this man-made habitat and survive and thrive there.