



Unit 6 - Habitats

A *habitat* is a place where certain *organisms* (plant and animal species) naturally live and grow. Like your home, habitats support life by providing the food, water and shelter that its inhabitants need to survive. The Earth supports a wide variety of habitats, and each habitat has its own unique plant and animal life that is uniquely suited to live in the kind of environment that the habitat provides. The survival of these plants and animals is completely dependent on the survival of the habitat itself.

Kinds of habitats

Some well-known habitats include dry deserts, open savannas (grasslands) and the polar ice caps. Each habitat is home to a variety of plants and animals that are unique to that specific environment.

In the extreme dry heat (and cold) of the desert, plants and animals have adapted to store moisture and use it sparingly. Many of the desert's animals are *crepuscular* (they are active only at dusk and dawn), while others are completely *nocturnal*, restricting their activities to the cooler temperatures of the night.



http://www.desertusa.com/july96/du_saguaro.html

The saguaro cactus grows very slowly and stores water, enabling it to survive the hot, dry weather of its desert habitat.

Animals living in the *savanna*, or warm tropical grassland habitats, have few places to hide. Therefore, some savanna inhabitants, such as cheetahs, lions and gazelles, have developed the ability for speed...either to chase prey or to run away from predators! Other animals in the savanna, such as zebras, giraffes and elephants, travel the savanna in large groups, knowing that there is improved safety in numbers.



<http://www.onime.com/Africa/bigcats/cheetah/distributionandhabitat.html>

The cheetah can slink through the vegetation of its savanna habitat, searching for prey.

The inhabitants of the polar ice habitats of the North and South Poles have adapted beautifully to freezing temperatures and the barren landscape. Polar bears, for example, keep warm with a thick layer of fat and a double layer of fur. Their small ears allow very little heat to escape. Their massive paws work like snowshoes, helping them by distributing their weight evenly over the snow so that they don't sink. Their stark white coat makes them nearly impossible to see against the snowy backdrop of the Arctic Circle. At the opposite end of the Earth, layers of blubber and downy feathers and large amounts of body oil help the Emperor Penguin survive the sometimes -140 degree Fahrenheit (-60 degrees Celsius) temperatures of Antarctica.



<http://www.polar-challenge.com/press/images.asp>

The polar bear's massive paws keep it from sinking into the snow, much like a pair of snowshoes!

These are only a few of the many habitats found on Earth. Other habitats include, but are definitely not limited, to the deep sea, marine tide pools and temperate forests. But none of these habitats is as rich with life as that of the hot, humid, dark and damp tropical rainforest!

Plant and animal habitat in the Amazon rainforest

Approximately 50% of the Earth's plants and animals reside in the world's tropical rainforests. This incredible abundance of life cannot exist solely on the rainforest floor—there's simply too much going on! In order to accommodate so many organisms, the Amazon rainforest has developed an amazingly intricate layering of habitats. The four main layers of the rainforest – emergent, canopy, understory, and forest floor – all play host to a different, but equally fascinating array of plants and animals. In fact, some rainforest animals and insects never touch the ground and have adapted their lives to living in tree branches high above the rainforest floor!

The bottom layer, the *forest floor*, is where tree life begins in the rainforest. There is little (if any) sunlight that reaches this level and few plants or shrubs manage to grow here. However, leaves and fruit, which fall from the trees above, decay on the forest floor, providing rich nutrients for the already fertile soil, helping new trees and plants grow. Most of the rainforest's insects and spiders live here, as well as animals like the anteater (somebody has to eat all those ants!) and the tapir. The muscular jaguar also makes its home here (and in the low branches of the understory); its black spots help it to be a better hunter by helping it to blend in with the speckled shadows of the rainforest floor.



The jaguar's speckled coat helps it to blend in with the shadows of the forest floor. What other natural defenses to animals posses that allow to flourish in the flooded forest?

http://www.reiserat.de/reisen_welt/peru/pflanzen_tiere.html

Just above the forest floor is the *understory*. This level is hot and damp, and the air is very still. The many shrubs, saplings and tree trunks, as well as vines and fragrant flowers, provide shelter and food for the bees, bats, snakes and frogs that call the understory their home. The understory also sometimes hosts animals that typically dwell in the layers above and below it; the jaguar is often found reclining on the low branches of the understory, and birds and monkeys, which normally live in the layer above, venture into the understory in search of food.

Many kinds of frogs populate the understory of the rainforest. The understory is a very hot, damp, and noisy habitat inside the flooded forest. Less than 5% of the sunlight reaches the understory.



<http://www.rainforesteducation.com/life/understory3.htm>

Above the understory is a dense covering of greenery called the *canopy*. Sunlight generously hits the upper layers of the canopy, but this rich green blanket, sometimes called the roof of the rainforest, prevents sunlight from reaching the levels below. Trees in this level soar as high as 150 feet; they must grow quickly in order to compete successfully for the limited sunlight available. Thick vines, air plants (such as mosses and lichen), and gorgeous tropical flowers (such as orchids and bromeliads) also grow abundantly in the canopy. Most of the rainforest's animals live in the canopy level and food here is abundant, though some canopy dwellers do venture into the understory when looking for food. Common inhabitants of the canopy include monkeys, toucans, parrots and sloths.



The sloth lives in the tree branches of the rainforest canopy, high above the forest floor.



The toucan, one of the more famous Amazonian inhabitants, can be found in the canopy level of the rainforest.

http://www.blueplanetbiomes.org/rnfrst_animal_page.htm

Only a few trees per acre manage to grow higher than the thick cover of the canopy level; these are the trees which make up the *emergent* level. Emergent trees have little protection from the sun and must adapt to hot temperatures, low humidity, and high winds. A variety of insects and an array of birds, such as macaws, eagles, and birds of paradise, live in the emergent level. Animals from the canopy sometimes venture into the emergent level for food or sun.

People living in the Amazon

The tropical rainforest is a rich and ripe place for plants and animals to live, but what kind of environment does it make for humans? Do humans live in the Amazon rainforest?

Actually, people have been successfully living in tropical rainforests for thousands of years, and studies estimate that over 2,000 indigenous tribes with more than seven million people lived in the Amazon before the arrival of the Europeans 500 years ago. Since then, estimated numbers have declined significantly; it is believed that less than 400 tribes and about one to one-and-a-half million people currently live in the Amazon rainforest. Some of these tribes are believed to live without knowledge of the outside world, while others have deliberately isolated themselves in an effort to escape the disease and exploitation that the outside world exposed them to.



These inhabitants of the Amazon survive off the richness of the rainforest, getting their food by hunting, fishing, gathering and cultivating small crops. They make their medicines from rainforest plants and build their homes from rainforest trees and plants.

Even their clothes are derived from rainforest “products.” Many, like their ancestors before them, are *subsistence farmers* who only hunt and grow what they needed to *subsist*, or survive, nothing more. Some of these farmers practice *slash and burn* agriculture, which, despite its harsh sounding name, can be one of the most ecologically sound methods of cultivation—when it is done correctly.

Slash and burn farmers clear the land by *slashing* (cutting) the trees and bushes and burning them to release nutrients into the soil. They grow crops in this newly fertile soil for a few years, and then slash and burn another plot of land. While they farm this new land, plants and trees of a secondary forest grow on the first and replace nutrients drained from farming. For slash and burn agriculture to be ecologically sound, the farmers must wait for the old field to rest for many years before returning to it and slashing and burning yet again. Rotating crops in this way ensures that the soil will always be rich. Unfortunately, today’s growing population and lack of land causes many of these farmers (as well as newer settlers to the area) to return to old fields prematurely; they cut down trees too soon and the land becomes permanently infertile. As a result, increasingly more acres of rainforest are cut down to make way for new fields and these new fields are never reclaimed by the rainforest.

The survival of the indigenous people of the Amazon rainforest is solely dependent on the conservation of their habitat. Until fairly recently, the rainforest protected these people and provided everything these people needed to survive. Unfortunately, their way of life has been increasingly threatened since the arrival of the Europeans. The Europeans unwittingly introduced non-native diseases that killed off 90% of the natives (who hadn’t built up any natural immunity to the diseases). More deliberately, many of these European settlers, who wanted this rich land for themselves, killed, enslaved or drove off the indigenous people. Within the last 40 years, wide roads constructed for timber and oil companies, cattle ranchers and miners have enabled settlers and other outsiders to tread even further into the rainforest, and have led to the destruction of millions of acres of rainforest every year.

Habitat: An Element of Survival

Remember, a habitat is defined as a place where certain organisms naturally live and grow. The habitat provides the food, water and shelter that these organisms need for survival. If the habitat is destroyed – or even altered in a minor way – the survival of the organisms that live there is gravely threatened. In today’s interactive world, where we are so dependent on products derived from all over the world, the loss of a rich habitat such as the rainforest would be a tremendous loss for everyone. Understanding and protecting the Earth’s habitats is a crucial element for survival, not only of rainforest plants, animals and people, but for people all over the world.

Questions for Discussion

Habitat is vital to survival. The three basic levels of habitat are: food, water, and shelter. How does your habitat provide these basic needs?

Think about your habitat. Where does your food come from? How can you trace your food back to the source?

Fresh water is a necessity to survival. Where does your water come from? Trace your water back from the tap to the source. What kinds of treatments are applied to ensure water's safety?

What are some ways to avoid wasting treated water?

What habitat would you most like to visit? Why did you choose this habitat? How do the people, plants, and animals survive in your favorite habitat?

In the flooded forest, indigenous people rely on their habitat to provide the elements of survival. What ways have rainforest dwelling people adapted to their surroundings. What kind of impact have they had on the forest as an ecosystem?

What kind of impact have people had on your habitat? What are ways you can reduce your impact?

How do plants, animals, and people co-exist in your habitat? How do plants, animals, and people co-exist in the flooded forest? Are there any similarities?

What conclusions can you draw about survival in the world's ecosystems? Can you apply to all geographic locations?

Further Exploration and Sources

<http://www.nmfs.noaa.gov/habitat/habitatprotection/index4.htm>

<http://school.discovery.com/lessonplans/programs/habitats/>

<http://library.thinkquest.org/26634/text/grass/survive.htm>

<http://www.siec.k12.in.us/~west/proj/penguins/emperor.html>

<http://library.thinkquest.org/11234/rainforest.html>

http://www.ran.org/info_center/factsheets/s06.html

<http://www.desertusa.com/survive.html>

http://www.edhelper.com/AnimalReadingComprehension_27_1.html

<http://www.chariho.k12.ri.us/faculty/riordan/rainforest/rainfrst.html>

<http://www.blueplanetbiomes.org/rainforest.htm>

<http://www.cesa10.k12.wi.us/Ecosystems/rainforests/intro/intro.htm>

<http://www.eduweb.com/agriculture/ag1.html>

<http://www.pbs.org/journeyintoamazonia/sacred.html>

http://news.nationalgeographic.com/news/2003/03/0310_030310_invisible1.html

<http://www.ems.org/amazon/indigenous.html>

http://www.ucls.uchicago.edu/people/faculty/Peggy_Doyle/madhanks.html

http://www.adventure-life.com/amazon/indigenous_people.php