WWF for a living planet®

AMAZON Initiative

The Amazon's flora and fauna

The Amazon biome, covering an area of 6.7 million km² (more than twice the size of India) represents over 40% of the planet's remaining tropical forests.

Trees and plants

The Amazon is particularly rich in trees and plants, with more than 40,000 species that play critical roles in regulating the global climate and sustaining the local water cycle. All have adapted to the abundant rain and often nutrient-poor soils. To defend themselves from herbivores some have developed tough leaves, resins or latex outer coats enabling them to resist many predators. Others produce leaves that are nutritionally poor or poisonous. Nonetheless, many of the plants and trees are valued for what they produce – timber, compounds valued in agriculture and medicines such as curare, fibres including kapok, rubber, and food for both the people living in the Amazon and the wider world.

The **kapok tree** *(Ceiba pentandra)* is a tall rainforest tree, reaching 50 m. With buttressed roots, a smooth grey trunk, and a wide top hosting an abundance of epiphytes and lianas, it is most commonly seen on forest edges, riverbanks and disturbed areas, where it receives more light. Kapok, a valued cotton-like fibre, surrounds the seeds and helps them disperse in the wind.

The 40 m high **Brazil-nut tree** *(Bertholletia excelsa),* that can live for 1,000 years, was so highly prized by indigenous people that its nuts were once used as currency. They can also be eaten, with the oils derived from them used in cooking, skin-care products and livestock feed. Other parts of the tree, rich in antioxidants, are brewed into medicinal teas to treat stomach aches or liver ailments. Only one group of insects, euglossine bees, can pollinate the Brazil-nut, the fruit of which is a woody pod containing about 20 nuts. Similarly, there is only one natural way for the nuts to leave the pod. The agouti, a large rodent, breaks the tough outer shell with its extremely sharp teeth and, after eating its fill, buries the rest for later, inadvertently planting new trees.

The Amazon biome landscape

- 79.9% tropical evergreen forest
- 6.8% anthropic (incl. pastures and land use changes)
- 4.0% savannas
- 3.9% flooded and swamp forest
- 1.4% deciduous forest
- 1.2% water bodies
- 2.8% others (incl. shrubland & bamboo)

With over 10% of all the world's known species

- >100,000 invertebrates
- 40,000 plant species
- 3,000 freshwater fish
- 1,300 birds
- 427 mammals
- >400 amphibians
- 378 reptiles

With only around 13% of Earth's biodiversity yet known to science, there may be many, many more.

Epiphytes, a wide range of plants including some ferns, orchids, cacti, and mosses, live on other plants, often virtually in mid-air. They trap what little moisture they need from the air and a litter base on tree branches.

In the Amazon, some **bromeliads** also occur as epiphytes, accumulating rainfall water and detritus in their cup-like structures. As many as 250 tree frogs, snails, and other species live within these structures, which afford them the perfect habitat at a vulnerable stage of their development.

Other plants that are common both as creepers and epiphytes in the Amazon biome are the **aroids**, which include **philodendrons**. These begin life on the ground, growing tendrils that attach themselves to tree trunks and climb. As the plants mature, they lose their ground roots and become climbing epiphytes.

Many of the Amazon's **palms** have a commercial value. One - *Murumurú* - is used for its oil that is said to contain three times more vitamin A than carrots, as well as other nutrients. Other palms are used to make brooms, hammocks, necklaces and string bags.

Vines give rainforests their characteristic dense appearance and are essential as food and "highways" for wildlife. Vines encompass a variety of plants, including lianas that hang from the treetops; bole climbers, which ascend tree trunks; and stranglers, which wrap themselves around trees and sometimes choke them. Widely present and robust, vines have long been used by humans as food, medicine, hallucinogens, poisons and construction materials.

Invertebrates

Scientists know of more than 100,000 Amazonian invertebrate species, but some believe that the true number may actually be as high as 30 million. Up to 30% of the animal biomass of the forests is made up by ants. Indeed, a 250 hectare area of rainforest can host up to 50,000 insect species.

Not only are invertebrate numbers still a source of scientific conjecture, but their relationships, including symbiotic ones, with one another as well as the trees, plants and animals around them, are also poorly understood.

Peru's Manu National Park and Tambopata National Park each has more butterfly species - 1,300 and 1,231 respectively - than are found in the whole of Europe,

which only has 321 species. But Amazonian invertebrates are not all as appealing as its butterflies – the forests also host such huge invertebrates as the 16 cm longhorn beetle, the 20 cm flatworm and the 30 cm Amazonian centipede.

Fish

The Amazon and its hundreds of tributaries teem with more than 3,000 fish species. In flooded forests, **plankton** – tiny aquatic plant and animal organisms – are abundant, drifting with the currents, making these forests ideal for fish growth, especially during flooding.

Electric eels *(Electrophorus electris)* can reach 1.8 m in length and deliver electric shocks of up to 650 volts. They are blind, but have an electric field to detect and stun prey.

Another impressive species, the **pirarucu** *(Arapaima gigas)* can reach up to 150 kg in weight and 3 m in length. Prevalent in lakes, it is an important protein source for people living along the Amazon. The pirarucu's built-in weaponry makes it an efficient fish predator. Apart from its sharp teeth, it has a toothed tongue, which it uses to process its fish prey.

The reputation that precedes the **piranha** (several species) is somewhat undeserved: it is actually much less aggressive than commonly believed. Indeed most of the 20 piranha species are vegetarian, and it is only advisable to avoid the red piranha *(Sarrasalmus nattereri)* when water levels and other food supplies are low.

Many Amazon fish have adapted to a fruit diet, probably as a result of the large areas of flooded forest near rivers and streams that provide a ready supply of fruit and seeds. The **giant tambaqui** *(Colossoma macropomum)*, a bass-like fish that can weigh up to 30 kg, has specialized powerful teeth that allow it to crush and grind hard fruit such as palm nuts and rubber tree seeds. Those seeds it swallows but does not digest are dispersed through the river network.

Amphibians

Amphibians are not just frogs – the Amazon is home to, amongst others, the **climbing salamander** *(Bolitoglossa altamazonica)*, the **orange-bellied leaf toad** *(Dendrophryniscus minutes)* and the **Peruvian smoothsided toad** *(Bufo glaberrimus)*. But it is frogs that predominate.

The frequent rain and high humidity have enabled many of the species to live in the trees, avoiding their predators in rainforest waters. Indeed, unlike their temperate counterparts, the frogs in this climate lay their eggs either on the forest floor or in the trees.

But beware, the more stunningly coloured the frogs – they range from bright blues through greens and oranges to vibrant yellows – the more toxic they are likely to be.

Amphibians are particularly sensitive to changes in their habitat – so changes in humidity and rainfall patterns, brought on by the loss of tree cover, are likely to be fatal to many of these species.

Reptiles

A majority of the world's reptiles are found in the tropics, including tropical South America. But despite this abundance of species, our knowledge of many Amazon reptiles is still poor.

Boas, collectively referred to as *boines* in South America, are widespread across the Amazon river basin. The Guianas host five species: the boa constrictor *(Boa constrictor)*, the emerald tree boa *(Corallus caninus)*, the common tree boa (*C. enydris*), the rainbow boa *(Epicrates cenchria)*, and the green anaconda *(Eunectes murinus)*.

The snakes swallow their prey, which include fish, turtles, lizards, crocodiles, birds, and even mammals, like deer, whole. As different boa species use different habitats and specialize in different prey, they are able to co-exist.

The **black caiman** *(Melanosuchus niger)* is the biggest of all caimans and the Amazon's largest predator, as adult males can reach a huge 6 m. The caiman's main predator is humans, who hunt them for leather or meat. Caimans eat fish and

land-dwelling animals including capybara and deer, with larger specimens taking tapirs, puma and jaguar.

All 20 turtle species found in the Amazon River basin belong to an ancient group called side-necked turtles. The **South American river turtle** *(Podocnemis expansa)* is the largest of these, with shells over 80 cm long reported for some females, while males measure 40 cm on average. These groups of turtles, which have inhabited the Earth for more than 158 million years, can be found in the Amazon and Orinoco river basins in Bolivia, Brazil, Colombia, Ecuador, Guyana, Peru and Venezuela.

Biologically, turtles act as indicator species as they are sensitive to changes in their habitat. In some places fishers are irreparably disturbing the sandy shores where turtles lay their eggs by spreading out their fishing lines and nets, lighting fires, and creating noise with outboard motors. Elsewhere riverside communities capture the turtles, roast their meat and eat their eggs.

But there are encouraging early signs of their sustainable management in several Amazon countries (such as Bolivia) where WWF works with riverside communities that are collecting eggs in order to release them in safety when the turtles hatch.

Birds

The South American tropics rank as one of the world's most diverse areas for birds. About 3,800 species are found here - over 1,300 in the Amazon – ranging from the colourful toucan to the majestic harpy eagle.

Parrots have been prized as pets for years, and **macaws**, the largest of the parrot family, have always been extremely popular due to their bright colour, size and intelligence. In recent years, the demand for them has grown steadily - and along with it the trade in birds captured from the wild.

The largest, the **Hyacinth Macaw** *(Anodorhynchus hyacinthinus),* has been one of the most seriously affected. With a naturally low reproductive rate and a long gestation time, the hyacinth macaw has been reduced to an estimated 6,500 birds in the wild, divided unequally amongst three main areas of Brazil, western Bolivia and northeastern Paraguay. In these areas, the Hyacinth Macaw's nest trees are destroyed and birds are hunted for food and feathers.

That most majestic of Amazon birds, the **harpy eagle** *(Harpia harpyja)* is over a meter tall, with a wingspan of 2 m. Almost no prey is too large for this eagle, which feeds on monkeys, sloths, and other birds. Deforestation is taking away its habitat, and populations are classified as “near threatened” by the IUCN Red List.

The **toucan** *(Ramphastidae family)*, an instantly recognizable symbol of the Amazon, is found in lowland moist forests and montane cloud forests, where it nests and roosts in tree cavities. Today, as a result of deforestation, most toucan species are classified as “lower risk” by the IUCN Red List.

The **hummingbirds** in the Amazon are small, hyperactive, and amazingly adapted. There are more than 300 species of hummingbirds there. Their adaptations include an ability to rotate their wings 180 degrees. They also have very high metabolisms, with heartbeats reaching 1,260 beats a minute, allowing some species to beat their wings 80 times a second. All this comes at a cost: hummingbirds need to make up the energy they use and must frequently refuel on high-calorie nectar.

Mammals

When the Maya and Inca civilizations ruled, the **jaguar** *(Panthera onca)* – the largest cat of the Americas – was revered as a divine creature. Indeed, it was believed that the jaguar’s eyes had a connection to the spirit world.

Today things have changed, and not just for the jaguar. Persecution, habitat degradation, and decreases in prey have reduced mammal populations across the Amazon biome. While the commercial hunting and trapping of jaguars for their pelts has greatly declined, the species remains a victim of ranchers, who kill it to protect their cattle. Today fewer than 50,000 mature breeding individuals remain.

Locally known as the boto, the **Amazon river** or **pink river dolphin** *(Inia geoffrensis)* is found throughout much of the Amazon and Orinoco river basins in Bolivia, Brazil, Colombia, Ecuador, Guyana, Peru, and Venezuela. It depends on healthy fish populations for survival. Although tens of thousands probably survive, the boto’s habitat is threatened by river development projects. Hydroelectric and irrigation schemes may reduce its ability to breed. Historically, the boto has been spared human persecution because it was believed to have magic powers.

Today however, it is increasingly viewed as an unwanted competitor by fishers. Others threats come from river pollution, from oil extraction and from mercury, cyanide, and arsenic leaching from gold mining activities. In the face of these threats, the boto is classified as “vulnerable” by the IUCN Red List of Threatened Species, and is listed on Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

One of the world’s three **manatee** species, *Trichechus inunguis*, is found from the mouth of the Amazon River to the upper reaches of its tributaries in Brazil, Colombia, Ecuador, Guyana, and Peru. It is exclusively herbivorous, feeding mostly during the wet season, when there is plenty of new vegetation. The manatee is classified as “vulnerable” by the IUCN Red List.

The **giant otter** *(Pteronura brasiliensis)* is the world’s largest otter. It is found throughout the Amazon River basin in small groups, foraging in slow-moving rivers, lakes, and swamps. While the otter fur trade has been banned, the combined impacts of habitat loss and pollution, together with illegal hunting, pose risks to the giant otters’ long-term survival. They are classified as “endangered” by the IUCN Red List, and are listed on Appendix I of CITES.

Another great swimming mammal, the **tapir** *(Tapirus terrestris)* is found in lowland tropical and subtropical moist forests, showing a preference for moist, wet or seasonally inundated areas. The impacts of deforestation, hunting and disease from domestic livestock have led to a reduction of its population. It is classified as “vulnerable” by the IUCN Red List.

The **Black spider monkey** *(Ateles paniscus)* – one of the largest primates in South America – plays an important role in seed dispersal, and thus forest renewal. However, they prefer pristine tropical forests and seldom venture into disturbed habitats, making them particularly susceptible to forest fragmentation. They are classified as “endangered” by the IUCN Red List, and are listed on Appendix II of CITES.

All images have been supplied by WWF-Canon Photo Database. André BÄRTSCHI, Diego M. GARCES, Michel GUNTHER, Martin HARVEY, Zig KOCH, Roger LE GUEN, Xavier PELLETIER, Anthony B. RATH, Y.-J. REY-MILLET, Michel ROGGO.

Conclusion

Although today 80% of the Amazon remains intact, it is under siege – from deforestation and from the development and improvement of both aquatic and terrestrial infrastructure, such as roads and dams.

The survival of so much of the Amazon, and especially its core, gives hope that its current diversity can be maintained if the wave of destructive development can be redirected and become sustainable. Things can change rapidly with the twin threats of deforestation and climate change reinforcing one another across the Amazon. That is why WWF is determined to see the Amazon Initiative succeed, contributing to a world in which humanity will live in harmony with nature.

Contact:

Rebeca Kritsch
Communication Manager
Amazon Initiative

rebeca@wwf.org.br
+55 61 33647464

February 2008

WWF

for a living planet®