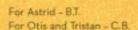


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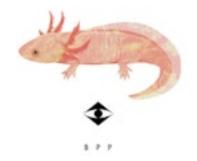
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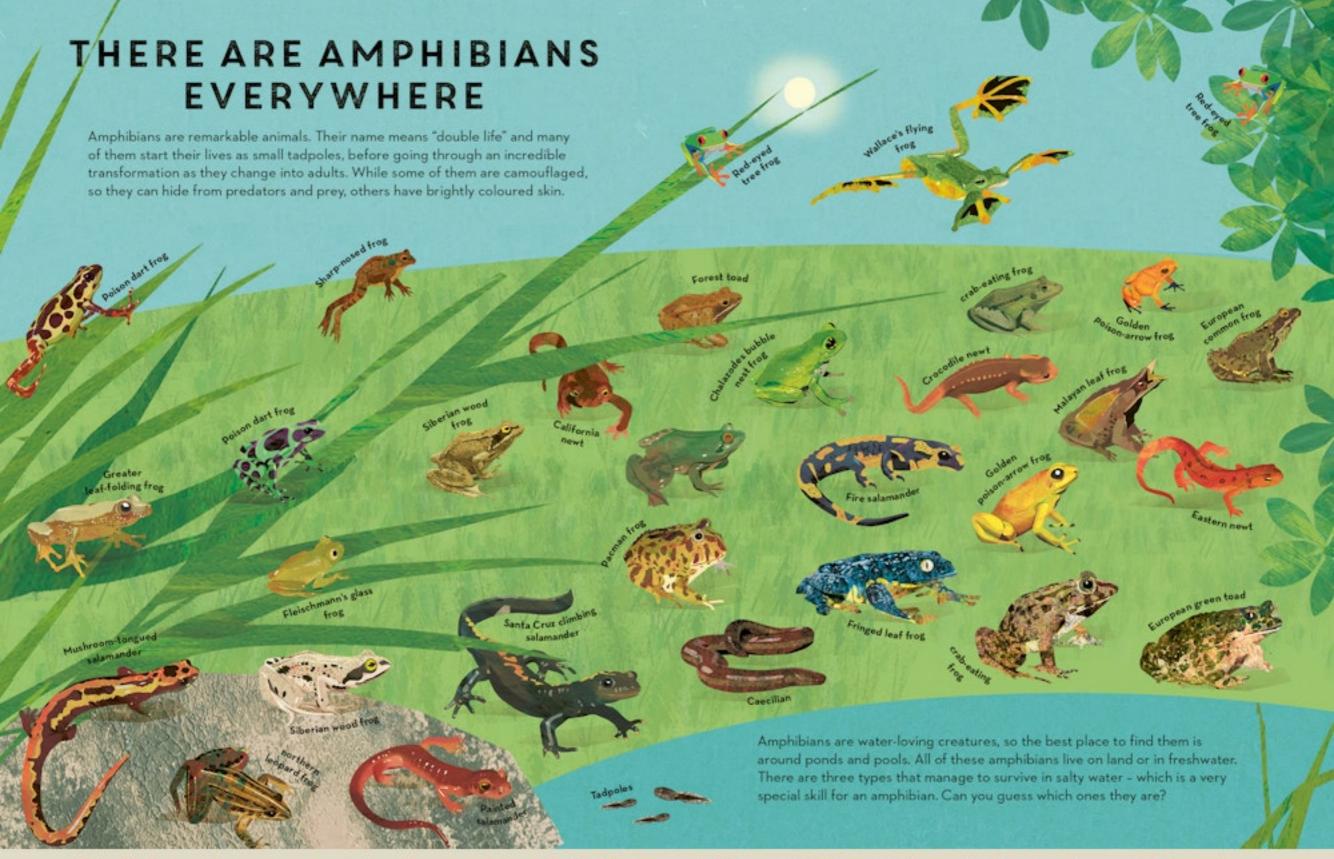
AMPHIBIANS

EVERYWHERE

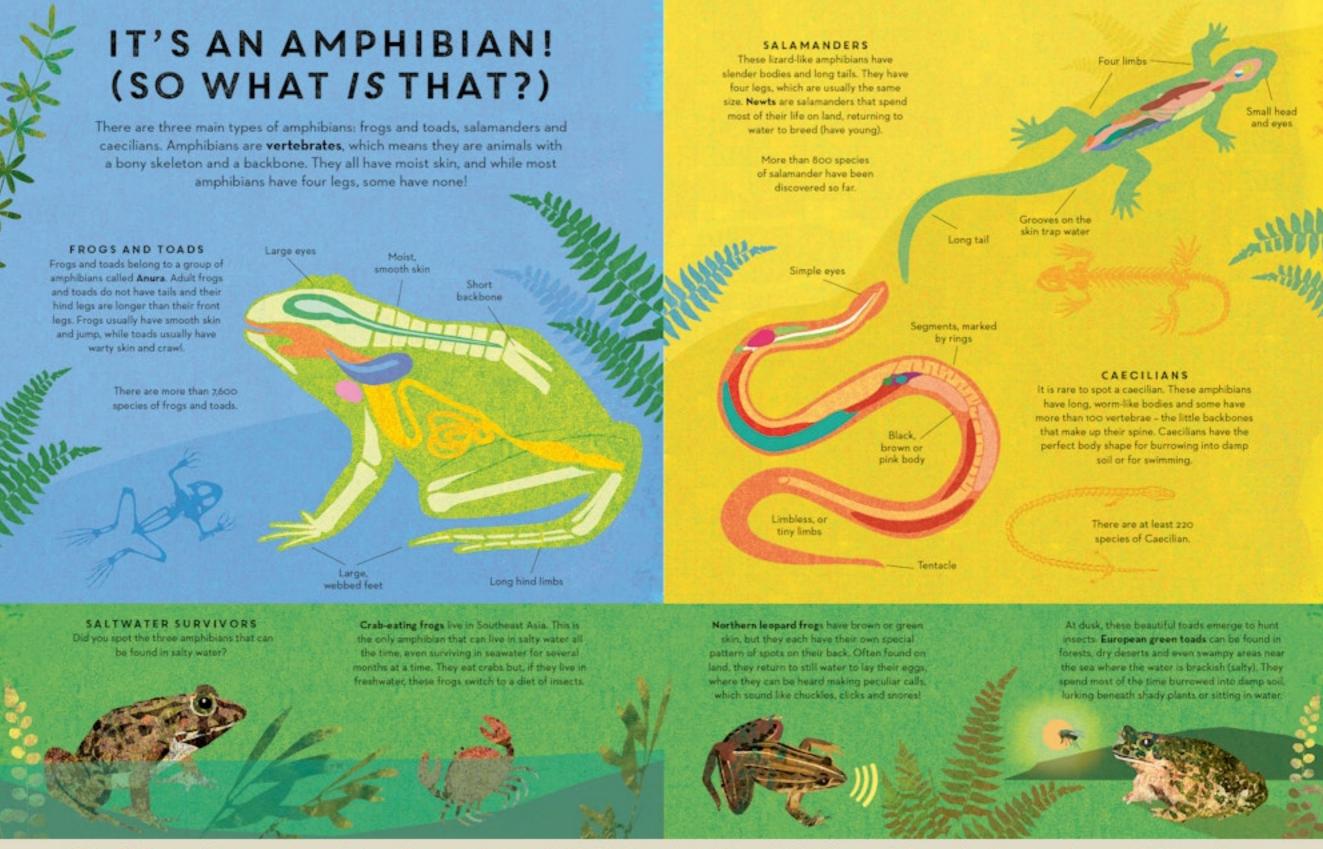


ILLUSTRATED BY BRITTA TECKENTRUP
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AMPHIBIANS HAVE BEEN AROUND FOR AGES

The first frogs lived on Earth around 250 million years ago, but the history of amphibians goes back even further - another 120 million years! Amphibians were amongst the first four-legged vertebrates that lived on land. Over time many species, or types, of amphibian evolved to live in water and on land. Today, there are more than 8,600 species of amphibian in the world.



Early ancestors of modern salamanders include Qinglongtriton, which lived about 160 million years ago. It was about 27 centimetres long and had gills, which means it lived in water and probably resembled many modern salamanders.

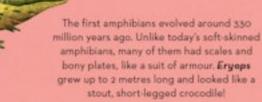


Eusthenopteron lived 380 million years ago. It was a large, meat-eating fish that could breathe with lungs and gills. It used its strong fins like limbs to move on the seabed. The first land-living vertebrates may have evolved from an animal like this.

With lungs for breathing in air and small limbs for walking, Ichthyostega could live in the sea and on land when it roamed the Earth around 365 million years ago.



About 375 million years ago, a fish known as Tiktoolik used its strong fins to lift its body off the seabed and could turn its head. It may even have been able to breathe in air for a short while.





Albanertetonids were predators that would sit and wait for prey to pass by - using their long, sticky tongue to catch their victim. It's a handy skill that many modern amphibians still use 100 million years later.





Around 190 million years ago, early caecilians, such as Eocaecillia, looked similar to modern ones, but they had little legs and did not have tentacles.



One of the oldest frogs yet discovered is called Triadobatrachus. It could walk and swim, and probably hopped short distances. Unlike modern frogs, Triadobatrachus had a short tail. This amphibian lived about 250 million years ago.



Over 200 million years ago, the largest amphibians to ever live were giant salamanders, such as Mastodonsaurus. This mega-beast reached an incredible length of 4 metres and probably ate fish and other amphibians.

Around 50 million years ago, many

amphibians looked similar to the ones we know today. Prosped holoserisca was an early type of spadefoot toad. These modern

amphibians used their big, wide feet like spades to burrow.



Resembling a giant salamander with a large head, Cyclotosaurus davidi grew up to 2.5 metres long. Nearly 245 million years ago, this beast spent its life in freshwater, hunting other animals to eat.

WHERE DO AMPHIBIANS LIVE?

The place where an animal lives is called its habitat. Although amphibians like to stay near watery habitats, they have been able to spread all across the world, from dark caves to mountain streams and from lush tropical forests to hot, dry deserts. Some types even survive in dry habitats for most of the year but travel back to ponds to breed.

FROGS AND TOADS

Frogs and toads can be found all over the world, in in both cool and warm places. Their favourite habitats are in tropical areas, where it is warm all year round and it rains most days.



Brrr - it's too cold! There are no amphibians in the Antarctic and just five species in the Arctic. The Siberian wood frog has special chemicals, called antifreeze, in its blood to stop it from freezing in extreme cold.

DRY GRASSLANDS

The bushveld rain frog lives in burrows beneath the dry grasslands of southern Africa. It stays there until the rain comes, when it pops out to find food or mates before returning home.

It is not and dry in the deserts of North America, where Couch's spadefoot frog lives. It copes with the heat by using its spade-like feet to dig a hole where It buries itself. It wraps itself in a cocoon made from its own dead skin to stop it from drying out and waits there until it rains.

PONDS, POOLS AND MARSHES

Some frogs spend almost their whole lives in, or next to, water. Northern cricket frogs like to sunbathe on pond plants and dive into the water if they sense danger.



SALAMANDERS

Almost all salamanders live in the northern half of the world, with only about 30 species living south of the Equator. They are most common in North and Central America, especially in forest habitats.

CAVES

Olms are salamanders that live in

caves, where they swim in streams

and hunt small animals to eat. They

have pink skin and little legs.

Most caecilians live in moist soil alongside

streams, lakes and swamps, although a few species spend their whole lives in water. Caecilians are found only in tropical areas of the world.

MOUNTAINS

Giant salamanders are the biggest amphibians in the world, and they can live for up to 50 years. The Japanese giant salamander lives in rocky, fast-flowing mountain streams.

WOODLAND For most of the year, California newts

can survive away from water, living in forest habitats, forests or grasslands. From November to December, they return to ponds to breed.

RIVERS CAECILIANS

Cayenne caecilians have lungs, but they spend their lives in water. They use a paddle-shaped tail to swim, like an eel.



HOW DO AMPHIBIANS LIVE?

Most amphibians spend at least part of their life in water. They are amazing animals because they can survive in two very different habitats: water and land. It can be a challenging life for these small creatures, which perhaps explains why there are fewer species of amphibian than any other major group of vertebrates (animals with backbones).

An amphibian's skin is smooth and covered with a slimy mucus to keep it moist. There are no scales, feathers or fur to protect it, but many amphibians can make a toxic skin slime, which can be poisonous to predators. Amphibians also have colourful skin to help them hide from predators and prey, to attract a mate and control their temperature.



The skin of an Australian green treefrog even changes colours - it is green in the sun but it turns brown in the shade!

COLD-BLOODED

Like reptiles and fish, amphibians are coldblooded. That means they cannot control their body temperature and will die if they get too hot or cold. That's why many adult frogs and toads hide in the shade or return to the water on a hot day.

BREATHING

While other vertebrates have lungs to breath in air, or gills to breathe in water, amphibians need to breathe in air or water, or both. Young amphibians that live in water breathe through gills. Adult amphibians that live on land breathe using lungs and their skin, although some types keep their gills.



Mud pupples are salamanders that can grow to 50 centimetres long. They live in ponds, rivers and streams and have feathery gills for breathing in water.

African hairy frogs grow special tufts of 'hair' on their legs. These tufts allow them to absorb more oxygen from water, so they can stay under the surface for longer.

SENSES

HEARING

Frogs and toads hear using special drum-like flaps of skin. There is one behind each eye. The skin vibrates when sound hits it, and messages are sent to the frog's brain so it can hear sound. Salamanders can hear well in water, but not in the air, Instead, they use their feet to sense vibrations in the ground.



SMELL AND TASTE

Burrowing amphibians have a good sense of smell, using it to find food and mates. Some frogs and salamanders can even find the ponds where they hatched by following the smell. Caecilians use their sense of smell to find food. They have a little tentacle below each eye. This sense organ is flicked, like a snake's tongue, to detect smells and tastes.









VISION

Many frogs and toads have large, colourful eyes which can see forwards, sideways and even backwards, helping them to find food using their eyesight! Caecilians have small eyes and mostly rely on their sense of smell to find food. The pupils of frog and toad eyes come in some amazing shapes and colours:



























Male frogs and toads can be very loud! When an American bullfrog croaks it expands its throat like a balloon, so the noise is louder and travels further. This stretched bubble of skin is called a vocal sac. Males croak to call females to come to them and to tell other males to stay away.





CLIMBING Many frogs and toads can climb, where they find good places to hide and food to eat. Climbing amphibians often have small bodies but big feet with large, sticky pads on their club-like toes that grip onto the bark. GLIDING Amphibians can't fly, but some frogs are able to glide through the air. Wallace's flying frogs have flaps of skin, called membranes, between their toes and on the sides of their body. As they leap out of a tree the membranes stretch and spread, like a parachute, to help the frogs to soar and land gently. Gliding frogs can travel impressive distances and change direction when they are in the air. A Wallace's tree frog can leap from a height of 6 metres and travel up to 5 metres in a single glide. CAN YOU FIND? It's easy to see a flying frog when it is soaring through the air, but much harder to see one when it is hiding amongst the green leaves of a tree. Can you find a Wallace's flying frog that is resting between flights? BURROWING Caecilians may lack legs, but they do have a strong

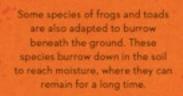
skull, which helps them to burrow through the

sequence to push their bodies forward, just like an

earthworm. A smooth, slimy skin makes it easier for a

caecilian to slip through soil and mud.

- . ground. They tense and relax the muscles in a



Northern leopard frogs have brown or green

skin, but they each have their own special

pattern of spots on their back. Often found on

land, they return to still water to lay their eggs,

where they can be heard making peculiar calls,

which sound like chuckles, clicks and snores!



LIFE STORIES FOAM NESTS The jelly coats of amphibian eggs can easily dry out, so grey foam nest frogs make a liquid, called mucus, which An amphibian's soft eggs are packed with goodness to help tadpoles grow, but that they whip up into a stretchy, sticky froth with their hind means they also make the perfect meal for predators, such as snakes, birds, fish and legs. It takes about six hours to make a foam nest big pond bugs. Some amphibians simply lay thousands of eggs, in the hope that a few enough for the female to lay her eggs inside. Foam nests of them will survive. Others have some clever ways to give their young a better chance stop the eggs from drying out, protect them from disease and hide them from predators. of making it to adulthood. DAD-DAY CARE PIGGYBACK RIDE A male Midwife toad gathers up the eggs his When a female Surinam toad lavs her eggs, her partner has laid and carries them on his back for partner spreads them over his partner's back a few weeks. If they are in danger of drying out, with his webbed foot as if he is icing a cake! Skin he returns to a nearby pond and dunks them in grows over the eggs, protecting them as they go it! When the eggs are ready to hatch, he sits in through their metamorphosis from tadpole to water so the tadpoles can swim away. little froglets. Eagle-eyed female Chalazodes bubble nest frogs search for holes in bamboo canes. They climb inside and lay their eggs, attaching them to the bamboo with strands of sticky, foamy mucus. The males then stay with the eggs, protecting them until they hatch into little froglets.



HIDDEN FROM VIEW Hiding eggs is a smart way to protect them. Greater leaf-folding frogs live in trees and lay their eggs on a leaf that is hanging above water. The female folds a leaf and sticks it with a glue that she makes on her

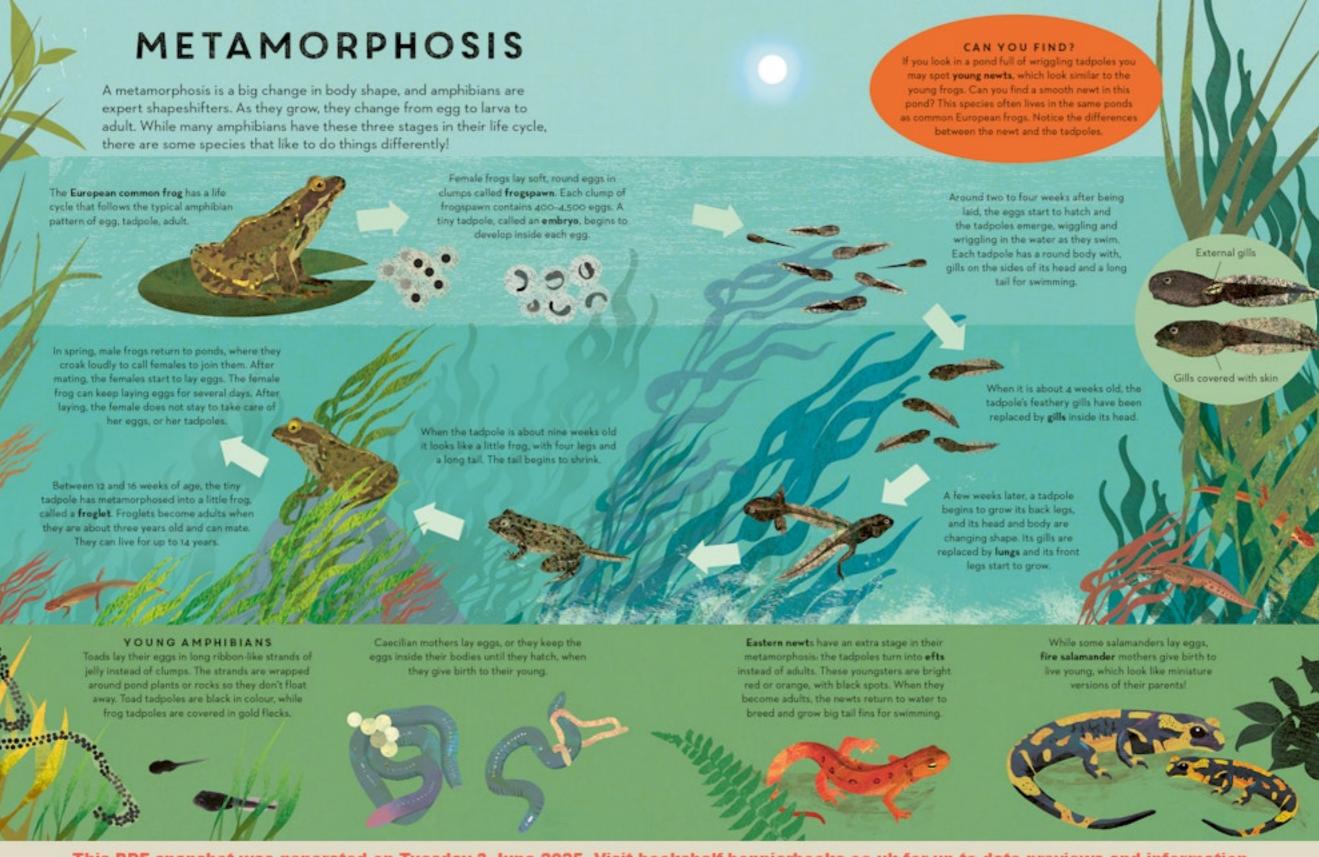
a leaf and sticks it with a glue that she makes on her body. When the eggs hatch the large tadpoles - which are up to 6.5 centimtres long - drop straight into the water.

19

AXOLOTES

Axolotis are salamanders that never grow up. After hatching, an axoloti spends its life as a tadpole with feathery gills. It can lay eggs without ever metamorphosing into an adult salamander. Axolotis lived in several Mexican lakes, but their habitats have been badly affected by pollution and they are now extremely rare. There may be only a few hundred of them left in the wild.





STAYING ALIVE

For most animals, life is a constant battle. They must find food, shelter and mates without being eaten themselves! Amphibians are at particular risk because they are slow and small and have soft skin. They also face the constant danger of drying out, getting too hot or too cold. Thankfully, nature has equipped amphibians with some special skills for staying alive.

A dry, sandy desert is a strange habitat for a frog. The desert rain fog, however, has managed to make a home there. The short, stout amphibian digs itself a burrow in a sand dune, where it spends the day, coming out at night to feast on dung beetles. It stays moist by absorbing water from the sand, especially after a foggy morning.



In cooler parts of the world, amphibians survive winter chills by taking a long rest. They stay at the bottom of a pend, or settle beneath a blanket of fallen leaves, to wait for spring.



If a greater siren's watery home dries up, it has a neat trick to stay alive. This large salamander makes itself a cocoon from mud and stays there, without food - for up to two years - waiting for rain to come.



The ornate horned frog copes with long dry spells of weather by shedding layers of skin to build itself a snug sleeping beg, or cocoon, where it waits for the rain to come.



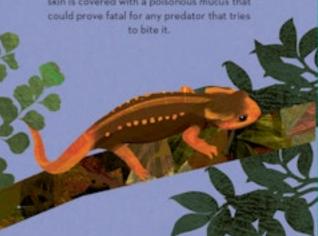
Some caecilian mothers feed their young in an extraordinary way. The Talta caecillan grows an extra thick layer of skin over her body and, when the young are hungry, they bite into her skin, tearing off juicy, strips to eat!



When hairy frogs are scared, they break their own bones to create claws. The sharp points poke through their toes, ready to lash out and slash a predator!



With its pattern of orange spots and stripes, this crocodile newt is warning that, like many amphibians, it tastes foul. Its warty skin is covered with a poisonous mucus that could prove fatal for any predator that tries



Camouflage is a great way for an amphibian to stay out of danger. The skin on this **Mossy frog** perfectly blends into clumps of moss that grow on a riverbank - it is almost invisible until it hops! If that fails, it rolls into a ball and pretends to be dead.



The painted salamander defends itself from attack by spraying poison from the base of its tail. Each squirt can travel more than 2 metres and, if it hits its target, it can cause terrible pain and even temporary blindness.



Fire-bellied toads have taxic skin and flash their colourful bellies to warn predators to keep a safe distance.





AMPHIBIANS AND PEOPLE

Most amphibians are small, shy and rarely seen. However, they have been part of human history for thousands of years, featuring in myths and legends as well as being an important source of food for many cultures. More recently, people have become fascinated by their extraordinary lives, and concerned about the uncertain future that they face.



MYTHS AND LEGENDS

Amphibians have often appeared in fairy tales, myths and other stories. In Ancient Egypt, frogs were a symbol of birth and water. In Central American cultures, frogs and toads were believed to be spirits of rain. In China, frogs were thought to bring good luck. In Europe, salamanders were believed to be magical creatures that could spring to life from fire.



AMPHIBIANS ABROAD

Over the centuries, humans have travelled around the world, bringing exoctic animals back with them to study and keep as pets. Unfortunately, when not controlled, these invasive species can harm their new habitat.

American Cane toads were introduced to Australia in the 1930s. Today, there are millions of these poisonous toads, damaging the natural environment.



CURIOUS CUISINE

Frogs are eaten as a source of protein, due to their muscular legs, especially in Asia, the Americas and France, where frogs' legs are a considered a delicacy. One billion wild frogs are captured and eaten every year around the world and scientists are worried that some species will be driven to extinction unless sustainable action is taken to protect frog populations.

AMPHIBIANS IN PERIL

Almost half of all amphibians are struggling to survive in our changing world, with their numbers falling dramatically. Four in ten of all the world's amphibians are already at risk of going extinct in the near future, and about 170 species are believed to have gone extinct in just the last 30 years. It is important to protect amphibians because they help all the world's nature to thrive.



RISING TEMPERATURES

People have not been taking good care of Earth and burning fossil fuels has damaged our planet. The world is warming up, the climate is changing and the environment is damaged by pollution. With their delicate skins, amphibians are at particular risk. They struggle to cope with even small changes in temperature and moisture.



HELPING HOMES

We can help amphibians by protecting their habitats. When forests and wetlands - such as swamps and marshes - are cleared to grow crops or build roads and homes, the animals that once lived there may quickly disappear.

DEADLY DISEASES

In recent years, a terrible disease has been spreading amongst amphibians. Called Chytridiomycosis (or Chytrid for short), this disease is spread by a fungus that damages amphibians' skin. It has wiped out many populations of amphibian, and has even led to some extinctions.

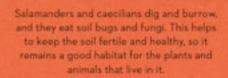
HELPFUL AMPHIBIANS



Scientists are using amphibians to learn more about how they manage to grow new limbs or tails to replace ones they have lost (regeneration). The axoloti has been studied extensively and researchers hope they may be able to find a way to help people grow new limbs if they need them.



Bug-eating amphibians are brilliant at controlling populations of flies and other insects that spread diseases, such as mosquitoes, and damage crops.



Tadpoles eat pond algae (small water plants).
This keeps pond and rivers healthy and clean,
so other creatures can live there too.



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