NEW YORK STATE

CONSERVATIONIST for Kids!

AMPHIBIANS & REPTILES

Tree frog by Aaron Winters

NEW YORK STATE

CONSERVATIONIST for Kids!

IN THIS ISSUE, students will learn what amphibians and reptiles are, as well as the differences between them, their natural history, and what species are found in New York State.

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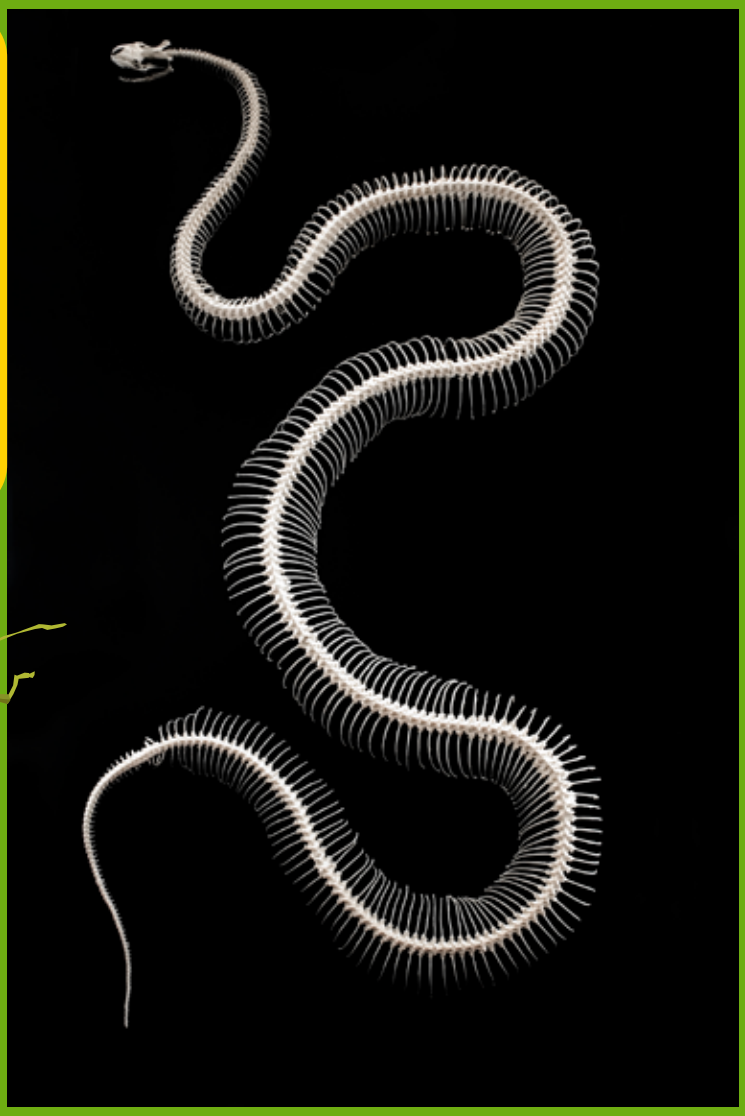
Just like birds, mammals, and fish, amphibians and reptiles are vertebrates, and have a skeleton made of bones and/or cartilage. Vertebrate comes from the word vertebrae, which are the bones that make up the backbone or spine. Most reptiles and amphibians are carnivores, meaning they eat meat, or insectivores, meaning they eat insects. Some lizards, turtles, and tortoises are primarily vegetarian, but even those that eat mostly plant material will eat some protein, usually insects or worms.



Birds and mammals are warm-blooded animals, or endotherms, which means they are able to make their own heat inside their bodies, even on cold days. Endotherm comes from the Greek words endon "within" and thermē "heat." Amphibians and reptiles (and nearly all fish) are cold-blooded, or ectotherms, which means that they need an outside source of heat to keep warm. Ectotherm comes from the Greek words ektós “outside” and thermē "heat."

Because they are cold-blooded, amphibians and reptiles need to find ways to get warm, such as laying in the sun or sitting on or beneath a log or rock that has been warmed by the sun (this is called basking). Amphibians do not rely on the sun as directly as reptiles do. They do not bask – they rely on gradually increasing air temperatures and day length that come with the increase in the angle of the sun as spring approaches. This results in rains and snow melt that trigger breeding migrations, and coming out of hibernation. Reptiles do not migrate to breed, but increasing day length similarly triggers emergence. During the winter, they are not able to remain active during the cold temperatures, and have to hibernate or find a place to safely overwinter. For more information about hibernation, see the Fall 2019 issue of *Conservationist for Kids*, “Surviving Winter” available online at **www.dec.ny.gov/education/105720.html**.

AMPHIBIAN & REPTILES –

We have mentioned the differences between warm-blooded and cold-blooded animals. So, what is an amphibian, and what is a reptile? Amphibians are frogs, toads, newts, and salamanders. Reptiles are snakes, crocodilians, lizards, turtles, and tortoises. The word amphibian comes from the Greek word amphíbios, meaning "both kinds of life," because amphibians can live on the land and in the water.

AMPHIBIAN

REPTILE

amphibian

reptile

The biggest difference between amphibians and reptiles is their skin; reptiles have impermeable skin with scales, while amphibians have permeable skin. Impermeable skin does a better job of holding in moisture, while permeable skin readily absorbs and releases it. This means that reptiles don't rely as heavily on water for survival and are able to survive under drier conditions. Turtles and tortoises also have a bony shell covering much of their body, which helps keep them safe.

Amphibians cannot be without water or moist areas for extended periods, or their skin and eggs could dry out. Their skin is porous and used for both water and oxygen intake, and they don't drink water – all of the moisture they need is absorbed through their skin. Their moist, porous skin makes them easily harmed by many different types of pollutants, such as road salt and many types of chemicals, as they can easily absorb them.

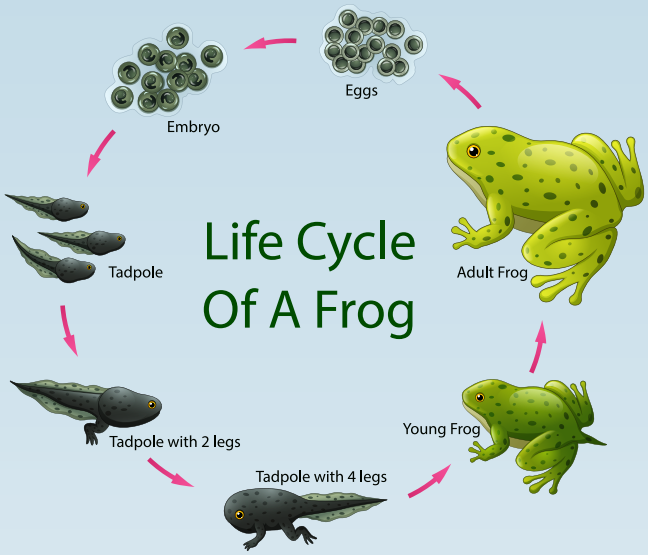
Susan Shafer

Most reptiles are born or hatch on land, with some spending part of their time in the water, mostly to find food. The word reptile comes from the Latin word repere, "meaning to creep." Dinosaurs were reptiles, and reptiles are very closely related to birds; most scientists agree that birds evolved from reptiles. Interestingly, scientists now believe that some dinosaurs were warm-blooded.

A NATURAL HISTORY

There are over 16,800 known species of living amphibians and reptiles around the world. In New York, we have 18 species of salamanders (including one newt), 3 species of toads, 11 species of frogs, 19 species of turtles (including 4 sea turtles), 4 species of lizard, and 17 species of snakes (3 of which are venomous).

Amphibians lay soft, jelly-like eggs, usually in the water. Some salamanders lay their eggs in moist locations on land, but most amphibians found in New York State lay their eggs in bodies of water such as ponds and lakes. Once ready, the embryo emerges from the egg, in a process known as hatching. The newly born amphibian is termed a hatchling, and is now in the stage called a larva, which in frogs is known as a tadpole. Tadpoles breathe through gills, much like fish, have tails, and don't have legs. Salamander larvae usually look like small adults, although they are not fully developed. Aquatic salamander larvae also breath through gills, but those that hatch on land breath through their skin. As tadpoles grow and develop, they begin to lose their tails and grow legs. Eventually, they will be able to leave the water, without the threat of drying out. Newts have a land-dwelling juvenile stage called an eft, and return to the water as adults. Frogs spend more time in the water than toads and most salamanders.



ECO Lt. Dick Thomas

The study of amphibians and reptiles is called herpetology, and together, reptiles and amphibians are known as herptiles, herpetofauna, or herps. We will learn more about different types of amphibians and reptiles on the following pages. Much more information about reptiles and amphibians can also be found on DEC's website at **www.dec.ny.gov/animals/277.html**.

All turtles and tortoises, most lizards, and some snakes lay eggs. Reptile eggs are generally leathery in texture and appearance. Some snakes give birth to live young instead of laying eggs. Those that lay eggs will usually lay them in or under rotten logs, beneath forest debris, in deep cervices in rocky surfaces, in mulch piles, and similar locations. Very few snakes in the northeast actually construct a nest; the hognose might be the closest in that they dig a hole similar to the way turtles do and backfill it. A few species of reptile such as the alligator and king cobra will stay in the area and defend their nest, and then help protect the young after they hatch, but most reptiles leave the nesting area behind after laying the eggs, with the young having to take care of themselves once they hatch.

TURTLE EGGS

Amphibians & Reptiles – A Sampler

Here are some examples of the amphibians and reptiles found in New York State:

Mike Adamovic

Spring Peeper – Spring peepers are very small, brownish frogs with a light x-shaped mark on their backs. Their loud, high-pitched chorus of "peeps" are often one of the first signs of spring.

Bullfrog – The bullfrog is New York's largest frog, reaching 6-8 inches in length. They are a mottled green color, and often seen along the banks and edges of shallow, warm water. Their loud "rum-rum" noise can often be heard on warm summer nights.

Sierra Luck

American Toad – American toads can be found in a variety of habitats, from forests to lawns. Their skin is somewhat drier than frog skin, and warty in appearance. Like frogs, toads lay their eggs in the water, usually shallow areas of lakes and ponds.

Red-spotted Newt/Red Eft – Adult newts are olive green in color, with red spots, and are fully aquatic. Their juvenile stage, the red eft, is often found in forested areas, and is a bright orangish-red color with red dots. They return to the water as adults, and transform into newts.

Spotted Salamander – Spotted salamanders are black in color, with bright yellow spots. They are very secretive, and rarely seen, but one of New York's most widespread salamander species. Most of the year, they are underground in root channels in forested habitats, eating worms, snails, and insects.

More information and additional species can be found on DEC's website under the "*Conservationist* Pullouts" section, **www.dec.ny.gov/pubs/104996.html**

Red-backed Salamander – This is New York's most abundant salamander, and one of the most numerous vertebrate species found in the forests of New York. They are thin, with small legs, and a brick-red back.

Timber Rattlesnake – One of three venomous snakes found in New York (the other two are the Eastern Massasauga and the Copperhead). They are a stocky snake, found primarily on rocky, wooded slopes, and have a series of segments that form a rattle at the end of their tail that make a distinct buzzing sound when shaken, warning of their presence. They eat small mammals, up to the size of chipmunks or squirrels, and the occasional bird. Venomous snakes should always be given plenty of distance, and should never be handled. Timber rattlesnakes are a threatened species, and are not widespread across the state.

Laurie Dirkx

JD Mays

Box Turtle – New York's most terrestrial turtle. They spend most of their time out of the water, in fields and forests. They will go to water to soak during hot and dry periods. Box turtles have a high, domed shell, and eat such things as strawberries, mushrooms, soft vegetation, worms, slugs, and snails.

Painted Turtle – The most common turtle in New York. They are often seen in large numbers basking on logs or rocks. They have a dark carapace with light lines outlining each scute or plate, with red at the edges, and a yellow or orange bottom shell (plastron). They eat a variety of invertebrates, tadpoles and vegetation.

Paul Reeves Photography

Laura Denapoli

Snapping Turtle – Our largest freshwater turtle. They have a large head, saw-toothed tail, large claws, and a saw-toothed rear shell. Snapping turtles have a strong bite, and spend most of their time under water, looking for food. They eat dead animals (carrion), and also live prey ranging from small invertebrates to young waterfowl or small fish.

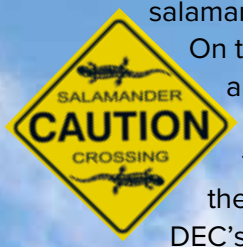
Common Garter Snake - New York's most common snake species, frequently found in lawns, old fields and woodland edges. They vary in color, but usually have three stripes running head to tail and a checkerboard pattern. They eat many kinds of insects, slugs, worms and an occasional small frog or mouse.

Wayne Jones

Black Rat Snake - Our longest snake, reaching six feet in length, they are black and have a satiny appearance. They eat rats and mice, and can often be found along rock ledges and around barns and other buildings.

Many species of amphibians and reptiles are declining around the world due to spreading diseases, collecting for the pet trade, habitat loss, and climate change. Here are a couple of ways that you can help make a difference.

Amphibian Migrations and Road Crossings



In early spring, when the ground is thawed and temperatures start to warm, a special group of frogs and salamanders leave the forest on rainy nights and migrate to breeding wetlands called woodland pools. On these journeys, they often need to cross roads that divide their habitat. When weather conditions are just right, there can be hundreds and thousands of frogs and salamanders crossing the roads. Unfortunately, many will not make it, as they are hard to see and will often get run over. On these busy migration nights, volunteers in the Hudson Valley are surveying roads, documenting the migration, and helping amphibians safely across roads. To learn more about this program, visit DEC's website at **www.dec.ny.gov/lands/51925.html**.

Give Turtles "a Brake"

Each May and June, motorists should be on the alert for turtles crossing the road. Turtles are long-lived and well adapted to their natural environment, as they can retreat to the safety of their shell when threatened by predators. But the turtle's shell provides no protection against a major cause of mortality, being struck by vehicles while crossing roadways. Our native turtles are on the move in May and June seeking sandy areas or loose soil to lay their eggs. In New York, thousands of turtles are killed each year when they are struck by vehicles as they migrate to their nesting areas.

If you see a turtle on the road, try to have the driver avoid hitting them. If you see a turtle in the road and it is safe, you can try to move it to the side of the road, in the direction it was heading. Picking the turtle up by its tail may frighten or injure it.

Most turtles, other than snapping turtles, can be picked up by the sides of its shell. Snapping turtles can reach a long distance, and have a strong bite, so if you are trying to help a snapping turtle, pick her up at the rear of the shell near the tail using both hands, or slide a car mat under the turtle to drag her safely across the road. Never take turtles home - all turtles native to New York are protected by law and cannot be collected without a permit.

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Conservationist for Kids
Supplement for Classroom Teachers – Amphibians and Reptiles
February 2020

Amphibians and Reptiles in New York State

There are approximately 8,100 known species of living amphibians around the world. In New York, we have 18 species of salamanders (including one newt), 3 species of toads, and 11 species of frogs. There are more than 8,700 species of reptiles found around the world. In New York, we have 19 different species of turtles (including 4 sea turtles), 4 species of lizards, and 17 species of snakes (3 of which are venomous). There are eight species of amphibians and reptiles classified as endangered in New York: Eastern Tiger Salamander, Eastern (Northern) Cricket Frog, Eastern Mud Turtle, Bog Turtle, Kemp's Ridley Sea Turtle, Leatherback Sea Turtle, Queensnake, and the Eastern Massasauga. Five species are identified as threatened: Blanding's Turtle, Green Sea Turtle, Loggerhead Sea Turtle, Northern Fence Lizard, and the Timber Rattlesnake. Additionally, there are more than a dozen species of amphibians and reptiles in New York designated as a species of special concern, meaning that although they are not currently considered endangered or threatened, there is documented evidence suggesting that the species may be in decline in the state.

Threats Facing Amphibians and Reptiles

Worldwide, amphibians and reptiles face numerous threats to their survival. These threats include disease, loss of habitat, collection for the pet trade, and climate change. There are several diseases that are a threat to many species of frogs. Although these diseases are primarily tropical in nature, as the climate changes it is possible that these diseases will begin to migrate to locations where they have not historically been found. This could be detrimental to temperate species of frogs and other amphibians, which are not acclimated to the diseases. Climate change may also cause additional threats to amphibians and reptiles, ranging from changes in seasonal temperature patterns, interruption to hibernation, change in abundance and availability of insect prey, changes in seasonal rainfall, rising sea levels, and changes in habitat due to the different temperature and rainfall patterns. Amphibians and reptiles are generally not able to move long distances, so as their habitats and food availability change, they are at risk of dying out.

Teacher Workshops

For teachers who have participated in a Project WILD or Aquatic WILD workshop, the activities listed below complement this issue of *Conservationist for Kids*. Visit **www.dec.ny.gov/education/1913.html** for information about workshops and how to obtain curriculum and activity guides.

Project WILD Activities	Aquatic WILD Activities
Environmental Barometer	Are You Me?
Habitrekking	Got Water?
Surprise Terrarium	Turtle Hurdles

This Issue's "Outside Page"

The "Outside Page" of this issue of *Conservationist for Kids* provides examples and suggestions of two ways students and their families can help make a difference for amphibians and reptiles here in New York. Both of the suggested activities focus on the presence of roads, and how they can be a hindrance to amphibians and reptiles as they go searching for breeding habitat, mates, or even food. Students are given information about the Amphibian Migrations and Road Crossings program of the Hudson River Estuary Program, and DEC's "Give Turtles a Brake" campaign. Snakes are often killed in the roads as well, usually when crossing from one side to the other.

Online Resources*

DEC's Amphibians & Reptiles webpage www.dec.ny.gov/animals/277.html
New York Natural Heritage Program webpage www.dec.ny.gov/animals/29338.html
New York Nature Explorer webpage www.dec.ny.gov/animals/57844.html
Amphibian Ark www.amphibianark.org
FrogWatch USA www.aza.org/frogwatch
Hudsonia https://hudsonia.org/
Partners in Amphibian and Reptile Conservation https://parcplace.org/
Save the Frogs! www.savethefrogs.com
Sea Turtle Conservancy https://conserveturtles.org
The Orianne Society www.oriannesociety.org

Books*

DKfindout! Reptiles and Amphibians, DK Children, 2017.
National Geographic Pocket Guide to Reptiles and Amphibians of North America, National Geographic, 2015.
Peterson Field Guide to Reptiles and Amphibians of Eastern and Central North America, Houghton Mifflin Harcourt, 2016.
Reptiles & Amphibians: An Augmented Reality Popup Book, FarSight XR, LLC, 2019
Smithsonian Handbooks: Reptiles and Amphibians, DK, 2002.
Ultimate Explorer Field Guide: Reptiles and Amphibians, National Geographic Children's Books, 2016.

**Please note, the listing of websites and books is not to be considered an endorsement, as not all have been reviewed by the editor.*

Conservationist for Kids **and an accompanying teacher supplement are distributed free of charge to 4th-grade classes throughout New York State three times per school year (fall, winter and spring).** If you would like to be added to or removed from the distribution list, need to update information, or if you have questions or comments, please e-mail the editor at **KidsConservationist@dec.ny.gov** or call 518-402-8047. Limited quantities of some back issues are also available on request. The full archives can be found online at **www.dec.ny.gov/education/100637.html**