

Frogs, Toads and Salamanders

The Southeastern United States is renowned for its diversity of amphibians. This guide introduces the common frogs, toads and salamanders that inhabit the Cumberland Plateau around Sewanee. Although larger animals such as birds and mammals are more likely to attract our attention, in terms of biomass our area contains many more amphibians than any other vertebrate animal. The springtime choruses of frogs and toads give us a hint of the abundance of these animals. One can encounter many more by exploring damp areas in the woods, or by scanning the ground after heavy rains. Despite worldwide declines in amphibian populations, the Cumberland Plateau still has large numbers of amphibians, and we hope that this guide will introduce you to some of these fascinating animals.

For more information on these species we recommend the *Reptiles and Amphibians* guide in the Peterson series.

BIODIVERSITY ON THE MOUNTAIN
THE SEWANEE HERBARIUM
DEPARTMENT OF BIOLOGY
THE UNIVERSITY OF THE SOUTH

SEWANEE
The University of the South

The Biodiversity on the Mountain series is produced by the Biology Department of the University of the South. This guide was written by David Haskell and Geoff West. If you have questions or comments, please call 931 598 1918, or email dhaskell@sewanee.edu.

Frogs and Toads

Frogs and toads are masters of disguise, often changing color to match their surroundings and hiding deep in vegetation. Although we rarely see these animals, their calls are conspicuous and distinctive. In addition, frog and toad eggs can be seen throughout the summer. The eggs, like the calls, differ markedly from species to species. This guide is organized into three columns: notes on the natural history of each species, a description of each species' call, then a description of the eggs.

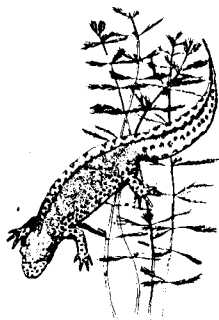
<i>Natural History</i>	<i>Calls</i>	<i>Eggs</i>
American Toad. Dry, "warty" skin distinguishes toads from frogs. You can't get warts from a toad, but the "warts" produce a nasty-tasting chemical to deter predators. Toads roam far from water and their insect-eating ways make these very common animals a gardener's best friend.	A sweet, musical trill lasting for many seconds.	Long strings. Eggs in single, uncrowded rows.
Fowler's Toad. Although this common toad looks very similar to the American toad (it has three or more warts in each dark spot on its back, the American has only two), its call is different. Fowler's tend to be found close to water.	A nasal, sheep-like "waaaa".	Long strings. Eggs may be crowded in double rows within the string.
Bullfrog. These huge frogs eat other frogs, small snakes and salamanders. They have been introduced into many areas by humans, resulting in the decline of other aquatic species. Common, but usually found only near deep water.	A very low, booming, resonant two- or three-syllabled groan.	A surface film of loose jelly containing hundreds of tiny eggs.
Pickerel Frog. This frog has parallel rows of square blotches along its back and can be found near lakes, streams and swamps.	Short, low creak like an old boot or door.	A firm, round cluster, two to four inches across.
Green Frog. and the leopard frog (see below) are common species found wherever there is shallow water and around lakes. Both species are green with spotted backs and stripey legs. The leopard frog, however, has a long light line along its upper jaw.	Like a plucked banjo string or rubber band. Sharp "EEEEK" call as they jump into the water.	Tiny black and white eggs are found in groups of 15-25 in a surface film.
Southern Leopard Frog. See green frog.	Short "crrreak" combined with hoarse chuckling.	A firm irregular cluster.
Northern Cricket Frog. These inch-long frogs live in plant cover at the water's edge and can be heard calling in the day as well as at night. Common.	Metallic "ick, ick, ick" rapidly repeated.	Eggs laid singly, attached to vegetation.
Upland Chorus Frog. These frogs congregate around shallow water every spring and are one of the earliest frogs to start calling each spring. Common.	"Crrreep". Like running a fingernail along the teeth of a plastic comb.	Loose, irregular cluster less than an inch across.
Spring Peeper Call from early spring to midsummer. Large numbers of peepers can produce an impressively loud display. Sometimes also heard briefly in the fall. These inch-long frogs have the shape of a cross on their backs. Common.	Single, high-pitched note repeated about every second. Groups sound like ringing bells.	Single eggs attached to submerged vegetation.
Gray Treefrog. These frogs call throughout the summer. They often call from trees or shrubs away from water, so can be heard all over town as well as in the forest. They change color to match their surroundings. Common.	A trilling "crrrok". Speed of trill depends on the temperature: hot nights mean fast croaks!	Tiny brown and cream eggs in groups of 10-20 in a surface film on pools and puddles.
Eastern Spadefoot Toad. Spadefoots spend most of their lives buried in the soil, coming out to breed after heavy rains. The "spade" (a small protuberance on their legs) allows them to dig rapidly into the soil. Uncommon.	Short cough or grunt.	Submerged, sediment-covered strings.
Eastern Narrowmouth Toad. Inch-long and very secretive. They have a fold of skin on their heads which they can move forward to wipe ants (a favorite food item) off their eyes. Uncommon.	A lamb-like "baaaa", less harsh than the more frequently heard call of the Fowler's Toad.	Eggs lie in a surface film and look like glass marbles.

Salamanders

There are three families of salamanders on the mountain. The newts or Salamandridae are represented by just one species, the very common Red-spotted newt. There are ten species in the lungless salamander family, or Plethodontidae. These salamanders inhabit woodlands and streams and exchange gases through their moist, permeable skin. The Ambystomidae family contains the mole salamanders. These colorful salamanders are rather large and spend most of their lives underground, coming out only to breed. Unless otherwise noted, all adult salamanders are about 6-10cm long.

Salamandridae

The adult form of the **Eastern Red-spotted Newt** (*Notophthalmus viridescens*) lives in streams and lakes. Newts taste bad, so are among the few salamanders that can live in lakes with fish. The adults are yellowish-brown to dark brown. The back and belly are marked with small black spots. The newts have an interesting life cycle: they are aquatic for 1-3 years in a larval form, then they become land-dwelling "red efts" for a few years, then return to the water again to breed. Red efts are orange-red and have bright red dots on their backs and are often seen in the forest after rains.



Plethodontidae

Most salamanders have an aquatic larval stage which metamorphoses into a semi-terrestrial or terrestrial adult. The **Slimy Salamander** (*Plethodon glutinosus*) and the **Zigzag Salamander** (*Plethodon dorsalis*), however, lay their eggs in moist areas on land. The larval stage and metamorphosis take place within the egg, so these species do not require water for breeding. Most salamanders are slightly slimy, but Slimy Salamanders are the Queens and Kings of slime! They are very hard to hold onto and their slime dries into a hard glue. The slime is presumably a defense against predators. The body is black with silver speckles. The Zigzag Salamander is found on rocky slopes and near caves. It has an irregular reddish to yellowish stripe that runs down its back to its tail.

The **Northern Dusky Salamander** (*Desmognathus fucus*) is brown with black mottling and has a light line extending from its eye to its mouth. Northern Dusky Salamanders are found in streams or under rocks. These salamanders have large, strong hind legs which they use to run and jump when disturbed by predators. They also have stiffened lower jaws and open their mouths by lifting the top of their heads. This stiff lower jaw helps them push their way under rocks and through the soil. They depend on streams and pools for breeding. Because they lack the noxious skin secretions of newts, Dusky Salamanders cannot breed in waters that contain fish.

The **Green Salamander** (*Aneides aeneus*) is a cliff-dweller. It can be seen on rock faces (and occasionally on trees or porches) after a heavy rain. This beautiful salamander is black with metallic green patches and has suction pads on its toes. The toes help it climb up cliffs.

Native Tennesseans will love the **Tennessee Cave Salamander** (*Gyrinophilus palleucus*) which is only found deep inside caves in Southern Tennessee and Northern Alabama. Its body is pale blue or pink, and its eyes have been reduced to dark spots. It usually does not metamorphose out of its aquatic larval stage, and hence has large feathery gills throughout its life. The reproductive organs develop inside the "larval" body. This species was first described by E. McCrady, a former Vice-Chancellor of the University of the South.

Both the **Mud Salamander** (*Pseudotriton montanus*) and the **Northern Red Salamander** (*Pseudotriton ruber*) are red with black spots. The black spots on the Northern Red are irregular and run together, the spots on Muds are distinct and circular. The Mud has brown eyes, and the Red has yellow eyes. Both these salamanders are rather stocky and short-legged and their colors fade from brilliant red to murky brown as they age. The Mud Salamander does live in muddy locations and will burrow into the mud if disturbed. The Northern Red Salamander lives in woodlands and streams.

The **Two-lined Salamander** (*Eurycea bislineata*) has a broad, yellow band running down the back to the tail. The band is bordered on either side by a black stripe. Both the larvae and the adults of these salamanders live in streams. Adults lay their eggs on the stream bed and will stay with them to defend them from predators such as fish or crayfish.

Long-tailed Salamander (*Eurycea longicauda*) is aptly named: its slender tail is much longer than its body. These salamanders are yellow to bright red-orange and are marked with scattered black spots which eventually turn into distinct bars on the tail. These salamanders live in vacated cicada holes and wood piles in damp areas. Like most salamanders, this species eats small earthworms and insects.

Unlike the Tennessee Cave Salamander, the more common **Cave Salamander** (*Eurycea lucifuga*) is terrestrial and found at the entrances of caves. This species is bright orange above and covered with jet black speckles. They are excellent climbers and use their tails like monkeys as they climb around the rocks.

Ambystomidae

The **Marbled Salamander** (*Ambystoma opacum*) is the smallest of the two ambystomas found in Sewanee (9-13 cm long). It is dark gray or black above with bold silvery crossbands. This salamander can be found near ponds, streams, and woodlands and breeds during the fall. Females lay their eggs in depressions in the ground which will later fill with water, inducing hatching. The larvae overwinter in the pools and will sometimes feast on the smaller larvae of the Spotted Salamander when these emerge from their eggs in the spring.

The **Spotted Salamander** (*Ambystoma maculatum*) is black above with two irregular rows of round, bright yellow or orange spots (15-25 cm long). These salamanders are usually only seen after the first warm rain in February when they emerge from under the ground to congregate in great numbers at temporary pools of water. They mate, then lay eggs contained in large (fist-sized) jelly masses. The larvae take many months to develop and emerge from the pools in late summer.