

F R O G S A N D T O A D S O F T E N N E S S E E



Tennessee is home to 21 native species of frogs and toads; a group of amphibians collectively known as anurans, meaning "tail-less." The geologic and geographic diversity of our state provides many different habitats in which our frogs and toads may prosper. From the mile-high peaks of the Appalachian Mountains in the east to the swampy coastal plains of the Mississippi River in the west, Tennessee is a rich garden bustling with amphibian life. One need only visit a roadside ditch after dusk to hear the remarkable songs that fill the landscape of Tennessee.

Several general features distinguish frogs from toads. Frogs have smooth, moist skin, prefer moist habitats, and leap with long hind legs. The careful observer can usually catch a glimpse of two large green eyes peering from the edge of a pool before the frog disappears with a "squeak" under the water. In contrast, toads are stocky creatures with very dry skin that is covered with bumps often referred to as warts. They prefer drier habitats and hop around on short, stubby legs. Some toads will position themselves under a porchlight and catch dinner the easy way. One Tennessee resident, the American toad, is a common neighbor and porch companion. While handling toads will not give you warts, many toads and frogs secrete a toxic substance from their skin that may cause severe burning, irritation, and allergic reaction. When handling these fascinating creatures, it is advisable to avoid hand contact with your eyes or mouth. These poisonous secretions are an adaptation to deter predators and increase an individual's chance of survival. An unfortunate puppy will learn early to "look but not touch" a toad when he unwittingly gets a mouthful of the bitter potion.

The life cycles of frogs and toads are quite similar. During breeding periods the males will congregate, generally around a water source, and begin vocalizing to attract females. This group of vocalizing males is referred to as a "congress" or "chorus." In the spring and summer months, ponds, roadside ditches, and temporary puddles come alive with the voices of thousands of frogs and toads. Whether it be the sweet melodic trill of the American toad, the playful yips of the barking treefrog, or the gentle hypnotizing growl of the bullfrog, Tennessee's frogs and toads emit a powerful lullaby. Each species has a specific call, preferred breeding habitat, and breeding season that aids in the identification of an anuran when one is unable to visually locate it. After mating takes place, females lay hundreds to thousands of jelly-coated eggs. Depending on the species, eggs may be in long strands, large floating masses, or individual eggs that may either float or sink, but all must be deposited in water.

After fertilization by the male and incubation by the warmth of the sun, the eggs hatch into a larval form called a tadpole or pollywog. This stage of life is adapted to a strictly aquatic lifestyle. Tadpoles respire through gills, have a muscular tail for swimming, and feed on plant material (algae) and plankton. Within as little as two weeks or as long as two years, metamorphosis will take place, transforming the aquatic tadpole into the terrestrial frog or toad. Legs appear, the tail is gradually resorbed, and lungs replace the gills as the primary breathing apparatus. The diet changes from that of an herbivore to a carnivore preying upon insects, spiders, small crustaceans, and other live prey.

As a resource, frogs and toads are extremely valuable, both economically and ecologically. Tons of insects, many of which are potentially threatening to gardens and forests, are consumed by frogs and toads. Advances in medical technology have been aided by many frog species. Nearly every biology student has learned anatomy by studying a dissected frog. Many a childhood fascination begins with the first discovery of these wonderful creatures; the excitement of finding a pool filled with tadpoles, the first capture of a toad in the backyard, or drifting into sleep with the sounds of treefrogs filling the atmosphere around a dark campsite. In addition to all of this, anurans play a major role as indicators of the health of the environment. Due to their permeable skin and close contact to the water, frogs and toads provide the first clues to problems associated with pollution. Recent attention has been focused on these animals and the fact that the group as a whole is suffering a decline. Worldwide efforts are being made to monitor the status of amphibian populations and determine what needs to happen in order to ensure the survival of these unique animals. The Tennessee Amphibian Monitoring Program (TAMP) is part of that effort with the goal of understanding the status of amphibian populations in our home state.

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"In the end we will conserve only what we love. We love only what we understand. We will understand only what we are taught."

Baba Dioum, African Conservationist



AMERICAN TOAD
(*Anaxyrus americanus*)

One of only two "true" toads found in Tennessee, American toads have dry, warty skin and horizontal pupils. *Anaxyrus americanus* is found throughout Tennessee and ranges in length from 2 to 3-1/2 inches. The color of this toad is quite variable (brown to brick-red) and it can be distinguished from the Fowler's toad by the kidney-shaped parotid glands (large bumps on the head directly behind the eyes which secrete a poison to deter predators) and also by counting the number of warts occurring in the dark blotches on the back and sides of the body. The American toad has only one or two warts per blotch while Fowler's toad has three or more. American toads begin breeding in early spring. Their call is a beautiful high-pitched trill lasting 30 seconds or longer.



SPRING PEEPER
(*Pseudacris crucifer*)

The most common of Tennessee's treefrogs, this small frog is one of the first sounds of spring throughout the state. Only 3/4 to 1-1/2 inches long, a chorus of these little frogs can be deafening. Coloration of *Pseudacris crucifer* varies from tan, gray, or brown but a characteristic "X" can be seen on the backs of most individuals. Spring peepers breed in woodland ponds, swamps, and roadside ditches, and can be heard as early as December and as late as September. They have a high pitched "peep, peep, peep" call and males will often call in trios.



FOWLER'S TOAD
(*Anaxyrus fowleri*)

The other "true" toad found in Tennessee, Fowler's toad also has dry, warty skin and horizontal pupils. The color of this toad may be quite variable. It can be distinguished from the American toad by the oval-shaped parotid glands, and has three or more warts in each dark blotch on the back and sides of the body, and the belly is not spotted. *Anaxyrus fowleri* breeds later in the year than the American toad, usually when the air temperature reaches the mid 70s. Their call is a short, nasal, raspy trill ("whaaa") which may be heard near water throughout the summer.



SOUTHEASTERN CHORUS FROG
(*Pseudacris feriarum*)

A small (barely an 1-1/2 inch long) member of the treefrog family, these animals are often seen climbing small shrubs or emergent aquatic vegetation. *Pseudacris feriarum* is found throughout the state. These frogs are early breeders and can be heard calling from December through March when cool rains bring them out of the mud. Coloration varies from gray to brown and light to dark green. The southeastern chorus frog has broken stripes on the back that distinguishes it from the mountain chorus frog. The vocalization of these frogs resembles the sound made by slowly flicking the teeth of a plastic comb.



EASTERN SPADEFOOT
(*Scaphiopus holbrookii*)

This toad does not belong to the "true" toad family and is the only member of its family east of the Mississippi River. A black spadelike projection on the hindfeet gives this toad its name, and is used for burrowing as this animal spends most of the year underground. *Scaphiopus holbrookii* has smooth, moist skin and elliptical pupils. The parotid gland is not as conspicuous as in the true toads. The eastern spadefoot is less than three inches in length and has two broken wavy lines down its back, coloration varies from cream-brown to greenish-yellow. This toad feeds almost exclusively on the exception of the high Appalachian Mountains. Their call sounds like that of a young crow, an explosive "errrrr".



BIRD-VOICED TREEFROG
(*Hyla avivoca*)

One of five species of true treefrogs found in Tennessee, this little frog (1 to 2 inches in length) can be green, grayish, or pale yellow. Their eyes are large in proportion to the head and a white rectangle is found beneath the eyes. They have enlarged toe pads and flash colors on the thigh are a light transparent green. *Hyla avivoca* breeds from March to September and the males like to call from trees standing in water. This species is found primarily west of the Tennessee River, with isolated populations in Cheatham County. As the name implies, this frog makes short, bird-like "whistles" which can be confused with the call of a bird.



EASTERN NARROW-MOUTHED TOAD
(*Gastrophryne carolinensis*)

Not a member of the "true" toad or spadefoot family, the eastern narrow-mouthed is in a family by itself in Tennessee. It is one of the smallest anurans in the state, measuring from 4/5 to 1-2/5 inches in length. It is a plump, smooth-skinned species, with a wrinkle-like fold of skin on the head behind the eyes. Coloration varies from gray to brown or a rusty reddish color on the back, the belly is dark gray to black. *Gastrophryne carolinensis* is found statewide with the exception of the high mountains. It burrows like the spadefoot toad and has tubercles on the hind feet. This toad feeds almost exclusively on ants. The call of this species resembles a bleating lamb, a high-pitched nasal "beeeee".



BARKING TREEFROG
(*Hyla gratiosa*)

One of five species of true treefrogs found in Tennessee, this is the largest and rarest treefrog measuring from 2 to 3-3/4 inches in length. The head is broad and short, and they have large discs on the tips of the toes. Coloration varies from bright green to darkish brown with a partial or uneven white stripe extending down from the jaw. It has coarsely granulated skin covering the body. *Hyla gratiosa* has been reported in only a few areas of Tennessee including the Clarksville area, parts of West Tennessee, and the Cumberland Plateau, west of the Sequatchie Valley. Males call while floating in the water from March to August. The "advertisement" call given from the water sounds like a beagle "baying" and the tree call sounds like the barking of a small dog. This frog has been known to hybridize with the green treefrog.



NORTHERN CRICKET FROG
(*Acris crepitans*)

One of two species of cricket frogs in Tennessee, the northern cricket frog is found throughout the state with the exception of the high Appalachian Mountains of upper East Tennessee. *Acris crepitans* is a very small frog, from 5/8 to 1-1/4 inches in length. It is a member of the tree frog family, however it is not a climber and lacks toe pads. The longest toe on each hind foot has 1-1/2 to 2 inches free of webbing. Cricket frogs are more active during the day than most other frogs or toads. They have warty, moist skin and the color can vary from rusty-brown to yellowish-green, but all have a distinguishing dark triangle on the head between the eyes. Their call resembles the click, click, click of two marbles knocking together and can be heard from April to June. The clicking will begin at a slow tempo, accelerate, and then slow again.



GREEN TREEFROG
(*Hyla cinerea*)

Of the five species of true treefrogs in Tennessee, the green treefrog is the most flashy—a bright green frog with a white or yellow stripe extending down each side from the jaw and sometimes with yellow spots flecked along the smooth back. *Hyla cinerea* is found primarily from the Tennessee River west along with some populations in northwestern Middle Tennessee and some isolated populations in Warren, Martin, and Hamilton counties on the Cumberland Plateau. It is our second largest treefrog measuring 1-1/2 to 2-1/2 inches in length. The green treefrog breeds from April to September with a call which sounds like a nasal hunk from a goose. They prefer floating in the water or climbing on emergent vegetation in swampy areas around bodies of water. These frogs have been known to hybridize with the barking treefrog.



SOUTHERN CRICKET FROG
(*Acris gryllus*)

The other species of cricket frogs in Tennessee, the southern cricket frog is found in the far southwest corner of the state along the Mississippi border. *Acris gryllus* is a very small frog, from 5/8 to 1-1/4 inches in length. It is a member of the treefrog family, however is not a climber and lacks toe pads. The longest toe on the hind feet has the last three joints free of webbing. Cricket frogs are more active during the day than most other frogs or toads. They have warty, moist skin and the color can vary from rusty-brown to yellowish-green, but all have a tell-tale dark triangle on the head between the eyes. Their call resembles the click, click, click of two marbles knocking together and can be heard from April to June. In the southern cricket frog the tempo of the clicking does not change.



GRAY TREEFROG/COPE'S GRAY TREEFROG
(*Hyla versicolor/Hyla chrysoscelis*)

Two distinct but identical-looking species of gray treefrogs are found in Tennessee. They are heard and seen calling from temporary ponds and puddles where they breed from April through August, making a short rasping trill. They range in size from 1-1/4 to 2-3/8 inches in length. Their skin is rough with dark blotches on the back, and flash colors on the thighs are a bright yellowish-orange. Note the color variations shown above. Cope's gray treefrog can be found statewide and the two species have overlapping ranges. The gray treefrog is known from only a few confirmed reports in Southwest Tennessee (Shelby County). The two species cannot be distinguished visually from one another, but only by counting the number of chromosomes in each specimen or by analysis of the pulse rate of the call at a known temperature. These frogs live high in the trees and only come down for breeding and hibernation.



MOUNTAIN CHORUS FROG
(*Pseudacris brachyphona*)

A small (barely 1-1/2 inches long) member of the treefrog family, the mountain chorus frog is often seen climbing in low vegetation such as shrubs or emergent aquatic plants. It is found in the higher elevations of the Cumberland Plateau and the Appalachians. These chorus frogs are early breeders, heard calling from December to March when cool rains bring them out of the mud. The coloration varies from gray to brown and light to dark green. *Pseudacris brachyphona* has a pair of characteristic "reverse parenthesis" stripes on its back and a light triangle between the eyes. Their call is a short, raspy, upward-slurred "reek-rack, reek-rack".



PICKEREL FROG
(*Lithobates palustris*)

The pickerel frog attains a length of only 3 inches. Coloration varies from bright green to brown. The pickerel frog has apricot flash colors on the thighs and two rows of squarish spots down the back. These two features distinguish them from the southern leopard frog. *Lithobates palustris* is found statewide and is common around cool springs and creeks of the Appalachians and Cumberland Plateau. This frog is also known to inhabit sinkholes and caves. Pickerel frog's skin secretion is toxic enough to spell death for other frogs when they come into contact with it. They breed from April to June and the call is a low-pitched, descending drawn-out snore; "reeeeeeoooo-www".



AMERICAN BULLFROG
(*Lithobates catesbeianus*)

The largest and most familiar frog to most Tennesseans is the bullfrog. These large greenish to brown frogs (see color variation in picture) can attain a length from 6 to 8 inches and weigh as much as a pound or more. A fold of skin extends behind the eye and around the tympanum, but NOT down the back. *Lithobates catesbeianus* prefers permanent water, usually large, slow moving creeks, ponds, rivers, and lakes throughout the state. The tadpoles of bullfrogs sometimes take as long as two to three years to metamorphose into the adult form. They breed from May to August and their call is an unmistakable loud, deep "jug-o-rum".



GREEN FROG
(*Lithobates clamitans*)

This medium-sized frog is regularly confused with young bullfrogs, however the presence of two dorsolateral folds of skin running the length of the green frog's back easily distinguishes the two. In addition, the bullfrog has distinct dark bands across the hind legs while the green frog merely has spots. Coloration is variable from green to tan. *Lithobates clamitans* is found throughout the state generally around permanent water sources and breeds from late April to August. Vocalization of the green frog is a deep "glunk" reminiscent of a loose banjo string. When spooked from the edge of a pond this species (as well as the bullfrog) will emit a quick squeak or squeal, called an "alarm call".



CRAWFISH FROG
(*Lithobates areolatus*)

This chunky frog is the second largest frog in Tennessee, measuring 3 to 4 inches in length. The northern crawfish frog ranges in color from creamy brown to chocolate, with some individuals having a purplish hue, all having black spots enclosed by a white circle, and a whitish belly. They also have prominent dorsolateral folds. *Lithobates areolatus* resides in burrows made by crawfish or muskrats in the bottomlands of West Tennessee and along the levees of the Mississippi River. These frogs can be heard from February to May, and their call is a loud, deep snore with tremendous carrying power.



DUSKY GOPHER FROG
(*Lithobates sевosus*)

The dusky gopher frog is the rarest of all frogs in Tennessee. Known only from one site in Coffee County, this frog closely resembles his cousin the crawfish frog. It is similar in size (2-1/2 to 3-1/2 inches) and appearance, however the gopher frog's spots are not enclosed in white, and its belly is mottled. In southeastern coastal states, the species breeds in late winter and its call is a deep snore approximately 2 seconds long. No one has ever heard gopher frogs in Tennessee, which could be due to their ability to vocalize under water! Gopher frogs are so named because of their habit of using gopher tortoise burrows by day. As this turtle does not occur in Tennessee, this frog probably uses mammal burrows and crayfish tunnels instead.



SOUTHERN LEOPARD FROG
(*Lithobates sphenoccephalus*)

The southern leopard frog is slightly larger than the similar looking pickerel frog and attains a length of 3-1/2 inches. This frog is found statewide with the exception of the high mountains along the North Carolina border. *Lithobates sphenoccephalus* ranges in color from green to brown, and has two rows of rounded spots down the back as well as a white spot in the center of the tympanum. These two features distinguish it from the pickerel frog. This frog begins breeding in late winter or early spring and has a second breeding season in the fall. Its call is a series of clucks interspersed with groans, sounding similar to rubbing a balloon with your finger.



WOOD FROG
(*Lithobates sylvaticus*)

The wood frog reaches its southernmost limits in Tennessee and is found in the moist woodlands of the Cumberland Plateau, the Appalachians, Cheatham, Houston and Humphreys counties. It is a rare species outside of this area within the state, but is regularly found in Cheatham County. This frog is the only amphibian found as far north as the Arctic Circle. Coloration is variable from a chocolate brown to a pale pink. Identification is aided by the presence of a dark mask behind the eye that continues around the tympanum, and dorsolateral skin folds down the back. *Lithobates sylvaticus* breeds in winter and early spring when ice is still on ponds and roadside ditches. Their call is a random series of clucks or quacks with little carrying power.



SOUTHERN TOAD
(*Anaxyrus terrestris*)

This large, stocky toad is abundant throughout the southeastern Coastal Plain of the United States but could be an inhabitant of southwestern portions of Tennessee. Coloration varies from gray to brown, and it has cranial crests and parotid glands. It prefers areas with sandy soils in which it burrows, but may occur in a variety of habitats. Breeding occurs from March to May and the male call is a high-pitched musical trill similar to a cricket, an intermediate sound between the American toad and Fowler's toad. They are known from northwestern Alabama and northeastern Mississippi.



ILLINOIS CHORUS FROG
(*Pseudacris streckeri illinoensis*)

The largest of the chorus frogs, this frog's stout forelegs give it a toad-like appearance. Coloration is variable, ranging from gray, hazel, brown and olive, to green. It has dark dorsal markings and a characteristic dark, mask-like stripe from the snout to the shoulder. This frog is found in a variety of habitats from woodlands to swamps and breeds from November to May. The male call is a single clear "cluck...cluck." A resident of northeastern Arkansas and extreme southeastern Missouri, this frog may possibly inhabit the Reelfoot Lake area of West Tennessee.



PLAINS LEOPARD FROG
(*Lithobates blairi*)

This frog is generally a middle American species, but could possibly inhabit parts of extreme northwestern Tennessee. It is visually similar to the southern leopard frog generally colored brown with a light spot in the middle of the tympanum. The plains leopard frog has a dark spot on the snout, which is lacking in the southern leopard frog. In addition, there is considerable yellow on the groin and some on the ventral surface of the thigh. Breeding begins with the first warm rains, and the call consists of 2 to 4 uttering "chuu-uck...chuu-ucks" similar to the southern leopard frog. If they occur in Tennessee, they are most likely in the Reelfoot Lake area.

Photographic images of frogs and toads by: Greg Sievert

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