




Identification of Tennessee Anurans



Hyla versicolor




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Anuran Families

Suborder Mesobatrachia Order Anura Suborder Neobatrachia

Bufonidae



2

True Toads

Scaphiopodidae



1

American Spadefoots

Microhylidae



1

Narrow-mouthed Toads

Hylidae



10

Tree Frogs

Ranidae



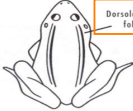
7

True Frogs

Morphological Characteristics

Ranidae, Hylidae

FROGS

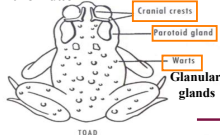


Dorsolateral fold

No fold

Some species are distinguished by the presence of raised longitudinal folds

Bufonidae



Cranial crests

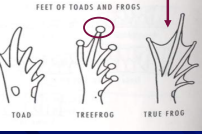
Parotoid glands

Warts

Glanular glands

TOAD

FEET OF TOADS AND FROGS



TOAD


TREEFROG

TRUE FROG


Family
Bufonidae

American toad


(*Anaxyrus americanus*)



Eggs: 1-2 strings
(4,000-12,000 eggs)
>10 m length



AMERICAN
(americanus)
Paratoid separate
or connected to
ridge by a spot



© Tom Tynning
Mass Audubon

SVL = 3"

Breeding Call

- Long, musical trill (constant)

Breeding Season

- Early (March)


Characteristics:

- Paratoid glands rarely touch cranial crest
- 1-2 glanular glands "warts" per dark spot

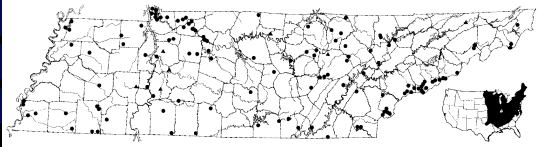
Family
Bufonidae

American toad

(*Anaxyrus americanus*)




Distribution:



<http://www.apsu.edu/amathas/>

- Eastern United States
 - Statewide




© Will Brown

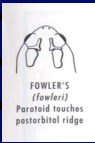
Family
Bufonidae

Fowler's toad


(*Anaxyrus fowleri*)



Eggs: 1-2 strings
(5,000-10,000 eggs)
<3 m length



FOWLER'S
(fowleri)
Paratoid touches
posterolateral ridge



© Tom Tynning
Mass Audubon

SVL = 2.5"

Breeding Call

- Nasal "w-a-a-h"
- Sheep bleating or baby crying

Breeding Season


- Mid (May)

Characteristics:

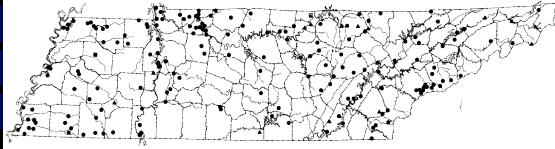
- Paratoid glands touch cranial crest
- ≥3 glanular glands "warts" per dark spot

Family
Bufonidae

Fowler's toad
(Anaxyrus fowleri)




Distribution:



<http://www.apsu.edu/amatlas/>

- Eastern United States
 - **Statewide**



Family
Scaphiopodidae

Eastern spadefoot
(Scaphiopus holbrookii)



Metatarsal tubercle



T-storms



©Tom Tyling Mass Audubon
SVL = 2"

Breeding Call

- Nasal grunts:
“wahh, wahh, wahh”
- Young crow

Breeding Season

- Late (June, July)
(heavy rain)

Characteristics:

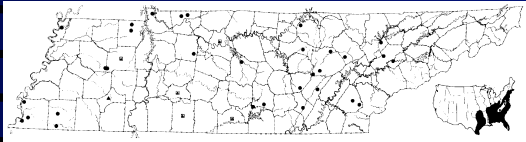
- Vertical Pupil
- **Glanular glands but no parotoid glands**

Family
Scaphiopodidae

Eastern spadefoot
(Scaphiopus holbrookii)


Xeric
Adapted
Genera

Distribution:



<http://www.apsu.edu/amatlas/>

- Southeastern United States
 - **Statewide (rare, Smokies)**



Family
Microhylidae

Eastern narrow-mouthed toad

(*Gastrophryne carolinensis*)




T-storms



SVL = 1"

Breeding Call

- High pitch buzz "bzzzzzz"
- Insect wings

Breeding Season

- Late (June, July) (heavy rain)

Characteristics:

- Pointed snout, short limbs, plump body
- **Folded skin between eyes**

Family
Microhylidae

Eastern narrow-mouthed toad

(*Gastrophryne carolinensis*)

Distribution:



<http://www.apsu.edu/amatlas/>

- Southeastern United States
- **Statewide (rare Smokies)**



Family
Hylidae

Eastern cricket frog

(*Acris crepitans*)

Acris = locust
crepitans = clattering

Breeding Call

- Metallic clicking (2 metal balls)
- Tempo changes: (slow-fast-slow)



SVL = <1"

Breeding Season

- Mid (May)

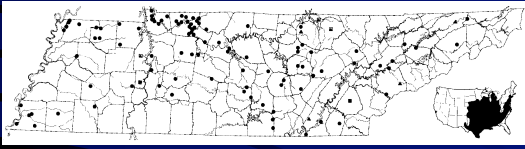
Characteristics:

- Dark triangle between eyes; often bright "Y" racing stripe
- **>1/2 of longest toe on rear feet webbed**

Family
Hylidae


Northern cricket frog (*Acris crepitans*)

Distribution:



<http://www.apsu.edu/amatlas/>

- Midwest and Eastern U.S.
 - Statewide



Family
Hylidae

Southern cricket frog (*Acris gryllus*)

Acris = locust
gryllus = cricket

Breeding Call


- Metallic clicking (2 metal balls)
- Raspier, shorter
- Tempo constant

Breeding Season

- Late (June, July)

Characteristics:

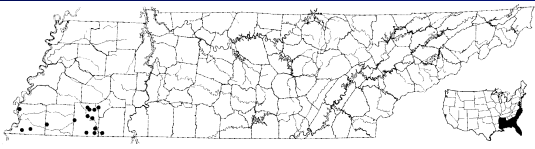
- Dark triangle between eyes; often bright "Y" racing stripe (more distinct line than *A. crepitans*)
- $\leq 1/2$ of longest toe on rear feet webbed



Family
Hylidae


Southern cricket frog (*Acris gryllus*)

Distribution:



<http://www.apsu.edu/amatlas/>

- Deep Southern U.S.
 - Southwest TN



Family
Hylidae

Bird-voiced treefrog (*Hyla avivoca*)

Breeding Call

- Bird-like Chirping
- Whistling for dog

Breeding Season

- Mid (May, June)

SVL = 1.5"

Characteristics:

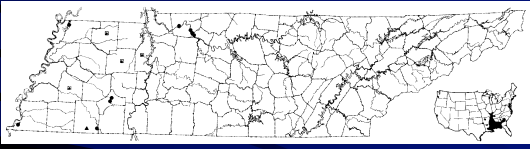
- Light green or gray with light-colored patch under eye
- **No flash colors like gray treefrogs**

Coloration can be highly variable!

Family
Hylidae

Bird-voiced treefrog (*Hyla avivoca*)

Distribution:



<http://www.apsu.edu/amatlas/>

- Primarily MAV
- **Western TN**

Family
Hylidae

Green treefrog (*Hyla cinerea*)

Breeding Call

- Short nasal repeating "quonk"
- Bicycle horn

Breeding Season

- Late (June, July)

SVL = 2"

Characteristics:

- Always green, smooth back and belly
- **White-yellow stripe extending from upper lip mid-laterally**

Family
Hylidae

Green treefrog

(Hyla cinerea)

Distribution:



<http://www.apsu.edu/amatlas/>

- Southeastern United States
- Western TN but expanding into East TN!



Family
Hylidae

Cope's Gray treefrog

(Hyla chrysoscelis)

Breeding Call

- Short raspy trill (constant)
- Faster than *H. versicolor*
- 34-69 pulses/sec




SVL = 2"

• ½ chromosomes of *H. versicolor*

Breeding Season

- Mid (May, June)

Characteristics:

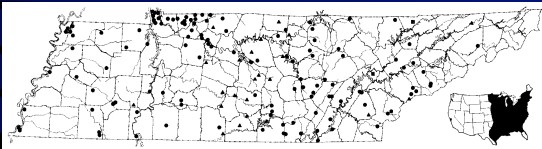
- Gray to greenish with mottled back
- Yellow-orange flash colors under legs

Family
Hylidae

Cope's Gray treefrog


(Hyla chrysoscelis)

Distribution:



<http://www.apsu.edu/amatlas/>


- Eastern United States
- Statewide



Family
Hylidae


Barking treefrog

(*Hyla gratiosa*)



Breeding Call

- Steady raspy honk
- Sounds similar to a beagle bark or Canada goose
- Higher pitch than green frog



SVL = 2-3"

Breeding Season

- Late (June, July)

Largest of the treefrogs in Tennessee

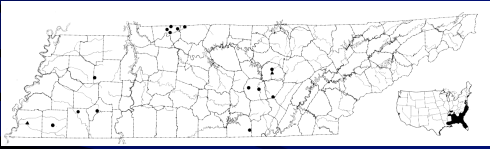
Characteristics:

- Solid green (granulated) or green with dark spots
- **White upper lip does not extend mid-laterally**

Family
Hylidae

Barking treefrog


(*Hyla gratiosa*)



<http://www.apsu.edu/amatlas/>

Distribution:


- Deep Southern U.S.
 - West TN & Cumberland Plateau



Family
Hylidae

Spring Peeper

(*Pseudacris crucifer*)



Breeding Call

- Clear Distinct Peep



SVL = 1"

Breeding Season

- Early (Feb, March)

"Cross bearer"

Characteristics:

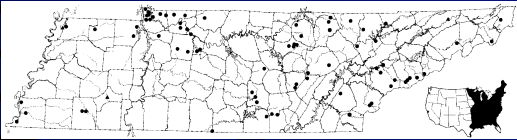
- Light-brown, smooth skin with dark line between eyes
- **Dark cross on back**

Family
Hylidae

Spring Peeper


(Pseudacris crucifer)

Distribution:



<http://www.apsu.edu/amatlas/>

- Eastern United States
 - **Statewide**



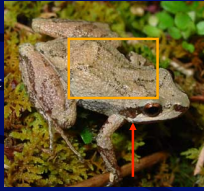
Family
Hylidae

Mountain Chorus Frog

(Pseudacris brachyphona)

Breeding Call

- Short, raspy call that rises in pitch
- Running finger over comb but duller than *P. feriarum*



Breeding Season

- Early (April)

1/3 size of a wood frog

Characteristics:

- Light-brown, smooth skin with dark line through eye
- **Backward parentheses on back (sometimes)**

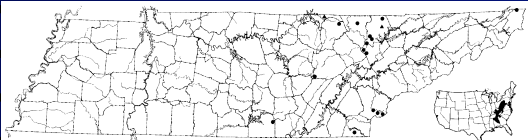
Family
Hylidae

Mountain Chorus Frog

(Pseudacris brachyphona)


Distribution:

>1000 m elevation



<http://www.apsu.edu/amatlas/>

- Southern Appalachia
 - **Mostly Cumberland Mountains and Plateau**



Family
Hylidae

Upland (southeastern)
Chorus Frog
(*Pseudacris feriarum*)

Breeding Call
•Running finger over comb but more metallic than *P. brachyphona*


Breeding Season
•Early (January)

Characteristics:
• Light to dark brown with dark triangle between eyes
• Three dark dorsal lines (usually)

Earliest breeding frog

Note: call rises (gray treefrogs do not)

SVL = 1"



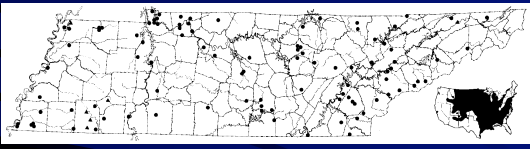
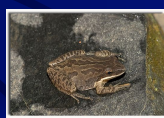
Family
Hylidae

Upland Chorus Frog
(*Pseudacris feriarum*)

Distribution:

http://www.apsu.edu/amAtlas/

• Southeastern United States
• **Statewide**

Family
Ranidae


Crawfish Frog
(*Lithobates areolatus*)

Breeding Call
•Deep "Waaaaa"
•Sounds like someone snoring

Breeding Season
•Early (March)

Characteristics:
• Dark spots encircled in white, white throat
• Dorsal lateral folds very apparent

SVL = 2.5"

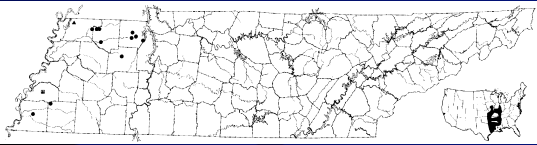


Family
Ranidae

Crawfish Frog


(*Lithobates areolatus*)

Distribution:



<http://www.apsu.edu/amatlas/>

- Mississippi Alluvial Valley
 - West Tennessee




Family
Ranidae

American bullfrog

(*Lithobates catesbeianus*)

Breeding Call

- loud deep "jug-o-rum"
- Often play dead when handled



SVL = 5"

Breeding Season

- Late (June, July)

Characteristics:

- Green or brown with dorsal lateral folds around tympanum
 - Males:** Tympanum larger than eye

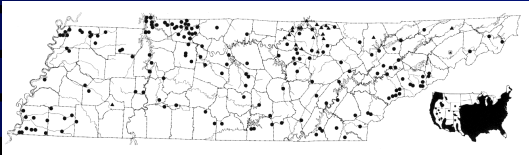
Largest frog in Tennessee

Family
Ranidae

American bullfrog


(*Lithobates catesbeianus*)

Distribution:



<http://www.apsu.edu/amatlas/>

- Eastern U.S.
(introduced western states)
- Statewide



Family
Ranidae

Green frog

(*Lithobates clamitans*)

Breeding Call

- Short, explosive "glunk"
- Banjo string being plucked
- Lower pitch than barking treefrog


Breeding Season

- Late (June, July)

Characteristics:

- Green or brown with dorsal lateral folds extending past tympanum, center of tympanum raised
- **Males:** Tympanum larger than eye

SVL = 3"

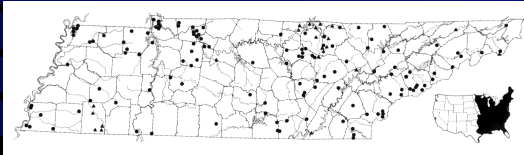


Family
Ranidae

Green frog


(*Lithobates clamitans*)

Distribution:



<http://www.apsu.edu/amAtlas/>

- Eastern United States
- **Statewide**



Family
Ranidae

Pickerel frog

(*Lithobates palustris*)

Breeding Call

- Drawn-out, descending snore, "yeeeeeeoww"
- Not as deep as *L. areolatus*

Breeding Season

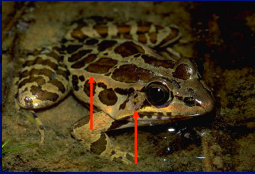
- Early (April)

Characteristics:

- Tan with dark paired dorsal spots (square)
- **No white spot on tympanum**

SVL = 2.5"

• Sounds like opening a creaky door

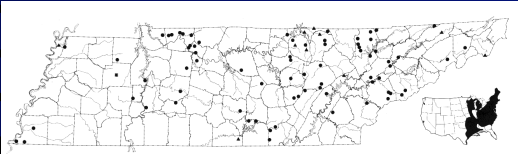


Family
Ranidae

Pickerel frog

(*Lithobates palustris*)


Distribution:



• Eastern United States
(excluding Gulf Coast)

• **Statewide**
(less common in west TN)

<http://www.apsu.edu/amatlas/>



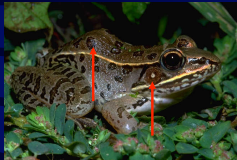
Family
Ranidae

Southern leopard frog

(*Lithobates sphenoccephalus*)

Breeding Call

- Series of clucks or chuckles
- Also, groans similar to rubbing hand over a balloon



SVL = 2.5"

Breeding Season

- Early (Feb, March)

Characteristics:

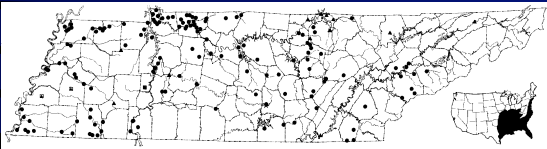
- Tan with dark dorsal spots in irregular pattern
- **White spot on tympanum**

Family
Ranidae

Southern leopard frog

(*Lithobates sphenoccephalus*)


Distribution:



• Southeastern U.S.

• **Statewide**
(not common in Smokies)

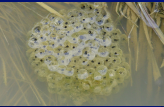
<http://www.apsu.edu/amatlas/>



Family
Ranidae


Wood frog

(*Lithobates sylvaticus*)



Breeding Call

- Series of clucks or chuckles (mallard)
- Interspersed with low grunts



SVL = 2"

Bi-colored Embryos
Black (above), white (below)

Forested wetlands often before ice is gone

Characteristics:

- Tan dark mask below and behind eye
- **White upper lip**

Breeding Season

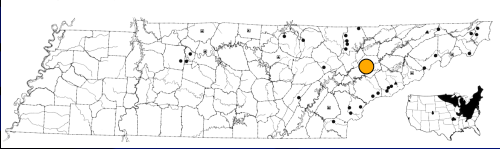
- Early (February)

Family
Ranidae

Wood frog


(*Lithobates sylvaticus*)

Distribution:



<http://www.apsu.edu/amAtlas/>

- Northeastern U.S.
- **Middle & East TN**



Commonly Confused Species

Past WFS 433/533 Students

"SnORES"

- Pickerel frog
- Crawfish frog

"High, Fast Trills"

- Eastern narrow-mouthed toad
- American toad

"Loud Clunks"

- Barking tree frog
- Green frog

"Low, Slow Trills"

- Upland chorus frog
- Mountain chorus frog
- Cope's gray tree frog

"Chuckles"

- Southern leopard frog
- wood frog

"Guttural Waah"

- Eastern spadefoot
- Fowler's toad

"Metallic Clicks"

- Eastern and southern cricket frog

Seasonal Phenology

Tennessee Anurans

January: upland chorus frog

February: wood frog, spring peeper, gopher frog

March: American toad, southern leopard frog, crawfish frog

April: pickerel frog, mountain chorus frog

May: Fowler's toad, northern cricket frog, gray treefrogs, bird-voiced treefrog

June/July: green frog, American bullfrog, southern cricket frog, eastern narrow-mouthed toad, eastern spadefoot, barking treefrog, green treefrog

August-Dec: possible to hear most species especially after rains and on warm days in fall and winter, although breeding for temperate anurans is concentrated January-July.

CALL SURVEYS



[HTTP://WWW.MTSU.EDU/MTSUC EE/TAMP.PHP](http://www.mtsu.edu/mtsucee/tamp.php)

Begin: ≥ 30 minutes after sunset (allow 5 min settling time) **End:** 1:00 am

Duration: 5 minutes

Abundance (by species):

- 0 = none heard
- 1 = individuals can be counted
- 2 = calls overlap but individuals can be distinguished
- 3 = calls overlap and individuals cannot be distinguished (full chorus)

North American
Amphibian Monitoring
Program

Citations and Helpful Websites

Identification Texts

- Niemiller, M., and R. G. Reynolds. 2011. The amphibians of Tennessee. University of Tennessee Press, Knoxville, TN.
- Dodd, C. K. Jr. 2004. The amphibians of Great Smoky Mountains National Park. The University of Tennessee Press, Knoxville, TN, USA.
- Dorcas, M., and W. Gibbons. 2008. Frogs and toads of the Southeast. University of Georgia Press, Athens, GA, USA.



Pictures and Calls

- LEAPS-Environmental Consulting
<http://www.leaps.ms/>
- Dr. Matt Niemiller (Frogs and Toads of TN)
<http://www.herpetology.us/tnerps/>
- Frog and Toads of Georgia
<http://www.knapp.home.mindspring.com/GAFrog.Toad.html>

HERPETOFAUNAL ATLASES OF TN

Amphibians: <http://apbrwww5.apsu.edu/amatlas/>
 Reptiles: <http://apbrwww5.apsu.edu/reptatlas/>

**ATLAS
OF
AMPHIBIANS IN TENNESSEE**

**ATLAS
OF
REPTILES IN TENNESSEE**

