



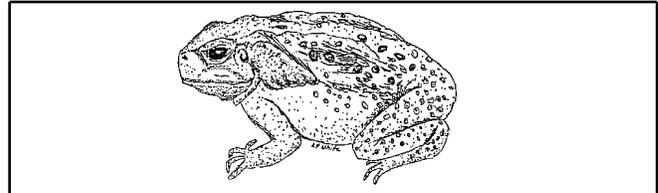
## **Frogs and Toads of Florida<sup>1</sup>**

Joe Schaefer and Jennifer Liebertz<sup>2</sup>

Frogs and toads are members of the class Amphibia, the first backboned animals to live on land. The word Amphibia is derived from the greek word "amphibios," which means "double life". Most frogs and toads have two stages in their life cycle, larvae (tadpole) and adult. There are approximately 80 species known in the United States; of these, 22 frog (and 4 additional subspecies), listed in Table 1, and 5 toad species, listed in Table 2, are native to Florida.

### **DESCRIPTION**

Frogs look different than toads in several ways. Most toads, except the eastern narrowmouth toad, have dry, warty skin, whereas frogs have moist, smooth skin. Most toads also have a pair of parotid glands bulging out from behind their eyes. These glands produce a bufotoxin that protects them from being eaten by most animals. All toads have these glands, but most are too small to severely affect people and our pets. The one exception is the non-native marine toad, which is large enough (6-inch long body) to release toxin amounts that can make people seriously ill, cause skin irritations, and kill dogs and cats. Frogs do not possess these glands, and there are no poisonous frogs in Florida.



**marine toad.**

Frogs and toads have evolved characteristics that allow them to survive on land. Adult frogs and toads have a keen sense of smell. This is controlled by a smell-taste organ called the Jacobsons organ in the nasal passages. Frogs and toads have a wide range of vision and are sensitive to movement. They cannot turn their heads, but their large, bulging eyes give them excellent side vision to see potential predators. Frogs and toads also have a well-developed outer ear. This circular tympanic membrane is located behind their eyes.

### **DISTRIBUTION AND HABITAT**

Frogs and toads live in a wide variety of habitats throughout Florida. Adults of many species spend considerable time in dry upland habitats and only migrate to wetlands during the breeding/egg-laying season.

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## LIFE STAGES

Frogs and toads have two life stages, the larvae or tadpole stage and the adult stage. When tadpoles metamorphose into adults, their body structure and breathing organs change. The tail disappears, legs form, the mouth enlarges, lungs replace gills, and other organs transform to adapt to a life that includes breathing air, eating different food items, and living on land as well as in the water.

## FEEDING

All adult frogs and toads are predators and feed on a wide variety of insects. They have a large mouth and a long, sticky tongue that they use to capture prey. Their hunting style is to sit and wait for their food to come to them. When an insect moves within range, they turn their body (if necessary), lunge forward, and shoot their tongue through the air. They also will pursue slower prey on the ground. Their feeding response is triggered by movement of prey. Because they swallow their prey whole there is little need for teeth. They also lack throat muscles to help them swallow, so they sort of push their food into their stomach with their upper head muscles and eyes. Tadpoles, immature frogs and toads, are herbivores (plant-eaters) and feed mostly on algae, which they filter from the water.

## REPRODUCTION

Frogs and toads move to ponds, lakes, streams, and ditches to breed. Males move to the pond first and begin calling. Usually, this activity takes place on rainy nights when the barometric pressure is falling. Once a female arrives, she selects her mate and breeding begins. When the male and female come close together, the male clasps the female around the waist with his forelegs. This clasping, known as amplexing, stimulates hormones in the female that cause her eggs to be released into the water. When this occurs, the male releases sperm, fertilizing the eggs. The eggs remain inside a gelatinous mass until hatching. Amphibian eggs must remain in a moist environment, because they have no protective shell. Toads lay their eggs in single strands, chorus frog eggs are in broken strands, and other frogs lay their eggs in large clumps.

## CONSERVATION ISSUES

Frogs and toads are an important link in food chains connected to wetland and upland habitats. They provide energy to fish and other aquatic organisms as well as more terrestrial species, such as wading birds, red-shouldered hawks, and a variety of snakes. At times, such as right after a heavy spring rain, it seems as though there is an abundance of frogs and toads in Florida. However, because their ecological role is so low in the food chain, there must be many of them for the proper amount of energy to be transferred to sustain animals at the higher levels. One way that people directly benefit from frogs and toads is that many of their insect prey are considered to be pests, such as mosquitos.

Some of the concerns about the future of Florida's frogs and toads are related to water quality and quantity. Very little is known about the impacts of various levels of contaminants on amphibian eggs, larva, and adults. Many frogs and toads use storm water retention ponds that contain high concentrations of pollutants.

Ephemeral or temporary ponds that may contain enough water to support eggs and tadpoles once a year or even once every 3 years are important to a majority of frogs and toads. The temporary nature of these ponds eliminates fish and other aquatic animals that prey on eggs and tadpoles. Many frogs and toads are so dependent on these fluctuating systems that they do not successfully reproduce in permanent waters.

Another potential threat to frogs and toads is the introduction of exotic (non-native) species. We do not know the extent of competition and disease transmissions that are being caused by exotics in Florida, but healthy populations of several species (e.g. greenhouse frog, Cuban treefrog, and giant toad) are well documented.

## NUISANCE PROBLEMS FOR HUMANS AND PETS

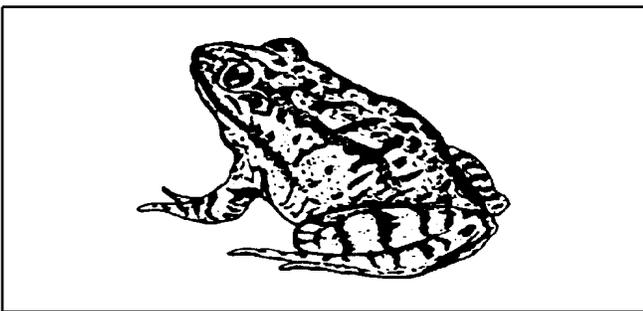
Homeowners who live near water may hear a variety of calling throughout the year. Frogs and toads will be attracted to any body of water for breeding, including bird baths and swimming pools.

If you are bothered by this, there is little you can do other than to make the water inaccessible with materials like screening and netting. If the noise is interrupting your sleep, you may want to consider closing the windows or turning on a fan or some other noise-making device that is less disturbing but will drown out the frog calls.

The large, non-native marine toad also may become a pest by eating your pet's food and causing dogs and cats to become deathly ill. If this species is a problem in your area, do not leave pet food in open dishes outside. These toads are an introduced (non-native) species and are not protected in Florida. They can be removed and disposed of humanely by placing them in a plastic container (or bag) in the freezer for 3 days. If you do not wish to handle the toads, contact your local nuisance animal trapper.

## LEGAL ASPECTS

Permits are required to sell or possess for sale any live amphibian or carcass, skin, or any body parts of amphibians native to the state of Florida. Frogs may be taken throughout the year by gigs, clubs, blow gun, hook and line, hand, or by shooting during daylight hours. A commercial freshwater fish dealer's license is required to take for sale or to sell frogs. The gopher frog (*Rana capito*), pine barrens treefrog (*Hyla andersonii*), and Florida bog frog (*Rana okaloosae*) are listed as species of special concern and are thus protected from taking, possessing, and selling of whole animals, body parts, and eggs.



**gopher frog.**

## SELECTED REFERENCES

Ashton, R. E. and P. S. Ashton. 1988. *Handbook of Reptiles and Amphibians of Florida: The Amphibians*. Windward Publishing, Miami. 191 pp.

Table 1.

Table 1. Frogs Native to Florida			
Common Name	Scientific Name	Florida Range	Principal Wetland Habitats
Northern Cricket Frog	<i>Acris crepitans crepitans</i>	P	all
Southern Cricket Frog	<i>Acris gryllus gryllus</i>	P	all
Florida Cricket Frog	<i>Acris gryllus dorsalis</i>	NS	all
Pine Barrens Treefrog	<i>Hyla andersonii</i>	P	small streams
Bird-voiced Treefrog	<i>Hyla avivoca</i>	P	river swamps
Cope's Gray Treefrog	<i>Hyla chrysoscelis</i>	PN	temporary ponds
Green Treefrog	<i>Hyla cinerea</i>	PNS	all
Southern Spring Peeper	<i>Hyla crucifer bartramiana</i>	N	temporary ponds
Northern Spring Peeper	<i>Hyla crucifer crucifer</i>	P	temporary ponds
Pinewoods Treefrog	<i>Hyla femoralis</i>	PNS	temporary ponds
Barking Treefrog	<i>Hyla gratiosa</i>	PNS	temporary ponds
Squirrel Treefrog	<i>Hyla squirella</i>	PNS	temporary ponds
Little Grass Frog	<i>Limnaoedus ocularis</i>	PNS	temporary ponds
Southern Chorus Frog	<i>Pseudacris nigrita nigrita</i>	PN	temporary ponds
Florida Chorus Frog	<i>Pseudacris nigrita verrucosa</i>	NS	temporary ponds
Ornate Chorus Frog	<i>Pseudacris ornata</i>	PNS	temporary ponds
Upland Chorus Frog	<i>Pseudacris triseriata feriarum</i>	P	all ponds
Florida Gopher Frog	<i>Rana capito aesopus</i>	PNS	temporary ponds
Dusky Gopher Frog	<i>Rana capito sevosa</i>	P	temporary ponds
Bullfrog	<i>Rana catesbeiana</i>	PNS	all
Bronze Frog	<i>Rana clamitans clamitans</i>	PN	river swamps
Pig Frog	<i>Rana grylio</i>	PN	marshes & lakes
River Frog	<i>Rana hecksheri</i>	PN	rivers

**Table 1.**

<b>Table 1. Frogs Native to Florida</b>			
Florida Bog Frog	<i>Rana okaloosae</i>	P	bogs & temp. ponds
Southern Leopard Frog	<i>Rana utricularia</i>	PNS	all
Carpenter Frog	<i>Rana virgatipes</i>	N	bogs & streams
Florida Range: P = panhandle; N = northern peninsula; S = southern peninsula			

**Table 2.**

<b>Table 2. Toads Native to Florida</b>			
Common Name	Scientific Name	Florida Range	Principal Wetland Habitats
Oak Toad	<i>Bufo quercicus</i>	PNS	temporary ponds
Southern Toad	<i>Bufo terrestris</i>	PNS	temp. & perm. ponds
Fowler's Toad	<i>Bufo woodhousii fowleri</i>	P	temp. & perm. ponds
Eastern Narrowmouth Toad	<i>Gastrophryne carolinensis</i>	PNS	temporary ponds
Eastern Spadefoot Toad	<i>Scaphiopus holbrookii holbrookii</i>	PNS	temporary ponds
Florida Range: P = panhandle; N = northern peninsula; S = southern peninsula			