

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF FISH & WILDLIFE
ENDANGERED & NONGAME SPECIES PROGRAM

The Leopard Frogs of New Jersey



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Introduction to Leopard Frogs

More than a dozen species of leopard frogs occur throughout North and Central America. Despite the existence of these many species, only two have traditionally been recognized from all of eastern North America (from Canada to Florida): the northern leopard frog, *Rana (Lithobates) pipiens* and the southern leopard frog, *R. sphenocephala* (*L. sphenocephalus*). However, in 2014 a third eastern species was described: the Atlantic Coast leopard frog, *R. (L.) kauffeldi*.

Leopard Frogs in New Jersey

Leopard frogs are widely distributed throughout the state of New Jersey (NJ), but prefer shallow swamps, open wet meadows, river floodplains, and even roadside and agricultural ditch systems. They are especially common throughout parts of the Pinelands, Meadowlands, and Delaware River Basin, but rarely found in heavily modified urban and suburban areas with highly manicured parks, lakes, and fish ponds.

Until recently, only the southern leopard frog was clearly recognized from NJ. But new research has shown that 2 to 3 distinct species may occur within the State. This includes the Atlantic Coast leopard frog (which was previously confused with the southern leopard frog) and the northern leopard frog, which likely occurred—and may still occur—in extreme northwestern NJ, based on museum specimens.

Purpose

These changes to the State's frog fauna are exciting and ecologically important, but the physical similarities of these species can also cause confusion. This guide is designed to help differentiate and identify these species through pictures, physical characteristics, acoustic patterns, habitat preferences, and breeding activity.



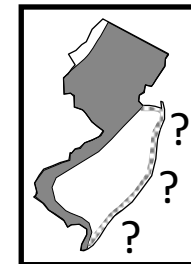
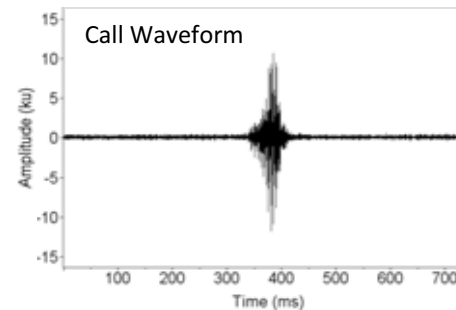
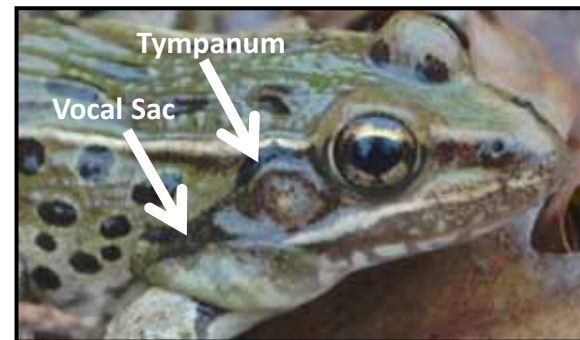
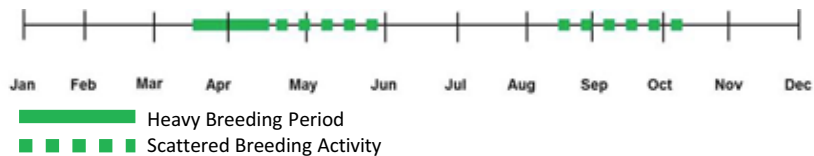
Atlantic Coast Leopard Frog (*Rana kauffeldi*)

Color and Characters: Body Size: 2½–2¾". Color is variable but far less varied and vivid than *R. sphenoccephala*. Particularly drab at night during the breeding season, ranging from dark olive-green to dark brown. Lighter shadings other times can include gray, mint, and green. Diagnostics include large external vocal sacs (in males) and a tympanic spot (off-white or beige) that may be small and faint compared to *R. sphenoccephala*, or totally absent in some frogs. Dark patterning on dorsal surface of the thigh (reticulum).

Call Description: A single 'chuck' (see call waveform) repeated many times in succession. Very similar to that of the wood frog, *R. sylvatica*, but accompanied by occasional secondary 'groans' that are distinct and drawn out. May be hard to differentiate from *R. sphenoccephala* when heard in loud choruses, as individual calls can be difficult to distinguish and verify. Frogs will call both day and night during peak periods (see below), but shift to a nocturnal and increasingly sporadic calling pattern later in the season.

Habitat: Typically found in open-canopied and early-successional mesic lowlands, large coastal freshwater impoundments, wet meadows, tidally influenced backwaters, and slow-flowing river floodplains. Often occurs in expansive wetland complexes with emergent vegetation (e.g., cattail or *Phragmites*) and interspersed uplands. Although coastal, not found directly in salt marshes.

Breeding Activity



Waveform adapted from Feinberg et al. 2014. Cryptic diversity in Metropolis: confirmation of a new leopard frog (*Anura: Ranidae*) from New York City and surrounding Atlantic Coast regions. *PLOS One* 9 (10), e0108213.

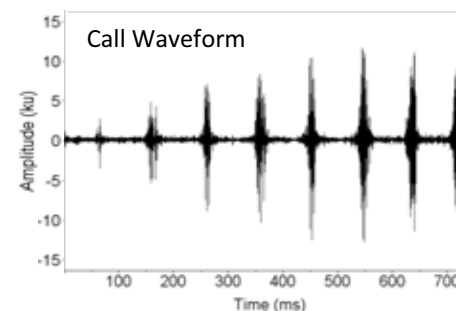
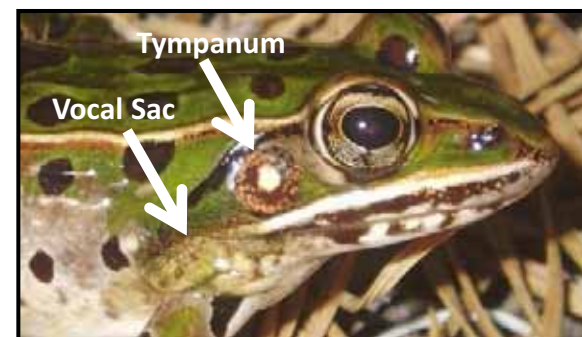
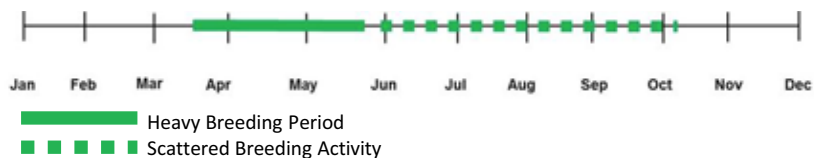
Southern Leopard Frog (*Rana sphenocephala*)

Color and Characters: Body Size: 2 $\frac{1}{3}$ –2 $\frac{3}{4}$ ". Color highly variable; lime-green to dark brown between individuals. Colors usually vivid, even in the breeding season. Diagnostic characteristics include external vocal sacs (in males) and a larger and typically more distinct light tympanic spot than *R. kauffeldi*. This spot is usually close to true white. Reticulum pattern is usually light.

Call Description: A multi-noted 'ak-ak-ak-ak' (see call waveform) typically repeated several times in succession. This chuckle-like call is distinct from other regional leopard frogs, especially when single individuals can be clearly distinguished. May be harder to differentiate in loud choruses where individual calls are not easily discernable. Occasional secondary grunts and groans are similar to other leopard frog species. Males will call day and night at peak season (see below), but switch to a mostly nocturnal pattern that may continue sporadically throughout much of the season.

Habitat: Similar canopy and structural preferences to *R. kauffeldi*. In New Jersey, typically restricted to sandy Pineland habitats away from mesic coastal marshes and river systems. Generally found in a wide variety of wetland types including wet ditches and smaller, more discrete ephemeral wetlands (but usually near other wetlands). Not found in expansive *Phragmites* marshes or directly within salt marshes; may exhibit broader habitat use farther south.

Breeding Activity



Waveform adapted from Feinberg et al. 2014. Cryptic diversity in Metropolis: confirmation of a new leopard frog (*Anura: Ranidae*) from New York City and surrounding Atlantic Coast regions. *PLOS One* 9 (10), e0108213.

Northern Leopard Frog (*Rana pipiens*)

Color and Characters: Body Size: 2½–3". Color likely similar to that described for *R. sphenocephala*. Diagnostics include a frequent snout spot, lack of large external vocal sacs, and typical absence of the light spot on the tympanum. Reticulum pattern always light.

Call Description: A long, drawn out, many-noted 'snore' (see waveform) that may be repeated a few times, sporadically. Call is distinct from other regional leopard frogs, but similar to the pickerel frog, *R. palustris*. Secondary groan similar to the other leopard frogs. Calling likely only occurs in spring; probably starts slightly later in the season than *R. kauffeldi* or *R. sphenocephala*.

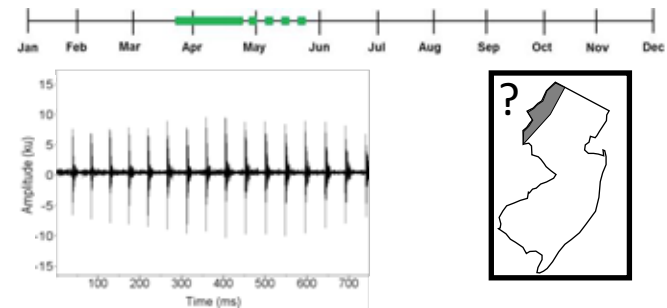
Habitat: As with *R. kauffeldi*, typically occurs in open-canopied and early-successional mesic habitats. Thus, the two species may overlap in an area such as northwestern New Jersey. In general found more interiorly (away from the coast) than *R. kauffeldi*.

Pickerel Frog (*Rana palustris*)

Color and Characters: Body Size: 2–2½". Color is light brown, with thick, cream-colored or off-white dorsolateral folds. Diagnostics includes spots that are often (but not always) rectangular, and aligned in two rows running laterally along the dorsum. A distinct flash of yellow-orange color by the inner thighs is a strong and highly reliable diagnostic (see picture). As with *R. pipiens*, snout spot is often present. Reticulum always light.










Call Description: Similar to the long, drawn out, multi-noted snore of *R. pipiens*, but delivered around twice as fast.

Habitat: Arguably most similar to *R. pipiens* across the focal region. Included here due to physical similarity with leopard frogs.



Waveform adapted from Feinberg et al. 2014. Cryptic diversity in Metropolis: confirmation of a new leopard frog (Anura: Ranidae) from New York City and surrounding Atlantic Coast regions. PLOS One 9 (10), e0108213.



Feature	Atlantic Coast Leopard Frog	Southern Leopard Frog	Northern Leopard Frog
Reticulum Pattern	 <p>Dark State</p> <p>Photo: Erik Kiviat</p>	 <p>Light State</p>	 <p>Light State</p> <p>Photo: Brian Zarate</p>
Spring Color Variation			 <p>Photo: Matthew Schlesinger</p>
Example Habitat			 <p>Photo: Matthew Schlesinger</p>

For audio and additional reading please see Feinberg, J.A., C.E. Newman, M.D. Schlesinger, G.J. Watkins-Colwell, B. Zarate, B. Curry, H.B. Shaffer, and J. Burger. 2014. Cryptic diversity in Metropolis: confirmation of a new leopard frog (*Anura: Ranidae*) from New York City and surrounding Atlantic Coast regions. *PLOS One* 9 (10), e0108213.