

Species Status Assessment

Class:	Amphibia
Family:	Ranidae
Scientific Name:	<i>Lithobates sphenoccephalus utricularius</i>
Common Name:	Southern leopard frog

Species synopsis:

NOTE: More than a century of taxonomic confusion regarding the leopard frogs of the East Coast was resolved in 2012 with the publication of a genetic analysis (Newman et al. 2012) confirming that a third, cryptic species of leopard frog (*Rana* [= *Lithobates*] sp. nov.) occurs in southern New York, northern New Jersey, and western Connecticut. The molecular evidence strongly supported the distinction of this new species from the previously known northern (*R. pipiens* [= *L. pipiens*]) and southern (*R. sphenoccephala* [= *L. sphenoccephalus*]) leopard frogs. The new species' formal description, which presents differences in vocalizations, morphology, and habitat affiliation (Feinberg et al. in preparation), is nearing submission for publication. This manuscript also presents bioacoustic evidence of the frog's occurrence in southern New Jersey, Maryland, Delaware, and as far south as the Virginia/North Carolina border, thereby raising uncertainty about which species of leopard frog occur(s) presently and historically throughout the region. Some evidence suggests that Long Island might at one time have had two species: the southern leopard frog in the pine barrens and the undescribed species in coastal wetlands and the Hudson Valley. For simplicity's sake, in this assessment we retain the name "southern leopard frog" even though much of the information available may refer to the undescribed species or a combination of species.

The southern leopard frog occurs in the eastern United States and reaches the northern extent of its range in the lower Hudson Valley of New York. It occurs along the vegetated edges of a variety of water bodies including marshes, wetlands, ponds, ditches, and slow streams. Formerly in the genus *Rana*, the southern leopard frog was reclassified into the genus *Lithobates* in 2006 along with several other species of water frogs that occur in New York. It is more closely related to the Florida leopard frog, *L. s. sphenoccephala*, than to the northern leopard frog, *L. pipiens*. It has also formerly been known as *Rana utricularia*.

Populations are declining in Pennsylvania and New York where the species is at the northernmost edge of the range. Its status as Special Concern in New York is due to threats to breeding wetlands and its restricted distribution in the state. In Connecticut it is known from a handful of locations. It is unclear whether this species ever occurred in Massachusetts or Rhode Island, but it does not seem to occur there at present. Elsewhere, including adjacent New Jersey to coastal Texas, populations appear to be stable.

I. Status

a. Current and Legal Protected Status

i. **Federal** Not Listed **Candidate?** No

ii. **New York** Special Concern; SGCN

b. Natural Heritage Program Rank

i. **Global** G5

ii. **New York** S1S2 **Tracked by NYNHP?** Yes

Other Rank:

IUCN Red List – Least Concern

Species of Moderate Concern (NEPARC 2010)

Status Discussion:

Southern leopard frogs are known from about five populations in the lower Hudson Valley of New York and two locations on Staten Island. The species may be extirpated from the rest of New York City and all of Long Island, where it was once considered the most common frog. A population is known at the Seneca Army Depot in central New York, and is believed to be the result of frogs being released over many decades, this species being a common laboratory subject (Gibbs et al. 2007). NEPARC (2010) lists southern leopard frog as a Species of Moderate Concern because more than 25% of northeastern states list it as SGCN.

II. Abundance and Distribution Trends

a. North America

i. Abundance

declining increasing stable unknown

ii. Distribution:

declining increasing stable unknown

Time frame considered: Past 20 years

b. Regional (e.g., Atlantic Flyway, USFWS Region 5 - Northeast, Watershed, Hydrologic Unit)

i. Abundance

declining increasing stable unknown

ii. Distribution:

declining increasing stable unknown

Regional Unit Considered: northern edge (NY and PA)

Time Frame Considered: last 20 years

c. Adjacent States and Provinces

CONNECTICUT **Not Present** **No data**

i. Abundance

declining increasing stable unknown

ii. Distribution:

declining increasing stable unknown

Regional Unit Considered: Not specified

Time Frame Considered: Not listed **SGCN?** No

MASSACHUSETTS Not Present _____ No data _____

i. Abundance

____ declining ____ increasing ____ stable X unknown

ii. Distribution:

____ declining ____ increasing ____ stable X unknown

Regional Unit Considered: _____ Not specified _____

Time Frame Considered: _____ Not listed _____ SGCN? No

ONTARIO Not Present X No data _____

QUEBEC Not Present X No data _____

VERMONT Not Present X No data _____

NEW JERSEY Not Present _____ No data _____

i. Abundance

____ declining ____ increasing X stable ____ unknown

ii. Distribution:

____ declining ____ increasing X stable ____ unknown

Time frame considered: _____ Not Specified _____

Listing Status: _____ Not Listed _____ SGCN? No

PENNSYLVANIA **Not Present** _____ **No data** _____

i. Abundance

 X declining ___increasing ___stable ___unknown

ii. Distribution:

 X declining ___increasing ___stable ___unknown

Time frame considered: Since 1980s

Listing Status: Endangered SGCN? Yes

NEW YORK

No data _____

i. Abundance

X declining ___ increasing ___ stable ___ unknown

ii. Distribution:

X declining ___ increasing ___ stable ___ unknown

Time frame considered: Since 1970s

Monitoring in New York.

The NY Amphibian and Reptile Atlas (Herp Atlas) was conducted in 1990-99. The Herp Atlas database also includes historic records from prior to 1990; these records are primarily a compilation of museum records and researchers' field notes. Note that several of the "southern leopard frog" records in the database are considered suspect.

Trends Discussion:

The range of the southern leopard frog is restricted in the northeast almost entirely to the non-glaciated portions of New York (Long Island and Orange and Rockland counties) and New Jersey (Klemens et al. 1987). Newman et al. (2012) documented the undescribed leopard frog in western Connecticut as well.

Populations in New York occur in areas that have been subjected to heavy development. Where appropriate habitat remains, southern leopard frog populations appear to be stable, but wetland losses have undoubtedly caused a long-term decline (Gibbs et al. 2007).

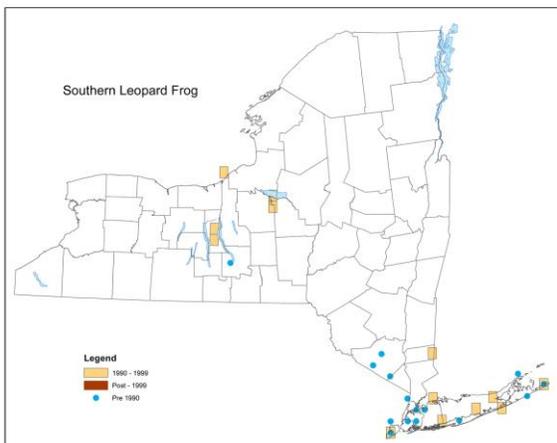


Figure 1: Distribution of southern leopard frog in New York (NY Herpetology database, NYSDEC)

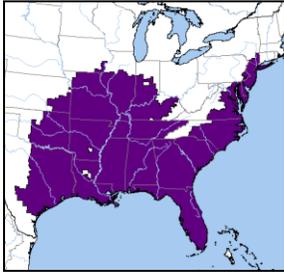


Figure 2: Distribution of southern leopard frog in North America (NatureServe 2012). Data developed as part of the Global Amphibian Assessment and provided by IUCN-World Conservation Union, Conservation International and NatureServe.

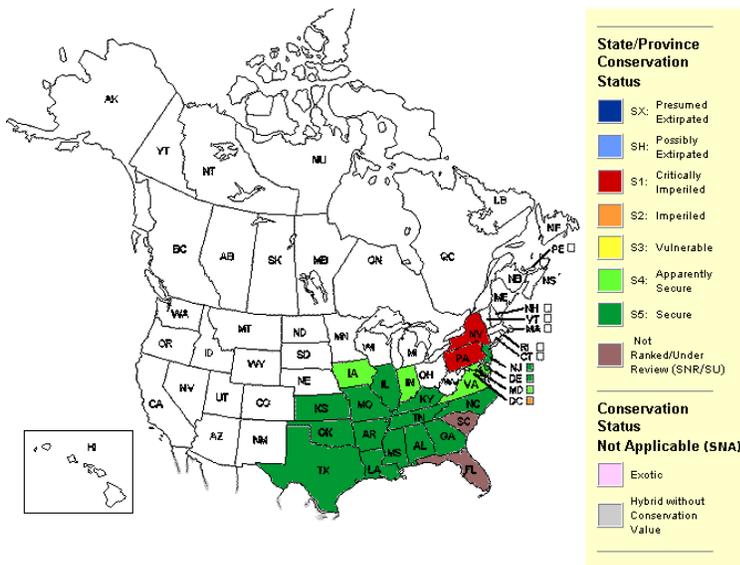


Figure 3: Conservation status of southern leopard frog in North America (NatureServe 2012)

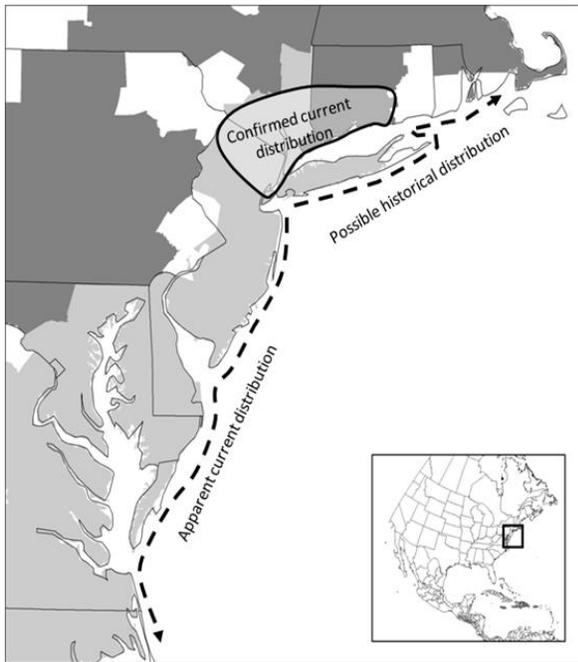


Figure 4: The distribution of *Rana pipiens* (dark gray), *R. sphenoccephala* (light gray), and *R. sp. nov.* (black outline, with dotted lines representing potential distribution along the coast) in the northeastern U.S. Adapted from Newman et al. (2012).

III. New York Rarity, if known:

Historic (select one)	<u># of Animals</u>	<u># of Locations</u>	<u>% of State</u>
prior to 1970	_____	<u>100+</u>	<u>20%</u>
prior to 1980	_____	_____	_____
prior to 1990	_____	_____	_____

Details of historic occurrence:

Southern leopard frogs were known from Long Island, New York City, and the lower Hudson Valley.

Current	<u># of Animals</u>	<u># of Locations</u>	<u>% of State</u>
	_____	<u>6</u>	<u><1%</u>

Details of current occurrence:

Southern leopard frogs occur on Staten Island and in the lower Hudson Valley. Two survey quads on the Herp Atlas map (Figure 2) from central New York represent a population at the Seneca Army Depot. This population is suspected to be the result of released southern leopard frogs, which are commonly used in science education.

New York's Contribution to Species North American Range:

For undescribed species:

% of NA Range in New York	Classification of New York Range
___ 100 (endemic)	<u>X</u> Core
___ 76-99	___ Peripheral
___ 51-75	___ Disjunct
___ 26-50	Distance to core population:
<u>X</u> 1-25	_____

For southern leopard frog:

% of NA Range in New York	Classification of New York Range
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100 (endemic)

Core

76-99

Peripheral

51-75

Disjunct

26-50

Distance to core population:

1-25

Rarity Discussion:

Southern leopard frogs are common in appropriate habitats.

IV. Primary Habitat or Community Type (from NY crosswalk of NE Aquatic, Marine, or Terrestrial Habitat Classification Systems):

1. Freshwater Marsh
2. Wet Meadow/Shrub Swamp
3. Eutrophic Pond
4. Ditch/Artificial Intermittent Stream

Habitat or Community Type Trend in New York:

Declining Stable Increasing Unknown

Time frame of decline/increase: Since 1950s

Habitat Specialist? Yes No

Indicator Species? Yes No

Habitat Discussion:

Southern leopard frogs breed during the spring in open permanent or temporary wetlands and brackish marshes. During the summer, they prefer moist meadows of grass, rush, and sedge. Adults may travel a distance from wetland habitats, residing in upland areas where vegetation provides

shade and small pools or puddles provide moisture. Hibernation occurs in the soft mud at the bottom of wetlands (Gibbs et al. 2007).

V. New York Species Demographics and Life History

- Breeder in New York**
 - Summer Resident**
 - Winter Resident**
 - Anadromous**
- Non-breeder in New York**
 - Summer Resident**
 - Winter Resident**
 - Catadromous**
- Migratory only**
- Unknown**

Species Demographics and Life History Discussion (include information about species life span, reproductive longevity, reproductive capacity, age to maturity, ability to disperse and colonize, and sources of mortality, if known):

Summarized from Gibbs et al. (2007): In New York, southern leopard frogs breed in shallow water during March through June. The presence of dense vegetation at the bottom of these wetlands is important to tadpole survival in terms of desiccation and avoidance of predators. Females attach egg masses to submerged vegetation, frequently communally with other eggs masses where they benefit from a “temperature effect” that quickens development of the embryos (Caldwell 1986). Hatching occurs in 7-12 days and tadpoles transform to froglets in 2-3 months. If predators are present, metamorphosis will take place earlier than when predation pressure is low (Saenz et al. 2003). Some individuals from late-hatching clutches may overwinter. Massive mortality of tadpoles can occur when shallow breeding pools dry before metamorphosis takes place.

VI. Threats:

Southern leopard frogs occur in the most densely developed areas of New York and have undoubtedly declined due to loss of wetlands. Where wetlands remain, however, this species can thrive even when surrounded by suburbia. However, where it becomes necessary to cross roads between upland areas and breeding areas, amphibians suffer high road mortality.

The chytrid fungus, *Batrachochytrium dendrobatidis* (Bd), first described in 1998 (Longcore et al. 1999), is a fungal pathogen that has affected more than 200 amphibian species in 6 countries (Skerratt et al. 2007). Southern leopard frogs are known to be susceptible to Bd (Daszak et al. 2005).

Southern leopard frog was classified as “moderately vulnerable” to predicted climate change in an assessment of vulnerability conducted by the New York Natural Heritage Program (Schlesinger et al. 2011).

Are there regulatory mechanisms that protect the species or its habitat in New York?

No Unknown

Yes

In 2006, the State of New York adopted legislation (ECL section 11-0107 sub 2) that gave all native frogs, turtles, snakes, lizards and salamanders legal protection as game species, and no salamander species are open to harvest. The legislation also outlaws the sale of any native species of herpetofauna regardless of its origin.

The Freshwater Wetlands Act provides protection for wetlands greater than 12.4 acres in size under Article 24 of the NYS Conservation Law. The Army Corps of Engineers has the authority to regulate smaller wetlands in New York State, and the DEC has the authority to regulate smaller wetlands that are of unusual local importance. The Protection of Waters Program provides protection for rivers, streams, lakes, and ponds under Article 15 of the NYS Conservation Law.

Describe knowledge of management/conservation actions that are needed for recovery/conservation, or to eliminate, minimize, or compensate for the identified threats:

The Comprehensive Wildlife Conservation Strategy (NYSDEC 2005) includes recommendations for the following actions for freshwater wetland amphibians, which includes southern leopard frog. Conservation actions following IUCN taxonomy are categorized in the table.

Easement acquisition:

- ___ Secure habitats critical to species survival by acquisition of conservation easements, or by other land protection mechanisms.

Habitat management:

- ___ Manage the variety of factors which might be limiting wetland habitat suitability for resident amphibian species, including management of exotic plant and animal species, management of adverse hydrological alterations, and management of anthropogenic inputs of sediments and toxicants.

Habitat research:

- ___ Develop standardized habitat survey protocols, and implement survey protocols at all known and potentially suitable sites, to document the character, quality and extent of occupied habitat.

Life history research:

- ___ Document life history parameters specific to New York populations of the species, including age and sex ratios, longevity, age at sexual maturity, survivorship of young, predator-prey relationships, and wetland/upland habitat requirements.

Modify regulation:

- ___ Modify Freshwater Wetlands Act, in order to protect wetlands smaller than 12.4 acres where they support species of conservation concern, and in order to expand the protected upland buffer beyond the 100-foot limit where necessary.
- ___ Adopt provisions into New York's Environmental Conservation Law designating four-toed salamander and Fowler's toad as a protected small game species.

Other action:

- ___ Periodically evaluate status of the subject species to determine whether appropriate E/T/SC status listings are in effect.

Population monitoring:

- ___ Conduct periodic surveys of known sites of species occurrence, in order to detect population trends.

Statewide baseline survey:

— Develop standardized population survey protocols, and implement protocols at all known and potentially suitable sites to document the extent of occupied habitat.

Conservation Actions	
Action Category	Action
Land/Water Protection	Site/Area Protection
Land/Water Protection	Resource/Habitat Protection
Land/Water Management	Site/Area Management
Land/Water Management	Habitat and Natural Process Restoration
Land/Water Management	Invasive/Problematic Species Control
Law/Policy	Legislation

VII. References

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