Species Status Assessment

Common Name: Atlantic Coast leopard frog **Date Updated:** January 10, 2025

Scientific Name: *Lithobates kauffeldi*

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Class: Amphibia

Family: Ranidae

Species Synopsis:

The taxonomy of leopard frogs (*Lithobates pipiens* complex) in the mid-Atlantic and northeastern US has been deliberated throughout the 20th century (Kauffeld 1937, Moore 1944, Pace 1974, Klemens et al. 1987). Prior to 2012, it was thought that two leopard frog species occurred in the eastern US, the northern leopard frog (*Lithobates pipiens*) and the southern leopard frog (*Lithobates sphenocephalus*). This paradigm changed when Newman et al. (2012) used molecular techniques to detect a third, genetically distinct, leopard frog occurring in the Tri-State area that includes New York, New Jersey, and Connecticut.

This recently described species, the Atlantic Coast leopard frog (*Lithobates kauffeldi*), is morphologically similar to *L. sphenocephalus* and *L. pipiens*, but is distinguishable by advertisement call, genetics, habitat, geographic distribution, and a combination of morphological characters (Feinberg et al. 2014).

The Atlantic Coast leopard frog has been documented in eight states along the east coast ranging north-south from Middlesex County, CT to Washington County, NC and east-west from Middlesex County, CT to Sussex County, VA (Figure 1, Schlesinger et al. 2018). While prior range maps of *L. sphenocephalus* included southern NY and northern NJ, these areas are confirmed to be occupied by *L. kauffeldi* or *L. pipiens*, not *L. sphenocephalus* (Feinberg et al. 2014, Schlesinger et al. 2018). One possible exception is the xeric Pine Barrens of Long Island where leopard frogs, believed to be *L. sphenocephalus*, were once common but few museum specimens exist from this habitat to verify species composition (Schlesinger et al. 2018).

Much of the published literature refers to accounts of southern leopard frogs or northern leopard frogs in what is now the range of the Atlantic Coast leopard frog. For the sake of simplicity, in this assessment we retain the name “Atlantic Coast leopard frog (*Lithobates kauffeldi*)” even though this information may also refer to the southern leopard frog, or a combination of species.

I. Status

a. Current legal protected Status

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

ii. **New York:** Currently Not Listed, Proposed Endangered; HPSGCN

b. Natural Heritage Program

i. **Global:** G3G4

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

Other Ranks:
-IUCN Red List: Least Concern
-COSEWIC: None
-Northeast Regional SGCN List (2023): High Concern

Status Discussion:

The Atlantic Coast leopard frog is a habitat specialist with a small range, centered in the most densely populated region of the United States (Schlesinger et al. 2018). It can be locally abundant where present but often occurs in isolated and scattered locales (Feinberg et al. 2014). While the Atlantic Coast leopard frog is believed to be secure in its core range (NJ, DE, VA, and possibly MD), it is exceptionally rare and appears to have declined substantially in the northern part of its range (Fig. 1, Schlesinger et al. 2018). Survival prospects of the Atlantic Coast leopard frog in the NY/NJ-metro area vary from tenuous to stable, with the most vulnerable populations being those that are small and isolated (Feinberg et al. 2014). Primary concerns include habitat loss and degradation, while a small geographic range and isolated populations leaves the species vulnerable to stochastic events. The New York Natural Heritage Program has assigned the Atlantic Coast leopard frog a State Conservation Status Rank of S1S2, indicating a status of imperiled to critically imperiled in New York State (New York Natural Heritage Program 2022). The species is currently unlisted but is proposed to be endangered. The Atlantic Coast leopard frog has no conservation status rank in many of the states in which it occurs (Fig. 2, NatureServe 2023).

II. Abundance and Distribution Trends

Region	Present?	Abundance	Distribution	Time Frame	Listing status	SGCN?
North America	Yes	Unknown	Unknown	Last 30 years	Not Listed Federally	
Northeastern US	Yes	Unknown	Unknown	Last 30 years		Yes
New York	Yes	Declining	Declining	1990-present	Proposed Endangered	Yes
Connecticut	Yes	Declining	Declining	Last 30 years	Not listed	Yes
Massachusetts	No	N/A	N/A			
New Jersey	Yes	Stable	Stable	Not specified	Not listed	No
Pennsylvania	Yes	Declining	Declining	Last 20 years	Endangered	No
Vermont	No	N/A	N/A			
Ontario	No	N/A	N/A			
Quebec	No	N/A	N/A			

Column options
Present?: Yes; No; Unknown; No data; (blank) or Choose an Item
Abundance and Distribution: Declining; Increasing; Stable; Unknown; Extirpated; N/A; (blank) or Choose an item
SGCN?: Yes; No; Unknown; (blank) or Choose an item

Monitoring in New York *(specify any monitoring activities or regular surveys that are conducted in New York):*

NYSDEC began conducting surveys in 2020 to refine the known distribution and describe suitable habitat for the Atlantic Coast leopard frog in NY. The Atlantic Coast leopard frog occurrences are tracked by the New York Natural Heritage Program.

Trends Discussion:

The range of the Atlantic Coast leopard frog comprises over 46,500 km^2, located almost entirely within the Northeast United States (Schlesinger et al. 2018). Surveys conducted from 2014-2015 confirmed Atlantic Coast leopard frogs in eight states: CT, NY, NJ, PA, DE, MD, VA, and NC. No Atlantic Coast leopard frogs were detected in MA or RI (Fig. 1, Schlesinger et al. 2018).

While surveys estimated a slight range-wide decline, the Atlantic Coast leopard frog is believed to be secure in the core of its range (NJ, DE, VA, and MD), with many large populations in protected wetlands. The range-wide conservation status is considered vulnerable to apparently secure – G3G4 (Schlesinger et al. 2018, NatureServe 2023).

Leopard frogs (*sensu lato*) have already vanished from parts of North America which they previously inhabited (Lannoo 2005, Weir et al. 2014), and the Atlantic Coast leopard frog is no different. At the northern edge of its range the Atlantic Coast leopard frog is remarkably rare and has declined significantly in the past 30 years, most notably in CT and NY (Klemens et al. 1987, Feinberg et al. 2014, Schlesinger et al. 2018). While some of these disappearances were likely caused by direct habitat loss or alteration, others occurred in coastal, suburban, and semi-rural areas for unknown reasons (Feinberg et al. 2014).

Additionally, while the Atlantic Coast leopard frog is common along the Delaware River, only a small portion of its range occurs in PA. Pennsylvania currently lists *L. kauffeldi* as endangered. The Atlantic Coast leopard frog may be rare at the known southern edge of its range, in North Carolina, but additional surveys are needed to confirm the species status (Schlesinger et al. 2018). In North Carolina the Atlantic Coast leopard frog is assigned a conservation status of S3 – vulnerable (NatureServe 2023).

The Atlantic Coast leopard frog occurs in three (CT, NJ, PA) of the seven US states and Canadian provinces adjacent to NY. Of these, the Atlantic Coast leopard frog is only considered stable in NJ (Schlesinger et al. 2018).

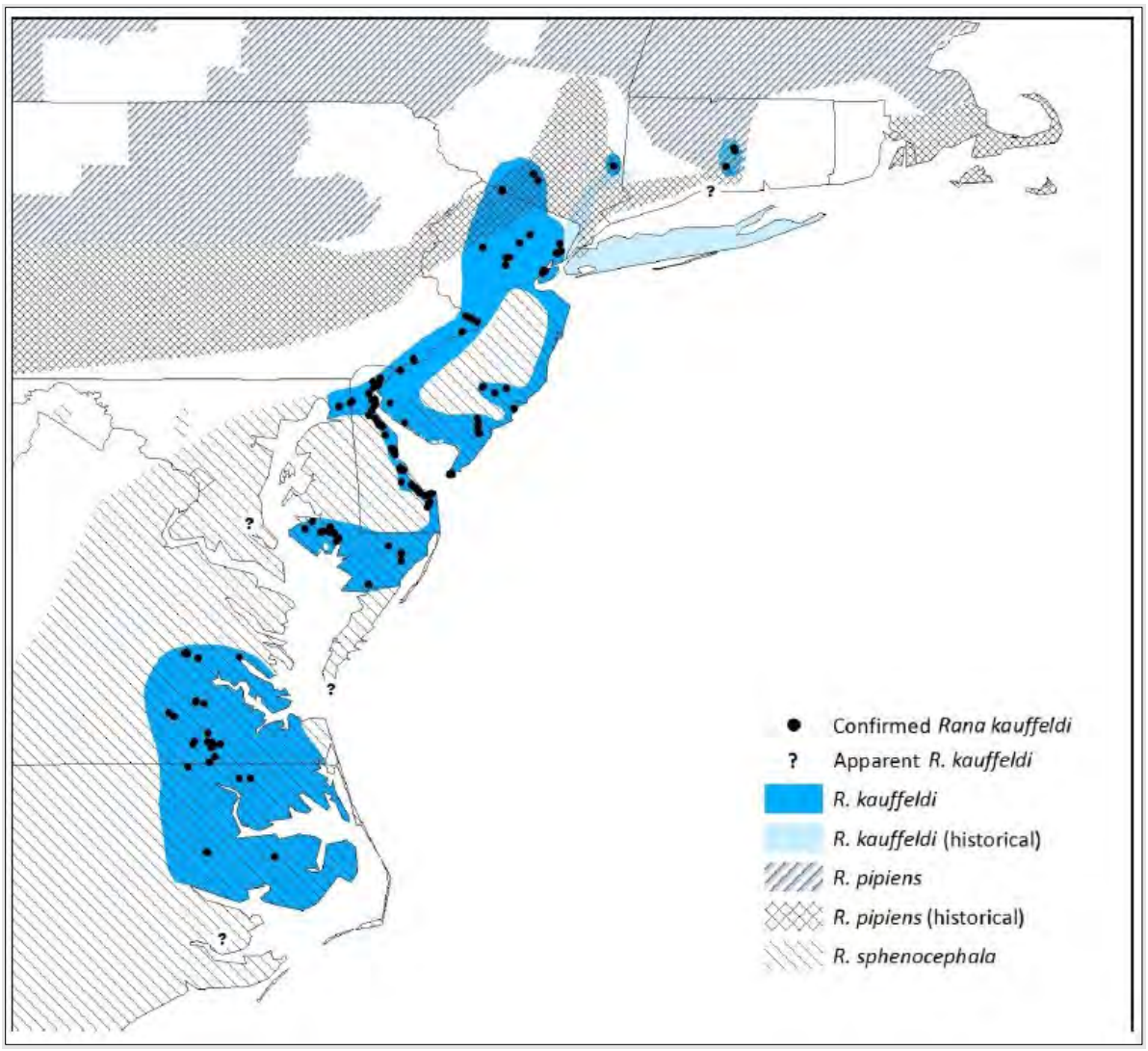

Figure 1. Range of *Lithobates kauffeldi*, with presence points confirmed by bioacoustics or genetics, compared to ranges of *L. pipiens* and *L. sphenocephalus*. Historical ranges of *L. kauffeldi* and *L. pipiens* are based on examination of museum specimens and recent detections. Question marks denote locations where museum specimens appear to be *L. kauffeldi* but no bioacoustics or genetic evidence is available, or where genetic determinations were questionable (Schlesinger et al. 2018). At The publication of Figure 1 used the genus of *Rana* for leopard frogs.

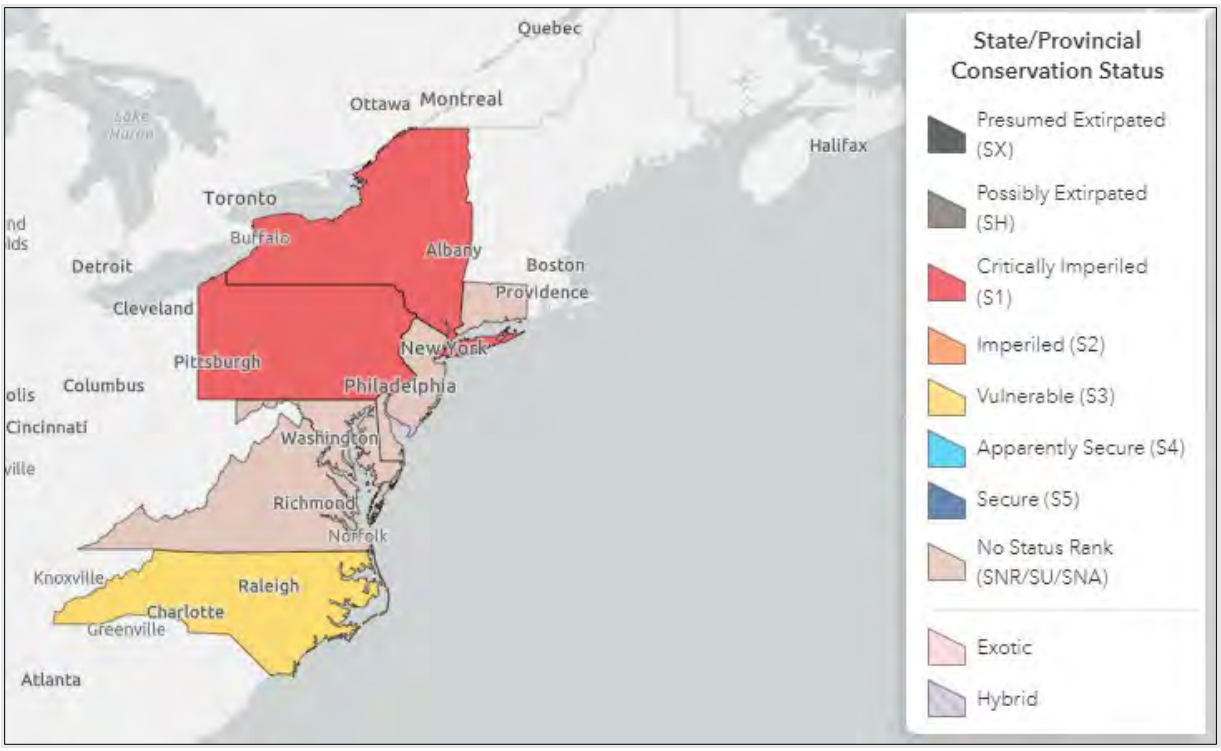

Figure 2. Conservation status of Atlantic Coast leopard frogs (*Lithobates kauffeldi*) in the United States (NatureServe 2023).

III. New York Rarity *(provide map, numbers, and percent of state occupied)*

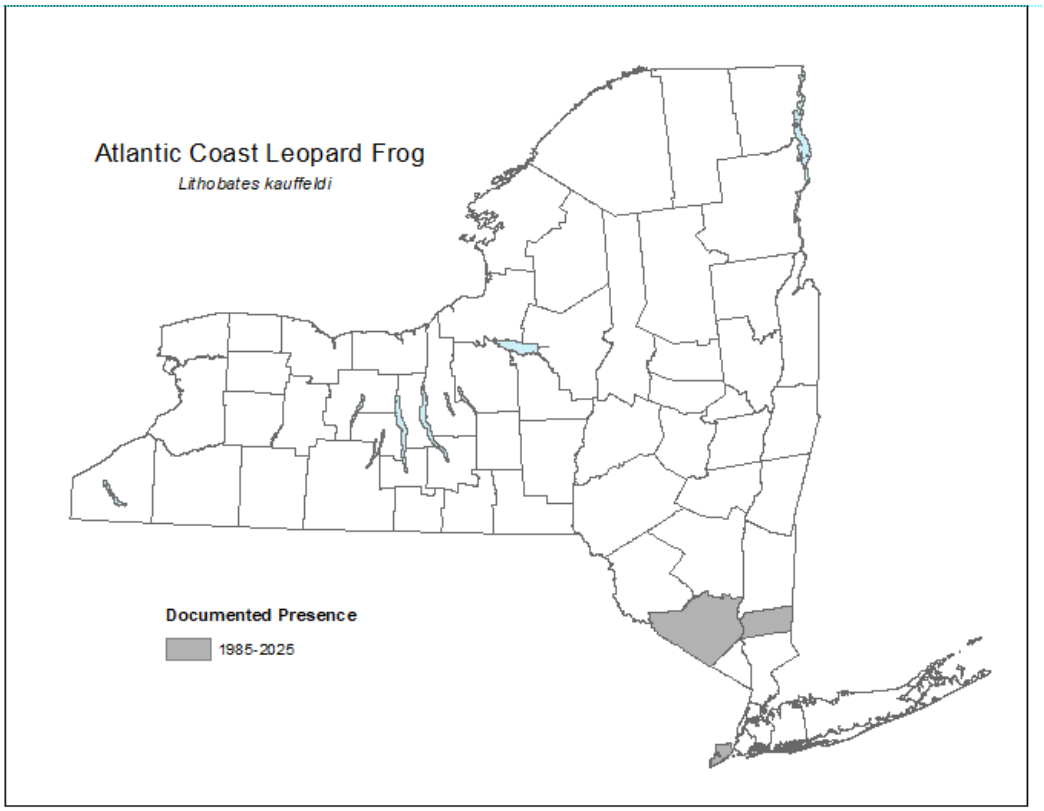

Figure 3. Distribution of Atlantic Coast leopard frog in New York (NYSDEC)

Details of historic and current occurrence:

In New York, the Atlantic Coast leopard frog once occurred across 11 counties and likely more than 100 populations (Schlesinger et al. 2018). While it was previously believed that the southern leopard frog was the predominant species of leopard frog throughout the southern Hudson Valley, Long Island, and NYC-metro area (Pace 1974, Klemens 1987, Gibbs 2007), historical information and museum specimens indicate that the Atlantic Coast leopard frog was the predominant species of leopard frog in the region (Feinberg et al. 2014, Schlesinger et al. 2018).

The Atlantic Coast leopard frog is currently known to occur at six locations within three counties in New York: Orange, Richmond, and Putnam (Schlesinger et al. 2018, NYNHP DATA). The Atlantic Coast leopard frog is believed to be extirpated from much of its range in the Hudson Valley and all of Long Island (Fig 1., Feinberg et al. 2014, Schlesinger et al. 2018). The last known leopard frog observation on Long Island occurred in Suffolk County in 1995 (NYNHP DATA). Schlesinger et al. (2018) didn't detect any leopard frogs on Long Island despite considerable survey effort.

New York's Contribution to Species North American Range:

Percent of North American Range in NY	Classification of NY Range	Distance to core population, if not in NY
1-25%	Peripheral	

Column options
Percent of North American Range in NY: 100% (endemic); 76-99%; 51-75%; 26-50%; 1-25%; 0%; Choose an item
Classification of NY Range: Core; Peripheral; Disjunct; (blank) or Choose an item

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

- **a.** Freshwater Marsh
- **b.** Wet Meadow/Shrub Swamp
- **c.** Eutrophic Pond
- **d.** Ditch/Artificial Intermittent Stream

Habitat or Community Type Trend in New York

Habitat Specialist?	Indicator Species?	Habitat/ Community Trend	Time frame of Decline/Increase
Yes	No	Declining	

Column options
Habitat Specialist and Indicator Species: Yes; No; Unknown; (blank) or Choose an item
Habitat/Community Trend: Declining; Stable; Increasing; Unknown; (blank) or Choose an item

Habitat Discussion:

In the northern portion of its range the Atlantic Coast leopard frog occupies mesic lowland habitats including coastal freshwater wetlands, tidally influenced backwaters, and interior riparian valley flood plains. This species is typically associated with large wetland complexes composed of open-canopied marshes, wet meadows, and slow-flowing systems with ample open upland and early successional habitats. Aquatic conditions are usually clear, shallow, and sometimes ephemeral, with emergent shrubs and vegetation such as cattail (*Typha* spp.) or common reed (*Phragmites australis*) (Feinberg et al. 2014).

South of the glacial maximum, the Atlantic Coast leopard frog is restricted to large coastal and riparian wetlands. In the southern portion of its range, it is primarily found in cypress-gum

swamps. Near the Delaware River and Bay, it occupies larger freshwater impoundments, tidal guts, and tidal freshwater marshes often dominated by common reed marshes that may be subject to salinity intrusions (Schlesinger et al. 2018).

Overall, the Atlantic Coast leopard frog does not occur far from coastal habitats. The farthest distance the species has been documented from coastal habitats is 40km (Schlesinger et al. 2018).

V. Species Demographic, and Life History:

Breeder in NY?	Non-breeder in NY?	Migratory Only?	Summer Resident?	Winter Resident?	Anadromous/ Catadromous?
Yes	-	-	Yes	Yes	-

Column options
First 5 fields: Yes; No; Unknown; (blank) or Choose an item
Anadromous/Catadromous: Anadromous; Catadromous; (blank) or Choose an item

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

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. During summer months, these frogs can be found in surrounding upland areas foraging, primarily in grassy areas a considerable distance from their spring/fall wetland habitat.

*Leopard frogs in New York formerly considered southern leopard frogs (*L. sphenocephalus*) are currently recognized as the Atlantic Coast leopard frog (*L. kauffeldi*) (Schlesinger et al. 2018).

Ongoing NYSDEC research from Richmond County corroborates some of the southern leopard frog report of Gibbs et al. 2007 including breeding in shallow water, and females attaching egg masses to submerged vegetation. Deviations include that Atlantic Coast leopard frog has been observed breeding in a range of salinity levels, and the breeding season in New York is limited to March and April.

VI. Threats *(from NY CWCS Database or newly described):*

Atlantic Coast leopard frogs occur in the most densely developed areas of New York and have undoubtedly declined due to loss of wetlands. Feinberg et al (2014) described metapopulations as having the potential to be a core component of the species’ population structure. Since the discovery of the species in Richmond County, a portion of its habitat has been developed. Through development and resulting fragmentation of habitat, the connectivity of breeding amphibian populations may diminish and could create population sinks (Hels and Nachman 2002, Carlson and Edenhamn 2000). Additionally, movement of amphibians in highly fragmented areas can result in elevated levels of road mortality (Gibbs and Shriver 2005). Due to the Atlantic Coast leopard frog’s primary habitat being freshwater and brackish wetlands along the coast, predicted sea level

rise and changes in precipitation may affect the frog's habitat (Feinberg et al 2014). Susceptibility of amphibians to increasingly saline and acidified environments varies across species (Brown and Walls 2013, Farquharson, Wepener, and Smit 2016). There have been observations of Atlantic Coast leopard frogs in environments with varying salinity levels, however ability of the species to tolerate major changes in salinity is unknown. In NYS, the habitat for Atlantic Coast leopard frog in Richmond County has been subjected to the intrusion of various spilled substances over time. Though there is no evidence of previous spills directly affecting Atlantic Coast leopard frog populations, amphibian populations are susceptible to contaminants in their environment (Egea-Serrano, Relyea, Miguel Tejedo, and Torralva 2012).

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). Chytrid fungus has had devastating impacts on amphibian populations; however, its impact is also dependent on environmental conditions and the physiology of each species (Lips 2016). In 2021, NYSDEC's wildlife health lab confirmed that chytrid fungus was present in one individual Atlantic Coast leopard frog in Richmond County, New York. The extent of the prevalence of the pathogen throughout the Richmond County populations is unknown.

Threat Level 1	Threat Level 2	Threat Level 3	Spatial Extent*	Severity*	Immediacy*	Trend	Certainty
1. Residential and Commercial	1.1 Housing & Urban Areas	Choose an item. (loss/degradation of habitat)	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
2. Agriculture & Aquaculture	2.1 Annual & Perennial Non-Timber Crops	Choose an item. (loss/degradation of habitat)	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
4. Transportation & Service Corridors	4.1 Roads & Railroads	4.1.1 Roads (roadkill)	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
8. Invasive & Other Problematic Species	8.4 Pathogens	8.4.2 Viral pathogens (ranavirus)	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
8. Invasive & Other Problematic Species	8.4 Pathogens	8.4.3 Fungal pathogens (chytrid)	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
11. Climate Change	11.3 Changes in Temperature Regimes	Choose an item. (temperature extremes)	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
11. Climate Change	11.4 Changes in Precipitation & Hydrological Regimes	11.4.2 Droughts	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.

Table 1. Threats to Atlantic coast leopard frog.

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

Yes: ✓ **No:** _____ **Unknown:** _____

If yes, describe mechanism and whether adequate to protect species/habitat:

Current New York State legislation (ECL sec. 11-0103) considers all native frog species to be small game and prohibits the take and commerce of such game species (ECL sec. 11-0107), except as permitted by the Fish and Wildlife Law. Section 3.5 of the Fish and Wildlife Chapter of Title 6 of the New York Codes, Rules and Regulations (6 CRR-NY 3.5) maintains open season for leopard frogs from June 15th to September 30th, with the exception of wildlife management units 1A, 1C, and 2A (DEC Regions 1 & 2 collectively), affording protection to the Richmond County population(s), but not the populations in the Hudson Valley (Orange and Putnam counties).

The Freshwater Wetlands Act provides protection for wetlands greater than 12.4 acres in size under Article 24 of the NYS Conservation Law. Beginning in 2028, the default size threshold of regulated wetlands will decrease to 7.4 acres. The Army Corps of Engineers has the authority to regulate 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 ECL.

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

Conservation actions identified in the 2015 New York State SWAP remain necessary for the conservation of the species. The following conservation actions have been summarized and are considered specific to Atlantic Coast leopard frog conservation goals; however additional identified actions in the 2015 SWAP may provide benefits on a broader scale.

Protect adequate and viable habitats for SGCN.

Atlantic Coast leopard frog conservation action: Identify and obtain land to maintain as protected habitat. Reduce and mitigate habitat loss which results from development, contamination, and climate change related impacts. Utilize existing legislation which protects New York State wetlands and wildlife.

Manage and restore habitats to benefit SGCN.

Atlantic Coast leopard frog conservation action: Protect habitat by managing and restoring existing suitable habitat. Collaborate with private landowners by creating incentives for habitat management and restoration. Coordinate with other regulatory authorities to improve habitat connectivity.

Protect SGCN populations to reverse declines in abundance or loss of range.

Atlantic Coast leopard frog conservation action: Strengthen legal protections for the Atlantic Coast leopard frog.

Manage SGCN to restore self-sustaining populations.

Atlantic Coast leopard frog conservation action: Identify existing populations and support them by managing and restoring existing habitat.

Develop and maintain current monitoring data on SGCN populations and habitats.

Atlantic Coast leopard frog conservation action: Describe population and habitat needs and organize associated data for collaboration. Utilize data to create management and conservation plans.

Foster research to improve our knowledge regarding SGCN populations and habitats.

Atlantic Coast leopard frog conservation action: Support population monitoring projects and determine the status of populations utilizing wetlands that are not protected under NYS ECL

Continue to integrate conservation of SGCN into key natural resource planning.

Atlantic Coast leopard frog conservation action: Consider Atlantic Coast leopard frog protection in planning and collaboration aspects of habitat protection initiatives in communities

Complete Conservation Actions table using IUCN conservation actions taxonomy at link below. Use headings 1-6 for Action Category (e.g., Land/Water Protection) and associated subcategories for Action (e.g., Site/Area Protection) - https://www.iucnredlist.org/resources/conservation-actions-classification-scheme

Action Category	Action	Description
A.1 Direct Habitat Management	A.1.0.0.0 Direct Habitat Management	Site/Area management
C.6 Design and Plan Conservation	C.6.0.0.0 Design and plan conservation	Site/Area protection
C.6 Design and Plan Conservation	C.6.0.0.0 Design and plan conservation	Resource/Habitat protection
C.6 Design and Plan Conservation	C.6.5.1.3 Develop a conservation, management, or restoration plan for protected private lands	Habitat and natural process restoration
C.7 Legislative and Regulatory Framework or Tools	C.7.1.2.0 Create, amend, or influence legislation	Legislation

Table 2. Recommended conservation actions for Atlantic coast leopard frog.

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