Species Status Assessment

Common Name: Northern red salamander **Date Updated:** January 2024

Scientific Name: *Pseudotriton ruber ruber* **Updated By:** Ashley Ballou

Class: Amphibia

Family: Plethodontidae

Species Synopsis:

Northern red salamanders can be found in the eastern United States from southern New York to southern Indiana and southward to the Gulf Coast, though they are absent from most of the Atlantic coastal plain south of Virginia and from peninsular Florida (Petranka 1998). Sites in New York are the northernmost occurrence for this species. Four subspecies are currently recognized: northern red salamanders (*P. r. ruber*), Blue Ridge red salamander (*P. r. nitidus*), blackchin red salamander (*P. r. schencki*), and southern red salamander (*P. r. vioscai*).

Northern red salamanders are typically found under rocks, logs, and leaf litter in moist forests near streams, pond, bogs, and wet meadows. Larvae develop in clean, cool streams and brooks. This species has disappeared from some areas where it was found historically, and remains abundant in some areas as well. A recent population trend is unknown.

I. Status

a. Current legal protected Status

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

ii. **New York:** Not Listed; SGCN

b. Natural Heritage Program

i. **Global:** G5

ii. **New York:** S3S4 **Tracked by NYNHP?:** No

Other Ranks:
-IUCN Red List: Least Concern
-COSEWIC: N/A
-Northeast Regional SGCN list (2023): Not Listed
-NEPARC Regional List (2010): Species of High Concern

Status Discussion:

At the northern edge of the range in New York, northern red salamander is ranked as Vulnerable. In most other states in the range, its status is Secure. Northeast Partners in Amphibian and Reptile Conservation (NEPARC 2010) list this species as a Species of High Concern because more than 50% of northeastern states list it as a Species of Greatest Conservation Need (SGCN), and as a high responsibility species because the Northeast comprises more than 50% of its distribution.

II. Abundance and Distribution Trends

Region	Present?	Abundance	Distribution	Time Frame	Listing status	SGCN?
North America	Yes	Stable	Stable			
Northeastern US	Yes	Unknown	Unknown			No
New York	Yes	Stable	Stable		Not Listed	No
Connecticut	No	N/A	N/A			
Massachusetts	No	N/A	N/A			
New Jersey	Yes	Unknown	Unknown		Not Listed	Yes
Pennsylvania	Yes	Stable	Stable		Not Listed	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:

There are currently no regular monitoring activities for the northern red salamander in New York.

The New York Amphibian and Reptile Atlas Project (Herp Atlas), conducted from 1990-1999, documented the geographic distribution of all species of amphibians and reptiles in the state. The Herp Atlas database also includes pre-1990 records from various sources, such as museum records, researchers' field notes, agency reports, and published literature.

Trends Discussion:

Red Salamander populations are likely stable (IUCN 2022, NatureServe 2020). The long-term trend of Northern Red Salamanders is likely stable. Populations observed in the early 1900s (Bishop 1927, Myers 1929, Axtell and Axtell 1948) appear to still exist in more recent surveys (NYS DEC 2009).

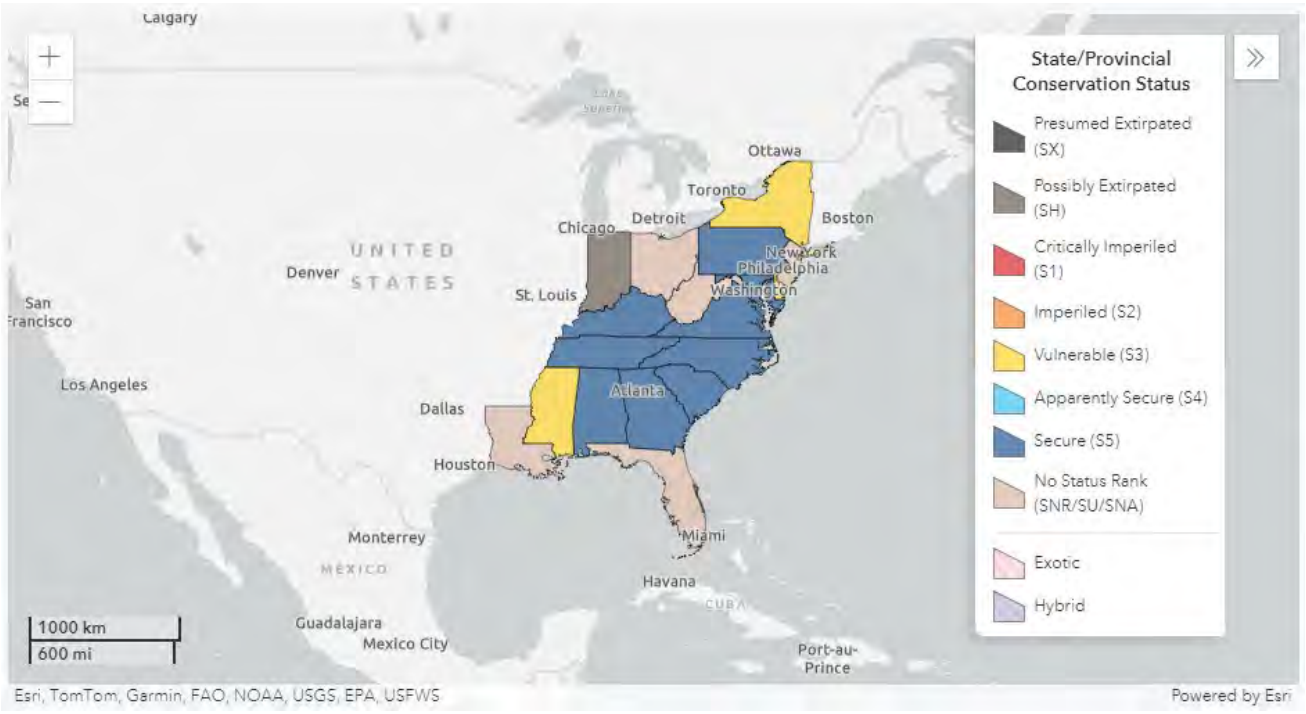

Figure 1. Conservation status of the red salamander in North America (NatureServe 2024)

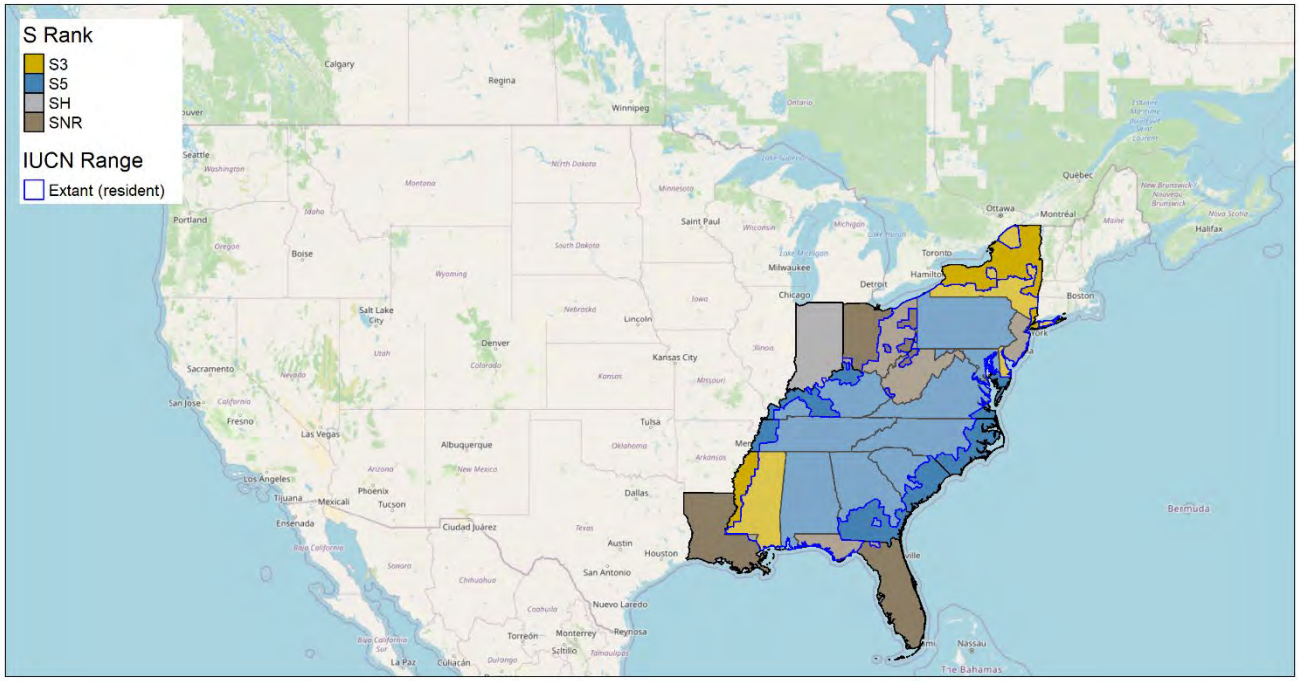

Figure 2. Conservation status and range of the red salamander in North America

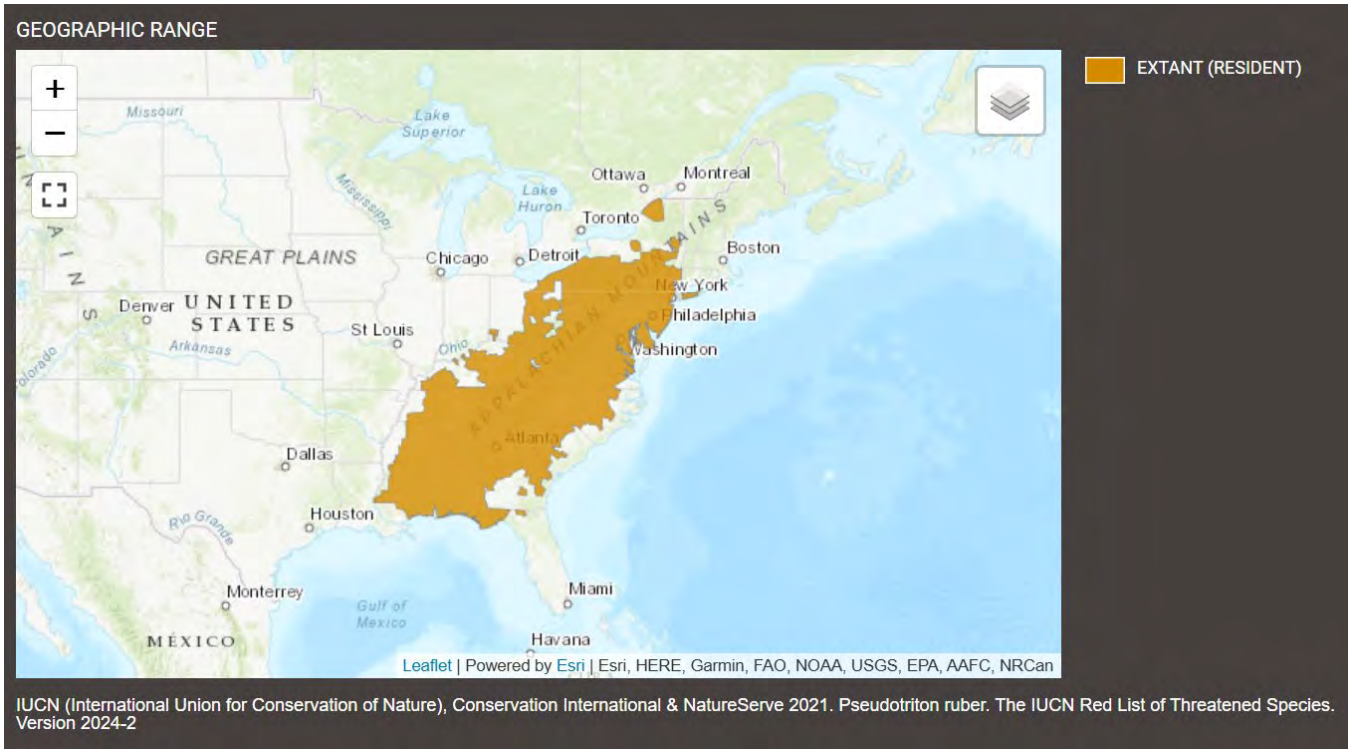

Figure 3: Red Salamander range map in North America (IUCN 2022)

III. New York Rarity

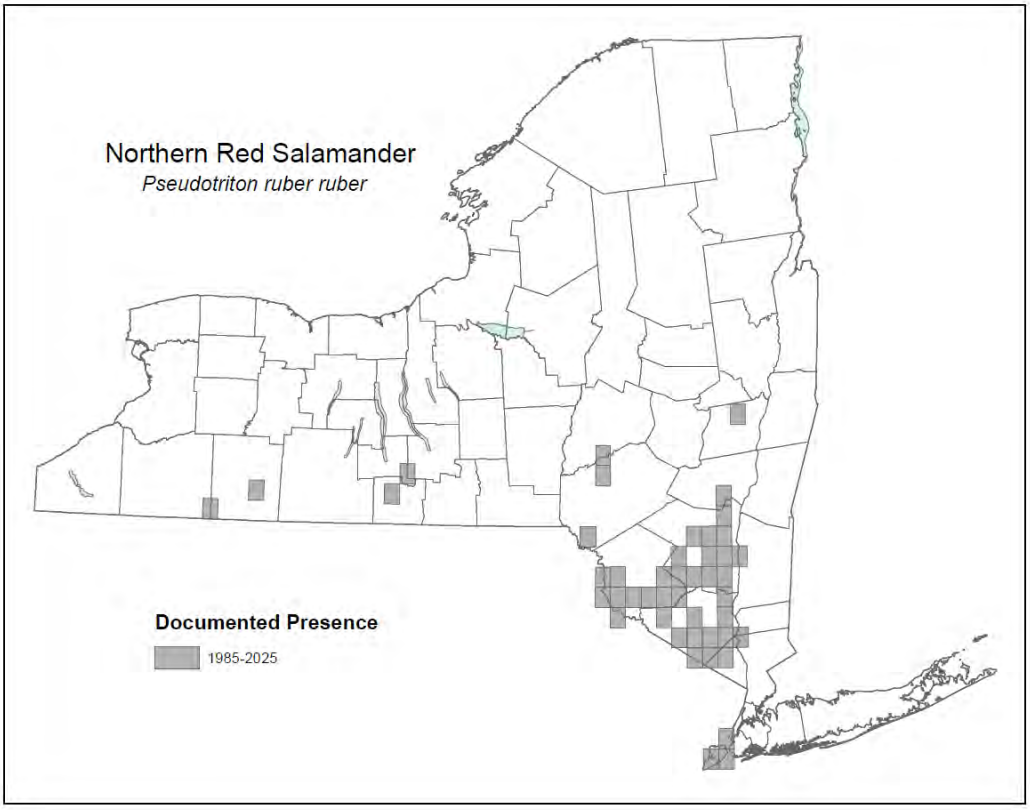

Figure 4. Records of northern red salamanders in New York**,** 1985-2025 (NY Herpetology database, NYSDEC)

Details of historic and current occurrence:

Red salamanders are not common in New York, but robust populations exist at some sites.

Bishop (1927) noted that he did not find red salamanders in streams in southwestern New York (Allegheny State Park) where they were taken in 1923. Wilmott (1933) stated that red salamanders are not nearly as common as they formerly were on Staten Island, New York. Northern red salamanders are currently found in the lower Hudson River Valley from Albany southward, on Staten Island, and in a few counties that border Pennsylvania. They are not found on Long Island, as the North American range map above implies.

The NYS Amphibian and Reptile Atlas (1990-99) documented red salamanders in 38 out of 979 survey quadrangles statewide. Data collected between 1985-1990 identified records in an additional 6 survey quadrangles, and since 2000, records were added in two additional survey quads that include a stream in the village of Treadwell, Delaware County.

Citizen science records submitted through iNaturalist align closely with occurrence records from the Herp Atlas (iNaturalist 2025).

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):*

1. Mixed Northern Hardwoods
2. Floodplain Forest
3. Riparian
4. Headwater/Creek, Cold
5. Palustrine
6. Vernal Pools

Habitat or Community Type Trend in New York

Habitat Specialist?	Indicator Species?	Habitat/ Community Trend	Time frame of Decline/Increase
Yes	Yes	Stable	

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:

Northern Red Salamanders can be found in or near clear, cool running water, especially spring-fed streams in wooded or open areas (Conant 1975, IUCN 2022). In central New York adults spent most of the year beneath stones, sticks, and logs within 2 to 30 feet from the edge of the water (Axtell and Axtell 1948). They are associated with constantly flowing, cold spring water with stones, debris, and densely growing aquatic plants (Axtell and Axtell 1948). Females attach their eggs to the underside of submerged rocks, and larvae generally live in still pools of springs and streams (IUCN 2022).

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:

Summarized from Gibbs et al. (2007): Courtship and mating occur in summer and early fall when adults are spending time beneath logs, rocks, and leaf litter on the moist forest floor. Females move to streams or ponds to lay eggs in mid-fall to early winter; in New York clutches have been found from October through early February. Eggs (50-80 per female) are laid on the underside of rocks in shallow water. It is believed that the female remains with the eggs until they hatch in 8-10 weeks. Larvae are fully aquatic until metamorphosis occurs in 3-5 years. Little information is available on predation; red salamanders have skin glands that secrete noxious chemicals and their red coloration provides a warning to potential predators.

VI. Threats:

Human activities around stream habitat can have a negative impact on Red Salamander habitat and populations. Siltation, runoff, stream acidification, and stream water temperature increases, caused by timbering, mining, road work, and urbanization, can threaten Red Salamander populations in New York (Mitchell and Gibbons 2010, Campbell Grant et al. 2014, Petranka 1998). Climate change also poses a threat to Red Salamanders, as it may cause water temperature increases and severe flooding that can alter the habitat.

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). Red salamanders are susceptible to Bd (Montanucci 2009). The fungus *Batrachochytrium salamandrivorans* (*Bsal*), also known as salamander chytrid, is another emerging pathogen that has caused major die-offs of salamanders in Europe, but has not yet been found in the United States (Martel et al 2013). The introduction of *Bsal* to North America could have severe impacts on biodiversity and salamander conservation.

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.	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	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
9. Pollution	9.1 Domestic & Urban Wastewater	9.1.2 Runoff	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
9. Pollution	9.3 Agricultural & Forestry Effluents	9.3.1 Nutrient loads 9.3.2 Soil erosion, sedimentation	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
11. Climate Change	11.3 Changes in Temperature Regimes	11.3.1 Heat waves (increase in water temperatures	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	11.4.1 Overabundant rains	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.

Table 1. Threats to northern red salamander.

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:

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 Environmental Conservation Law.

These protections are not adequate to protect all habitats utilized by the species in NYS.

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

Management needs for the Red Salamander include minimizing pollution and conserving the habitat (Mitchell et al. 2006). Maintain or increase wetland connectivity through appropriate culvert design and reducing road crossings through streams. Silt, pollution, and runoff into wetlands and streams should be reduced or eliminated as well. Forest buffers around streams and wetlands should be created or maintained with native vegetation. Rocks, logs, and debris should be left in wetlands and surrounding forest.

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
A.2 Direct Species Management	A.2.0.0.0 Direct Species Management	Invasive/problematic species control
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 northern red salamander.

The Comprehensive Wildlife Conservation Strategy (NYSDEC 2005) includes recommendations for the following actions for stream salamanders, which includes northern red salamander. Actions that have been accomplished, or where progress has been made, are indicated with a check.

Habitat management:

____ Undertake remedial actions as needed to restore habitat quality in degraded streams.

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:

__✓__ Adopt into New York's Environmental Conservation Law provisions which designate all species in this group of stream salamanders as a protected small game species.

Other action:

____ Periodically evaluate status of the species to determine whether the appropriate E/T/SC status listing is in effect.

Population monitoring:

____ Conduct periodic re-survey of known sites of species occurrence, in order to detect population trends.

Statewide baseline survey:

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

VII. References

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