Species Status Assessment

Common Name: Western chorus frog **Date Updated:** January 9, 2025

Scientific Name: *Pseudacris triseriata* **Updated By:** C. Macklem & L. Pipino

Class: Amphibia

Family: Hylidae

Species Synopsis *(a short paragraph which describes species taxonomy, distribution, recent trends, and habitat in New York):*

Western chorus frogs, *Pseudacris triseriata* (Wied-Neuwied 1838), are part of the trilling frog clade of *Pseudacris*, which includes *P. brimleyi*, *P. brachyphona*, *P. clarkii*, *P. feriarum*, *P. fouquettei*, *P. kalmi*, *P. maculata*, *P. nigrita*, and *P. triseriata* (Barrow et al. 2014, Ethier et al. 2021).

The western chorus frog occurs in the east-central United States in Michigan, Illinois, western New York, western Pennsylvania, Ohio, Indiana, western Kentucky, northwestern Tennessee, and southern Illinois, as well as in southern Ontario, Canada (Lemmon et al. 2007). In New York, the species occurs in low-lying areas of the Great Lakes Plain of western New York (Lemmon et al. 2007, Dodd 2013), where they can be found in open country using damp meadows, bottomland swamps, and temporary pools (Gibbs et al. 2007).

Genetic analyses in the 2000s first suggested that populations of chorus frogs in southern Québec and Ontario, northern New York, and northeastern Vermont previously thought to be the western chorus frog, *P. triseriata*, may in fact be the boreal chorus frog, *P. maculata* (Moriarty and Cannatella 2004, Lemmon et al. 2007), with the proposed dividing line between the two species lying in Oswego County in New York (Dodd 2013). Almost identical, these two species can be distinguished best by their breeding calls. Since those findings, additional call surveys were performed in New York, clarifying the distinction between the northern New York *P. maculata* population and the western New York *P. triseriata* population (Corser et al. 2012). Additionally, mitochondrial analyses and call surveys in Québec and Ontario confirmed the presence of *P. maculata* populations and their misidentification as *P. triseriata* (Rogic et al. 2015). However, *P. triseriata* are still found in the southernmost part of Ontario, with the contact zone between the two species at the western end of Lake Ontario in Canada (COSEWIC 2008, Corser et al. 2012).

In New York, western chorus frogs appear to have experienced a range retraction northward of up to 100 km, and recent surveys suggest that the species may no longer be present in the southwest corner of the state (Corser et al. 2012, NYS DEC unpublished).

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:** S2S3 **Tracked by NYNHP?:** Watch List

Other Ranks:
-IUCN Red List: Least Concern
-COSEWIC (2008): Not at Risk for the Carolinian population in Ontario
-NEPARC Regional List (2010): Not a species of priority
-Northeast Regional SGCN List (2023): Not listed
-NY Natural Heritage Program: Watch List

Status Discussion:

Assessing the range-wide status of this species is challenging due to genetic findings that modified the previously accepted range of the species (Lemmon et al. 2007). Not all states or provinces have accepted the taxonomic changes, nor have they all conducted surveys to clarify zones of sympatry and allopatry between the *Pseudacris* species. For example, the Carolinian population of chorus frogs in Ontario, Canada, is classified as "Not at Risk" (COSEWIC 2008), while the Great Lakes/St. Lawrence-Canadian Shield population in Ontario and Quebec is listed as Threatened under the Species at Risk Act (COSEWIC 2008). Both populations are currently recognized as western chorus frogs. However, genetic research and call surveys indicate that the Great Lakes/St. Lawrence-Canadian Shield population is, in fact, *P. maculata* misidentified as *P. triseriata* (Rogic et al. 2015). Despite this, COSEWIC opted not to change the species name as it would not change recovery efforts for the Great Lakes/St. Lawrence-Canadian Shield Designatable Unit (Environment Canada 2015). For the remainder of this document, "western chorus frogs" will indicate the Carolinian population of western chorus frogs in Canada while "boreal chorus frogs" will be used to reference the Great Lakes/St. Lawrence-Canadian Shield population.

The IUCN Red List (2022) classifies the species as Least Concern due to its "wide distribution, tolerance of some forms of habitat alteration and presumed large population size, despite localized declines." Additionally, NEPARC (2010) does not consider western chorus frog to be a species of priority because of its limited distribution in the Northeast. Though not currently listed, the western chorus frog is considered critically imperiled in Pennsylvania. The species is highly restricted in New York, with the most recent survey efforts in the western part of New York finding western chorus frogs in only two counties in the northwest corner of the state.

II. Abundance and Distribution Trends

Region	Present?	Abundance	Distribution	Time Frame	Listing status	SGCN?
North America	Yes				G5	
Northeastern US	Yes	Declining	Declining	Since the 1970s		No
New York	Yes	Unknown	Declining	Since the 1970s	S2S3,	Yes
Connecticut	No	N/A	N/A			
Massachusetts	No	N/A	N/A			
New Jersey	No	N/A	N/A			
Pennsylvania	Yes	Unknown	Declining		S1, Not listed	Yes

Region	Present?	Abundance	Distribution	Time Frame	Listing status	SGCN?
Vermont	No	N/A	N/A			
Ontario	Yes	Stable	Stable	Since the 1990s	S4, Carolinian population Not at Risk	
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):*

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, and published literature.

Additionally, statewide frog breeding call surveys were performed by F. Schueler in 1973-1980, Gibbs et al. (2005) in 2001-2002, Corser et al. (2012) in 2010, and the NYS DEC in 2013-2016. These surveys identified wetlands occupied by breeding frogs, including western chorus frogs throughout the state.

Trends Discussion *(insert map of North American/regional distribution and status):*

According to NatureServe (2024), "Over the long term, [the] area of occupancy, number of subpopulations, and population size probably have declined, but the degree of decline is uncertain." They estimate species trends between <50% decline and relatively stable (NatureServe 2024).

Populations appear stable and/or the species is not ranked in Michigan, Ohio, Indiana, Kentucky, and Ontario (COSEWIC 2008, NatureServe 2024); however, western chorus frogs have very restricted ranges in Tennessee, Illinois, Pennsylvania, and New York (Lemmon et al. 2007). Western chorus frogs are considered a Species of Greatest Conservation Need in Pennsylvania and were found to be critically imperiled in the state (PGC-PFBC 2015). Additionally, there have been no recent sightings of western chorus frogs in Pennsylvania on iNaturalist and only one in Tennessee (iNaturalist 2024). Minton (2001) stated that this species was numerous in Indiana in 1945-1970, declined markedly during 1975-1985, and apparently has increased since then.

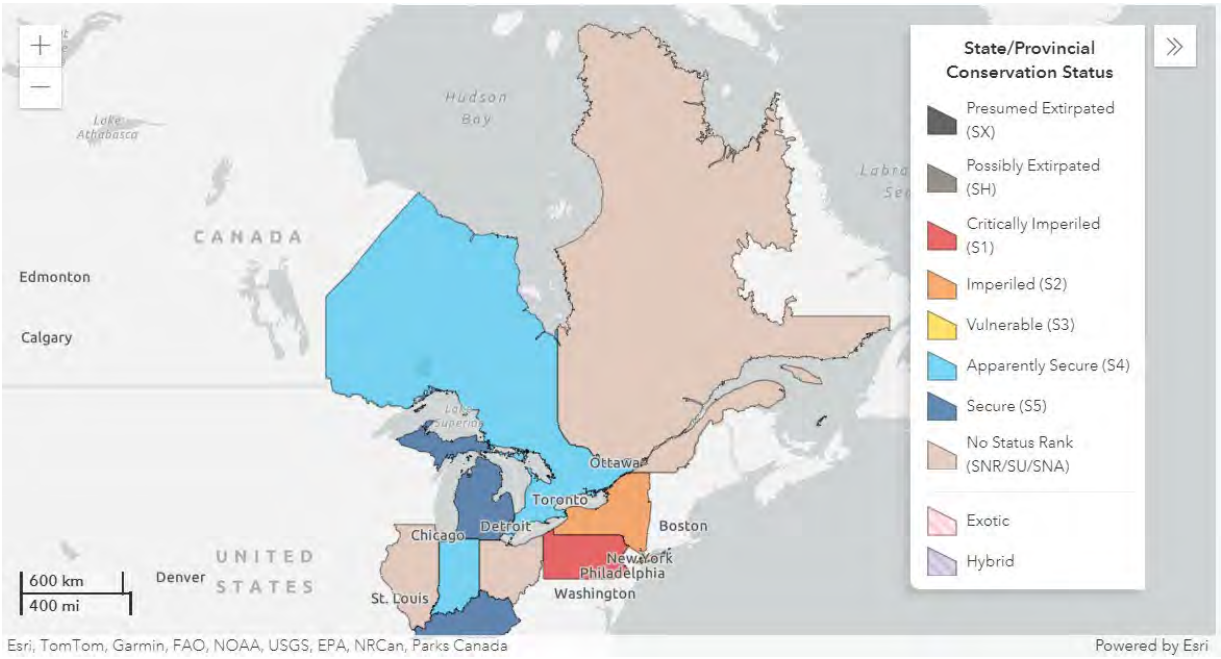

Figure 1. Conservation status of the western chorus frog (*Pseudacris triseriata)* in North America (NatureServe 2024).

Figure 2. Western chorus frog range map (IUCN 2022)

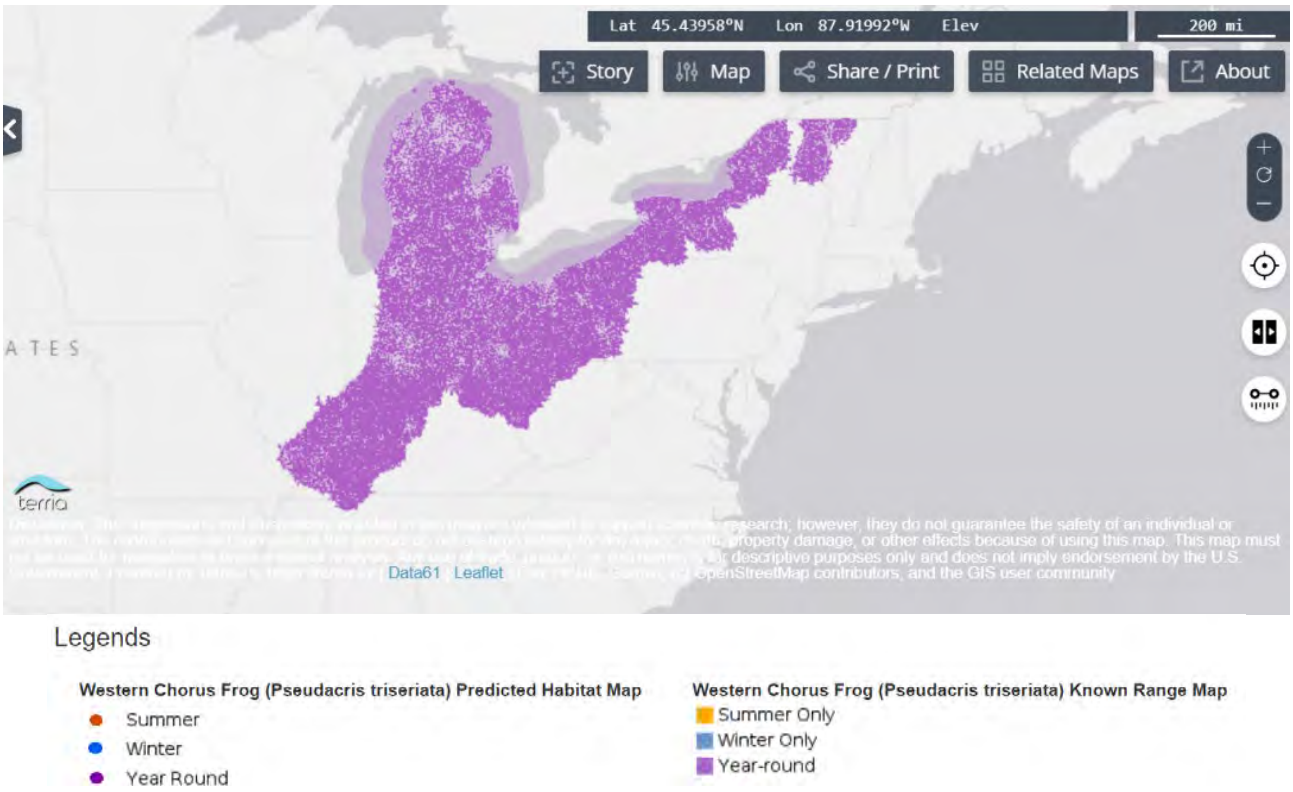

Figure 3. Western chorus frog predicted habitat map and known range map (USGS 2019)

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

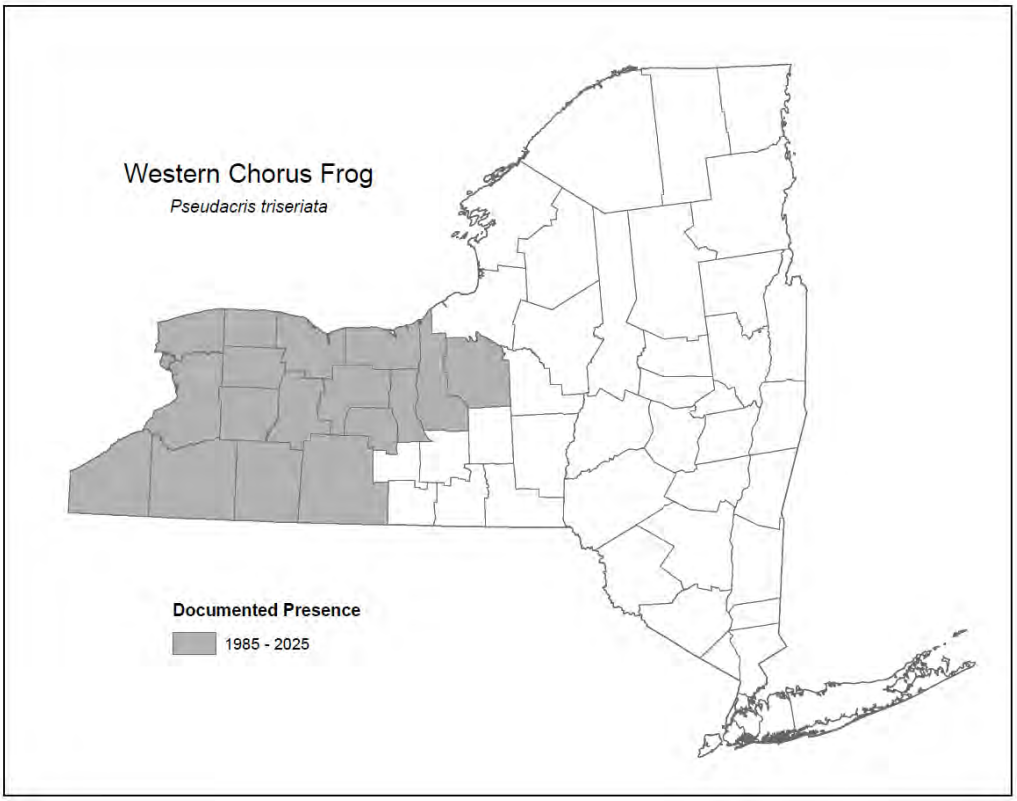

Figure 4: Distribution of western chorus frog (*Pseudacris triseriata*) in New York, 1985-2025 (NYSDEC)

Details of historic and current occurrence:

Western chorus frogs are restricted to the low-lying areas of western and central New York. Statewide frog breeding call surveys were conducted in 1973-1980, 2001-2002, 2010, and 2013-2016. The studies in the early 2000s yielded conflicting results. Surveys performed in 2001-2002, which revisited sites originally surveyed in 1973-1980, suggested an apparent increase in western chorus frogs; however, the study noted that only 62% of the original sites could be relocated in 2001-2002, and ~5% of sites were evidently destroyed (Gibbs et al. 2005). In contrast, around this same time a second study compared survey data gathered by biologists from St. Bonaventure University (1958-1987) with data from the NYSDEC, and found a 100 km range retraction northward, and apparent extirpation of upland valley locations in southwestern New York (Roblee 2001). Surveys performed in 2010 supported Roblee's (2001) findings, identifying an approximate 100 km range retraction toward the northwest corner of the state (Corser et al. 2012). More recent surveys conducted by the NYSDEC in western New York found western chorus frogs in just two counties in the northwest corner of the state. These findings suggest that the species' range may be even more restricted than previously thought (NYSDEC unpublished). Additional surveys are needed to better assess the current distribution of the species in the state.

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. Freshwater Marsh
2. Great Lakes/Freshwater Estuary Marsh
3. Wet Meadow/Shrub Swamp
4. Vernal Pool
5. Native Barrens and Savanna

Habitat or Community Type Trend in New York

Habitat Specialist?	Indicator Species?	Habitat/ Community Trend	Time frame of Decline/Increase
No	Yes	Declining	Wetlands, since 1950s

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:

Western chorus frogs occur in open grasslands, meadows, and along forest edges (Gibbs et al. 2007). Within these habitats, adults are found in damp meadows and shallow pools with low shrubs and grasses, often under logs, among dead vegetation and leaf litter, and in damp crevices or burrows

(Harding and Holman 1992, Kolozsvary and Swihart 1999, Green et al. 2013). Breeding occurs in any shallow temporary water bodies with at least 10 cm of water including flooded fields, ditches, and rain pools (Skelly 1996). Western chorus frogs typically overwinter in soil and leaf litter, or in underground burrows near breeding sites (Harding and Holman 1992, Gibbs et al. 2007). Gibbs et al. (2005) found that chorus frogs in New York thrive in areas with less acidic soils and in areas with more pasture, less cultivated grasses, and less forests of all types. However, this data did not distinguish between western and boreal chorus frogs.

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):*

The western chorus frog breeding season can occur from February through June, though it typically peaks in March and April (Gibbs et al. 2007, Ethier et al. 2021). Adults typically remain within 100 m of the breeding pond for the spring and summer, rarely migrating more than 200 m within a single generation (Ethier et al. 2021). During the breeding season, females oviposit about 500 to 1500 eggs that hatch after 3-27 days, most often within two weeks (Ethier et al. 2021). Tadpoles metamorphose within 40-90 days (Ethier et al. 2021). Juveniles typically remain near natal ponds for several weeks before migrating, typically less than 500 m, to more terrestrial habitats (Ethier et al. 2021). Chorus frogs may migrate short distances to overwintering habitat but usually remain close to the breeding site (Ethier et al. 2021). Western chorus frogs produce a glucose-based cryoprotectant that allows them to tolerate temperatures below 0 °C as they may overwinter under logs, rocks, or leaf litter (Ethier et al. 2021). Chorus frogs tend to be philopatric, remaining in and/or returning to the natal pond area, when and where suitable habitat persists, following overwintering (Ethier et al. 2021).

Survival rates for the species are limited and variable; however, data suggests an egg survival probability of 0.37-0.87, larval survival probability of 0.9, juvenile survival probability of 0.06-0.13, and adult survival probability of 0.19 (Ethier et al. 2021). Western chorus frogs typically reach sexual maturity after 1-2 years and have a lifespan of 1-3 years, though this may be an underestimation (Ethier et al. 2021).

VI. Threats *(from NY 2015 SWAP or newly described):*

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. (habitat loss/degradation)	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. (habitat loss/degradation; agricultural intensification)	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
7. Natural System Modifications	7.3 Other Ecosystem Modifications	7.3.2 Vegetation succession	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*; West Nile control)	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.
8. Invasive & Other Problematic Species	8.1 Invasive Non-Native Plants & Animals	Choose an item. (Triple E)	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
9. Pollution	9.3 Agricultural & Forestry Effluents	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
9. Pollution	9.6 Excess Energy	Choose an item. (UV radiation)	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.	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 western chorus frog.

Threats Discussion:

As a species that uses low-lying areas, the western chorus frog is highly susceptible to habitat loss and fragmentation. This has occurred due to succession of habitat, as well as increasing urbanization and intensifying agricultural practices, which directly eliminate breeding habitats through the draining, filling, and mowing of temporary ponds and the surrounding upland areas (Bleakney 1959, Brisson and Bouchard 2003, COSEWIC 2008, Corser et al. 2012, Environment Canada 2015, Vermont Fish & Wildlife Department 2015). The effects of urbanization appear particularly harmful to chorus frogs, as the abundance of boreal chorus frogs in Iowa decreased with increasing urban density (Pillsbury and Miller 2008), and boreal chorus frogs were detected in only 3 of 96 urban ponds in Wisconsin (Sauer et al. 2022). Additionally, research in Alberta revealed that natural wetlands supported higher levels of boreal chorus frog occurrence and abundance than stormwater wetlands, and that the frogs preferred wetlands with greater aquatic vegetation (Scheffers and Paszkowski 2013). Urbanization may also have legacy effects on *Pseudacris* species, as spring peeper populations have declined with increasing time since urbanization (Gagné and Fahrig 2010), suggesting that current abundances might not fully reflect the long-term impacts from this type of disturbance.

Genetic isolation is also a concern for the western chorus frogs remaining in western New York as shallow wetland habitats and source populations may be limited. Additionally, western chorus frogs have relatively low mobility and high site-fidelity to their natal ponds, making it difficult for populations to recover when habitats are lost or fragmented (Ethier et al. 2021). *Pseudacris* frog dispersal is further limited by roads, and road mortality has been documented as a threat to the species (COSEWIC 2008).

Degradation of water quality is another major concern linked to urbanization and agricultural practices. Agricultural and industrial chemicals such as glyphosate have been shown to be toxic to chorus frogs or cause mortality (Smith 2001, COSEWIC 2008). Evidence also suggests that *Pseudacris* species are sensitive to increased salinity in the environment, which may accumulate in breeding pools due to road salt deposition and/or wastewater contamination. Several studies on boreal chorus frogs have shown that increased salinity from sodium chloride road salts and saline wastewaters reduced hatching success, larval survival, growth, development, and activity, and increased deformities (Tornabene et al. 2020, Tornabene et al. 2021). The impact of these exposures also accumulated across life stages of the frogs (Tornabene et al. 2020, Tornabene et al. 2021). When examining the impact of saline wastewaters from energy production, boreal chorus frog populations were found to decrease in abundance as saline wastewater contamination increased, with wetlands exhibiting the highest concentrations of chloride having fewer or no amphibians present (Hossack et al. 2018). Furthermore, in all the aforementioned studies, boreal chorus frogs were found to be more sensitive to salinity than other frog and salamander species. *Pseudacris crucifer* frogs have also been found to be sensitive to road salts, with environmentally relevant concentrations reducing *P. crucifer* tadpole survival (Macklem 2016) and acute toxicity tests showing abnormalities and that *P. crucifer* tadpoles have intermediate sensitivity to chloride relative to other amphibian species (Collins and Russell 2009).

Several emerging diseases also pose a threat to western chorus frogs, including *Batrachochytrium dendrobatidis* (*Bd*), *B. salamandrivorans* (*Bsal*), and *Ranavirus*. The chytrid fungus, *Batrachochytrium dendrobatidis* (*Bd*), first described in 1998 (Longcore et al. 1999), has become a disease of global concern, with a recent study finding *Bd*-infection in 86 of 119 (72%) sampled countries and in 1062 of 1966 (54%) amphibian species tested (Monzon et al. 2020). Chytrid infections in *Pseudacris* species have been documented from specimens collected as early as the 1990s (Ouellet et al. 2005), and in Minnesota, *Pseudacris* chorus frogs were found to be infected with *Bd*, *Ranavirus*, and to have co-infections of both pathogens (Talbott et al. 2018). In Ontario, one study found that 14% of *Pseudacris* tadpoles were infected with *Ranavirus* (Duffus et al. 2008). It was also shown that *P. triseriata* are not

only susceptible to *Ranavirus* infection, but that *Ranavirus* infection can lead to mortality in the species (Mihaljevic et al. 2018).

The western chorus 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). Frogs, including *Pseudacris* species, in Ontario have been shown to have trends towards earlier spring emergence that correspond to a regional estimated increase in spring temperatures of 2.7–2.8°C over the last 40 years (Klaus and Lougheed 2013). Laboratory studies have also found that boreal chorus frogs have limited potential to adapt to reduced hydroperiods (Amburgey et al. 2012, Environment Canada 2015).

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 11-0107 sub 2) that gave all native frogs, turtles, snakes, lizards, and salamanders legal protection as game species, with very few species open to harvest. The legislation also outlaws the sale of any native species of herpetofauna regardless of its origin.

Under Article 24 of the New York State Environmental Conservation Law, the Freshwater Wetlands Act provides protection to wetlands greater than 12.4 acres in size and smaller wetlands of ‘Unusual Importance’. Beginning on January 1, 2028, the default size threshold of regulated wetlands will decrease to 7.4 acres. The U.S. Army Corps of Engineers also protects wetlands, irrespective of size, under Section 404 of the Clean Water Act.

Under Article 15 Title 5 of the New York State Environmental Conservation Law, the Protection of Waters program provides protection for the state’s water resources, including rivers, streams, lakes, and ponds.

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

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

Protection of known occupied breeding habitat is critical; other potential management actions include increasing the connectivity of known breeding pond areas, improving water quality by reducing road salt, nutrient, and other pollutant inputs, and managing the vegetation at breeding pond locations. Canada has also undertaken captive breeding and reintroduction efforts to conserve the species in Quebec and has already successfully bred and reared boreal chorus frogs (Environment Canada 2015, Ethier et al. 2024).

The Comprehensive Wildlife Conservation Strategy (NYSDEC 2005) includes recommendations for the following actions for freshwater wetland amphibians, including chorus frogs. Actions that have been accomplished, or where progress has been made, are indicated with a check.

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, 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.

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.

The 2015 State Wildlife Action Plan includes the following recommended actions for chorus frogs:

- Evaluate chorus frog taxonomy and distribution.

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

Action Category	Action	Description
A.2 Direct Species Management	A.2.0.0.0 Direct Species Management	Invasive/problematic species control
C.6 Design and Plan Conservation	C.6.0.0.0 Design and plan conservation	Site/Area and 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 western chorus frog.

VII. References

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