

Species Status Assessment

Class: Amphibia
Family: Hylidae
Scientific Name: *Acris crepitans*
Common Name: Eastern cricket frog

Species synopsis:

The eastern cricket frog (*A. crepitans*) occurs in most of the eastern half of the United States and may be declining in as many as 17 states. Three subspecies are recognized: Blanchard's cricket frog (*A. c. blanchardi*) in the west and midwest (including extirpated populations in southern Ontario), eastern cricket frog (*A. c. crepitans*) in the east (including NY), and coastal cricket frog (*A. c. paludicola*) along the Gulf Coast. Cricket frogs are considered common where they occur, but severe declines have been noted in the northern fringes of the distribution, including New York. Despite numerous reports of declines, and ample scientific literature on the biology of eastern cricket frogs, there is no clear-cut indication of the cause(s) of the declining trend, although a number of anthropogenic factors and environmental conditions have been suggested. Populations in the central regions of the distribution are stable.

Cricket frogs are found along the vegetated shorelines of lakes, bogs, ponds, vernal pools and extensive marshes. They use upland forests during the fall and for hibernation. Where it occurs in the lower Hudson Valley of New York, this tiny frog is at the northern extent of the range in the East; it has been extirpated from Long Island and Staten Island. Only seven sites within four metapopulations remain in the lower Hudson Valley, representing a decline of about 30% in the last twenty years. Severe declines have been documented in Pennsylvania during this period as well; both states list cricket frog as endangered.

I. Status

a. Current and Legal Protected Status

- i. **Federal** Not Listed **Candidate?** No
- ii. **New York** Endangered; SGCN

b. Natural Heritage Program Rank

- i. **Global** G5
- ii. **New York** S1 **Tracked by NYNHP?** Yes

Other Rank:

IUCN Red List – Least Concern

High Concern (NEPARC 2010)

Endangered in Ontario, Wisconsin, Pennsylvania

The Ontario Fish & Wildlife Conservation Act designates cricket frog as a Specially Protected Amphibian

Status Discussion:

Eastern cricket frog was listed as threatened in New York in 1983 and revised to endangered status in 1999. It was listed as endangered in Pennsylvania in 2010 due to its extirpation from 37 of 43 known locations. NEPARC (2010) lists eastern cricket frog as a Species of High Concern because more than 50% of northeastern states listed it in their Wildlife Action Plans.

II. Abundance and Distribution Trends

a. North America

i. Abundance

___ declining ___ increasing X stable ___ unknown

ii. Distribution:

___ declining ___ increasing X stable ___ unknown

Time frame considered: Last 20 years

b. Regional

i. Abundance

 X declining ___ increasing ___ stable ___ unknown

ii. Distribution:

 X declining ___ increasing ___ stable ___ unknown

Regional Unit Considered: Northeast

Time Frame Considered: Last 20 years

c. Adjacent States and Provinces

CONNECTICUT Not Present X No data _____

MASSACHUSETTS 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: Last 10 years

Listing Status: Not Listed SGCN? No

ONTARIO Not Present X No data _____

i. Abundance

____ declining ____ increasing _____ stable ____ unknown

ii. Distribution:

____ declining ____ increasing _____ stable ____ unknown

Time frame considered: Extirpated

Listing Status: Endangered

Trends Discussion:

From Kenney and Stearns (2012): In New York, the distribution of eastern cricket frogs has historically been limited to the lower Hudson Valley, as well as Richmond and Suffolk counties (Gibbs et al. 2007, New York Natural Heritage Program 2010; see Figure 2). Cricket frogs were extirpated from Suffolk County by the 1930s and from Richmond County by the 1970s (Gibbs et al. 2007). During the 1990s, eastern cricket frogs were documented from 26 distinct sites in New York, which likely represented frogs from five remaining metapopulations (Figure 3). Most of these sites (22 sites) were resurveyed during the breeding seasons in 2009-2011 and cricket frogs were only detected at seven of those sites. These seven sites likely represented frogs from only four remaining metapopulations in New York (Figure 3).

Declines have been documented in other peripheral populations as well. In Pennsylvania, cricket frog was listed as endangered in 2010 as a result of a precipitous decline documented since the early 1980s. It has been eliminated from 92% of its historic (pre-1983) locations. Of the six locations that have been discovered since 1983, three have been extirpated. Populations of Blanchard's cricket frog occurred historically in extreme southern Ontario at Point Pelee Peninsula and Point Pelee Island in Lake Ontario, but have been extirpated (Oldham 1992).

Eastern cricket frog populations near the center of the distribution appear to be robust and stable (Davis et al. 1998, Hemesath 1998, Gray and Brown 2005).

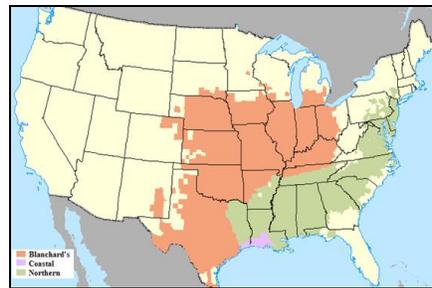


Figure 1. Cricket frog distribution. This map was constructed based on range maps from Conant and Collins (1998), and the websites of state wildlife agencies, the National Amphibian Atlas (2009), the North American Amphibian Monitoring Program (2009), and the Center for Reptile and Amphibian Conservation and Management (2010). Source: Kenny and Stearns (2012).

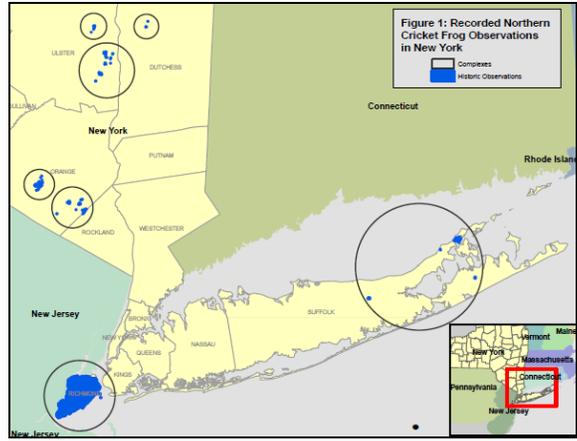


Figure 2: Historic observations of eastern cricket frog in New York. Source: Kenney and Stearns (2012).

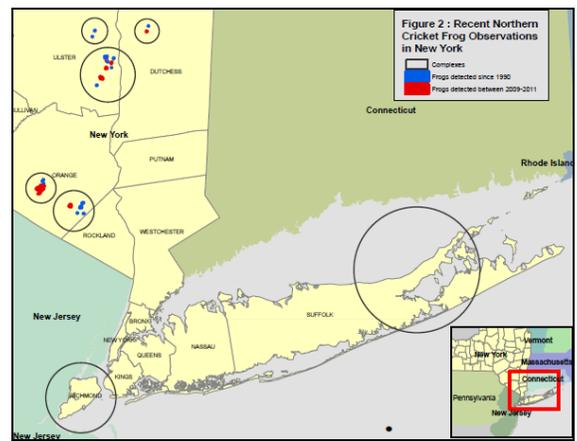


Figure 3: Recent observations of eastern cricket frog in New York. Source: Kenney and Stearns (2012).

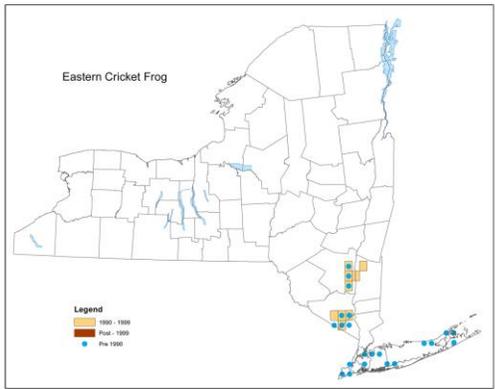


Figure 4: Distribution of eastern cricket frog in New York (NYS Amphibian and Reptile Atlas).

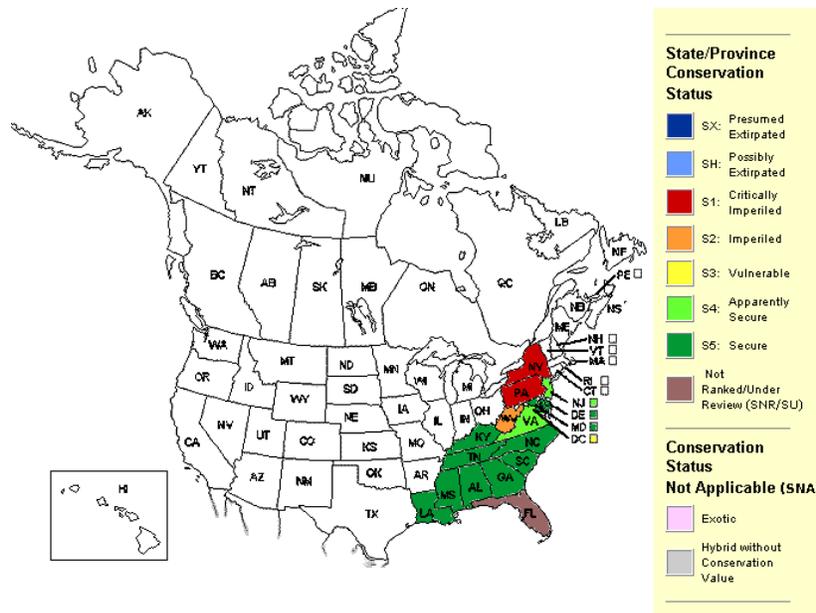


Figure 5: Conservation status of eastern cricket frog in North America (NatureServe 2013).

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>26 sites</u>	_____
prior to 1980	_____	_____	_____
prior to 1990	_____	_____	_____

Details of historic occurrence:

Eastern cricket frog has been historically limited to the lower Hudson Valley, Long Island, and Staten Island. It was extirpated from Long Island by the 1930s and from Staten Island by the 1970s.

Current	<u># of Animals</u>	<u># of Locations</u>	<u>% of State</u>
	_____	<u>7 sites</u>	_____

Details of current occurrence:

During the 1990s, eastern cricket frogs were documented from 26 distinct sites in New York, which likely represented frogs from 5 remaining metapopulations. The majority of these sites (22 sites) were resurveyed during the breeding seasons in 2009-2011 and cricket frogs were only detected at 7 of those sites. These seven sites—in Dutchess, Orange, and Ulster counties—likely represent frogs from only four remaining metapopulations in New York.

New York’s Contribution to Species North American Range:

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

Rarity Discussion:

Eastern cricket frogs are found in only 7 sites in New York.

IV. Primary Habitat or Community Type:

1. Floodplain Forest
2. Hardwood Swamp
3. Freshwater Marsh
4. Eutrophic Pond
5. Farm Pond/Artificial Pond
6. Bog Lake

Habitat or Community Type Trend in New York:

Declining Stable Increasing Unknown

Time frame of decline/increase: Wetlands decline since 1970s

Habitat Specialist? Yes No

Indicator Species? Yes No

Habitat Discussion:

From Kenney and Stearns (2012): Breeding occurs in almost any permanent freshwater body including lakes, ponds, rivers, and streams, though large water bodies and those that are polluted are generally avoided. Breeding areas typically have shallow water, floating mats of aquatic vegetation, sloping banks that are muddy or sandy, limited canopy cover, and at least some surrounding forest. In New York, calling males have been documented in man-made irrigation ponds in apple orchards. Adult cricket frogs frequently move between water bodies. Movements between ponds up to 1.3km apart have been documented. After rain events, cricket frogs may move away from water bodies. In New York, studies marking individual frogs have documented movements from 300m to 515m from breeding ponds (G. Kenney, personal communication).

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:

Eastern cricket frogs breed from the end of May to the beginning of July (Gibbs et al. 2007). Breeding occurs in shallow water, where females lay 200-400 eggs singly or in small groups of fewer than a dozen. The eggs hatch quickly, in just 3 to 4 days. In New York, metamorphosis occurs in July or August.

From Kenney and Stearns (2012): Cricket frogs are consumed by a variety of predators, including aquatic spiders, bullfrogs, fish, snakes, turtles, birds, and mammals (Burkett 1984, Perrill and Magier 1988, Gray and Brown 2005). Largely due to heavy predation, cricket frog populations decrease tremendously between metamorphosis and the next breeding season (Gray 1983, Burkett 1984, Gray and Brown 2005). As a result, mean life expectancy is about 4 months, and individuals born the previous year are mostly eliminated from the population by October (Gray 1983, Burkett 1984, O'Neill 2001, Gray and Brown 2005). Occasionally, adults survive to a second breeding season (Gray 1983).

Eastern cricket frog populations function on a metapopulation level, with smaller, adjacent populations interacting via linked habitats.

VI. Threats:

It is not entirely clear what is causing the decline of cricket frog populations. A number of potential causes have been suggested including habitat loss and degradation, chemical pollutants, non-native species, pathogens, climate change, and ultraviolet radiation (Kenney and Stearns 2012).

Habitat loss is likely the largest threat to eastern cricket frogs in New York. Their complex habitat requirements, which include both semi-permanent wetlands and forested uplands, increase their vulnerability to habitat changes. Residential and commercial development in the three counties where cricket frogs occur is particularly intense. Habitat loss from dredging, filling, and landfill was thought to be the cause of the extirpation of this species from Ontario. At one site in Ontario, natural flooding during the winter of 1972 was thought to have caused the disappearance of the cricket frog population. Additionally, high water levels allowed non-native carp to reach wetlands where cricket frogs bred (Cook 1984, Oldham and Campbell 1990).

Forest management practices (i.e., logging) have the potential to kill cricket frogs in the hibernacula. Poor sediment management following removal of trees can result in degradation of water quality in breeding areas (Kenney and Stearns 2012).

Populations that are in close proximity to roads will suffer from road mortality as individuals move from breeding areas to upland habitats. Additionally, use of ATVs in forested uplands may also cause mortality, especially since cricket frogs will use water pooled in tire tracks.

The management of aquatic plants in cricket frog breeding habitats poses a significant threat to the persistence of cricket frogs, as they are dependent upon aquatic vegetation for breeding, egg laying and tadpole development. Non-native grass carp may eradicate or reduce all of the vegetation in breeding ponds, while milfoil moths (*Acentria ephemerella*) and milfoil weevils (*Euhrychiopsis lecontei*) may effectively reduce invasive vegetation while improving habitat for native vegetation. Chemicals used to control aquatic vegetation and algal blooms may negatively affect cricket frogs as well (Kenney and Stearns 2012).

Increased levels of ultraviolet radiation from depletion of the ozone layer may be affecting amphibian populations worldwide (Blaustein et al. 1998).

Eastern cricket 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).

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). Eastern cricket frogs are known to be susceptible to Bd (Rothermel et al. 2008).

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

No Unknown

Yes

The eastern cricket frog is listed as an endangered species in New York and is protected by Environmental Conservation Law (ECL) section 11-0535 and the New York Code of Rules and Regulations (6 NYCRR Part 182). A permit is required for any proposed project that may result in a take of a species listed as Threatened or Endangered, including, but not limited to, actions that may kill or harm individual animals or result in the adverse modification, degradation or destruction of habitat occupied by the listed species.

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:

This species will benefit from wetland restoration. Management actions are detailed in the recovery plan (Kenney and Stearns 2012).

Cricket frogs likely function at a metapopulation scale in which the habitats of localized extirpations are re-colonized from nearby populations when conditions are again favorable. A metapopulation can persist for long periods of time as long as dispersing individuals can move between sites through suitable habitat. So while localized extirpations may be caused by a variety of reasons, the key to long term sustainable populations are to maintain the habitat connections between sites of suitable cricket frog habitat (Kenney and Stearns 2012).

The Comprehensive Wildlife Conservation Strategy (NYSDEC 2005) includes recommendations for the following actions for freshwater wetland amphibians, which includes eastern cricket 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.

Other action:

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

Population enhancement:

- ___ Employ restoration techniques for the cricket frog at selected sites as needed, including captive breeding and repatriation/relocation strategies.

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
Species Management	Species Recovery
Law/Policy	Legislation

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