Species Status Assessment

Common Name: Tiger spiketail **Date Updated:** January 8, 2024

Scientific Name: *Cordulegaster erronea* **Updated By:** Erin L. White

Class: Insecta

Family: Cordulegastridae

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

The distributional center of the tiger spiketail (*Cordulegaster erronea*) is in northeastern Kentucky in the mixed mesophytic forest ecoregion, and extends south to Louisiana and north to western Michigan and northern New York. New York forms the northeastern range extent and an older, pre-1926, record from Keene Valley in Essex County is the northernmost known record for this species. Southeastern New York is the stronghold for this species within the lower Hudson River watershed in Orange, Rockland, Putnam and Westchester counties and is contiguous with New Jersey populations (Barlow 1995, Bangma and Barlow 2010). These populations were not discovered until the early 1990s and some have remained extant ever since, while additional sites were added during the New York State Dragonfly and Damselfly Survey (NYDDS) and in subsequent years (iNaturalist 2024). A second occupied area in the Finger Lakes region of central New York has been known since the 1920s and was rediscovered at Excelsior Glen in Schuyler County in the late 1990s. During the NYDDS, a second Schuyler County record was reported in 2005 as well as one along a small tributary stream of Otisco Lake in southwestern Onondaga County in 2008 (White et al. 2010). The habitat in the Finger Lakes varies slightly from that in southeastern New York and lies more in accordance with habitat in Michigan (O'Brien 1998) and Ohio (Glotzhober and Riggs 1996, Glotzhober 2006)— exposed, silty streams flowing from deep wooded ravines into large lakes (White et al. 2010). The rarity of the species in this portion of the state is highlighted by the low rate of detections from over 16 surveys in 2004 and 2005 in suitable habitats by experienced observers during the first season who failed to find any additional sites. Nevertheless, Glotzhober (2006) reported that the acquisition of a positive search image and increased survey effort greatly expanded the number of known sites and overall range in Ohio. Indeed, in NY since 2010, it has been confirmed in fifteen counties.

From White et al. 2010: Across their range, *C. erronea* are habitat specialists inhabiting tiny, forested, spring-fed coldwater streams, small spring trickles, or seeps in partial shade that are too small for fish but where there is a constant, slight water flow and a sandy or gravelly substrate (Barlow 1995, Donnelly 1999, Dunkle 2000). In northern New Jersey, the species is restricted to perennial low-to-medium-gradient forested coldwater springs and trickles with a fine sand substrate that is relatively free of organic matter with a mix of skunk cabbage, jewelweed, sedges, and ferns (Barlow 1995). In Ohio, *C. erronea* use small headwater streamlets with persistent flow and good forest cover in steep ravinres and adults spend significant time in the forest canopy and flying the stream during the day (Glotzhober 2006). An informative distribution model found that environmental variables with topograhic position (slope, topographic index) and surficial geography were the most important parameters for defining suitable habitats for this species (New York Natural Heritage Program 2011). It has also been noted that geological areas conducive to the formation and maintenance of numerous permanent spring-fed seeps draining into deep, wooded glacial valleys were ideal locations.

I. Status

a. Current legal protected Status

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

ii. **New York:** Not Listed

b. Natural Heritage Program

i. **Global:** G4

ii. **New York:** S1 **Tracked by NYNHP?:** Yes

Other Ranks:

-NYS 2025 SGCN Status: Species of Greatest Conservation Need

-IUCN Red List: Least Concern

-Northeast Regional Rank (White et al.2015): R1R2, Primary Responsibility

Status Discussion:

White *et al.* (2010) suggested that the status as S1, which is it's current rank (NYNHP 2024). Based on information since 2010, I would recommend a rank change to S2, as range extent, area of occupancy and trend information changed significantly. Based on rarity, trend, and threat information, this species should remain an SGCN, but no longer an HPSGCN.

II. Abundance and Distribution Trends

Region	Present?	Abundance	Distribution	Time Frame	Listing status	SGCN?
North America	Yes	Unknown	Unknown	Last assessment US 1985; Canada 2011		-
Northeastern US	Yes	Unknown	Declining	Pre and post 2000	R1R2; RSGCN	Yes
New York	Yes	Unknown	Increasing	Pre and post 2005	S1; HPSGCN	Yes
Connecticut	Yes	Unknown	Unknown		T; S2; SGCN	Yes
Massachusetts	No	-	-			-
New Jersey	Yes	Unknown	Unknown		S3	Yes
Pennsylvania	Yes	Unknown	Unknown		S3	Yes
Vermont	Yes	Unknown	Unknown		S1	No
Ontario	Yes	Unknown	Unknown		S1	-
Quebec	No	-	-			-

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 State Dragonfly and Damselfly Survey (NYDDS) was conducted from 2005-2009 but there are no organized, regular monitoring or survey activities directed toward this species or to sites where it has been documented. As many sites occur on protected lands, NYNHP staff do revisit many known sites over time through inventory work with OPRHP and Div. Lands & Forests.

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

No estimate of population size for this species has been made based on observations from locations in fifteen counties since 2010 (NYNHP 2024 and iNaturalist 2024). The full extent and size of these populations have not been determined, many sites have not been revisited, and some known sites that have been revisited have not been reconfirmed in recent years. It is known from more counties than historically, which could be a reflection of increased survey effort since 2005, but the suggested trend is stable to increasing for NY.

New location information on *C. erronea* in New York in recent years may reflect heightened interest in surveying for this species rather than a population increase or a range expansion (White *et al.* 2010).

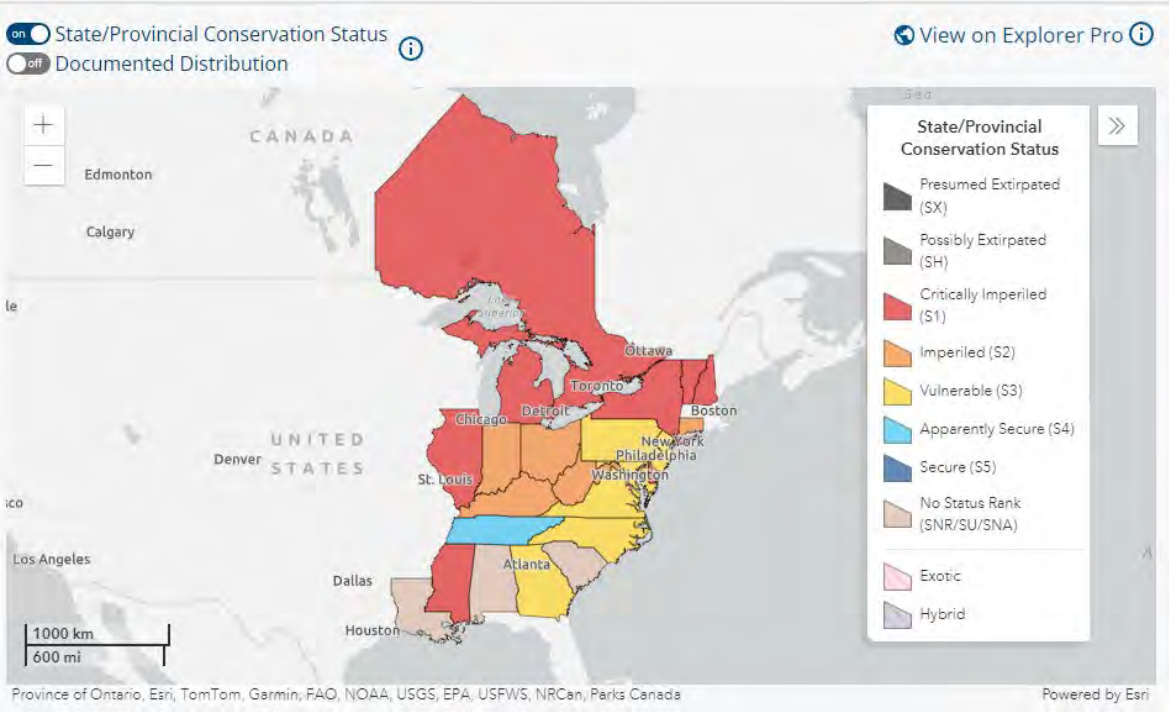

Figure 1. Conservation status of the tiger spiketail in North America (NatureServe 2024).

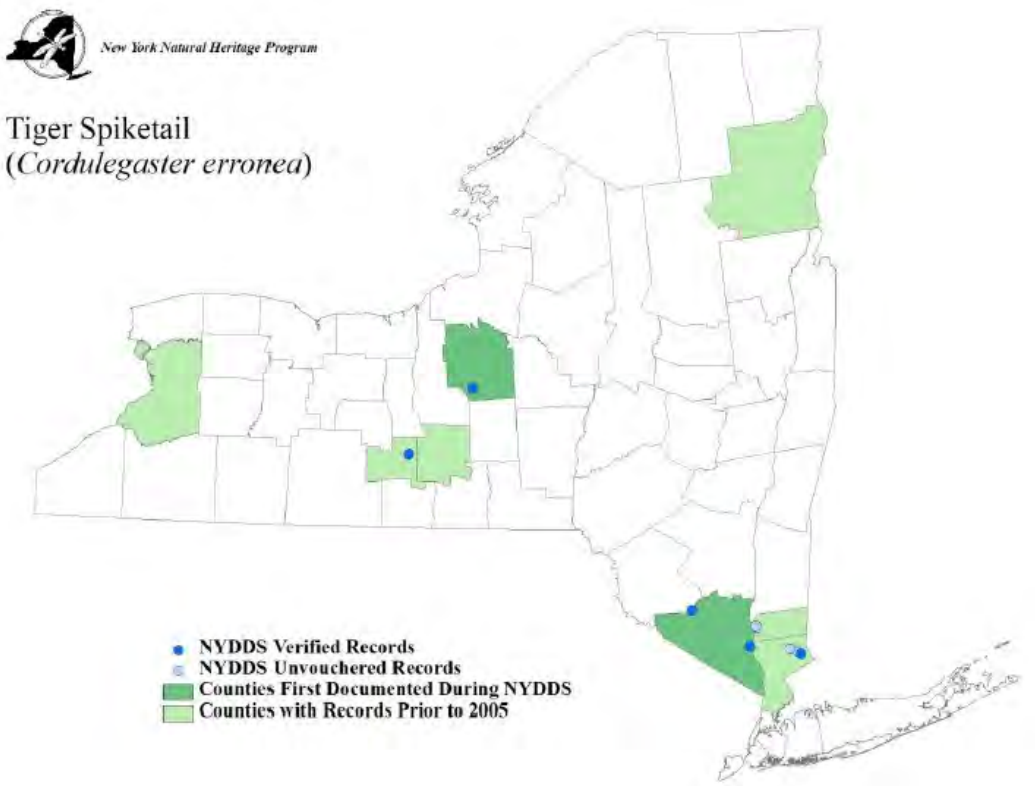

Figure 2. Occurrence record of the tiger spiketail in New York during the NYDDS (White *et al.* 2010).

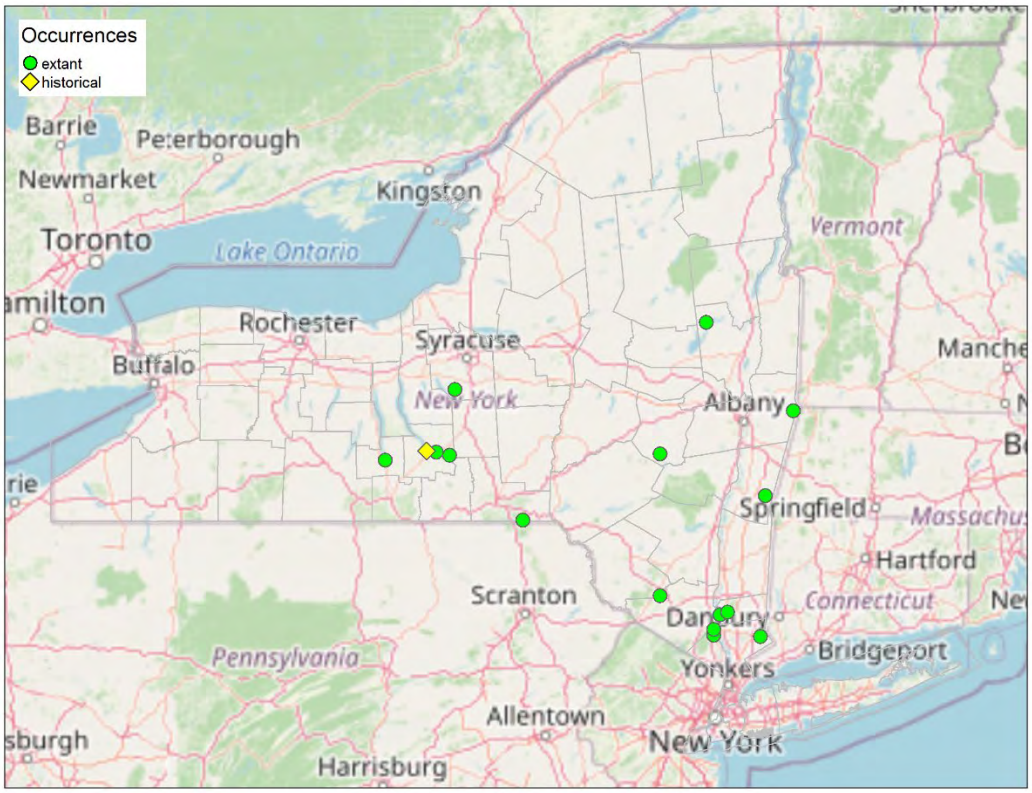

Figure 3. NYNHP element occurrence records for the tiger spiketail in New York (NYNHP 2024).

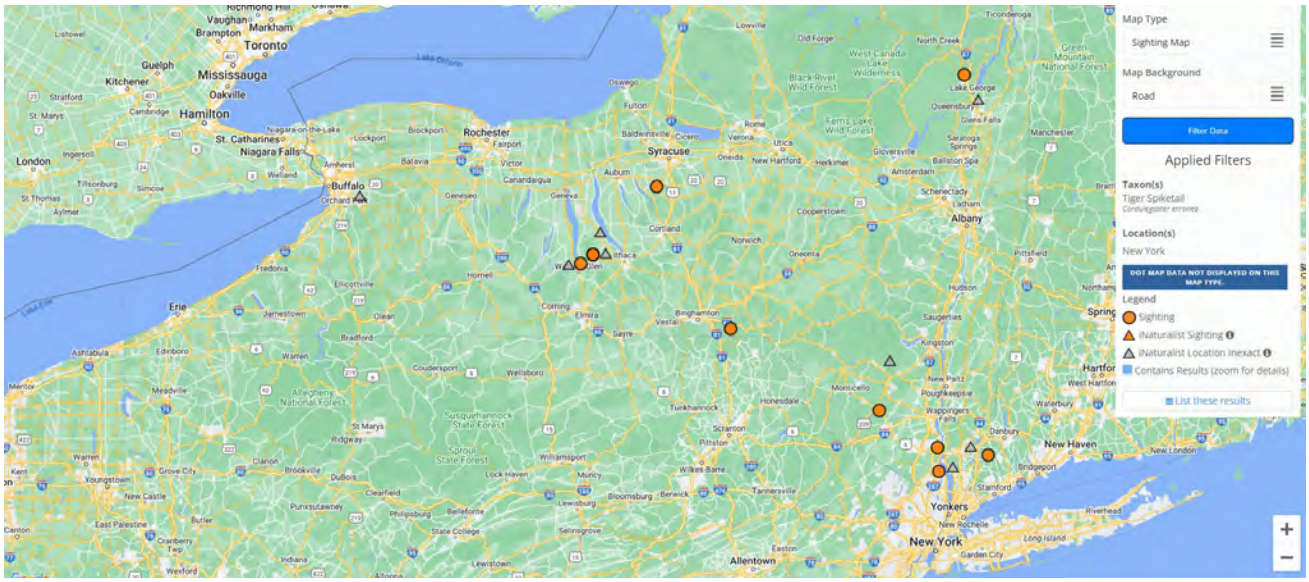

Figure 4. Distribution of the tiger spiketail in New York (Abbott 2024).

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

Years	# of Records	# of Counties	% of State
Pre-2004	at least 6	6	~10%
2005-2009	5	5	~8%
2010-2023	at least 15	15	~24%

Table 1. Records of tiger spiketail in New York.

Details of historic and current occurrence:

Pre-2004, Tiger Spiketails were known from Erie, Schuyler, Tompkins, Essex, Putnam, and Westchester Counties (Donnelly 2004). During the NYDDS, records were confirmed in five counties: Schuyler, Onondaga, Orange, Rockland, and Westchester (White et al. 2010). Since 2010, there are confirmed observations from 15 counties in NY, mainly from strongholds in the Hudson Valley and the Finger Lakes (iNaturalist 2024). I reviewed these and they look valid from the photographs. As many exact locations are obscured to me on iNaturalist, I was unable to determine if multiple records will be the same EO, but can assume at least one EO per County (Abbott 2024, iNaturalist 2024).

If it occurs in 15/62 counties, that is very roughly about 24% of the state, though the occupied area of those counties would be smaller.

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	~700 miles

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):*

Seepages near the following:

a. Size/Waterbody Type: Headwater, Creek

b. Geology: Low-Buffered Acidic

c. Temperature: Transitional Cool, Cold

d. Gradient: Very Low Gradient, Low-Moderate, Moderate-High,

Habitat or Community Type Trend in New York

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

From NYNHP 2024b: *C. erronea* inhabits coldwater streams, small spring trickles, or seeps in partial shade that are too small for fish where there is a constant, slight water flow and a non-silt substrate (Barlow 1995, Dunkle 2000, Nikula et al. 2003, Holst 2005). Larvae are aquatic and found in the water during this lifestage, whereas adults are terrestrial and are found in habitats surrounding streams, springs, and seeps.

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):*

From NYNHP 2024b*: C. erronea* larvae are aquatic and burrow tail first into the substrate of waters where they are found. They then cover themselves with muck and wait for prey (Mead 2003). Adults are terrestrial and perch at an oblique (about a 45 degree) angle on vegetation on the edges of their water habitats and hunt in fields and forest clearings (Nikula *et al.* 2003). Females oviposit by hovering vertically over shallow water and plunging the tip of their abdomen into the mud in a sewing-machine like movement (Dunkle 2000, Nikula et at. 2003). *C. erronea* larvae feed on smaller aquatic invertebrates and adults feed on insects which they capture in flight (New York Natural Heritage Program 2009).

In Ohio, larvae inhabit sandy (less often silt or muck) stretches of very shallow streamlets upstream of obstructions that exclude fish (Glotzhober 2006).

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

From NYS DEC 2005: “Since seepage areas are key areas for this species for oviposition, any activities that alter the groundwater seepages in an area would be a threat to tiger spiketails. Little published information is available citing specific cases of negative impacts to the various species of stream and seepage dwelling odonates, but any activities which degrade the sensitive hydrology of these habitats would threaten populations of these species. The most important likely negative impacts would come from changes in the natural hydrology such as nearby development, increases in the sediment load of the seepage or associated stream (such as might result should logging occur down to the stream edge), changes in dissolved oxygen content, direct effects of pesticides, and chemical contamination by runoff of agricultural or other discharge” (Novak 2006).

The tiger spiketail was classified as “not vulnerable/presumed stable” (PS) to predicted climate change in an assessment of vulnerability conducted by the New York Natural Heritage Program. Available evidence does not suggest that abundance and/or range extent within the geographical area assessed with change (increase/decrease) substantially by 2050. Actual range boundaries may change (Schlesinger et al. 2011).

Threats to NY Populations	
Threat Category	**Threat**
1. Natural System Modifications	Dams & Water Management/Use (change in natural hydrology)
2. Biological Resource Use	Logging & Wood Harvesting (siltation of streams)
3. Climate Change & Severe Weather	Droughts
4. Climate Change & Severe Weather	Storms & Flooding
5. Energy Production & Mining	Oil & Gas Drilling (hydraulic fracturing issues)
6. Invasive & Other Problematic Species & Genes	Invasive Non-Native/Alien Species (hemlock wooly adelgid)

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:

Article 15 of Environmental Conservation Law provides protection of rivers, streams, lakes and ponds through the Protection of Waters Program.

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

Any measures to reduce water contamination, agricultural run-off, siltation, and damming that would affect flow of springs and small stream seepage areas should be considered when managing for this species (NYS DEC 2005, NYNHP 2024b).

Further research is needed to define the distribution and population size of the tiger spiketail. In addition, research is required to understand the habitat requirements and threats to this species, and to create appropriate management guidelines for its persistence in known locations (NYS DEC 2005, NYNHP 2024b).

A distributional model predicted that the tributaries feeding into the central Finger Lakes, especially Seneca, Cayuga, Keuka, and Canandaigua lakes, as well as along Eighteen Mile creek near North Evens in Erie county should have suitable habitat for this rare and elusive species (White et al. 2010). These are areas that could be surveyed.

The Comprehensive Wildlife Conservation Strategy (NYSDEC 2005) includes recommendations for the following actions for odonates of seeps and rivulets, and for tiger spiketail in particular:

Habitat monitoring:

_____ Support and encourage habitat monitoring efforts that would complete the baseline assessment of habitat quality and threats.

Habitat research:

_____ Support and encourage research projects that will help define preferred habitat in order to guide future monitoring, restoration and habitat protection efforts.

New regulation:

_____ Recommendations for official state endangered, threatened, and special concern listing are an anticipated result of the statewide inventory. The gray petaltail is currently listed as Special Concern. It is possible that a change in this species listing status may be warranted following additional surveys or that one of the other two species may be recommended for listing and officially adding these species to the list would constitute a concrete action.

Population monitoring:

_____ Conduct surveys to obtain repeatable, relative abundance estimates for these species at known sites and newly discovered sites where access permission to conduct surveys is obtained.

Conservation Actions	
Action Category	**Action**
1. Land/Water Protection	Resource and habitat protection
2. Land/Water Protection	Site/area protection
3. Land/water management	Site/area management
4. Land/water management	Habitat & natural process restoration
5. Land/water management	Invasives/problematic species control
3. Education and Awareness	Awareness & Communications
3. Education and Awareness	Training
4. Law and Policy	Policies and Regulations

Table 2. Recommended conservation actions for tiger spiketail

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Date first prepared	August 13, 2012
First revision	February 19, 2014 (Samantha Hoff)

Latest revision	January 8, 2024 (Erin L. White)