Species Status Assessment

Common Name: Lake emerald **Date Updated:** December 22, 2023

Scientific Name: *Somatochlora cingulata* **Updated By:** Erin L. White

Class: Insecta

Family: Corduliidae

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

The center of distribution for the lake emerald (*Somatochlora cingulata*) lies in northwestern Ontario in the central Canadian Shield forest, and ranges west to British Columbia, south to Wyoming, and northeast to Newfoundland and Labrador. New York lies at the southern range extent and a 1966 record from Slide Mountain in the Catskills is the southernmost known occurrence in the northeast (Donnelly 1999, Donnelly 2004). This boreal species does not seem to have clear habitat preferences and is found in both lentic and lotic waters (Walker and Corbet 1975)**.** However, it is generally considered a species of higher elevations, regardless of whether occurring at lakes or rivers.

I. Status

a. Current legal protected Status

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

ii. **New York:** Not Listed

b. Natural Heritage Program

i. **Global:** G5

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

Other Ranks:

-NYS 2025 SGCN Status: High Priority Species of Greatest Conservation Need

-IUCN Red List: Least Concern

-Northeast Regional Rank (White et al.2015): R4, shared responsibility

Status Discussion:

White *et al.* (2010) calculated a revised S-rank of S1.

II. Abundance and Distribution Trends

Region	Present?	Abundance	Distribution	Time Frame	Listing status	SGCN?
North America	Yes	-	-	Last assessment		-

Region	Present?	Abundance	Distribution	Time Frame	Listing status	SGCN?
				US 2004, Canada 2012		
Northeastern US	Yes	-	-	Pre and post 2000	R4	No
New York	Yes	-	-	Pre and post 2005	S1; HPSGCN	Yes
Connecticut	No	-	-			-
Massachusetts	Not Detected	Declining	Declining		SH	No
New Jersey	No	-	-			-
Pennsylvania	No	-	-			-
Vermont	Yes	Unknown	Unknown		S1; SGCN	Yes
Ontario	Yes	Stable	Stable		S4	-
Quebec	Yes	Stable	Stable		S5	-

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 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.

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

Trend information for this species is unknown.
Prior to the 1990s, this species was known for New York from a single record from Slide Mountain in Ulster County in 1966 (Donnelly 1992). Two additional records were obtained in the 1990s (Donnelly 1999) and three other new locations were found during the NYDDS along with a re-confirmation at one of the 1990s sites. All of the recent records (in four counties) have come from the Adirondacks, while the species has not been relocated in the Catskills area. It is almost certain that the recent records are the result of increased numbers of observers looking for dragonflies in the Adirondacks rather than an increasing trend for the species. As such, comparative survey effort in future years will be needed to establish trend information.

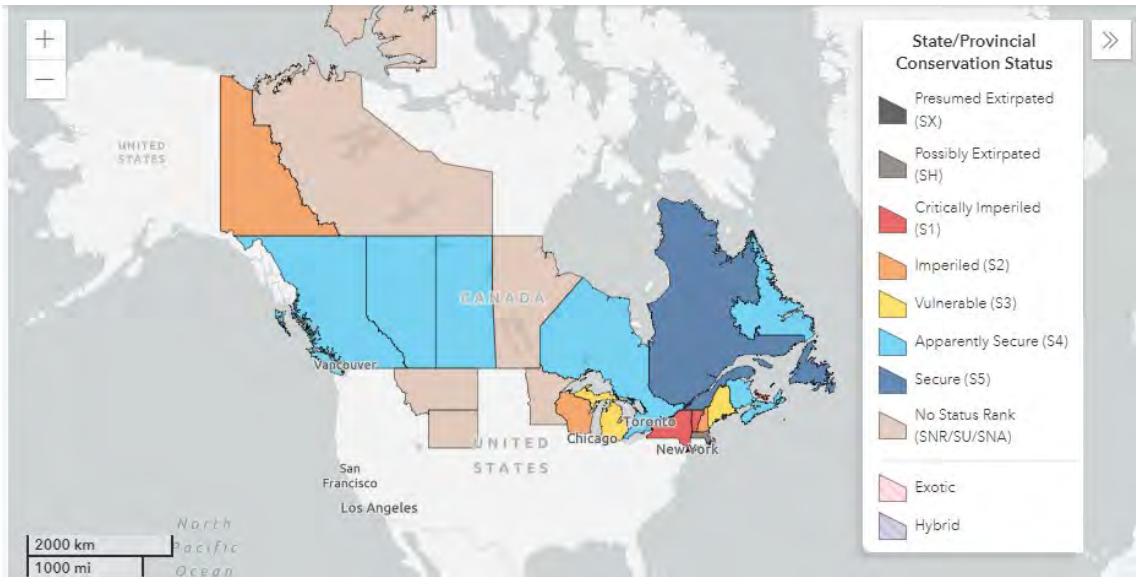

Figure 1. Conservation status of the Lake Emerald in North America (NatureServe 2023).

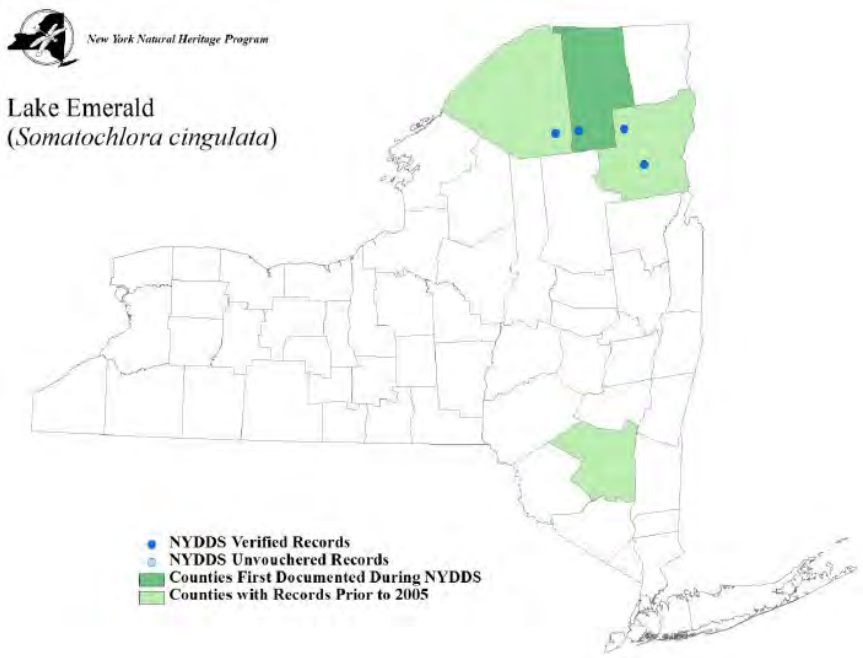

Figure 2. Occurrence record of the Lake Emerald in New York during the NYDDS (White *et al.* 2010).

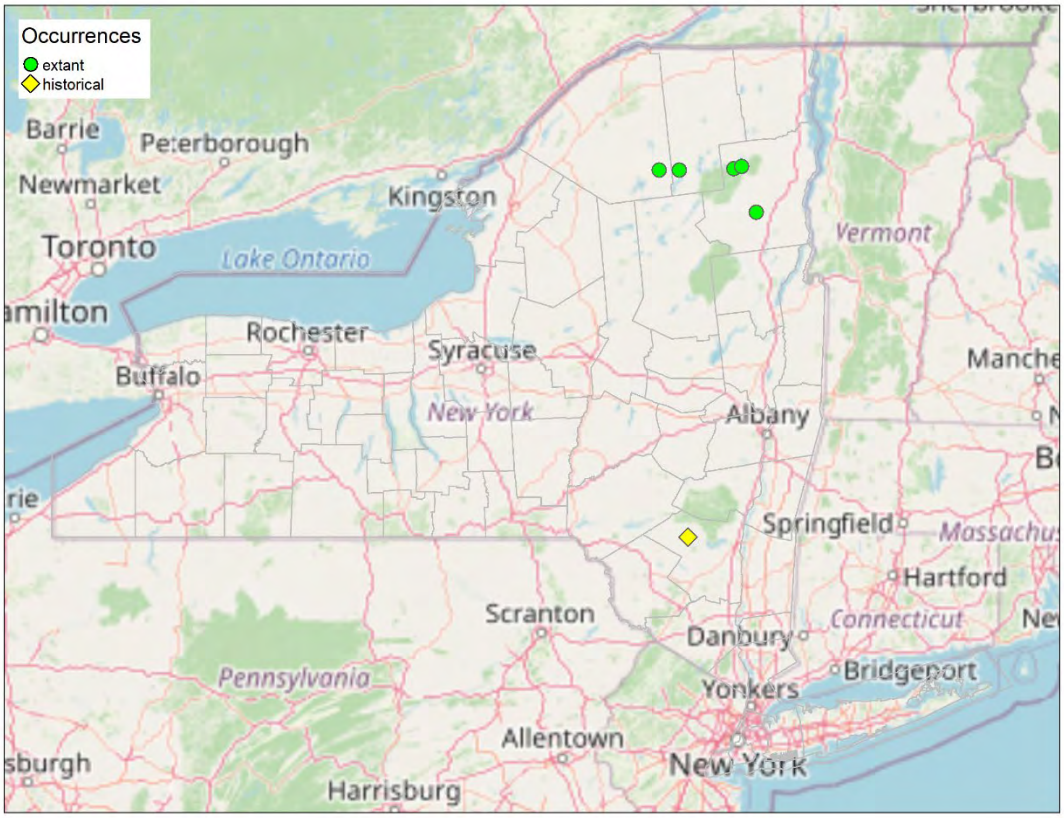

Figure 3. NYNHP element occurrence records for the Lake Emerald in New York (NYNHP 2023a).

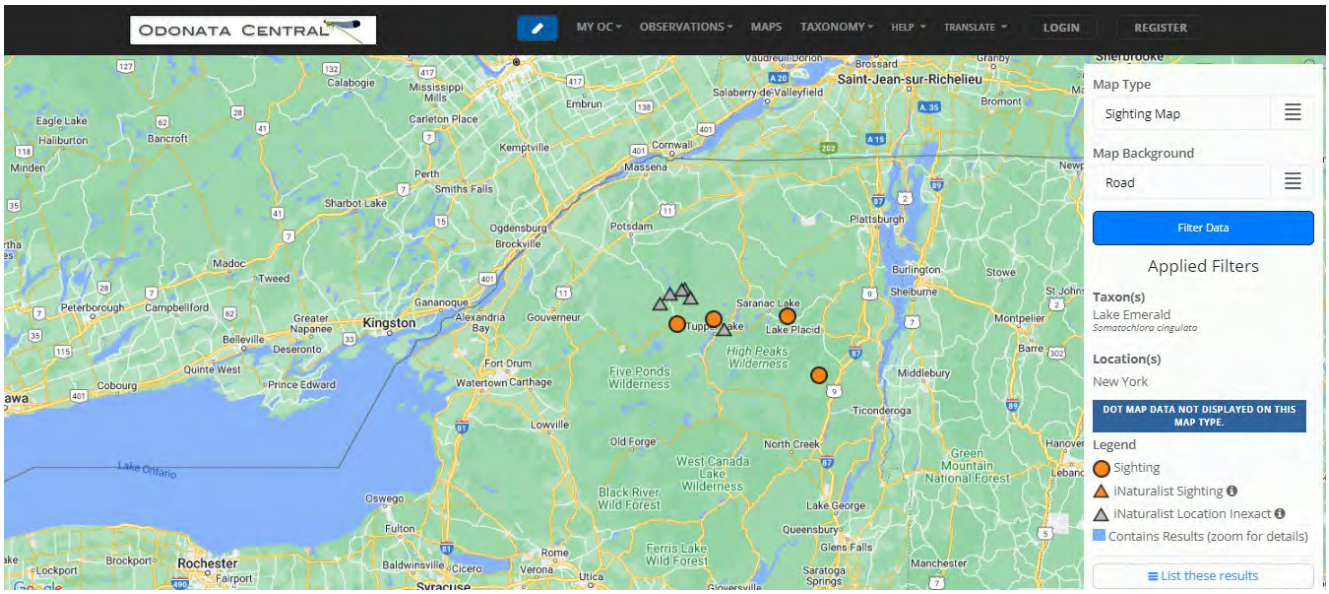

Figure 4. Distribution of the lake emerald in New York (Abbott 2023).

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

Years	# of Records	# of Counties	% of State
Pre-2005	2	3	<1-5%
2005-2009	3	2	<1-3%
2010-2023	4	4	1-7%

Table 1. Records of lake emerald in New York.

Details of historic and current occurrence:

Prior to 2005, the species was known from Massewepie Mire (1994) in St. Lawrence County (where it has been confirmed in recent years), Boreas River at Route 29N in Essex County (1995) and a 1966 from Slide Mountain in Ulster County (Donnelly 1999, iNaturalist 2023, NYNHP 2023). During the NYDDS, Lake Emeralds were documented at two new locations in Essex County and one in Franklin County (White et al. 2010). In recent years (since 2010), they have been documented at Massawepie Mire in St. Lawrence County, a new site in Essex County, a new site in Franklin County and a new site in Herkimer County (Abbott 2023, iNaturalist 2023, NYNHP 2023).

If it occurs in 4/62 counties, that is very roughly about 6.5% of the state, though the occupied area of those counties is rather small. There are likely additional undocumented populations in northern NY and the % of the state can be estimated to be <1-7% currently.

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	~500 mi

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. Lacustrine, cold water deep, mud bottom
2. Lacustrine, cold water deep, sand/gravel bottom
3. Lacustrine, cold water shallow, mud bottom
4. Lacustrine, cold water shallow, sand/gravel bottom
5. Creek, very low gradient, moderately buffered transitional cool
6. Small River: Low-Moderate Gradient, Acidic, Cold or cool
7. Medium River, Low-Moderate Gradient, Acidic, Cold or cool

Habitat or Community Type Trend in New York

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

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 White et al. 2010: This boreal species does not show clear habitat preference, as it is found in both lentic and lotic habitats (Walker and Corbet 1975), although it is generally considered a species of higher elevations, regardless of habitat type occupied, and all New York locations are from higher elevations**.** Lentic habitats include shallower, boggy lakes as well as deeper rocky ponds with sandy beaches. Lotic habitats include sluggish well-vegetated reaches of medium-sized and large rivers (Cannings and Cannings 1994; Nikula *et al.* 2003). Despite being seen in New York at only eight sites, it has been found across all of the aforementioned habitat types, except perhaps “large” river. Adults usually fly out of reach far out over the water (Walker and Corbet 1975).

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):*

S. cingulata has an extended flight season and most pre and post 2005 records of adults and exuviae in New York have been found between 25 June and 17 August. There are a few late records from Sept and early Oct. This aligns with Maine (Brunelle and deMaynadier 2005) where the flight season extends through September or New Hampshire where 17 records from the New Hampshire Dragonfly Survey span June 15-September 25 (Hunt 2012). Walker and Corbet (1975) reported that the majority of dates were in July and August and similarly, 13 of the 17 New Hampshire records were from July or August (Hunt 2012).

Adults usually fly far out of reach over water (Walker and Colbert 1975). Boreal *Somatochlora* nymphs take at least 4 years to develop and they occupy shallow water meadows, sedge-filled pools, and sedge-filled shallows of small ponds. During this time, they are drought resistent and can survive dry conditions for up to 4-9 months through certain physiological adaptations and by actively burrowing in mud and seeking out sheltered locations in moss, cracks in mud, crevices in rotting logs, and sedge root clumps (Wiley and Eiler 1972).

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

Little published information is available citing specific cases of negative impacts to this species or other lake-dwelling odonates, but any activities which degrade the sensitive hydrology of these habitats would threaten populations of these species. Examples include eutrophication and changes in dissolved oxygen content, direct effects of pesticides, increases in the sediment load of the lake (such as might result should logging occur down to the lake edge), chemical contamination by runoff of agricultural or other discharge, acidification of lakes by airborne industrial emissions (NatureServe 2012). White et al. (2015) found most habitats of the Lake Emerald to be moderately vulnerable.

The lake emerald 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. Residential & Commercial Development	Housing & Urban Areas (habitat loss from lakeside development)
2. Climate Change & Severe Weather	Temperature Extremes
3. Pollution	Industrial & Military Effluents (mercury)

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:

The Freshwater Wetlands Act provides protection for regulated wetlands greater than 12.4 acres in size under Article 24 of the NYS Conservation Law. The Adirondack Park Agency has the authority to regulate smaller wetlands within the Adirondack Park. 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:

Additional survey efforts are needed and these may elucidate specific management recommendations that could warrant implementation at specific sites supporting this species in New York.
The Comprehensive Wildlife Conservation Strategy (NYSDEC 2005) includes recommendations for the following actions for odonates of lakes and ponds, and for the lake emerald 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. It is expected that one or more of these species may be recommended for listing and officially adding these species to the list would constitute a specific 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 3. Recommended conservation actions for lake emerald

VII. References

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