

Species Status Assessment

Common Name: Broad-tailed shadowdragon **Date Updated:** January 8, 2024

Scientific Name: *Neurocordulia michaeli* **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):

This newly described species (Brunelle 2000) was discovered as a new member of NY's odonate fauna in 2008 during the NYDDS. It is only known from two sites on the Delaware River and the NY populations are disjunct from the main range forming a small outlier on the extreme southern range boundary of this northerly species. No new sites have been discovered since 2009 and this cryptic, crepuscular species will always likely suffer from a lack of complete knowledge.

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:

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

-IUCN Red List: Least Concern

-Northeast Regional Rank (White et al.2015): R3, Primary Responsibility

Status Discussion:

This is a newly documented species in NYS, discovered at just 2 locales in the state during NYDDS White *et al.* (2010). There have been no confirmed sightings since 2009. Rarity, trend, and threat information suggest this species should be an HPSGCN.

II. Abundance and Distribution Trends

Region	Present?	Abundance	Distribution	Time Frame	Listing status	SGCN?
North America	Yes	Unknown	Unknown	Species was just formally recognized in 2000		-

Region	Present?	Abundance	Distribution	Time Frame	Listing status	SGCN?
				(Brunelle, 2000).		
Northeastern US	Yes	-	Declining	Pre and post 2000	R3; RSGCN	Yes
New York	Yes	Unknown	Declining	Pre and post 2005	S1; HPSGCN	No
Connecticut	No	-	-			No
Massachusetts	No	-	-			No
New Jersey	No	-	-			No
Pennsylvania	No	-	-			-
Vermont	No	-	-			-
Ontario	Yes	Unknown	Unknown		S2	-
Quebec	Yes	Unknown	Unknown		S3	-

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.

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

Recent survey efforts have expanded the known range of this species, especially in Ontario (Catling *et al.*, 2004). However, because this is a newly described, cryptic, crepuscular species (Brunelle, 2000) this probably does not indicate a recent range expansion, but simply increased attention by Odonatologists.

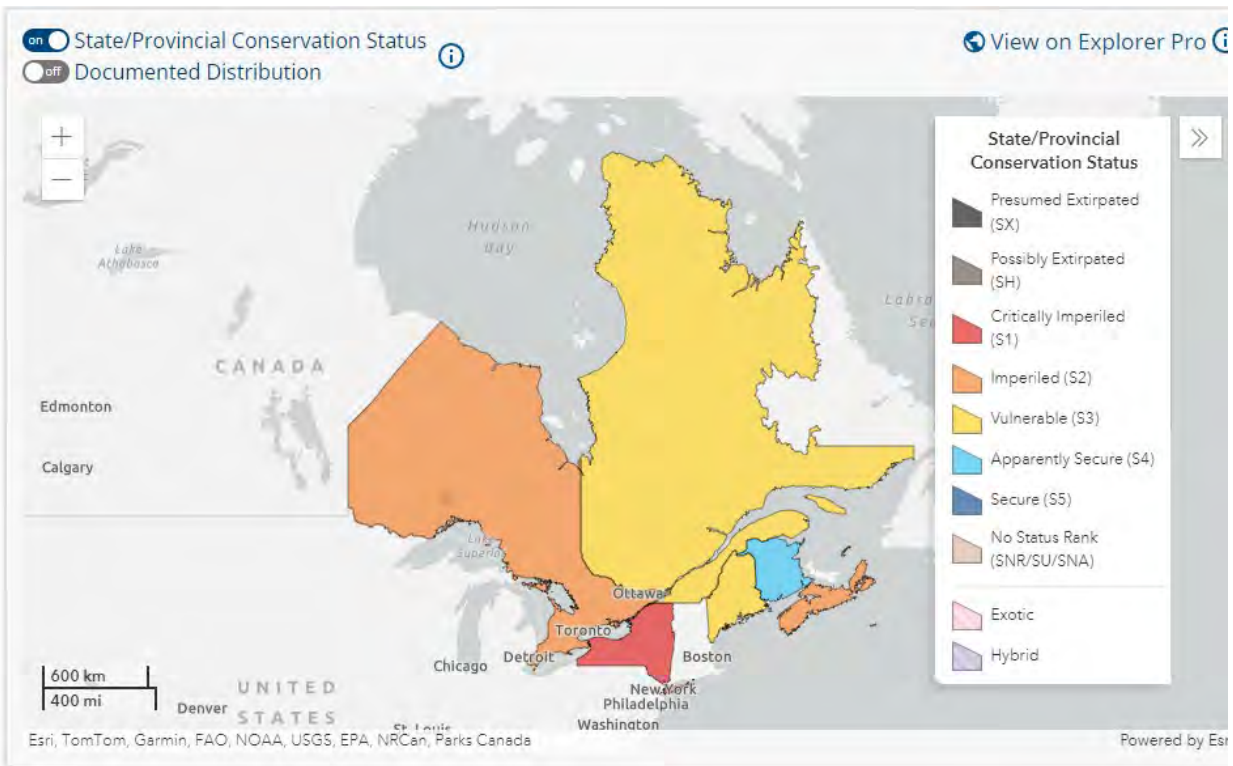


Figure 1. Conservation status of the Broad-tailed Shadowdragon in North America (NatureServe 2024).

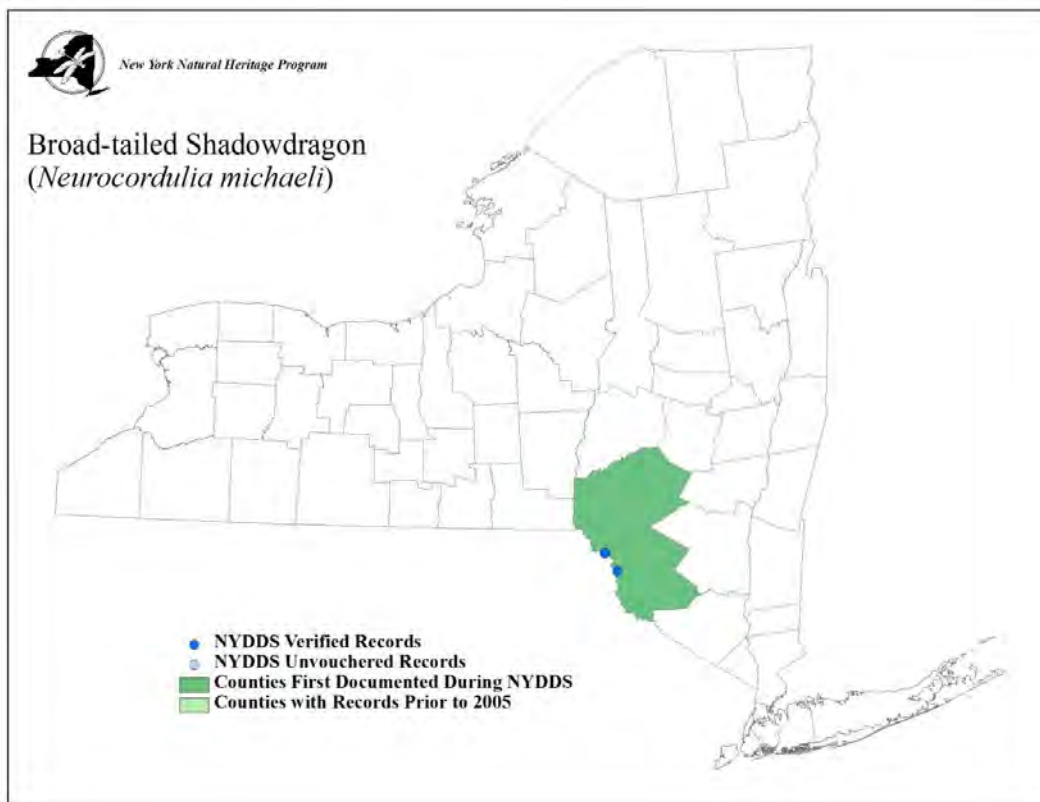


Figure 2. Occurrence record of the Broad-tailed Shadowdragon in New York during the NYDDS (White *et al.* 2010).

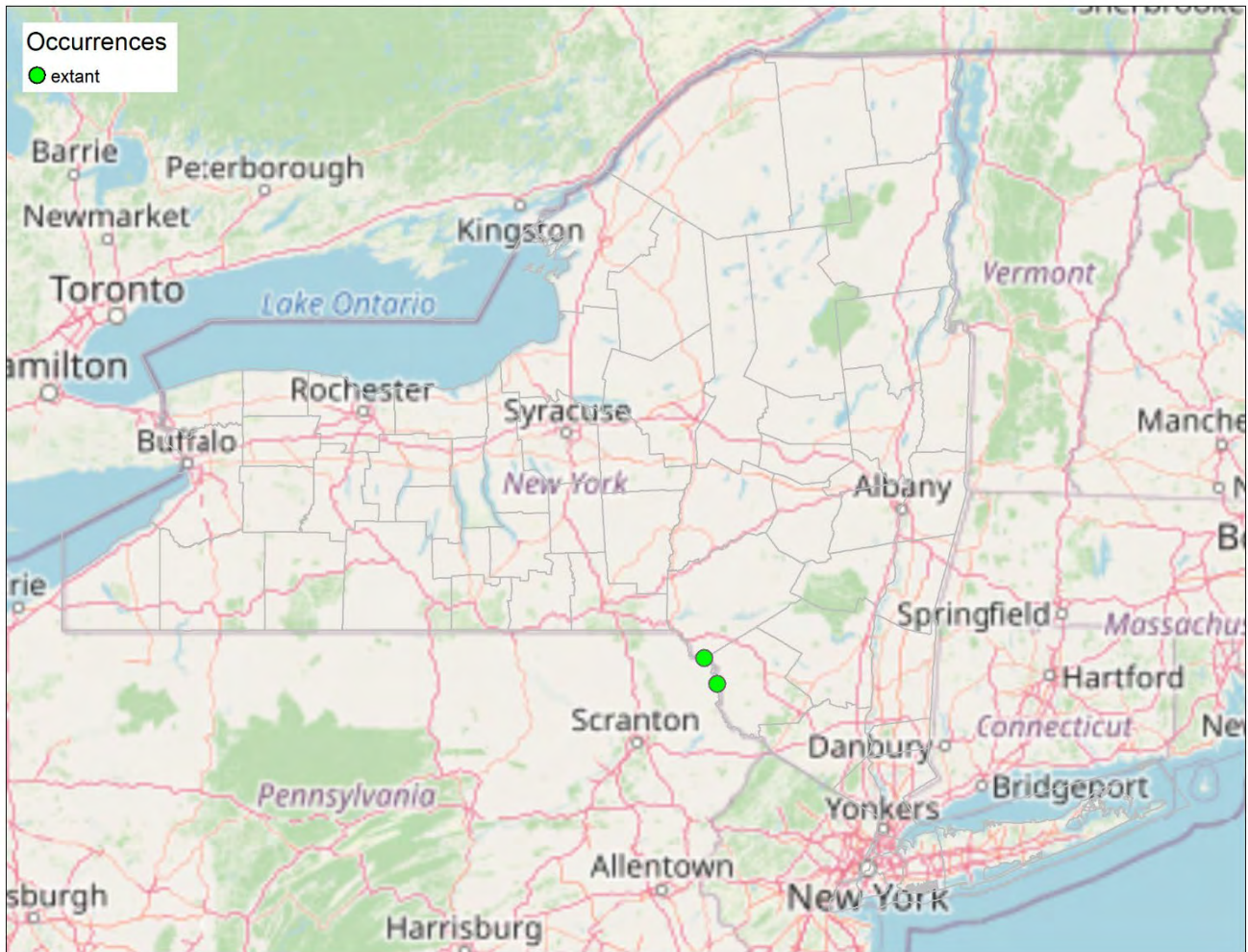


Figure 3. NYNHP element occurrence records for the broad-tailed shadowdragon in New York (NYNHP 2024).

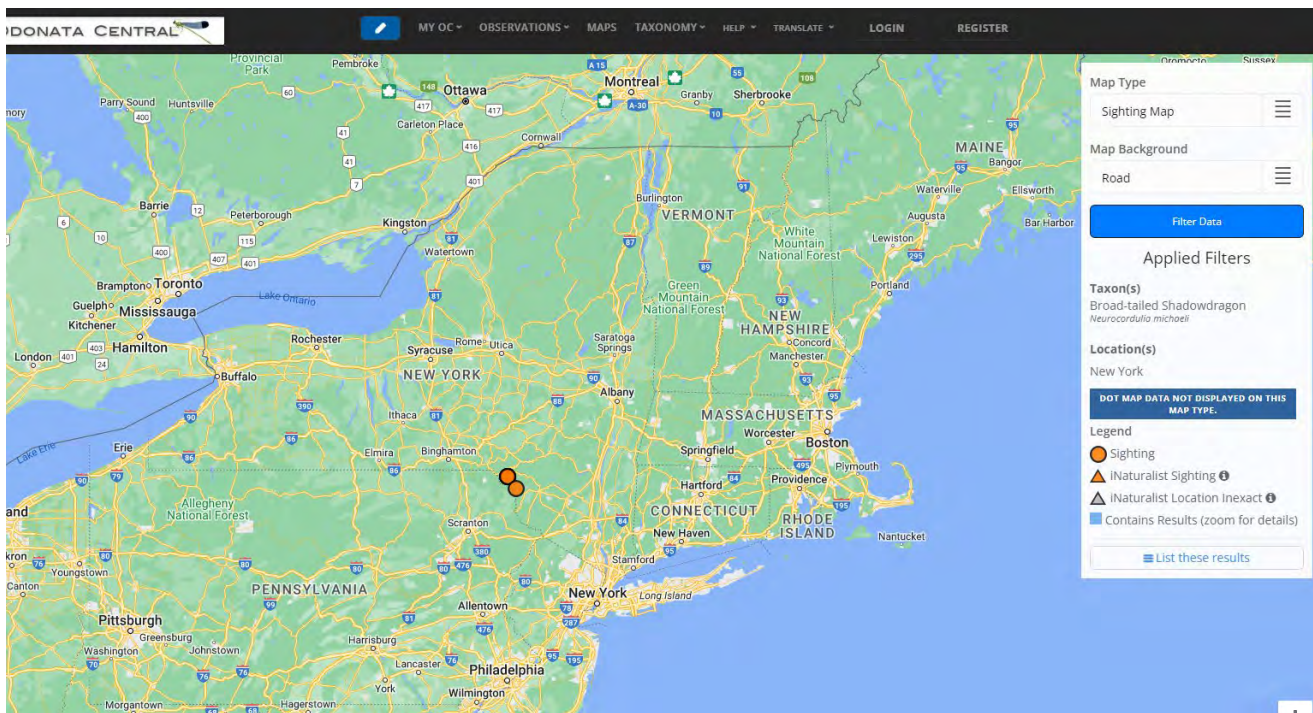


Figure 4. Distribution of the broad-tailed shadowdragon in New York (Abbott 2024).

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

N. michaeli may be more common and widespread than current records indicate, but owing to its cryptic, crepuscular behavior as well as its similarity to other *Neurocordulia*, it may be under-reported. Status of disjunction is not known, but the species was not discovered during a multi-year odonate atlas just completed in New Hampshire (Hunt, 2012).

Years	# of Records	# of Counties	% of State
Pre-2004	0	0	0
2005-2009	2	1	<1-2%
2010-2023	0	0	0-2%

Table 1. Records of broadtail shadowdragon in New York.

Details of historic and current occurrence:

This species was newly discovered in NYS on the Delaware River in 2008, 2009 during the NYDDS at two nearby locations on the Delaware River. There was an unconfirmed exuvial record from the Oswegatchie River in St. Lawrence County during the NYDDS, but could not be confirmed without an adult (White et al. 2010). No additional reports have surfaced since this time (Abbott 2024, iNaturalist 2024, White *et al.*, 2010). As with other locations in Maine (Brunelle, 2000) and Ontario (Catling *et al.*, 2004), the species can sometimes be locally abundant.

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%	Disjunct	Few hundred 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):*

a. Size/Waterbody Type: Medium Mainstem River

b. Geology: Moderately Buffered

c. Temperature: Transitional Warm

d. Gradient: Very Low to Low to Moderate

Habitat or Community Type Trend in New York

Habitat Specialist?	Indicator Species?	Habitat/Community Trend	Time frame of Decline/Increase
Yes	Yes	Declining	See Donnelly (1993) for specifics on Delaware River

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:

This dragonfly is found only in clear, clean medium to large rivers with a strong current over coarse cobbles and periodic rapids sections; it is not found in tumultuous mountain streams. Larvae have been collected from beneath stones under boulders in water one-half to 1 meter deep in riffles at the head of spring-fed pools. The exuviae (shed skins) can sometimes be found on bridge abutments. Adults presumably live in riparian forests.

Eggs are laid outside of plant tissues in rapids and the downstream ends of pools, and development of larvae in interstices of the benthic cobbles where the eggs would be carried when laid. Larvae have been taken in larger rivers (St. Croix River, Charlotte County, New Brunswick), but laying has not yet been observed in that habitat and the larvae might have been flushed from tributaries. The microhabitat appears to be rapids sections below pools (Corser 2013).

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):*

As with all Neurocordulia, this is a crepuscular (twilight) species that flies for about 45 minutes after sundown in late May to early June in New York. Daylight hours are probably spent at rest in the understory of surrounding forests (Catling et al., 2004). In New York, this species has only been detected during the last few days in May and first couple days of June. In Ontario and Maine, the flight season encompasses June, July.

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

Because the entire NYS population occurs on only a small segment of the Delaware River, any activities which degrade the sensitive hydrology of these habitats would threaten this species. The most important likely negative impacts would come from changes in the natural hydrology such as water removals (from hydrofracking), the building of dams (Donnelly, 1993), increases in the sediment load 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).

Threats to NY Populations	
Threat Category	Threat
1. Natural Systems Modifications	Dams & water management/use (alteration of natural hydrology)
2. Biological Resource Use	Logging & wood harvesting (siltation)
3. Energy Production & Mining	Fracking issues

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 permit program. This is not adequate to protect the habitat/species.

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 or hydrological alteration such as agricultural run-off, upland development, and damming that would affect flow of small forested streams should be considered when managing for this species (New York Natural Heritage Program 2024b).

Given the apparent range expansion suggested by the increasing number of recent records, monitoring of some subset of sites in the face of climate change may shed light on whether this is a threat to the species or a possible factor involved in the range change.

The effects on this species of managing the upper Delaware River as a coldwater trout sport fishery (via hypolimnial water releases from the NYC water supply dams) should be investigated. In addition, dense stands of invasive Japanese Knotweed (*Fallopia japonica*) along the riverbanks may alter ecological processes along this reach of the river.

The Comprehensive Wildlife Conservation Strategy (NYSDEC 2006) includes recommendations for the following actions for odonates of rivers and streams.

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 at least a few species will be recommended for listing and officially adding these species to the list would constitute a concrete action. Four of the species are currently listed as Special Concern, but it is possible a change in their listing status may be warranted following additional surveys.

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. Maintain existing populations and, if needed and possible, establish or restore additional populations, to ensure the long-term persistence of these species in New York State.

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 broad-tailed shadowdragon

VII. References

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Originally prepared by	Jeffrey D. Corser
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