Species Status Assessment

Common Name: Marsh Flicker **Date:** 2024-10-13

Scientific Name: *Pyractomena dispersa* **Updated By:** Katie Hietala-Henschell

Class: Insecta

Family: Lampyridae

Species Synopsis

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

Pyractomena dispersa, also known as the Marsh Flicker, is a wetland habitat specialist and can be found in river sloughs or marshy habitat with cattails present. This species has a disjunct population separating eastern and western portions with few occurrences. It has been reported from the Great Plains region and has occurrences scattered in the Southeast, Northeast, Upper Midwest, and Rocky Mountains (Lloyd 2018, Walker 2021).

Across its range, the IUCN Red List Firefly Specialist group has assessed *P. dispersa* as Data Deficient with a decreasing population trend (Walker 2021). In New York, *P. dispersa* has been documented from Madison, Otsego, Tompkins, Rockland, Ulster, Dutchess, and Rensselaer counties. This species appears to be active in New York as early as late May through mid-June (Green 1957, Lloyd 2018). Preliminary results suggest the possibility of *P. dispersa* occurring in Albany County (NYNHP 2024).

In 2021, the International Union for Conservation of Nature (IUCN) Red List conducted baseline conservation assessments for nearly 80% of described firefly species in the United States and Canada. The IUCN Red List found approximately 14% of fireflies are threatened with extinction and more than half of the species (53%) could not be evaluated due to lack of data (Fallon et al. 2021). Future firefly work including monitoring and protecting populations of at-risk species, preserving, and restoring habitat, and gathering data to fill critical information gaps (e.g., population trends) for potentially rare or at-risk species, like *P. dispersa*, will help inform conservation efforts.

I. Status

a. Current legal protected Status

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

ii. **New York:** Unprotected

b. Natural Heritage Program

i. **Global:** GU

ii. **New York:** SNR **Tracked by NYNHP?:** No

Other Ranks:

-New York 2025 SGCN status: High Priority Species of Greatest Conservation Need
-COSEWIC: Not listed in Canada
-IUCN Red List: Data Deficient
-Northeast Regional SGCN: Not listed

Status Discussion:

Pyractomena dispersa has been assessed by the IUCN Red List Firefly Specialist Group as having a decreasing population trend (Walker 2021). This species is a habitat specialist of ponds, river sloughs, or marsh habitats with cattails (Faust 2017). In New York, this species appears to be restricted to the southern part of the state and is currently documented from six counties. West Virginia is the only U.S. state with a State Conservation Rank and *P. dispersa* has been assessed as Vulnerable (S3) (NatureServe 2023). *Pyractomena dispersa* appears to occur in smaller populations along with others in the genus *Pyractomena* which typically occur in lower numbers (Faust 2017). *P. dispersa* is suspected to be of high conservation concern (Fallon et al. 2022).

II. Abundance and Distribution Trends

Region	Present?	Abundance	Distribution	Time Frame	Listing status or S-Rank	SGCN?
North America	Yes	Unknown	Unknown	Unknown		
Northeastern US	Yes	Unknown	Unknown	Unknown		
New York	Yes	Unknown	Unknown	Unknown	SNR	No
Connecticut	No	Unknown	Unknown	Unknown	SNR	No
Massachusetts	No	Unknown	Unknown	Unknown	SNR	No
New Jersey	No	Unknown	Unknown	Unknown	SNR	No
Pennsylvania	No	Unknown	Unknown	Unknown	SNR	No
Vermont	No	Unknown	Unknown	Unknown	SNR	No
Ontario	No	-	-	-		
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 Dark Skies for Fireflies project (2023-2025), a partnership between New York Natural Heritage Program (NYNHP) and the Office of Parks, Recreation, and Historic Preservation (OPRHP), is an effort to survey fireflies in New York State Parks; however, there are no systematic monitoring efforts directed toward this species.

Trends Discussion

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

The IUCN Red List conservation status for *P. dispersa* was assessed as Data Deficient because local extirpations have occurred throughout its range (Walker 2021). In part because this species is wetland habitat specialist and wetlands have declined in the U.S. While large scale data sets are currently unavailable to confidently estimate trends several case studies are available. Fireflies that are restricted to specialized habitats tend to be more likely to be threatened by some level of extinction and should be included as SGCN (Fallon et al. 2021).

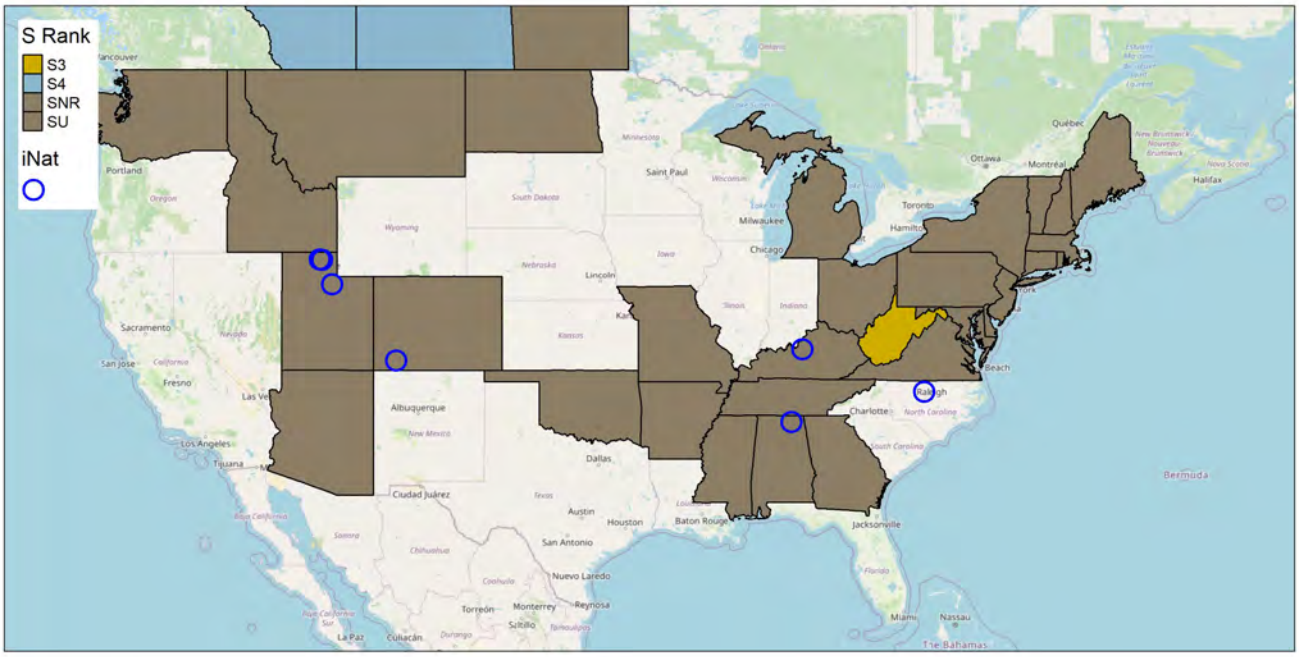

Figure 1: *Pyractomena dispersa* North American distribution. Points show research-grade iNaturalist observations (iNaturalist community 2023, NatureServe 2023).

Figure 2: IUCN Red List map of *Pyractomena dispersa* North American distribution (Walker 2021).

Figure 3: *Pyractomena dispersa* regional distribution as reported at https://northeastwildlifediversity.org/rsgcn .

III. New York Rarity

(provide map, numbers, and percent of state occupied)

Within its range, *P. dispersa* prefers wetland habitat with a cattail component (Faust 2017). Currently, there are no records of *P. dispersa* in the NYNHP element occurrence database. Available records suggest that this species occurs in approximately 10% of New York (NYNHP 2024). *P. dispersa* was observed in Madison, Otsego, Tompkins, Rockland, Ulster, Dutchess, and Rensselaer counties in the early and mid-1900s (Green 1957, Lloyd 2018). Preliminary data from the Dark Skies for Fireflies project suggest that *P. dispersa* may occur in Albany County (NYNHP 2024). Flash pattern data and voucher specimens were collected in 2023 and 2024. Species determinations and verifications are currently underway.

Figure 4: NYS distribution of *Pyractomena dispersa* based on historic records (pre-1999) primarily from Green 1957 and Lloyd 2018. These points represent low accuracy from georeferenced locations based on county level descriptions (NYNHP 2024).

Years	# of records	# of Counties	% of counties in State
Pre-1999	10	6	9.7
2000-present	NA	NA	NA

Table 1. Number of observations of *Pyractomena dispersa* grouped by the dates known to be extant (repeat observations (element occurrences) include the years spanning first observation to last observation) and the number and percent of total of counties these observations fall within for New York State.

Details of historic and current occurrence:

Percent of North American Range in NY	Classification of NY Range	Distance to core population, if not in NY
1-25%	Disjunct	

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):

NatureServe (2023) broad habitat types: Old field, Grassland/herbaceous, Herbaceous Wetland, Bog/fen

Habitat or Community Type Trend in New York

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

IUCN Red List (Walker 2021):

Adult *Pyractomena dispersa* are typically seen flying over wet habitats including swamps, marshes, river sloughs, low wet pastures where the water table prevents agricultural crops from growing, and other poorly drained areas (Lloyd 2018, Faust 2017). In the Rocky Mountains, this species occurs in permanent marsh areas at altitudes from 2,100 to 2,440 metres (Buschman 2016).

V. Species Demographics and Life History

Breeder in NY?	Non-breeder in NY?	Migratory Only?	Summer Resident?	Winter Resident?	Anadromous/ Catadromous?
Yes	Yes	No	Yes	Yes	No

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):

IUCN Red List (Walker 2021):

At lower latitudes, adults of this species are active in the spring, beginning in April, but at higher latitudes and altitudes, adults are active from late June to early July (Lloyd 2018). Courtship displays begin about 35 minutes after sunset (Faust 2017). Males fly low over vegetation giving off short, yellow-orange flicker-flashes that are repeated every three to five seconds (Faust 2017, Lloyd 2018). After seeing a female flash response, males land nearby instead of flying directly to the female, perhaps as protection against predatory *Photuris* fireflies (Lloyd 2018).

Many larval *Pyractomena* are known to be predacious, feeding on snails and other invertebrates (Buschman 1984, Majka 2012, Lloyd 2018). However, feeding habits of larval *P. dispersa* are unknown.

VI. Threats

Threat Level 1	Threat Level 2	Threat Level 3	Spatial Extent	Severity	Immediacy	Trend	Certainty
6. Human Intrusions & Disturbance	6.1 Recreational Activities	6.1.8 Wildlife observation/photography	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
7. Natural System Modifications	7.3 Other Ecosystem Modifications	(habitat loss/degradation)	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
9. Pollution	9.3 Agricultural & Forestry Effluents	9.3.1 Nutrient loads	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
9. Pollution	9.3 Agricultural & Forestry Effluents	9.3.3 Herbicides & pesticides (runoff)	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
9. Pollution	9.6 Excess Energy	9.6.1 Light pollution	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
11. Climate Change	11.1 Habitat Shifting & Alteration	-	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 2. Threats to *Pyractomena dispersa.*

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:

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

Threats to *P. dispersa* include light pollution, soil and air pollution, pesticides, habitat fragmentation and destruction, and climate change (Lewis et al. 2024). Minimizing these key threats are needed to conserve at-risk firefly species. In addition, Reed et al. (2020) found that fireflies have numerous risk factors that can contribute and make them more susceptible to various threats, including specialized diets, poor dispersal abilities, and unique mating signals and behaviors.

Artificial lights can impair firefly communication resulting in reduced courtship and mating (Faust et al. 2012). *P. dispersa* becomes active within an hour after sunset (Faust 2017), potentially making it less sensitive to light pollution. Even low levels of light pollution can reduce reproductive success (Owens et al. 2022). Light pollution can be managed by turning off unnecessary lights and planting hedgerows or trees around occupied sites to block trespassing light. Pesticide exposure can reduce fitness and cause mortality, especially in the long-lived, ground-dwelling larval life stage. Runoff or direct exposure of insecticides, herbicides, and fertilizers may degrade firefly habitat and can have lethal and sublethal effects on fireflies (Lewis et al. 2024). Sublethal effects can include changes in the midgut, body convulsions, persistent glow, and other physiological changes (Wang et al. 2022). Indirect effects include contaminating and reducing available prey.

Habitat loss and degradation is another leading threat to firefly populations. While some fireflies are generalists, like the common *Photinus pyralis* (Big Dipper Firefly), others are habitat specialists and are restricted to specific conditions. Once unique habitats – such as wetlands and mature forests – are lost, fireflies may experience direct mortality or be unable to recolonize an area that has been converted or developed. Climate Change can result in more droughts, wildfires, floods, sea-level rise, etc. all of which can potentially negatively impact fireflies in all life stages. Maintaining the natural hydrology of a site will benefit firefly populations.

Overtourism can lead to development and trampling. Impressive firefly light shows can draw large crowds that may increase onsite light pollution or trample individuals and habitat (Lewis et al. 2024). While programing and education/outreach surrounding these species can increase insect conservation and awareness, care should be taken at known sites to limit access areas and light use during breeding.

Additional conservation actions to support at-risk firefly populations include reducing light pollution that spills into parks or other sensitive areas, eliminate the use of broad-spectrum insecticides, modify mosquito control programs to minimize risk to fireflies, and protect wetland and riparian habitat from recreational activities (Lewis et al. 2024).

Table 3. Recommended conservation actions for *Pyractomena dispersa*.

Action Category	Action	Description
A.1 Direct Habitat Management	A.1.0.0.0 Direct Habitat Management	Site/Area management
A.2 Direct Species Management	A.2.0.0.0 Direct Species Management	Invasive/problematic species control
B.3 Outreach	B.3.1.0.0 Outreach, communication, and distribution	Awareness & Communications
C.6 Design and Plan Conservation	C.6.0.0.0 Design and plan conservation.	Site/Area protection
C.6 Design and Plan Conservation	C.6.0.0.0 Design and plan conservation.	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.7.1.3.0 Create, amend, or influence regulation	Regulations
C.7 Legislative and Regulatory Framework or Tools	C.7.2.1.0 Create or amend policies	Policies
C.9 Education and Training	C.9.2.0.0 Training and individual skill development	Training

VII. References

This SSA drew heavily from these resources:

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Additional references:

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Lloyd, J.E. 2018. *A naturalist's long walk among shadows: of North American Photuris - patterns, outlines, silhouettes… echoes*. Self-published, Gainesville, FL.

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