Species Status Assessment

Common Name	globe flat sedge	**Date Updated:**	2023-12-20
Scientific Name	*Cyperus echinatus*	**Updated By:**	Kyle J. Webster
Family	Cyperaceae		

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

Globe flat sedge (*Cyperus echinatus*) is a perennial graminoid in the Sedge Family (Cyperaceae). It occurs from Massachusetts south Florida and west to New Mexico, Kansas, Nebraska, and Michigan (NatureServe 2023). *Cyperus* has a global distribution throughout tropical and pantemperate areas and consists of approximately 600 species, 96 of which occur in North America (Flora North America 2002). There are 32 species of *Cyperus* in New York, 19 of which are native (Werier et al. 2023).

In New York, *Cyperus echinatus* occurs in open disturbed habitats within serpentine barrens, coastal oak-hickory forests, edges of high salt marshes, grasslands, and meadows. (Edinger et al. 2014, NYNHP 2023, 2024). It was once common in the New York City area but is now considered extirpated from Queens, New York, Kings, and Nassau Counties. It is now known to be extant from only 11 populations in the Bronx, Staten Island, Westchester County and Orange County (NYNHP 2023).

Cyperus echinatus has declined in New York over the last 100 years, but the short-term trends are unclear. Many of the historical populations has have been extirpated due to development (NYNHP 2023, 2024). Some new populations have been found in recent years, but some existing populations appear to be declining and there is not enough survey data to assess the status of others (NYNHP 2023). More surveys are needed to assess the short-term trends of *Cyperus echinatus* New York.

I. Status

a. Current legal protected Status

i. Federal: **Candidate:**

ii. New York: Endangered

b. Natural Heritage Program

i. Global: G5

ii. New York: S1 **Tracked by NYNHP?** On Active Tracking List

Other Ranks:

COSEWIC: Not listed in Canada
IUCN Red List: Not assessed by IUCN Red List

Status Discussion:

Cyperus echinatus is Endangered in New York State (Ring 2023). There are 11 extant populations in the state. At least two of those populations have declined and many have been surveyed only once. Most historical records from the New York City area are presumed extirpated. Only two populations contain more than 100 individuals. The remaining contain fewer than 50 individuals. Two populations have not been seen in recent surveys.

II. Abundance and Distribution

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	E	
Connecticut	Yes	Unknown	Unknown	Unknown	SNR	
Massachusetts	Yes	Unknown	Unknown	Unknown	SNR	
New Jersey	Yes	Unknown	Unknown	Unknown	S4	
Pennsylvania	Yes	Unknown	Unknown	Unknown	S4	
Vermont	No	-	-	-		
Ontario	No	-	-	-		
Quebec	No	-	-	-		

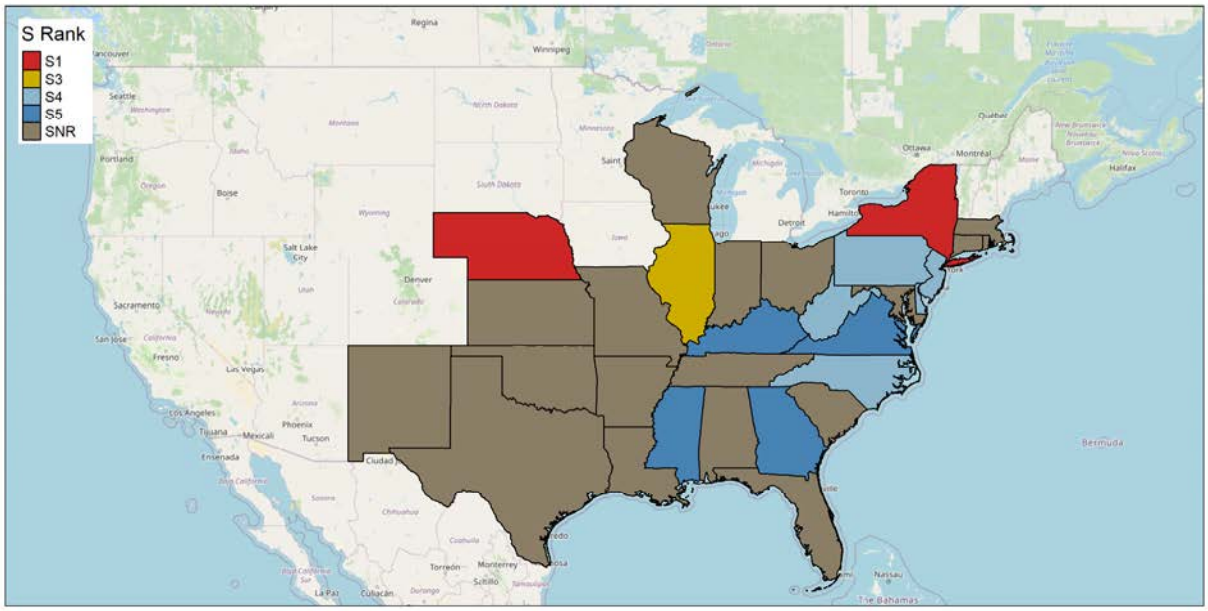

Figure 11: Cyperus echinatus *North American distribution.*

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

III. NY Rarity and Trends

Trends Discussion

Cyperus echinatus has declined in New York over the last 100 years. It was once relatively common in the New York City area and on Staten Island, but development has extirpated most populations and destroyed their habitat (NYNHP 2023, 2024). The short-term trends of extant populations are unclear. There have been four new populations found within the last five years, but the existing populations appear to be declining due to invasive plant species, succession, and disturbance (NYNHP 2023). Of the 11 extant populations none contain more than 100 individuals (NYNHP 2023). Two of the populations were not found when last surveyed, at least one has clearly declined, and six have only been surveyed once (NYNHP 2023). More surveys are needed to assess the short-term trends in New York.

Details of historic and current occurrence

This species is known from the Lower Hudson Valley and New York City area, including Bronx, Kings, Nassau, New York, Orange, Queens, Richmond, and Westchester Counties (NYNHP 2023, Werier et al. 2023). It was once common in the New York City area but is now considered extirpated from Queens, New York, Kings, and Nassau Counties, and restricted to a few populations in the Bronx, Staten Island, Westchester County and Orange County (NYNHP 2023).

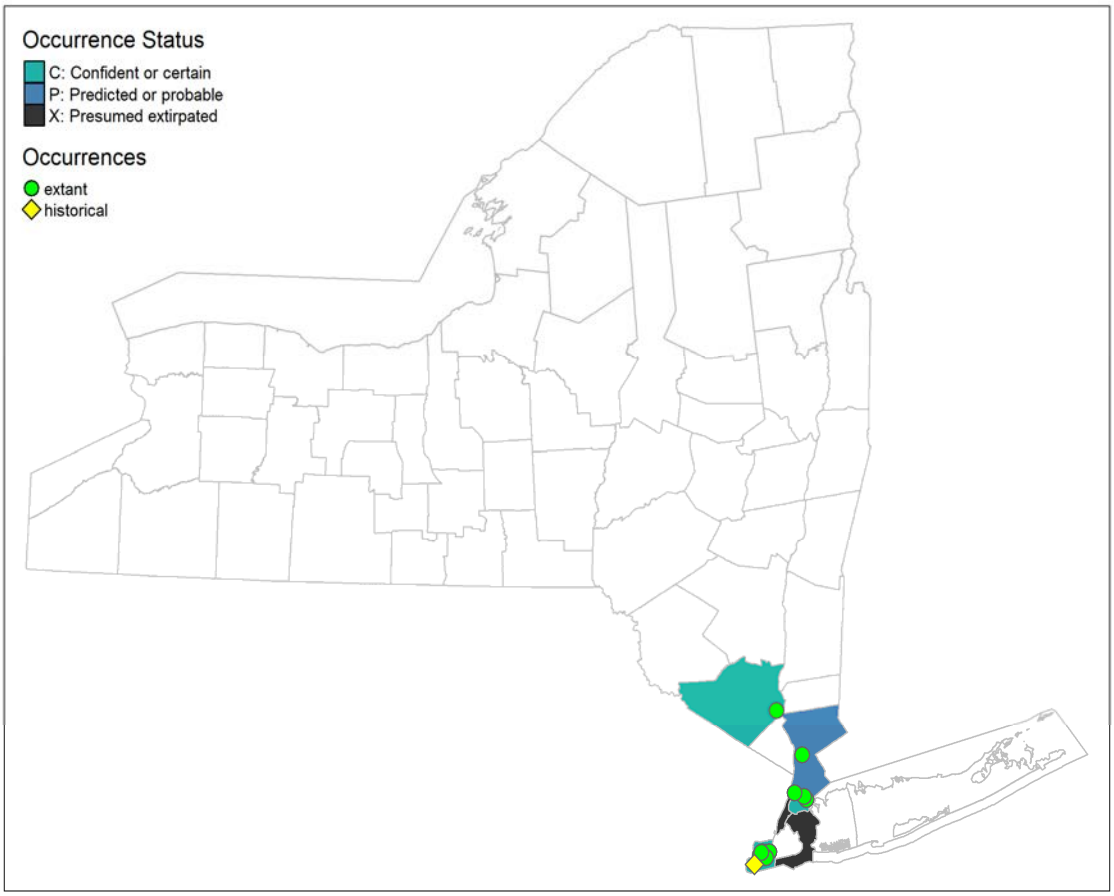

Figure 22: *NYS distribution of* Cyperus echinatus.

Table 1. *Number of records (element occurrences) of* Cyperus echinatus *grouped by the dates known to be extant (the years spanning first observation to last observation) and the number and percent of total of USGS 7.5 minute map quadrangles these observations fall within for New York State.*

Years	# of Records	# of distinct quads	% of quads in State
Pre-1995	6	4	0.4
1995-2004	3	2	0.2
2005-2014	4	3	0.3
2015-2023	7	5	0.5

Monitoring in New York

There are 12 populations known statewide, of which 11 are extant and one is historical. One population occurs on NYS Park lands and is monitored on a ten-year rotation. None of the other populations are regularly monitored. Two populations have not been surveyed since 1987 and 1991 respectively, while the remaining populations were last surveyed between 2011 and 2023 (NYNHP 2023).

IV. Primary Habitat or Community Type *(from NY crosswalk of NE Aquatic, Marine, or Terrestrial Habitat Classification Systems):*

NY Natural Heritage Communities: Serpentine barrens, Coastal oak-hickory forest, High salt marsh (Edinger et al. 2014).

Habitat or Community Type Trend in New York

Declining:	**Stable:**	**Increasing:**	**Unknown:** ✓
Time Frame of Decline/Increase:			
Habitat Specialist	**Yes:**	**No:** ✓	

Habitat Discussion:

In New York *Cyperus echinatus* occurs in open, disturbed, habitats within serpentine barrens, coastal oak-hickory forests, edges of high salt marshes, grasslands, and meadows. (Edinger et al. 2014, NYNHP 2023, 2024).

Disturbed, sunny sites, in mesic places, well-drained soils; predominantly an inland species of roadsides, pastures, and other disturbed ground (Flora North America 2002). Dry woods and fields (Gleason & Cronquist 1991). Sandy swamps, ditches, open woods and barrens (Fernald 1970).

V. Species Demographics and Life History *(include information about species life span, reproductive longevity, reproductive capacity, age to maturity, and ability to disperse and colonize):*

Cyperus echinatus is a perennial sedge. In New York, the wind pollinated flowers bloom in mid-summer. Each flower develops into a single seed (achene). The seeds develop throughout summer and disperse when mature, typically in early autumn (NYNHP 2023). In addition to falling directly from the inflorescence, seeds may be dispersed short distances by wind and water (Lew-Smith 2003).

Justice (1975) found that the seeds of some related *Cyperus* were dormant at maturity and for a short time after dispersal. They found that many species of *Cyperus* require after-ripening, maturation of the seed after dispersal, for germination to occur (Justice 1957). While some dormant seeds were able to germinate under a combination of light exposure and cold stratification, after-ripening was found to reduce those requirements and increase germination rates over time (Justice 1957). Baskin and Baskin (1971a, 1971b) found that the seeds of the related *Cyperus squarrosus* could be forced to germinate through a combination of stratification, scarification, and exposure to light. Baskin and Baskin (1971b) concluded that the duration and intensity of light was a critical factor to initiating germination of *Cyperus squarrosus* seeds and likely limited the species habitat. The combination of these factors being required for germination may indicate that disturbance is required to induce germination in the field.

Most *Cyperus* species, including *Cyperus echinatus*, occur in open habitats and are assumed to be disturbance-adapted. Disturbance is often required to prevent shading by perennial woody plants and to initiate germination. In New England, the severity and frequency of disturbance are important to the growth and persistence of *Cyperus houghtonii* populations (Lew-Smith 2003). Given *Cyperus echinatus* occupies similar habitats, similar conclusions might be drawn.

Little information regarding the natural history, demographics, or ecology of *Cyperus echinatus* itself is available. More research is needed.

Table 2. *Phenology of* Cyperus echinatus *in New York State (NYNHP 2023).*

Phenology	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Fruiting							■	■	■	■		

VI. Threats

Current populations are threatened by destruction from development and trampling. Succession and lack of disturbances also threatens this species. A lack of fire or other disturbances that maintain open habitats may lead to decreases and eventually extirpation of populations.

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:

Dormant season prescribed fire, mowing, or other management techniques that maintain open habitats and encourage germination should be implemented. Direct and persistent disturbances should be minimized or avoided. Development within or adjacent to the plants should be avoided or its impacts mitigated.

Complete Conservation Actions table using IUCN conservation actions taxonomy at link below. Use headings 1-6 for Action Category (e.g., Land/Water Protection) and associated subcategories for Action (e.g., Site/Area Protection) - https://www.iucnredlist.org/resources/conservation-actions-classification-scheme

Table 3. *Recommended conservation actions for* Cyperus echinatus*.*

Conservation Actions	
Action Category	**Action**
Land/water protection	1.1. Site/area protection
Land/water protection	1.2. Resource & habitat protection
Land/water management	2.1. Site/area management
Land/water management	2.2. Invasive/problematic species control
Land/water management	2.3. Habitat & natural process restoration

VII. References

This SSA drew heavily from these resources:

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