

Species Status Assessment

Common Name	reflexed flat sedge	Date Updated:	2023-03-05
Scientific Name	<i>Cyperus retrorsus</i>	Updated By:	Kyle J. Webster
Family	Cyperaceae		

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

Reflexed flat sedge (*Cyperus retrorsus*) is a perennial graminoid in the Sedge Family (Cyperaceae). It occurs from along the coastal plain from southeastern New York to Florida, then west to Texas, and then inland to Kentucky and southeastern Oklahoma (Weakley 2020). *Cyperus* has a global distribution throughout tropical and temperate 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 retrorsus* occurs in sandy coastal habitats including maritime dunes and the upper edges salt marshes, however more information on the habitat requirements of this species in the state is needed (NYNHP 2023). There are six extant populations known from Kings, Nassau, Queens, and Suffolk Counties. Most of the historical populations of *Cyperus retrorsus* are from western Long Island and New York City (NYNHP 2023).

Cyperus retrorsus has declined in New York over the long-term. With fewer than 20 populations ever documented in the state, it has likely always been rare (NYNHP 2024). The majority of these historical populations are assumed to be extirpated due to development or habitat destruction (NYNHP 2023). Due to a lack of recent census data the short-term trends within the populations are unknown. More surveys are needed to understand the short-term trends of *Cyperus retrorsus* in New York.

I. Status

a. Current legal protected Status

i. Federal:		Candidate:	
ii. New York:	<u>Endangered</u>		

b. Natural Heritage Program

i. Global:	<u>G5</u>		
ii. New York:	<u>S1</u>	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 retrorsus is Endangered in New York (Ring 2023). There are six extant populations but one has not been seen despite recent survey efforts. At least four populations have been extirpated due habitat destruction. One population consists of 150-300 individuals, while the remaining populations consist of fewer than twelve individuals or have not been censused.

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	No	-	-	-		
Massachusetts	Yes	Unknown	Unknown	Unknown	S1	
New Jersey	Yes	Unknown	Unknown	Unknown	SNR	
Pennsylvania	Yes	Unknown	Unknown	Unknown	SH	
Vermont	No	-	-	-		
Ontario	No	-	-	-		
Quebec	No	-	-	-		

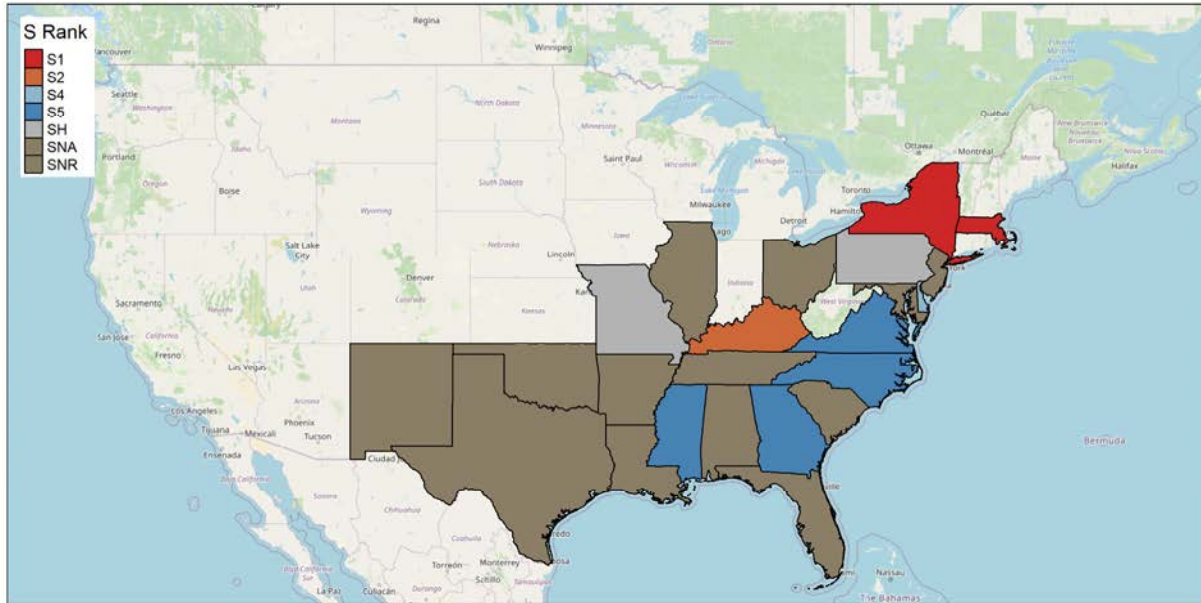


Figure 1: *Cyperus retrorsus* North American distribution.

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 retrorsus has declined in New York over the long-term. This species was likely always rare in the state with fewer than 20 populations having been documented (NYNHP 2024). The majority of these historical populations were concentrated around New York City and western Long Island and are assumed to be extirpated due to development. Currently there are six extant populations, one of which has not been seen during recent surveys (NYNHP 2023). Due to a lack of recent census survey data the short-term trends within populations are unknown. More surveys of extant and historical populations are needed to better determine the short-term trends of *Cyperus retrorsus* in New York.

Details of historic and current occurrence

Cyperus retrorsus is currently known from Kings, Nassau, Queens, and Suffolk County. It was historically known from most of Long Island, Staten Island, and Westchester County. Many historically known populations around New York City and western Long Island are assumed to be extirpated.

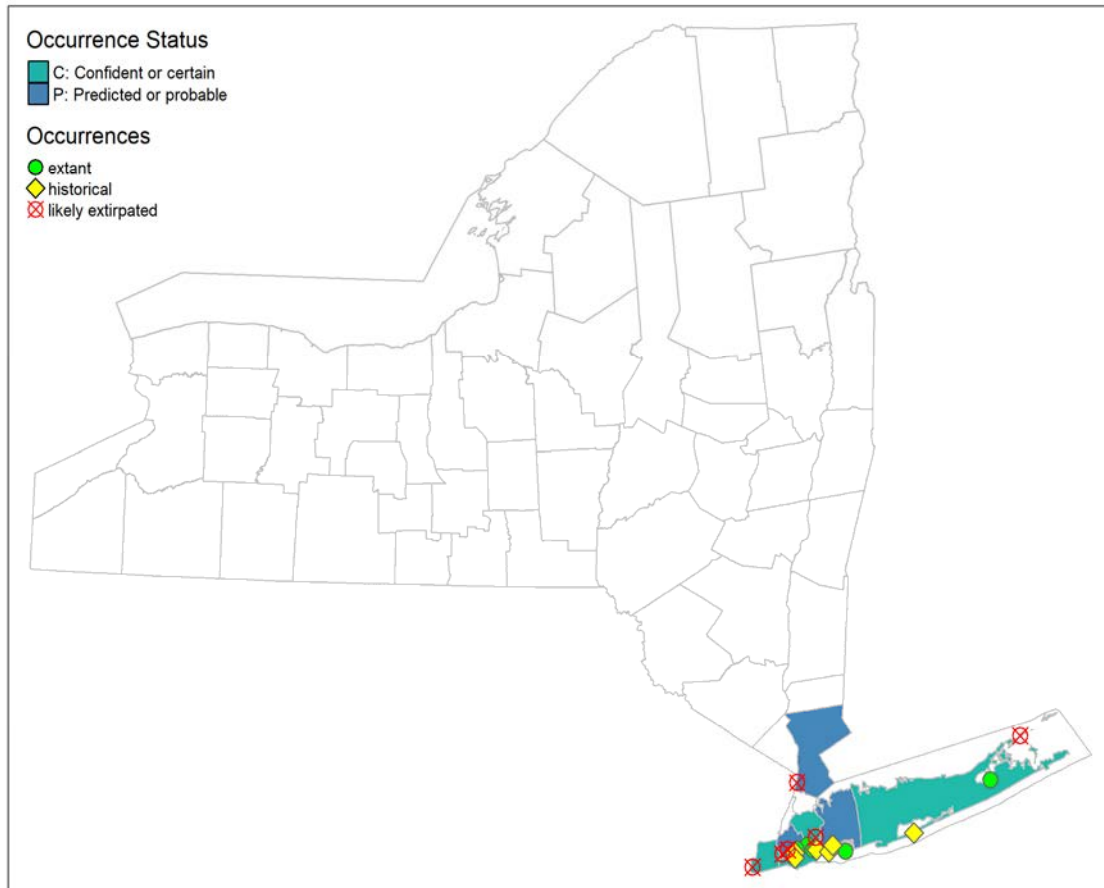


Figure 2: NYS distribution of *Cyperus retrorsus*.

Table 1. Number of records (element occurrences) of *Cyperus retrorsus* 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	14	14	1.4
1995-2004	1	1	0.1
2005-2014	0	0	0.0
2015-2023	2	2	0.2

Monitoring in New York

There are 17 populations known statewide, of which six are extant, seven are historical, and four are extirpated (NYNHP 2023). One population occurs on NYS Parks lands and is monitored on a ten-year rotation. None of the other populations are regularly monitored. One of the extant populations has not been seen since 2003 despite surveys for it (NYNHP 2023). Two extant populations were last seen in 1992 and 1994, one was last seen in 2003, and two were last seen in 2018 and 2019 (NYNHP 2023).

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

Habitat or Community Type Trend in New York

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

Habitat Discussion:

This species occurs in sandy coastal habitats including maritime dunes and the upper edges of salt marshes (NYNHP 2023). Open woods and thickets in moist to dry, sandy soils (FNA 2002). Sandy barrens and coast (Gleason & Cronquist 1991). Dry woodlands, forests, and rock outcrops (Weakley 2020).

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 retrorsus 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). However, little published information is available regarding the seed dispersal of *Cyperus*.

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 retrorsus*, occur in open habitats and are assumed to be disturbance-adapted. Disturbance is often required to prevent shading by perennial woody plants and 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). Menges and Kohfeldt (1995) found that in Florida scrub habitats a lack of fire led to significant decreases in the abundance of *Cyperus retrorsus*. Given *Cyperus retrorsus* occupies similar habitats in New York, similar conclusions might be drawn. Unfortunately, very little information regarding the specific natural history, demographics, or ecology of *Cyperus retrorsus* is available. More research is needed.

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

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

VI. Threats

Direct disturbance from recreation on beaches and in nearby swales and saltmarshes threaten populations of *Cyperus retrorsus*. The establishment and dominance of *Phragmites australis* within salt marsh habitats also threatens this species.

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:

Beach and dune areas where *Cyperus retrorsus* occurs should be protected from direct and persistent disturbances including vehicle and foot traffic. *Phragmites* should be controlled or otherwise managed to reduce the impacts on the salt marsh communities.

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 retrorsus*.

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:

NatureServe. 2023. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. <http://www.natureserve.org/explorer>. [Accessed 12/14/2023].

New York Natural Heritage Program, State University of New York College of Environmental Science and Forestry. 2023. Element Occurrence and Element Dataset. Albany, New York. [Exported 12/14/2023].

New York Natural Heritage Program. 2024. Online Conservation Guide for *Cyperus retrorsus* var. *retrorsus*. Available from: <https://guides.nynhp.org/retrorse-flatsedge/>. [Accessed 03/05/2024].

Werier, David, Kyle Webster, Troy Weldy, Andrew Nelson, Richard Mitchell, and Robert Ingalls. 2023. New York Flora Atlas. [S. M. Landry and K. N. Campbell (original application development), USF Water Institute. University of South Florida]. New York Flora Association, Albany, New York. [Accessed 11/21/2023].

Additional references:

Baskin, Jerry M. and Carol C. Baskin. 1971a. Germination of *Cyperus inflexus* Muhl. *Botanical Gazette* 132: 3-9.

Baskin, Jerry M. and Carol C. Baskin. 1971b. The possible ecological significance of the light requirement for germination in *Cyperus inflexus*. *Bulletin of the Torrey Botanical Club* 98: 25-33.

Edinger, G. J., D. J. Evans, S. Gebauer, T. G. Howard, D. M. Hunt, and A. M. Olivero (editors). 2014. *Ecological Communities of New York State. Second Edition. A revised and expanded edition of Carol Reschke's Ecological Communities of New York State.* New York Natural Heritage Program, New York State Department of Environmental Conservation, Albany, NY.

Menges, Eric S. and Nancy Kohfeldt. 1995. Life History Strategies of Florida Scrub Plants in Relation to Fire. *Bulletin of the Torrey Botanical Club*. Vol. 122. Issue 4:282-297.

Fernald, M.L. 1950. *Gray's manual of botany. 8th edition.* D. Van Nostrand, New York. 1632 pp.

Flora of North America Editorial Committee. 2002. *Flora of North America, North of Mexico. Volume 23. Magnoliophyta: Commelinidae (in part): Cyperaceae.* Oxford University Press, New York. 608 pp.

Gleason, Henry A. and A. Cronquist. 1991. *Manual of Vascular Plants of Northeastern United States and Adjacent Canada.* The New York Botanical Garden, Bronx, New York. 910 pp.

Holmgren, Noel. 1998. *The Illustrated Companion to Gleason and Cronquist's Manual. Illustrations of the Vascular Plants of Northeastern United States and Adjacent Canada.* The New York Botanical Garden, Bronx, New York.

Justice, Oren L. 1957. Germination, dormancy, and viability in seeds of certain weedy species of *Cyperus*. *Proceedings of the Association of Official Seed Analysts*. Vol. 47:167-175.

Lew-Smith, Michael 2003. *Cyperus houghtonii* Torrey, Houghton's Flat Sedge, Conservation and Research Plan for New England. New England Plant Conservation Program. New England Wildflower Society.

Mitchell, Richard S. 1986. A checklist of New York State plants. Bulletin No. 458. New York State Museum. 272 pp.

Ring, Richard M. 2023. New York Rare Plant Status Lists. New York Natural Heritage Program, State University of New York College of Environmental Science and Forestry, Albany, NY. December 2023. 108 pp.

Weakley, A.S. 2020. Flora of the southeastern United States. University of North Carolina Herbarium, North Carolina Botanical Garden, Chapel Hill, NC. Available from: <https://ncbg.unc.edu/research/unc-herbarium/floras/>

Zaremba, Robert E. 1991. Corrections to phenology list of April 9, 1991.