

Species Listing PROPOSAL Form:
Listing Endangered, Threatened, and Special Concern Species in Massachusetts

Scientific name: Cyperus retrorsus

Current Listed Status (if any): Watch-List

Common name: Pine Barren Flatsedge

Proposed Action:

Add the species, with the status of:

Endangered

Remove the species

Change the species' status to: _____

Change the scientific name to: _____

Change the common name to: _____

(Please justify proposed name change.)

Proponent's Name and Address:

Robert Wernerehl
MassWildlife Natural Heritage and Endangered Species Program
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Phone Number:

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Fax:

Proponent's Signature:

Date Submitted:

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Fax:

Association, Institution or Business represented by proponent: None

Proponent's Signature:

Date Submitted:

Please submit to: Natural Heritage & Endangered Species Program, Massachusetts Division of Fisheries & Wildlife, 1 Rabbit Hill Road, Westborough, MA 01581

Justification

Justify the proposed change in legal status of the species by addressing each of the criteria below, as listed in the Massachusetts Endangered Species Act (MGL c. 131A) and its implementing regulations (321 CMR 10.00), and provide literature citations or other documentation wherever possible. Expand onto additional pages as needed but make sure you address all of the questions below. The burden of proof is on the proponent for a listing, delisting, or status change.

(1) Taxonomic status. Is the species a valid taxonomic entity? Please cite scientific literature.

Cyperus retrorsus Chapman was first published in Bot. Gaz. 3: 17 (1878) (POWO, 7/24/2023)

<https://powo.science.kew.org/taxon/urn:lsid:ipni.org:names:75054-2>

(2) Recentness of records. How recently has the species been conclusively documented within Massachusetts? Our Biotics has an element occurrence record from 2018 by Greg Palermo and Robert Wernerehl

(3) Native species status. Is the species indigenous to Massachusetts?

Cullina et.al. (2011) list this species as native, as does POWO, and Haines (2011).

(4) Habitat in Massachusetts. Is a population of the species supported by habitat within the state of Massachusetts?

Yes. Naczi describes the habitat as “sunny or lightly shaded, dry-mesic or mesic, sandy forest edges, openings, and clearings.” Haines (2011) describes the habitat as “sandy soil of woodlands, clearings, and trail edges.”

(5) Federal Endangered Species Act status. Is the species listed under the federal Endangered Species Act? If so, what is its federal status (Endangered or Threatened)

No. This species is not listed under the Federal Endangered Species Act.

(6) Rarity and geographic distribution.

(a) Does the species have a small number of occurrences (populations) and/or small size of populations in the state? Are there potentially undocumented occurrences in the state, and if so, is it possible to estimate the potential number of undocumented occurrences?

There is a single known population on Martha's Vineyard. During the most recent observation year, 2018, it was described as having 100 plants in the population. There are several botanists currently working on updating the Flora of Martha's Vineyard through the Polly Hill Arboretum, who are actively searching for new populations of all plants, including this species.

(b) What is the extent of the species' entire geographic range, and where within this range are Massachusetts populations (center or edge of range, or peripherally isolated)? Is the species a state or regional endemic?

Massachusetts represents the species northern-most extent. The closest populations to the south are located on Long Island in New York. The range of the species extends from Martha's Vineyard south to Florida, west to Oklahoma and Texas. It is considered rare in New York (Critically Imperiled) and Kentucky (Imperiled) (NatureServe Explorer, 2023.) It is ranked as S1 (Critically Imperiled) in Massachusetts. It is possibly Extirpated from Pennsylvania and Missouri.

It is not a state or regional endemic.

(7) Trends.

(c) Is the species decreasing (or increasing) in state distribution, number of occurrences, and/or population size? What is the reproductive status of populations? Is reproductive capacity naturally low? Has any long-term trend in these factors been documented?

The single population was first documented in 1999 by an herbarium collection by Rawinski (MASS). There is no description of the population or habitat on this collection. Two other collections have been made more recently in 2018 (PHARB) and 2019 (NEBC), which also do not include any description of the population size and describe the habitat as along trail at edge of tidal pond shore or salt marsh. The only record in the NHESP database is from 2018, describing the population as having 100 stems. Reviewer Michael Piantedosi notes changes in the population in reports submitted to Native Plant Trust (previously New England Wild Flower Society) from 2014 (estimated at 100 plants) to 2017 (counted to be 349 genets). Wernerehl estimated the population as 100 genets in 2018, indicating the population has not significantly changed.

No additional populations have been located since the initial observation in 1999. There are no verified historical populations from Massachusetts. The single population produces seed, though its viability has not been tested.

(8) Threats and vulnerability.

(d) What factors are driving a decreasing trend, or threatening reproductive status in the state? Please identify and describe any of the following threats, if present: habitat loss or degradation; predators, parasites, or competitors; species-targeted taking of individual organisms or disruption of breeding activity.

The population of this species is on protected land owned by Mass Audubon. Trampling is a possible threat due to its location adjacent to a trail. It is located in uplands, but it is threatened by loss of habitat due to sea-level rise.

(e) Does the species have highly specialized habitat, resource needs, or other ecological requirements? Is dispersal ability poor?

The species has not spread to new locations in over 20 years, suggesting that the habitat is somewhat specialized. Botanist Tom Rawinski, writing with experience of this species south of Massachusetts, suggests a certain level of disturbance is required either by trail use or by wave, wind, and blowing sand that occurs at or slightly above extreme high tide/storm tide levels." Expansion of *Phragmites australis* also threatens this species.

York Natural Heritage Program (2023) describes the habitat of the closest populations to Massachusetts as, “sandy coastal habitats including maritime dunes and the upper edges of a salt marsh. More information on the habitat requirements of this species in the state is needed.”

Conservation goals.

What specific conservation goals should be met in order to change the conservation status or to remove the species from the state list? Please address goals for any or all of the following:

(a) State distribution, number of occurrences (populations), population levels, and/or reproductive rates

Efforts should be made to find additional populations of this species. Dukes, Nantucket, and Barnstable counties all have potential habitats. Seed should be tested for fertility and requirements for germination.

(b) Amount of protected habitat and/or number of protected occurrences

To downlist *Cyperus retrorsus* to Threatened, it should have at least 20 populations, with at least a third of them (7) ranked as excellent or good viability. Excellent or good populations should have at least 100 flowering spikes. For it to be considered as a species of Special Concern, it should have over 45 populations in the state, with at least a third (15) ranked as excellent or good.

For this species to be removed from the MESA list, there should be 75 populations in the state, with at least a third (25) ranked good to excellent.

(c) Management of protected habitat and/or occurrences

Management needs are not known for this species as there is only the one population. However, the habitat around the population might be opened so that it could spread into new areas. Seed could be collected, and germination attempted with any new plants generated planted into a new prepared open habitat for them on protected land, on Martha’s Vineyard. If successful, additional populations could be tried in other areas.

Literature cited, additional documentation, and comments.

Cullina, Melissa Dow et.al. (2011). The Vascular Plants of Massachusetts: A County Checklist First Addition. Massachusetts Natural Heritage and Endangered Species Program, Mass. Dept. of Fisheries and Wildlife.

Haines, Arthur (2011). Flora Novae Angliae. New England Wild Flower Society. Yale University Press.

Herbarium specimen data provided by: New England Botanical Club (Harvard University Herbaria, The Polly Hill Arboretum Herbarium, University of Massachusetts Amherst, Herbarium, and Yale University Herbarium, Yale Peabody Museum. (Accessed through the Consortium of Northeastern Herbaria web site, <https://neherbaria.org/>, 2023-07-24.)

Naczi, Robert, The New York Botanical Garden. Website: <https://www.nybg.org/science-project/the-new-manual-of-vascular-plants-project-by-nybg/>

NatureServe (2023). NatureServe Network Biodiversity Location Data accessed through NatureServe Explorer [web application]. NatureServe, Arlington, Virginia. Available <https://explorer.natureserve.org/>. (Accessed: July 24, 2023).

New York Natural Heritage Program. 2023. Online Conservation Guide for *Cyperus retrorsus* var. *retrorsus*. Available from: <https://guides.nynhp.org/retrorse-flatsedge/>. Accessed July 24, 2023.

POWO (2023). “Plants of the World Online. Facilitated by the Royal Botanical Gardens, Kew. Published on the Internet; <http://www.plantsoftheworld.org/> Retrieved 24 July, 2023.”