

Species Listing PROPOSAL Form:

Listing Endangered, Threatened, and Special Concern Species in Massachusetts

Scientific name: *Dichantherium scoparium*

Current Listed Status (if any): **Not Listed**

Common name: Velvety rosette panic-grass

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:

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Association, Institution or Business represented by proponent:

Proponent's Signature:



Date Submitted: 3/3/2023

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.

Dichantherium scoparium (Lam.) Gould is a valid taxonomic entity accepted in Integrated Taxonomic Information System (<https://www.itis.gov/>). The first recognized specimen was collected by Michaux in 1791 from South Carolina and noted as *Panicum pubescens*. The species was then formally described as *P. scoparium* by Lamarck 1798. There have been a variety of taxonomic reviews for *Panicum*, *Dichantherium* and other graminoid genera, and as a result there are a number of synonyms for *D. scoparium*. Synonyms include: *Chasea pubescens* (Lamarck) Nieuwland, Amer. Midl., *P. laxiflorum* var. *pubescens* (Lamarck) Chapman, *P. pubescens* Lam (1798), *P. scoparium* var. *genuinum*. *D. scoparium* was moved into the genus *Dichantherium* and received its current name in 1974 by Gould.

D. scoparium or its synonyms have been commonly referenced in a variety of floras including Gray's Manual of Botany (Fernald, 1970), Manual of Vascular Plants of Northeastern United States and Adjacent Canada (Gleason and Cronquist, 1991), Flora of North America (Frekman and Lelong, 2003), Flora Novae Angliae (Haines, 2011), and Flora of the Southern and Mid Atlantic State (LeBlond in Weakley, 2018).

(2) Recentness of records. How recently has the species been conclusively documented within Massachusetts?

Contemporary Massachusetts records for *D. scoparium* include seven new observations (2017 (3) and 2019 (1) 2020 (3) by Weise & Charpentier, Grima, Curtin & Palermo) with vouchers verified by Arthur Haines, Research Botanist with Native Plant Trust. These observations have been documented in Montague, Dennis, Brewster, and Edgartown. The observations support a total of three extant populations, two of which are comprised of multiple subpopulations. See distribution of southern New England and coastal NY records in the below image (Weise et al., 2020)

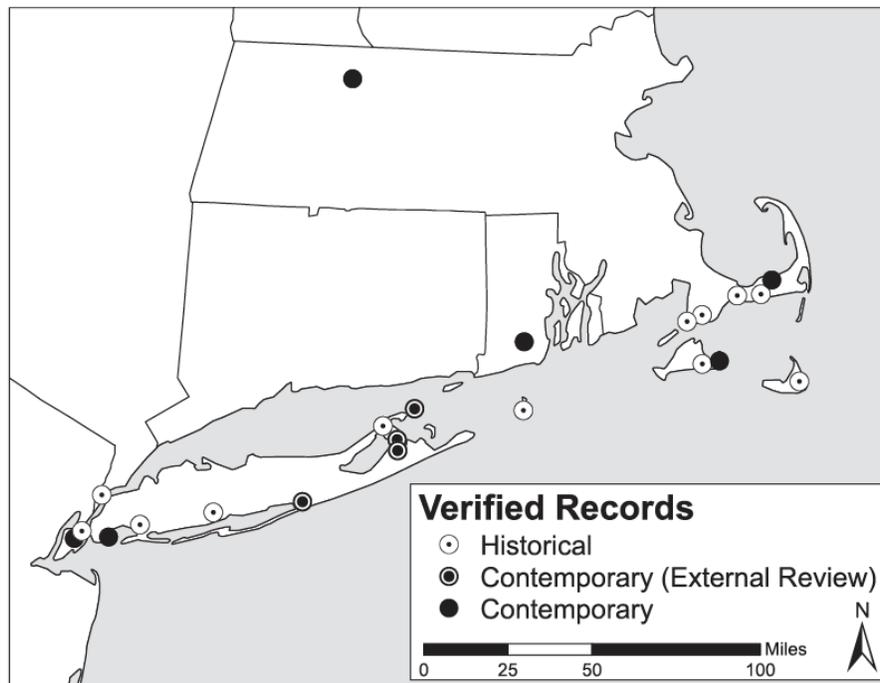


Figure 2. Map of verified *Dichanthelium scoparium* records from New England and New York, differentiated by time period (historical, 1903–1947; and contemporary, 1989–present), and source of verification (see Table 1 for details). Except for the four contemporary collections in Massachusetts and Rhode Island, latitude and longitude were estimated based on locality information provided in the corresponding record. Map shows 41°54' to 39°56' N and 74°23' to 69°35' W.

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

D. scoparium is regarded as being native to Massachusetts (NatureServe Explorer; Haines, 2011). Specimens of *D. scoparium* from Massachusetts date back to 1903 (Cheney), with plants reported to occur in natural habitats comparable to habitats in the core of its native range.

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

Yes, *D. scoparium* can be found on pond shores, wetland edges and clearings particularly on sandy soils with patterns of disturbance such as fire, mowing, or other control of woody vegetation, especially with periodic soil scarification. These habitats occur throughout most of Massachusetts, especially in coastal areas and inland glacial outwash zones.

(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 does not have federal status.

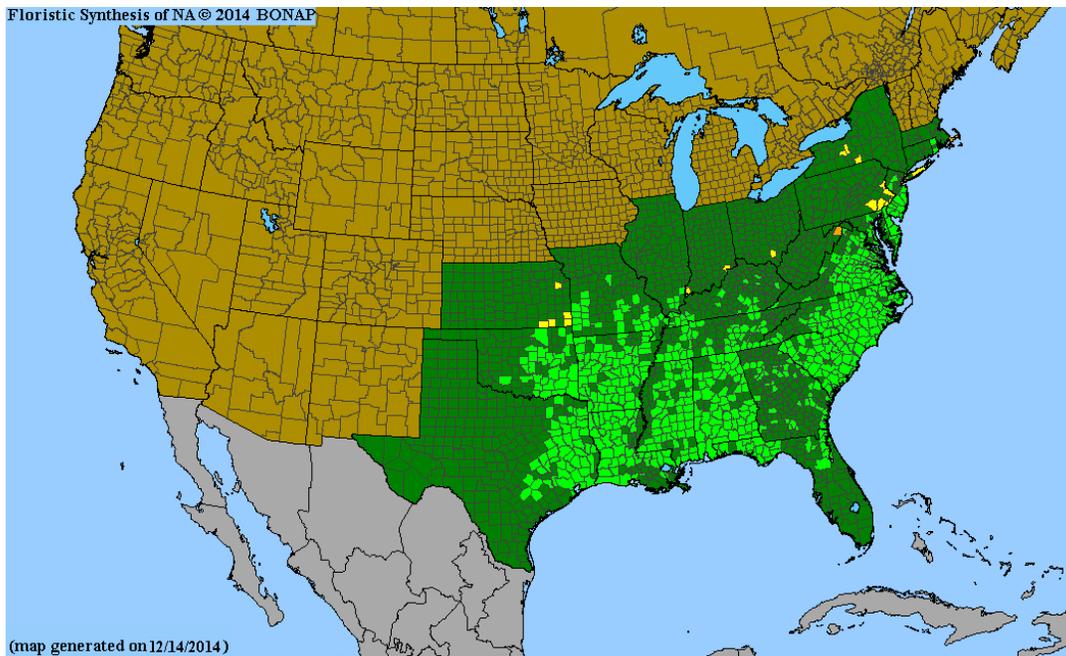
6) Rarity and geographic distribution.

(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?

D. scoparium has a total of three extant populations in Massachusetts two of which are comprised of two or more subpopulations. Additional undocumented populations may exist in Massachusetts, however there are unlikely to be a significant number.

(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?

It is common along the Atlantic coastal plain northward into New Jersey (Freckmann and Lelong 2003; Kartesz 2015; LeBlond 2018 in Weise et al., 2020) and extends westward to Texas and north Kansas and the Great Lakes region. *D. scoparium* reaches its northern edge-of-range in New York (where it is listed as endangered) and southern New England, with Massachusetts representing the northernmost current and historical occurrences. Within the New England region, *D. scoparium* historically occurred in Massachusetts and Rhode Island. Extant populations have also been documented in Massachusetts and Rhode Island (Weise, et al, 2020).



North American distribution of *Dichanthelium scoparium* from [BONAP](#) (Above)

The species is listed as G5 (Globally Secure) by Naturesure and state Endangered/S1/Critically Imperiled in New York (New York Natural Heritage Program 2020; Young 2019). Other state listing, aside from those listed below, have not been researched at this time.

According to NatureServes Conservation Explorer, *D. scoparium* is also listed as rare and has received conservation rankings in other parts of its range. Listings include:

- Kansas: S2 - Imperiled
- Illinois: S1 - Critically Imperiled
- Indiana: S1 - Critically Imperiled
- Ohio: S1 - Critically Imperiled
- Pennsylvania: S1 - Critically Imperiled
- West Virginia: Presumed Extirpated

Flora Conservanda (Brumback & Gerke, 2013), a New England regional assessment for rare plant conservation, lists *D. scoparium* as Division 4 - Historic Taxa. Listing occurred before new discoveries of populations were made for the species in 2017-2020 (Weise et al. 2020). With this new information, *D. scoparium* would likely be listed as Division 2: Regionally Rare Taxa.

“Within New England, these taxa have 20 or fewer current (observed within the last 20–25 years) occurrences. This Division includes taxa that are rare or uncommon throughout their entire range as well as taxa that reach the edge of their distributional range in our region. It is important to conserve these edge-of-range occurrences as part of New England’s natural heritage as well as to avoid shrinkage of these species’ ranges. All taxa in Division 2 have G-Ranks of G4 or G5 (apparently secure to secure globally).”

(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 number of known populations of *D. scoparium* has increased in recent years - from zero known extant populations to three (in Massachusetts). These populations have all been observed to produce fruit and spread vegetatively, however the viability of each population has not yet been determined. Additional extant populations also occur in New York and Rhode Island (see Weise et al. 2020 for a full listing of locations).

Long term trends indicate that *D. scoparium* may have always been rare in the region. Weise et al. (2020) provide a discussion of historic occurrences and anthropogenic influences which may have influenced *D. scoparium*’s contemporary rarity. The section referenced has been quoted in Section 8 below.

(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.

Threats to extant populations of *D. scoparium* include anthropogenic impacts through work on right of ways by utility companies; and succession-related competition driven by the reduction in disturbance regimes which maintain suitable habitat.

Weise et al. (2020) give a detailed summary of factors which may be responsible for the species regional rarity. Potential factors driving a decreasing trend or which have maintained *D. scoparium*’s rarity have been hypothesized to include anthropogenic alterations to disturbance regimes, such as fire suppression; and habitat fragmentation.

“An important commonality emerges from these seemingly disparate

accounts, suggesting that disturbance regime, as opposed to strictly edaphic factors, may be the most important determinant for the occurrence and persistence of this species on the landscape. Suppression of competing woody vegetation seems to be especially important for *Dichanthelium scoparium* as it has been reported to respond positively to annual mowing (Gardner et al. 2004; M. Lamont, pers. comm.) and application of prescribed fire (Boyer and Carter 2011; Grima, pers. obs.; Tompkins et al. 2010). As a species dependent upon frequent disturbance, it is also extremely vulnerable to the ephemerality of such habitats (i.e., natural succession) and to the severity and timing of disturbances.

Dichanthelium scoparium was probably never common and perhaps always rare in our region, occurring at the northern edge of its range. We cannot say for certain whether it was extirpated from New England or if it has merely been overlooked, as many factors are likely to have contributed to its scarcity or precluded its detection. The decades following the 1931 Nantucket collection were marked by changes at the landscape level that could have adversely affected any extant populations as well as the general availability of suitable habitat for *D. scoparium*. Specifically, through the mid- and late-twentieth century, coastal areas in southern New England experienced the combined effects of increased conversion of natural habitats to residential and commercial development (Motzkin et al. 2002), heightened and increasingly effective efforts at wildfire suppression (Motzkin et al. 2002), and widespread natural succession to mature forest cover (e.g., Dunwiddie et al. 1996; Foster and Motzkin 2003; Hall et al. 2002). These same factors are believed to have resulted in significant declines of other rare flora of the New England coastal plain, such as *Schwalbea americana* L. (recently rediscovered on Cape Cod; Peters 1995), *Agalinis acuta* Pennell (both naturally occurring and reintroduced occurrences; NatureServe 2019), *Sabatia campanulata* (L.) Torr. (extant; Zaremba 2004), and *Corema conradii* (Torr.) Torr. (extant; e.g., Dunwiddie et al. 1996).”

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

Yes, *D. scoparium* requires open habitats where competition of woody species is maintained through consistent disturbance regimes. These habitats are relatively rare and highly fragmented on the landscape compared with their historical distribution. Dispersal ability of *D. scoparium* is unknown and is likely limited due to the lack of contiguous suitable habitat.

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

I) Status of *D. scoparium* populations in Massachusetts

a) Determine the extent of extant populations

Survey suitable habitat for *D. scoparium* within the vicinity of known populations. The populations of *D. scoparium* located on the Cape and Martha's Vineyard each contain multiple known subpopulations. Additional subpopulations may exist within the vicinity of extant populations.

b) Determine the viability of *D. scoparium* seeds

i) Make collections of *D. scoparium* fruit to conduct germination trials. This will inform whether dispersal limitations are influencing the rarity of *D. scoparium*.

ii) Collaborate with location and national conservation partners, such as Native Plant Trust and National Laboratory for Genetic Resources Preservation to test seed viability, germination, viability degradation patterns during storage, etc.

c) Locate Additional Extant Populations

i) Create materials for dispersal to botanists and the public which highlight *D. scoparium*'s identifying characteristics. This species is relatively easy to identify compared with other members of the genus but may be overlooked as the related, common species, *Dichanthelium clandestinum*.

ii) Conduct *de novo* surveys within suitable habitats, focused in coastal areas of Massachusetts and within the vicinity of historic collection sites.

II) Ex Situ Conservation

- a) Collect and bank seed from all extant populations at a suitable conservation focused long-term seed bank facility. Seed banking will ensure the conservation of Massachusetts *D. scoparium* genotypes.
- b) Conduct experimental vegetative propagation from a robust population. If successful, publish findings in a publicly accessible digital forum. Vegetative propagation may be a means to support augmentation and translocation of imperilled populations, especially those subject to permitted Take under state laws.

III) Protection and management of Known Stations

- a) Protect the 3 known populations plus a minimum of 12 additional populations with high quality habitats on conserved lands.
- b) Protection of *D. scoparium* under MESA will assist in ensuring extant populations are protected from anthropogenic influences, including development and management to and upgrades of utility systems in Right of Ways by utility companies.
 - i) Protection of *D. scoparium* in Right of Ways should acknowledge that the existence and maintenance of suitable habitat at relevant stations is due to the vegetation management often conducted by utility companies. Protection at these sites should aim to maintain habitat suitability through the control of woody species via mowing and use of monocot-friendly herbicides.

Literature cited, additional documentation, and comments.

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