

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

Scientific name: _____ **Opuntia cespitosa** _____

Current Listed Status (if any): ___ Watch List ___

Common name: ___ Cespitose Prickly-Pear _____

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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Natural Heritage & Endangered Species Program

Division of Fisheries & Wildlife

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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.

Yes. The name was first published in Bull. Bot. (Geneva) 1: 216 (1830) and is accepted.

<https://powo.science.kew.org/taxon/urn:lsid:ipni.org:names:136441-1>

Plants of the World Online. Facilitated by the Royal Botanic Gardens, Kew. Published on the Internet;

<http://www.plantsoftheworldonline.org/> Retrieved 28 February 2023.**(2) Recentness of records. How recently has the species been conclusively documented within Massachusetts?**

July of 2022 by Kelly Omand, botanist with Nantucket Conservation Foundation

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

Yes. It was noted on Nantucket by Bicknell and published in 1911 (see references)

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

Yes. It is a coastal dune and maritime scrub species on sand and there are many acres of such habitat on Cape Cod and the Islands.

(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, the species has no 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?

There are currently two populations. The Nantucket population has a little over 2000 plants all concentrated along the northeast shore, and a Barnstable population has just one. Yes, there are potentially undocumented occurrences in the state. The potential number of undocumented occurrences are likely to be no more than 20, as the genus is very easy to observe almost all year around, and more reports of this should have come in over time via our collection of data on *Opuntia humifusa*, (state endangered) or through iNaturalist.

(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?

Northeast Texas east and north through AR, MO, MS, AL GA, IL, TN, KY, IN, MI, OH, VA, DE, MD, PA, NJ, NY, CT and the Cape and Islands of Massachusetts. It is not a regional or state 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?

Although *Opuntia cespitosa* was named early in the 19th century, and noted on Nantucket in the early 20th century, the taxon was subsumed into *Opuntia humifusa* due to taxonomic confusion. In more recent times, *O. cespitosa* has been split back out and recognized. In a significant paper by Majure et al. (2017), genetic work showed as well as clear morphological distinctions clearly showed this taxon should be separated from *O. humifusa*. New England's prominent botanist, Arthur Haines, published a blog post in 2020 recognizing this change only recently (Haines 2020). Due to this fact, in the last few years, the population has gone from essentially zero to over 2000 plants. However it is expected to hold steady at this point. The plant reproduces from fleshy fruits that contain solid seeds that either fall from the plant or could be moved short distances by animals. Though the reproductive capacity is likely not low, the habitat is quite specific and clearly limited by the sea on all directions.

(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 largest population occurs where there is no development and little human influence or disturbance. But it is quite close to the sea and to sea level, so sea level rise is the largest threat. The Massachusetts Department of Public Health (2022) states that sea levels in Massachusetts are projected to rise another foot by 2030, and 2.3 to 4.2 feet by 2070. With storms becoming more intense, it is likely these populations would be greatly reduced.

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

The species appears to have very specialized habitat at this time, with only two populations known. It requires extensive sand, and full sun, without significant competition from other plants. Yes, the dispersal ability is limited due to heavy fruits and very slow growth.

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
State status is required by MESA statutes to follow federal listing status at the same level of listing or higher.**

Since this species can be considered quite long lived and hardy under most circumstances the following numbers might be lower than proposals for more ephemeral, vulnerable plant species.

For *Opuntia cespitosa* to be down-listed to Threatened, there should be 12 populations larger than 40 plants of which 10 should be considered good to excellent. Half of these should be on the mainland.

For *Opuntia cespitosa* to be down-listed to Special Concern, there should be 20 populations larger than 50 plants of which 15 are ranked good to excellent. Half of these should be on the mainland.

For *Opuntia cespitosa* to be removed from the MESA list, there should be 50 populations larger than 60 plants of which 30 are ranked good to excellent. Half of these should be off the island of Nantucket or Martha's Vineyard.

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

Essentially all of the current large population is protected in part by belonging to private, non-profit conservation land trust organizations. However this does not guarantee permanent legal protection.

(c) Management of protected habitat and/or occurrences

The current habitat is self-managed from wind and salt overspray that keeps shrubs and trees from overgrowing the site. More research is needed to determine any further management needs.

Literature cited, additional documentation, and comments.

Bicknell EP (1911) The Ferns and Flowering Plants of Nantucket-VIII. Bulletin of the Torrey Botanical Club 38:447–460. <https://doi.org/10.2307/2479331>

Haines A (2020) In the Field with Arthur Haines: Recognizing a New Species of Prickly Pear.

Majure LC, Judd WS, Soltis PS, Soltis DE (2017) Taxonomic revision of the *Opuntia humifusa* complex (Opuntieae: Cactaceae) of the eastern United States. *Phytotaxa* 290:1–65.

<https://doi.org/10.11646/phytotaxa.290.1.1>

Massachusetts Department of Public Health (2022) Climate Hazard Assessment Profile- Sea Level Rise

<https://www.mass.gov/doc/climate-hazard-assessment-profile-sea-level-rise/download>

POWO (2023). "Plants of the World Online. Facilitated by the Royal Botanic Gardens, Kew. Published on the Internet; <http://www.plantsoftheworldonline.org/>

Retrieved 28 February 2023."