

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

Scientific name: Andrena parnassiae

Current Listed Status (if any): none

Common name: Parnassia Miner

Proposed Action:

Add the species, with the status of: Threatened
 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: Massachusetts Division of Fisheries & Wildlife

Proponent's Signature: Michael F. Veit


Date Submitted: March 1, 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, *Andrena parnassiae*, Cockerell, 1902 is a valid species (Ascher & Pickering 2020).
- (2) **Recentness of records.** How recently has the species been conclusively documented within Massachusetts?
 - The most recent records are from 2021 (M.F. Veit collection, Veit et al. 2021).
- (3) **Native species status.** Is the species indigenous to Massachusetts?
 - Yes (Ascher & Pickering 2016, Veit et al. 2021)
- (4) **Habitat in Massachusetts.** Is a population of the species supported by habitat within the state of Massachusetts?
 - Yes, *A. parnassiae* is currently known from eight locations in western Massachusetts.
- (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
- (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?
 - *Andrena parnassiae* is very rare in Massachusetts, currently only known from eight locations in western Massachusetts (see Map 1 below). Females of this species specialize in collecting pollen from the flowers of plants in the genus *Parnassia* (Grass-of-Parnassus, family Celastraceae). *Parnassia glauca* (Fen Grass-of-Parnassus) is the only species within this genus found in the northeastern U.S. In Massachusetts, as elsewhere, it is most often associated with calcareous wetlands. Calcareous wetlands are rare and threatened in Massachusetts (ranked S1/S2) and exclusively found in the westernmost counties (Motzkin 1994, Swain 2020). Most calcareous wetlands in Massachusetts have been surveyed for *A. parnassiae* and it is unlikely that many additional populations will be found in the future.
 - (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?
 - In the U.S., populations of *A. parnassiae* range in distribution from Vermont south to North Carolina in the East, and west to Michigan.
- (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?
 - Historically, *A. parnassiae* has not been well documented. The species was only first discovered in Massachusetts in 2019. No previous records in Massachusetts are known. In his treatise on the bees of the eastern U.S., Mitchell (1962) only recorded *A. parnassiae* from Vermont in the Northeast. The historical absence of *A. parnassiae* records is most likely the result of the isolated, rare, and specialized habitat of the bee and its host plant (i.e., it was overlooked).

(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 host plant for *A. parnassiae* in Massachusetts, *P. glauca*, has been found growing almost exclusively in calcareous wetlands. Calcareous wetlands are rare and threatened in Massachusetts and restricted to locations with specific characteristics of surficial geology and hydrology (Swain 2020). In Massachusetts this is primarily the westernmost counties.
- Threats to calcareous wetlands include factors that reduce groundwater quality and quantity, activities that disturb the vegetation, substrate, or water supply such as land clearing, ATV use, agriculture, and beaver activity, as well as competition from invasive species including Purple Loosestrife (*Lythrum salicaria*), Common Reed (*Phragmites australis*), and Reed Canary Grass (*Phalaris arundinacea*) (Swain 2020).

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

- Yes, the host plant of *A. parnassiae*, *P. glauca* is almost entirely restricted to calcareous wetlands which are uncommon to rare and limited in distribution in Massachusetts (Swain 2020).

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
 - Several of the sites currently inhabited by *A. parnassiae* are protected lands owned by the Commonwealth of Massachusetts or by non-governmental conservation organizations; others are in private ownership. Efforts should be made to maintain the ecological integrity of protected sites (including habitat management, as needed), as well as to protect additional sites currently in private ownership.

Literature cited, additional documentation, and comments.

- Ascher, J.S., and J. Pickering. 2020. Discover Life bee species guide and world checklist (Hymenoptera: Apoidea: Anthophila). http://www.discoverlife.org/mp/20q?guide=Apoidea_species
- Mitchell, T.B. 1962. *Bees of the Eastern United States*. North Carolina Agricultural Experiment Station Technical Bulletin No. 152, Raleigh, North Carolina. 557 pp.
- Motzkin, G. 1994. Calcareous Fens of Western New England and Adjacent New York State. *Rhodora* 96(885): 44-68.
- Swain, P.C. 2020. *Classification of the Natural Communities of Massachusetts*. Natural Heritage & Endangered Species Program, Division of Fisheries and Wildlife, Westborough, Massachusetts. 321 pp. <https://www.mass.gov/doc/classification-of-the-natural-communities-of-massachusetts/download>
- Veit, M.F., J.S. Ascher, J. Milam, F.R. Morrison, and P.Z. Goldstein. 2021. A checklist of the bees of Massachusetts (Hymenoptera: Apoidea: Anthophila). *Journal of the Kansas Entomological Society* 94: 81-157.

Map 1. Current records of *Andrena parnassiae* in Massachusetts. Data from Michael Veit.

