

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

Scientific name: *Digrammia eremiata* Current Listed Status (if any): Threatened

Common name: Three-Lined Angle Moth

**Proposed Action:**

Add the species, with the status of: \_\_\_\_\_

Change the scientific name to: \_\_\_\_\_

Remove the species

Change the common name to: \_\_\_\_\_

Change the species' status to: \_\_\_\_\_

(Please justify proposed name change.)

**Proponent's Name and Address:**

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Association, Institution or Business represented by proponent: Massachusetts Natural Heritage & Endangered Species Program

Proponent's Signature:



Date Submitted: June 2, 2014

Please submit to: Natural Heritage & Endangered Species Program, Massachusetts Division of Fisheries & Wildlife, 100 Hartwell Street, Suite 230, West Boylston, MA 01583

**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, *Digrammia eremiata* was first described by Guenée in 1858, as *Psamatodes eremiata* (Scoble 1999), and its species status continues to be recognized in recent works including Covell (1984), Ferguson (2008), and MPG (2014).

**(2) Recentness of records.** How recently has the species been conclusively documented within Massachusetts? The most recent (and only) record of *Digrammia eremiata* in Massachusetts is from 21 August 1983, observed by D.F. Schweitzer (NHESP database). Therefore, *Digrammia eremiata* has not been documented in Massachusetts in over 30 years, and is considered a historic species for the state. "Historic" refers to a species that has not been present in Massachusetts for over 25 years, and that has no records in the NHESP database less than 25 years old (NHESP 2008).

**(3) Native species status.** Is the species indigenous to Massachusetts? Although now a historic species for the state, *Digrammia eremiata* was considered a native species in Massachusetts; the type locality is North America (Scoble 1999).

**(4) Habitat in Massachusetts.** Is a population of the species supported by habitat within the state of Massachusetts? Presumably not, since the last known observation of *Digrammia eremiata* in Massachusetts was over 30 years ago (NHESP database).

**(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, *Digrammia eremiata* 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?

*Digrammia eremiata* is listed as a Threatened species in Massachusetts. However, it has not been documented in Massachusetts in over 30 years, and is therefore considered a historic species for the state. Potential habitat still exists at the historic occurrence site on Martha's Vineyard. That site, and other sites on Martha's Vineyard with apparently suitable habitat for *Digrammia eremiata*, have been surveyed in recent years by P.Z. Goldstein, M.W. Nelson, and T. Simmons, but the species has not been found. Likewise, apparently suitable habitat on Nantucket has been extensively surveyed by M. Mello, but these efforts were not successful in finding *Digrammia eremiata*.

(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 is at the northeastern edge of the geographic range of *Digrammia eremiata*; this species is widely but locally distributed throughout much of eastern North America, from New Hampshire south to Florida, and west to Manitoba and Texas (Ferguson 2008).

**(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?

*Digrammia eremiata* was formerly considered a native species in Massachusetts, but has not been documented in the state in over 30 years, and is considered a historic species for Massachusetts.

**(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 that may have contributed to the loss of *Digrammia eremiata* from Massachusetts include: (1) habitat loss; (2) fire suppression; (3) introduced generalist parasitoids; (4) aerial insecticide spraying; (5) non-target herbiciding; (6) off-road vehicles; and (7) light pollution.

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

In Massachusetts, *Digrammia eremiata* inhabited sandplain grassland and heathland, where larvae fed upon Goat's Rue (*Tephrosia virginiana*). As a flying insect, *Digrammia eremiata* disperses readily.

### **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

*Digrammia eremiata* has not been documented in Massachusetts in over 30 years, and is therefore considered a historic species for the state. According to NHESP (2008), “Historic (no record in the NHESP database less than 25 years old) and extirpated species will be proposed for delisting.”

Furthermore, Ferguson (2008) described a previously unrecognized species, *Digrammia equivocata*, that “superficially resembles *D. eremiata* and *D. ordinata* and has been placed with them in the past.” *Digrammia equivocata* not only occurs in Massachusetts; indeed, its type locality is West Tisbury on Martha’s Vineyard (Ferguson 2008). According to Ferguson (2008), “Males of *Digrammia equivocata* are almost unique within the genus in having an uncleft eighth sternum... and this may be seen and the moths readily identified without dissection by brushing a few scales from the posterior margin of this segment. The moths have three especially definite and regular transverse lines on the forewing and two on the hindwing, the latter fully as distinct as those on the forewing. The clarity and even course of these lines usually provide the clues needed to separate *equivocata* from the very similar *eremiata* and from other members of that group. However, occasional *equivocata* have lines that are not so definite, and a few *eremiata* have lines almost like those of *equivocata*. In such cases it may be necessary to refer to the genitalia, which are exceptionally distinct.” Given these considerations, historic records of *Digrammia eremiata* may have been confused with *Digrammia equivocata*, and all such records should be considered tentative unless specimen(s) have been examined.

The historic occurrence site for *Digrammia eremiata* on Martha’s Vineyard, and other sites with apparently suitable habitat on both Martha’s Vineyard and Nantucket have been surveyed in recent years, but the species has not been found. If *Digrammia eremiata* is ever rediscovered in Massachusetts (and definitively identified as described above), then the species should be returned to the state list of Endangered, Threatened, and Special Concern species.

### **Literature cited, additional documentation, and comments.**

- Covell, C.V. 1984. *A Field Guide to Moths of Eastern North America*. Peterson Field Guide Series. Houghton Mifflin Co., Boston, Massachusetts. 496 pp.
- Ferguson, D.C. 2008. Geometroidea, Geometridae (part): Ennominae (part): Abraxini, Cassymini, Macariini. Fascicle 17.2. 431 pp. In: R.W. Hodges (ed.). *The Moths of North America*. Allen Press, Lawrence, Kansas.
- MPG. 2014. *North American moth photographers group*. Digital guide to moth identification. Mississippi State University, Mississippi State, Mississippi. <http://mothphotographersgroup.msstate.edu/MainMenu.shtml>.
- NHESP. 2008. *Listing Endangered species in Massachusetts: the basis, criteria, and procedure for listing Endangered, Threatened, and Special Concern species*. Natural Heritage & Endangered Species Program, Massachusetts Division of Fisheries and Wildlife, Westborough, Massachusetts. 29 pp.
- Scoble, M.J. 1999. *Geometrid Moths of the World: A Catalogue (Lepidoptera, Geometridae)*. Volume 1. CSIRO Publishing, Collingwood, Victoria, Australia. 482 pp.