

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

Scientific name: Zanclognatha martha Current Listed Status (if any): Threatened

Common name: Pine Barrens Zanclognatha

**Proposed Action:**

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

Remove the species

Change the species' status to Special Concern

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 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, *Zanclognatha martha* was first described by Barnes in 1928 (Poole 1989), and its species status continues to be recognized in recent works including Lafontaine & Schmidt (2010), Wagner & McCabe (2011), and Wagner et al. (2011).

**(2) Recentness of records.** How recently has the species been conclusively documented within Massachusetts? The most recent record of *Zanclognatha martha* in Massachusetts is from 31 July 2013, observed by P.Z. Goldstein (NHESP database).

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

Yes; the type locality of *Zanclognatha martha* is Lakehurst, New Jersey, U.S.A. (Poole 1989).

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

Yes, currently there are seven known element occurrences (local populations) of *Zanclognatha martha* in Massachusetts (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, *Zanclognatha martha* 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?

*Zanclognatha martha* is listed as a Threatened species in Massachusetts. *Zanclognatha martha* currently has seven known element occurrences (local populations) in the state: four in the Connecticut River Valley, one in Worcester County, one in Bristol County, and one in Plymouth County (NHESP database). *Zanclognatha martha* is not known to occur on Cape Cod or the offshore islands. Within its range in the state, substantial potential habitat remains unsurveyed, and it is likely that there are many undocumented occurrences (M. Mello, pers. comm.). For the seven currently known populations of *Zanclognatha martha*, there is a total of 14,205 acres of mapped habitat, of which a total of 6,225 acres (44%) is on protected open space. No data on population size are available.

(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 populations of *Zanclognatha martha* are near the northeastern edge of its geographic range, which extends from Maine south to Florida, and west to Wisconsin and Texas (Wagner et al. 2011).

**(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?

There are no data to indicate any trends in state distribution, population size, or reproductive status of *Zanclognatha martha* in Massachusetts. *Zanclognatha martha* has a single brood (generation) per year.

**(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.

Potential threats to *Zanclognatha martha* in Massachusetts include: (1) habitat loss; (2) clearcut timber harvest; (3) introduced generalist parasitoids; (4) aerial insecticide spraying; and (5) light pollution. Habitat loss is less of a threat to *Zanclognatha martha* than most of the species that inhabit pitch pine-scrub oak barrens, as the larvae of this moth feed on pitch pine (*Pinus rigida*) (Wagner et al. 2011). Therefore this species persists in unmanaged, late-successional barrens. This is in sharp contrast to other pine barrens species, most of which feed on scrub oak (*Quercus ilicifolia*) or lowbush blueberries (*Vaccinium angustifolium* and *V. pallidum*), and therefore require management consisting of prescribed fire or mechanical cutting to maintain an open vegetation structure with larval host plants. Clearcut timber harvest is a potential threat to a local population of *Zanclognatha martha*. However, most timber harvest in Massachusetts consists of tree thinning or other types of selective cutting, and clearcutting is relatively rare and generally does not occur at a large scale. Furthermore, pitch pine is not considered a desirable timber resource. With regard to introduced generalist parasitoids, currently none are

known that are a serious threat to species with larvae that mature in the spring, as is the case with *Zanclognatha martha*. The most notorious offender, *Compsilura concinnata*, occurs in greatest numbers in late summer and early autumn, and therefore most seriously impacts species with larvae that mature late in the season. Aerial insecticide spraying is a potential threat to *Zanclognatha martha*; however, most such spraying (e.g., mosquito spraying to reduce the risk of Eastern Equine Encephalitis) occurs in wetlands, which are not inhabited by *Zanclognatha martha*. Finally, light pollution is a potential threat to *Zanclognatha martha*; however, three of the seven currently known populations of *Zanclognatha martha* in the state inhabit large, unfragmented tracts of pitch pine-scrub oak barrens, where encroachment from development and associated light pollution are minimal.

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

In Massachusetts, *Zanclognatha martha* inhabits pitch pine-scrub oak barrens, including late-successional barrens; the larval host plant is pitch pine (*Pinus rigida*) (Wagner et al. 2011). As a flying insect, *Zanclognatha martha* 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

With seven current element occurrences (local populations) and 14,205 acres of mapped habitat (of which 44% is on protected land), the status of *Zanclognatha martha* should be changed from Threatened to Special Concern. Substantial potential habitat remains unsurveyed, and it is likely that there are many undocumented occurrences. Potential threats to *Zanclognatha martha* include habitat loss, clearcut timber harvest, introduced generalist parasitoids, aerial insecticide spraying, and light pollution; however, none of these factors constitute population-level threats for the reasons described above under (8) Threats and vulnerability.

Additional targeted surveys for *Zanclognatha martha* in Massachusetts are needed. When and if the total number of element occurrences in the state exceeds 20, and at least 50% of mapped habitat for these occurrences is managed and protected from known threats, then *Zanclognatha martha* should be considered for removal from the Massachusetts List of Endangered, Threatened, and Special Concern Species.

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

Lafontaine, J.D., and B.C. Schmidt. 2010. Annotated check list of the Noctuoidea (Insecta, Lepidoptera) of North America north of Mexico. *Zookeys* 40: 1-239.

Poole, R.W. 1989. Noctuidae. Fascicle 118, Part 2. pp. 501-1013 In: J.B. Heppner (ed.). *Lepidoptera Catalog (New Series)*. E.J. Brill, New York, New York.

Wagner, D.L., and T.L. McCabe. 2011. A new *Zanclognatha* from eastern North America and preliminary key to the larvae of the genus (Lepidoptera: Noctuidae: Herminiinae). *ZooKeys* 49: 89-101.

Wagner, D.L., D.F. Schweitzer, J.B. Sullivan, and R.C. Reardon. 2011. *Owlet Caterpillars of Eastern North America*. Princeton University Press, Princeton, New Jersey. 576 pp.