

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

Scientific name: *Cicindela limbalis*

Current Listed Status (if any): Special Concern

Common name: Bank Tiger Beetle

Proposed Action:

Add the species, with the status of: _____

Remove the species

Change the species' status to: Threatened

Change the scientific name to: _____

Change the common name to: Claybank Tiger Beetle (Leonard & Bell 1999, Pearson et al. 2006, BugGuide 2014)

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, *Cicindela limbalis* was first described by Klug in 1834 (Freitag 1999), and its species status continues to be recognized in recent works including Leonard & Bell (1999) and Pearson et al. (2006).

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

The most recent record of *Cicindela limbalis* in Massachusetts is from 4 September 2008, observed by M.W. Nelson and T. Simmons (NHESP database).

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

Yes; the type locality of *Cicindela limbalis* is North America (Freitag 1999). Museum specimens of *Cicindela limbalis* from Massachusetts date back to the early 1900s (NHESP database).

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

Yes, currently there are two known element occurrences (local populations) of *Cicindela limbalis* 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, *Cicindela limbalis* 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?

Cicindela limbalis is listed as a Special Concern species in Massachusetts. However, *Cicindela limbalis* currently has only two known element occurrences (local populations) in the state, both on the offshore islands. No data on population size are available, but no more than three adults have been observed at any single time and place, suggesting that populations are small. Potential habitat exists on many of the offshore islands of Massachusetts. Some of the most apparently suitable habitat has been surveyed in recent years by P.Z. Goldstein, M.W. Nelson, and T. Simmons, but to date no additional populations have been found. However, unsurveyed potential habitat remains, and it seems likely that a small number of undiscovered population(s) exist; this is the primary reason for the proposed status of Threatened (as opposed to Endangered), despite only two currently known populations in the state. For these two populations, there is a total of 64 acres of mapped habitat, of which a total of 19 acres (30%) is on protected open space.

(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 *Cicindela limbalis* are at the eastern edge of a large geographic range, which extends north to Newfoundland, south to Georgia, and west to Yukon and New Mexico (NatureServe 2014). Pearson et al. (2006) state that this species is "extirpated from southern New England except for a single population on Block Island, Rhode Island"; apparently the authors were not aware of the existence of the two Massachusetts populations.

(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, number of occurrences, population size, or reproductive status of *Cicindela limbalis* in Massachusetts. *Cicindela limbalis* has a three-year life cycle (Leonard & Bell 1999), unusually long for an insect; therefore reproductive capacity is relatively low as compared to most insects.

(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 primary threat to *Cicindela limbalis* in Massachusetts is habitat loss or degradation due to: (1) development; (2) beach or bluff stabilization; and (3) off-road vehicles. Introduced generalist parasitoids may pose a threat. Additionally, if the two populations of this species in Massachusetts are as small as they appear, then the large fluctuation in numbers intrinsic to insect populations makes population extirpation more likely. Aerial insecticide spraying is a potential threat, but is unlikely to occur in habitat for *Cicindela limbalis*.

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

In Massachusetts, *Cicindela limbalis* inhabits sparsely vegetated clay and till cliffs and banks (in particular, morainal deposits along the shorelines of the offshore islands), as well as adjacent beach, where adult beetles hunt for prey. As a flying insect, *Cicindela limbalis* 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 only two current element occurrences (local populations) and 64 acres of mapped habitat (of which only 30% is on protected land), the status of *Cicindela limbalis* should be changed from Special Concern to Threatened. Threats include habitat loss or degradation due to development, beach or bluff stabilization, and off-road vehicles. Given its rarity, it could be argued that *Cicindela limbalis* should be listed as Endangered in Massachusetts; however, unsurveyed potential habitat remains, and it seems likely that a small number of undiscovered population(s) exist.

Additional targeted surveys for *Cicindela limbalis* 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 the status of this species should be downgraded to Special Concern.

Literature cited, additional documentation, and comments.

- BugGuide. 2014. *BugGuide*. Identification, images, & information for insects, spiders & their kin for the United States & Canada. Iowa State University, Ames, Iowa. <http://bugguide.net/node/view/15740>.
- Freitag, R. 1999. *Catalogue of the Tiger Beetles of Canada and the United States*. NRC Research Press, Ottawa, Ontario, Canada. 195 pp.
- Leonard, J.G., and R.T. Bell. 1999. *Northeastern Tiger Beetles: A Field Guide to Tiger Beetles of New England and Eastern Canada*. CRC Press, Boca Raton, Florida. 176 pp.
- NatureServe. 2014. *NatureServe Explorer: An online encyclopedia of life* [web application]. Version 7.1. NatureServe, Arlington, Virginia. <http://www.natureserve.org/explorer>.
- Pearson, D.L., C.B. Knisley, and C.J. Kazilek. 2006. *A Field Guide to the Tiger Beetles of the United States and Canada*. Oxford University Press, New York, New York. 227 pp.