

## Species Status Assessment

**Class:** Insecta  
**Family:** Cicindelidae  
**Scientific Name:** *Cicindela marginipennis*  
**Common Name:** Cobblestone Tiger Beetle

### Species synopsis:

Isolated populations of cobblestone tiger beetle occur throughout the eastern United States as well as in New Brunswick, Canada. Cobblestone tiger beetles are found on sandy cobble beaches on the upstream sides of islands and along the banks of small to medium sized rivers with swift-flowing water (Dunn 1981, Nothnagle 1993, Leonard and Bell 1999, Pearson et al. 2006). This beetle is extant in 9 rivers in 11 states (NatureServe 2012). Within New York this species occurs on the islands and banks of the Cattaraugus and Upper Genesee rivers. Sites in at least two states have been lost to dams or waterway construction, however not all habitats are currently threatened.

### I. Status

#### a. Current Legal Protected Status

- i. **Federal** Not Listed **Candidate:** No
- ii. **New York** Not Listed; SGCN

#### b. Natural Heritage Program Rank

- i. **Global** G2
- ii. **New York** S1 **Tracked by NYNHP?** Yes

### Other Rank:

COSEWIC: Endangered  
IUCN Red List: Near Threatened

**Status Discussion:**

With only two extant occurrences and having disappeared from one or two historical locations, this species has a calculated rank of S1S2 (Critically Imperiled to Imperiled). Its current range in New York includes portions of the Genesee River and Cattaraugus Creek (Schlesinger 2010).

**II. Abundance and Distribution Trends**

**a. North America**

**i. Abundance**

X  declining \_\_\_increasing \_\_\_stable \_\_\_unknown

**ii. Distribution:**

X  declining \_\_\_increasing \_\_\_stable \_\_\_unknown

**Time frame considered:** 1900-2000

Moderate decline

**b. Regional**

**i. Abundance**

X  declining \_\_\_increasing \_\_\_stable \_\_\_unknown

**ii. Distribution:**

X  declining \_\_\_increasing \_\_\_stable \_\_\_unknown

**Regional Unit Considered:** Northeast

**Time Frame Considered:** 1900-2000

Moderate decline

c. Adjacent States and Provinces

CONNECTICUT                      Not Present     X                        No data       

ONTARIO                              Not Present     X                        No data       

QUEBEC                                Not Present     X                        No data       

MASSACHUSETTS                      Not Present                               No data   X  

i. Abundance

       declining          increasing                             stable                        X   unknown

ii. Distribution:

       declining          increasing                             stable                        X   unknown

Time frame considered: \_\_\_\_\_

Listing Status:        Not ranked \_\_\_\_\_                      SGCN?   No  

NEW JERSEY                              Not Present                               No data   X  

i. Abundance

       declining          increasing                             stable                        X   unknown

ii. Distribution:

       declining          increasing                        X   stable                             unknown

Time frame considered: \_\_\_\_\_

Listing Status:        S1 \_\_\_\_\_                      SGCN?   No

PENNSYLVANIA                      Not Present \_\_\_\_\_                      No data   X  

i. Abundance

\_\_\_\_ declining    \_\_\_\_increasing                      \_\_\_\_stable                        X   unknown

ii. Distribution:

\_\_\_\_ declining    \_\_\_\_increasing                        X   stable                      \_\_\_\_unknown

Time frame considered: \_\_\_\_\_

Listing Status: \_\_\_\_\_ S1 \_\_\_\_\_ SGCN?   No  

VERMONT                              Not Present \_\_\_\_\_                      No data   X  

i. Abundance

\_\_\_\_ declining    \_\_\_\_increasing                      \_\_\_\_stable                        X   unknown

ii. Distribution:

\_\_\_\_ declining    \_\_\_\_increasing                      \_\_\_\_stable                        X   unknown

Time frame considered: \_\_\_\_\_

Listing Status: \_\_\_\_\_ S1 \_\_\_\_\_ SGCN?   No  

d. NEW YORK                              Not Present \_\_\_\_\_                      No data \_\_\_\_\_

i. Abundance

\_\_\_\_ declining    \_\_\_\_increasing                      \_\_\_\_stable                        X   unknown

ii. Distribution:

\_\_\_\_ declining    \_\_\_\_increasing                        X   stable                      \_\_\_\_unknown

Time frame considered: \_\_\_\_\_

### Monitoring in New York.

There are no regular monitoring activities at this time.

### Trends Discussion:

Trend information for this species is unknown.

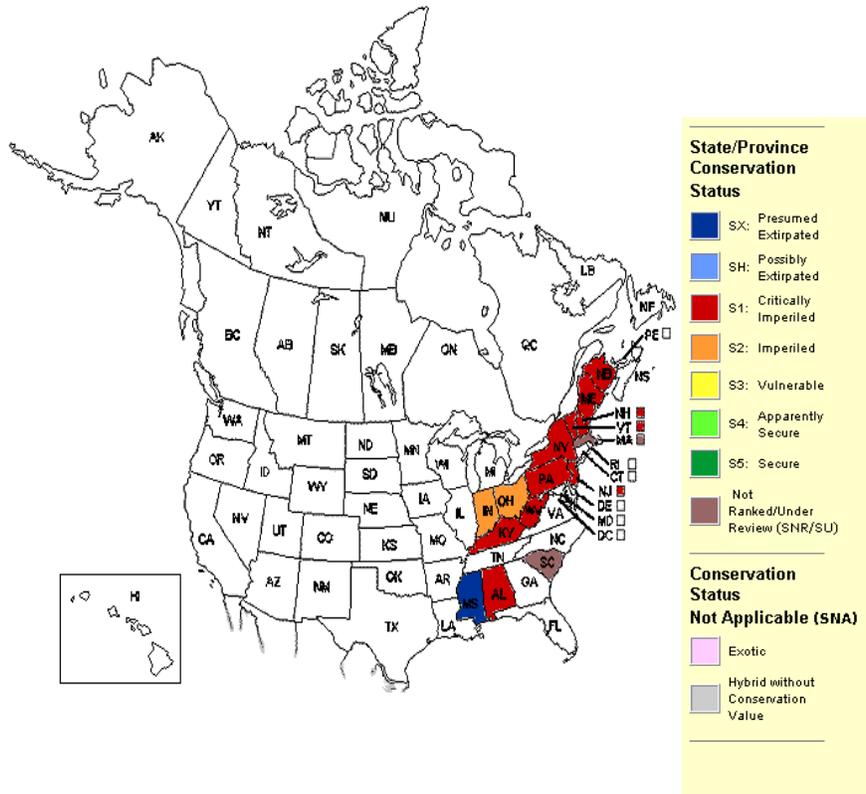
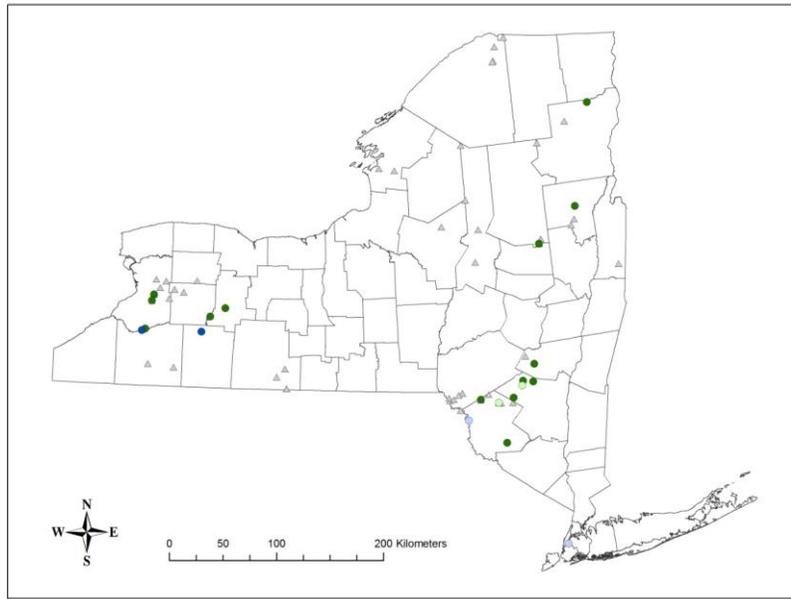


Figure 1. Conservation status of the cobblestone tiger beetle in North America (NatureServe 2011).



**Figure 2.** New York locations for *Cicindela ancocisconensis* (light green: approximate historical locations; dark green: extant locations) and *C. marginipennis* (light blue: approximate historical locations). Gray triangles are locations surveyed where neither species was detected. Map from Schlesinger (2010).

**III. New York Rarity, if known:**

<b>Historic</b> (select one)	<b><u># of Animals</u></b>	<b><u># of Locations</u></b>	<b><u>% of State</u></b>
<b>prior to 1970</b>	_____	<b>3</b>	_____
<b>prior to 1980</b>	_____	_____	_____
<b>prior to 1990</b>	_____	_____	_____

**Details of historic occurrence:**

*Cicindela marginipennis* was known historically from three locations in New York: Cattaraugus Creek in Cattaraugus County, the Delaware River at Callicoon in Delaware County (Leng in Leonard 1928), and New York City (Gordon 1939). The Callicoon location has been searched multiple times without success and appears to be extirpated. It is unclear where the New York City record came from and it does not appear to be substantiated by a specimen.

<b>Current</b>	<b><u># of Animals</u></b>	<b><u># of Locations</u></b>	<b><u>% of State</u></b>
	_____	<u>2</u>	_____

**Details of current occurrence:**

Cattaraugus Creek in Cattaraugus and Erie Counties. Genesee River in Allegheny, Livingston and Wyoming counties.

**New York's Contribution to Species North American Range:**

**Distribution** (percent of NY where species occurs)

X 0-5%  
 \_\_\_\_\_ 6-10%  
 \_\_\_\_\_ 11-25%  
 \_\_\_\_\_ 26-50%  
 \_\_\_\_\_ >50%

**Abundance** (within NY distribution)

\_\_\_ abundant  
 \_\_\_ common  
 \_\_\_ fairly common  
X uncommon  
 \_\_\_ rare

**NY's Contribution to North American range**

\_\_\_\_\_ 0-5%  
 \_\_\_\_\_ 6-10%  
X 11-25%  
 \_\_\_\_\_ 26-50%  
 \_\_\_\_\_ >50%

**Classification of New York Range**

Core

Peripheral

Disjunct

Distance to nearest population: \_\_\_\_\_

**IV. Primary Habitat or Community Type:**

1. Lake and River Shore/Beach

**Habitat or Community Type Trend in New York:**

Declining     Stable     Increasing     Unknown

Time frame of decline/increase: \_\_\_\_\_

Habitat Specialist?                       Yes     No

Indicator Species?                       Yes     No

**Habitat Discussion:**

Cobblestone tiger beetles concentrate in the middle of the cobbled shoreline, 20-50 m away from the water's edge (Nothnagle 1993, 1995; TNC 1995). This area is not heavily scoured or subject to heavy sedimentation and the vegetation is not dense (TNC 1995). The minimum required habitat size is approximately 0.08 ha (0.2 ac) with a sand and vegetation cover of 20-50% and cobble-sized stones ranging in diameter from 2.5-7.6 cm (1-3 in) (Nothnagle 1995). Cobblestone tiger beetles do not typically inhabit gravel or areas with large stones and boulders (Nothnagle 1995).

**V. New York Species Demographics and Life History**

- Breeder in New York**
  - Summer Resident**
  - Winter Resident**
  - Anadromous**
- Non-breeder in New York**
  - Summer Resident**
  - Winter Resident**
  - Catadromous**
- Migratory only**
- Unknown**

**Species Demographics and Life History Discussion:**

Individual *C. marginipennis* are known to disperse at least several hundred meters (Hudgins et al. 2010).

Copulation has been observed from mid July to late August, with oviposition behavior observed as late as August 28 (Nothnagle, pers. obs.).

The larval period consists of three instars or moults, which occur over a period of two years in Vermont. The three instars have burrow diameters of 1.5 mm, 2.5 mm and 3.5 mm, respectively. First instar larvae were seen in early September, with second instars first appearing in mid September. Second instar larvae are active again in the spring, and moult to the third instar in July. Third instars overwinter again, resume activity in early May, and emerge as adults in late June or early July, about 22 months after hatching from eggs. Larvae from two different annual cohorts are active at the same time.

Adults are active primarily on warm, sunny days. They are capable of rapid flight, but forage in a cursorial fashion, running along the ground in short, erratic movements. This beetle has a "summer active" life history, in which adults are active only during the summer months. In Vermont, adults are generally found from early July until early September, although year to year variation in emergence and disappearance occurs. Peak adult densities are seen from mid to late July, after which adults gradually decline.

Larvae plug their holes in mid to late September for hibernation. Since the life cycle requires two or three years, larvae are always present in burrows in the soil.

## **VI. Threats:**

Alteration of natural flooding regimes, primarily due to construction of dams, is probably the primary threat to this species (Novak 1999, Knisley and Shultz 1997). Dams will inundate cobble bar habitat upstream of the dam while the natural flooding regime is altered downstream of the dam. When natural flooding regimes are altered cobble bars become overgrown with dense herbaceous and shrub vegetation becoming unsuitable for the beetles. Gravel mining of cobble bars, an activity regulated by NYSDEC but for which permits are sometimes given, is also a major threat. There are a number of existing permits on both the Genesee River (Taft 2002) and Cattaraugus Creek that have the potential to negatively impact populations of *Cicindela marginipennis*. Off road vehicle use of cobble bars can destroy larval habitat and has been noted as a threat both in the literature and during on site surveys in western New York. Intensive collecting by private collectors has been noted as a threat to some species of tiger beetle and is a potential threat primarily to *Cicindela marginipennis*.

Recent severe flood events in various parts of the state associated with tropical storms and possibly of greater frequency and severity due to climate change are a serious potential threat to the small, isolated populations of this species. While such flooding may create very good cobble bar habitat, it is also be very possible that entire metapopulations could be wiped out in a single storm event leaving no or few individuals surviving to repopulate newly created habitat. The drainages occupied by cobblestone tiger beetle in New York were not affected by the severe storms of 2011 and 2012, but could certainly be in future years.

### **Are there regulatory mechanisms that protect the species or its habitat in New York?**

No       Unknown

Yes

The Protection of Waters Program provides protection for rivers, streams, lakes, and ponds under Article 15 of the NYS Conservation Law.

### **Knowledge of management/conservation actions that are needed for recovery/conservation, or to eliminate, minimize, or compensate for the identified threats:**

Schlesinger (2010) recommends that this species be listed as Threatened in New York. Although not in immediate danger of extirpation from New York, the cobblestone tiger beetle could become endangered or extirpated (or both) if one of the two occurrences experienced a population reduction from extreme flooding. Changes in water management of the Mount Morris Dam on the Genesee River could have profound effects on the beetle's population upstream. Further, a large portion of the Cattaraugus Creek population is on private land, and any cobble and gravel mining occurring there could substantially affect larval and adult habitat (Schlesinger 2010).

Conservation actions following IUCN taxonomy are categorized in the table below.

<b>Conservation Actions</b>	
<b>Action Category</b>	<b>Action</b>
Law and Policy	Policies and Regulations
Education and Awareness	Awareness & Communications
Land/Water Protection	Site/Area Protection
Land/Water Protection	Resource/Habitat Protection
Land/Water Management	Site/Area Management
Land/Water Management	Invasive/Problematic Species Control
Land/Water Protection	Site/Area Protection

The Comprehensive Wildlife Conservation Strategy (NYSDEC 2005) includes recommendations for the following actions for riparian tiger beetles, and for the cobblestone tiger beetle in particular.

**Habitat management:**

- \_\_\_ Reduce or eliminate detrimental ATV use on cobble bars where these species occur or could occur if such activity was lacking or reduced.

**Habitat monitoring:**

- \_\_\_ Compile baseline data on existing threats to these species including existing gravel mine permits, exiting areas of high ATV use, existing hydrological flow alterations.

**Habitat research:**

- \_\_\_ Larval habitat for Cobblestone tiger beetles should be determined by excavation of a limited number of larval burrows and adult beetle dispersal should be identified through a mark-recapture effort . Vegetation density, cobble size, and sand/cobble interspersion are habitat characteristics that probably need to be determined for both species as well as common species that co-occur with them.
- \_\_\_ Support and encourage research that would increase knowledge of the impact of poorly known threats to these species (e.g. invasion by aggressive, non-native plants such as *Polygonum cuspidatum* and *Lythrum salicaria*, in riparian areas; development in riparian areas).

**Habitat restoration:**

- \_\_\_ Determine if there are streams/rivers with existing dams where restoration of more natural flow regimes could result in restoration of suitable habitat for these species.
- \_\_\_ Determine if there is a means of restoring suitable (as in not overgrown) cobble bar habitat on the Delaware River where Cobblestone tiger beetle appears to have been extirpated.

**New regulation:**

— Recommendations for official state endangered, threatened, or special concern listing are an anticipated result of the statewide inventory. It is expected that one or both species will be recommended for listing and officially adding these species to the list would constitute a specific action.

**Population monitoring:**

— Conduct surveys to obtain repeatable, transect count, baseline population assessments at occupied sites where the species occur..

**Statewide baseline survey:**

— Conduct surveys for these species at potential sites throughout the state. Cobblestone tiger beetle is known from just two rivers in the state while *Cicindela ancocisconensis* is currently known from less than 10 streams/rivers. A currently approved, but not yet begun State Wildlife Grant Tiger Beetle Project will utilize Natural Heritage Program staff and other biologists to conduct surveys for these species at potential sites throughout the state.

## VII. References

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