

Management Plan for
Cobblestone Tiger Beetle
(*Cicindela marginipennis*)
in New Brunswick



Department of Natural Resources and Energy Development

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PREFACE

Under the New Brunswick *Species at Risk Act* (section 20), the Minister is required to prepare a management plan for species that have been listed as Special Concern. A management plan is a recovery document that describes the conservation measures that would improve the status of the species and prevent it from declining into the more serious risk categories of Threatened or Endangered.

Management plans are the second of a pair of complementary documents that cover the background information and path forward for the conservation of the species. The first of the pair is the species status report, which provides a comprehensive description of the population, distribution, trends, and threats leading to the classification of the species as Special Concern. The management plan identifies a conservation direction and specific measures that are expected to alleviate or ease the factors underlying the species precarious status.

The Minister may adopt a management plan, in whole or in part, with any modifications that the Minister considers necessary, provided that the requirements of the provincial *Species at Risk Act* are met.

This management plan has been prepared by the Department of Natural Resources and Energy Development (DNRED).

Photo credit: Hubert Askanas

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Introduction

The *Management Plan for Cobblestone Tiger Beetle (Cicindela marginipennis) in New Brunswick* outlines the management direction and conservation measures recommended for the recovery of this shoreline beetle species, as required under section 20 of the provincial *Species at Risk Act*. Though intended to alleviate threats at the provincial scale, it will also contribute to the national conservation work for the species where it complements federal recovery efforts^[2].

Species Information

Adult Cobblestone Tiger Beetles are 11-14 mm in the length. They can be brown or a dull olive-green in colour with a cream-coloured border around the wing coverings with occasional additional variations. Their abdomen is bright red-orange which can be seen during flight^[1].

The Cobblestone Tiger Beetle is endemic to eastern North America. Within the United States, the species occurs in disjunct populations along major rivers and rarely exceed 60 individuals at a site^[4]. Within Canada, there are three isolated regions where Cobblestone Tiger Beetles exist, all within New Brunswick. These three sites occur on the Saint John River, the Southwest Miramichi River, and at Grand Lake and Maquapit Lake (Figure 1)^[3]. Almost all known sites for the Cobblestone Tiger Beetle in the province occur on privately owned lands, including privately owned nature preserves.

Cobblestone Tiger Beetles have four life stages: egg, larvae, pupa, and adult. The species may take more than two years to reach their adult life stage. Adult Cobblestone Tiger Beetles are only active during the summer months and are diurnal predators that pursue and capture their prey^[1]. Little is known about the larval ecology of Cobblestone Tiger Beetles, but other *Cicindela* species deposit eggs in the soil and once the egg hatches the larvae build a burrow in the substrate and ambush prey^[3].

[Please note: detailed maps of survey sites have not been included to protect precise locational information for this data sensitive species. Please contact the Department of Natural Resources and Energy Development, Species at Risk Program, if you require this information.]

Species: Cobblestone Tiger Beetle (*Cicindela marginipennis* Dejean)

Status: Special Concern (2022)

Population Estimates:

New Brunswick	2019 estimate between 11,093-14,333 ^[3]
Canada	Same as above
United States	Unknown

Population trends for New Brunswick

Grand Lake complex sub-population – Between the mid-2000's and the late 2010's, the data indicate synchronous extreme fluctuations in the abundance of adult beetles. The trend shows a high abundance in the mid-late 2000's, low abundance in the mid-2010's, and a high abundance in the late 2010's^[3].

Southwest Miramichi River complex sub-population – Adults were approximately 17 times more common in 2019 than 2020, but the difference could be between cohorts and not a change in overall abundance^[3]. This is possible if age of maturity is consistent (2 years), then separated cohorts could develop and have different abundances. It should be noted that the population was discovered in 2019; so long-term trend data is not available.

Saint John River complex sub-population – There are insufficient data to speculate about fluctuations^[3].

Habitat

The habitat characteristics or biophysical attributes that appear to be key to understanding habitat and the nature of threats to the Cobblestone Tiger Beetle are:

- Sparsely vegetated and scoured shoreline habitat;
- High beaches that are infrequently flooded; and
- High cobblestone content with fine sand and gravel in between (necessary for the laying of egg and for larvae to form burrows) (Figure 2)^[1].

It is likely that a significant portion of the species natural ecological distribution has been lost with the filling of the reservoir of the Mactaquac Dam and submergence of 19 islands where there was potentially suitable habitat.

Threats

The conservation measures proposed for the Cobblestone Tiger Beetle in New Brunswick are intended to address threats that have been identified as significant in the provincial context. Threats described in this report were taken from existing threat assessments for the Cobblestone Tiger Beetle, including the Committee on the Status of Endangered Wildlife in Canada status report and the New Brunswick status report for the species^[1,3].

In assessing the impact of each threat, it is important to take into account that there are only three isolated populations where this species occur, which have sub-populations within. This creates uncertainty in identifying the percentage of a population that may be affected by a given threat.

Threats have been assessed for all three populations and it was deemed that only the Grand Lake sub-population has a significant level of threat due to destruction of habitat by recreational activities and cottage development^[3]. No significant threats were noted for the Saint John River and Southwest Miramichi River sub-populations as populations are mostly on islands; therefore,

recreational activities are limited due to water levels and the areas are unsuitable for development. However, the threats listed below could have some influence.

The primary threats to Cobblestone Tiger Beetles are habitat loss or degradation from development and off-road vehicles^[3]. Both threats cause damage to the beetles' habitat. As this species breeds and forages along cobble beaches, damage to this habitat can cause declines. Currently, examples of habitat damage at Grand Lake include beach raking, beach grading, and removal of vegetation. Off-road vehicles damage and compact cobble along beaches and directly kill Cobblestone Tiger Beetles. Off-road vehicles also remove shoreline vegetation, causing increased habitat damage^[3].

Other threats include climate change and extreme weather events, and agricultural runoff^[1]. Removal of individuals due to collection is possible, but currently unknown in the province. The current lack of understanding on the causes of the species population fluctuations and movement between locations is problematic, as it inhibits the ability to recognize and potentially prevent population declines.

Management Objective

The focus of the management objective is to reduce habitat degradation to the Grand Lake and Maquapit Lake population and maintain current habitat quality for the Saint John River and Southwest Miramichi River populations. This work often involves collaboration across government jurisdictions and partners. The management objective and conservation measures proposed in this management plan reflect the role of DNRED within this mosaic.

The provincial management objective for the Cobblestone Tiger Beetle is to maintain habitat quality for the Southwest Miramichi and Saint John River Island populations and improve habitat quality for the Grand Lake and Maquapit Lake population to support its continued presence in New Brunswick.

Broad Strategies and Conservation Measures

Priority Conservation Measures

Priority conservation measures to mitigate threats are described in Table 1 to facilitate the conservation of Cobblestone Tiger Beetles.

Table 1. Priority Conservation Measures Table.

Priority Conservation Measures	Threat	General description
Monitoring of Cobblestone Tiger Beetle populations	All	Establish and implement an annual monitoring program at the Grand Lake and Maquapit Lake sub-populations to detect changes. Supplementary monitoring of the Saint John River and Southwest Miramichi River sub-populations would be beneficial.

Priority Conservation Measures	Threat	General description
Monitoring habitat changes at and surrounding Cobblestone Tiger Beetle populations	All	Develop a monitoring plan that provides schedules and protocols for tracking potential threats and changes in habitat.
Stewardship and education	Shoreline development and alteration Off-road vehicles	Increased awareness of the species to local residents, specifically at Grand Lake and Maquapit Lake, using strategies identified in the stewardship plan.
Habitat maintenance and restoration	Shoreline development and alteration	Improvement and restoration of Cobblestone Tiger Beetle habitat at Grand Lake and Maquapit Lake and maintenance of habitat at the Saint John River Islands and Southwest Miramichi River Islands.
Land conservation	Shoreline development and alteration	Prioritization of land conservation in areas of high threat from development to the species.
Research	Knowledge gaps	Improve our understanding of the ecology of the species, including population fluctuations, identifying whether there is movement between sites, and if populations within a location are stable.

Actions already completed or currently underway

The work and engagement of several individuals and organizations have provided a solid basis for the conservation of Cobblestone Tiger Beetles. These include the interest and support from residents of the area, the stewardship work of the Nature Trust of New Brunswick (NTNB), John Klymko from the Atlantic Canada Conservation Data Centre (ACCDC), Reginald Webster and Rodger Gwiazdowski from the University of Massachusetts, and Stephen Heard from the University of New Brunswick (UNB).

With the help of partners (listed above), there has been efforts to engage with the public, conduct species research, and complete population surveys throughout New Brunswick. Outreach to the public has mainly focused on Grand Lake and Maquapit Lake due to the high threats of shoreline modification. In 2019, conservation standards planning was initiated for the species to identify priorities for monitoring and management. Through these workshops, a pilot stewardship plan was initiated and started in the summer of 2022, with the help of UNB, NTNB and ACCDC.

There has also been land conservation to further protect the species. NTNB protected several islands in the Upper Saint John River as well as a property along the shore of Maquapit Lake.

Measuring results

To measure the success of the above strategies, Cobblestone Tiger Beetles at Grand Lake and Maquapit Lake sub-populations will be monitored to track population changes. If the Cobblestone Tiger Beetle population declines more than 30 per cent before the Committee on the Status of Species at Risk's reassessment period (10-year cycle), then DNRED will reassess the status of the species.

The habitat at and around the Saint John River and the Southwest Miramichi River Islands will be monitored to detect possible changes in threats (i.e., development and recreationally activity). If an increase in threats is detected, the sub-populations will be monitored to track population changes.

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Figure 1. Distribution of Cobblestone Tiger Beetles in New Brunswick.

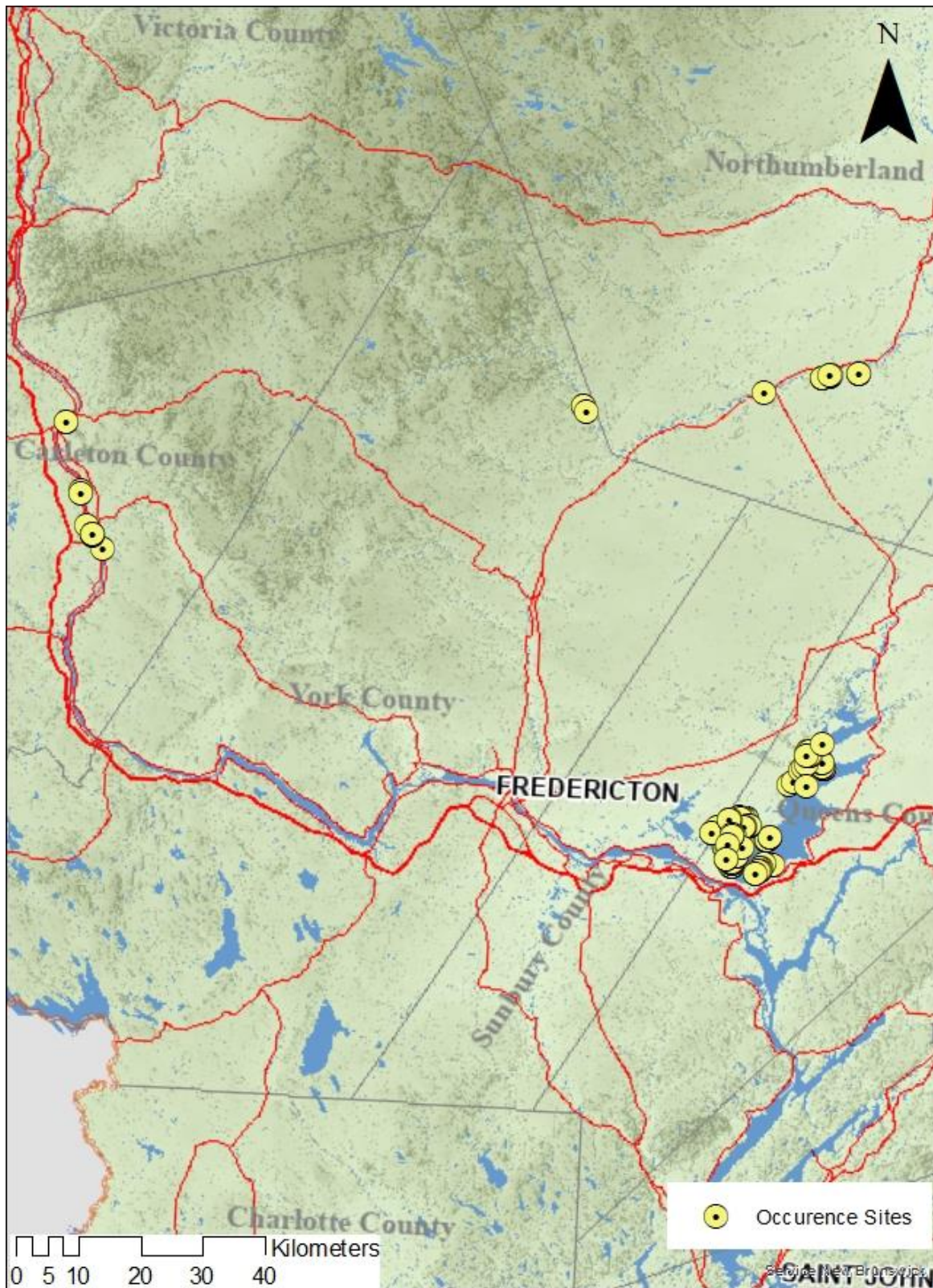


Figure 2. Cobblestone beach on Grand Lake where there is a Cobblestone Tiger Beetle (*Cicindela marginipennis*) colony. Photograph by John Klymko, 2013.



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References

- [1] COSEWIC. 2021. COSEWIC assessment and status report on the Cobblestone Tiger Beetle *Cicindela marginipennis* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 27 pp.
- [2] Environment Canada. 2013. Recovery Strategy for the Cobblestone Tiger Beetle (*Cicindela marginipennis*) in Canada [Proposed]. *Species at Risk Act Recovery Strategy Series*. Environment Canada, Ottawa. v + 17 pp.
- [3] New Brunswick Department of Natural Resources and Energy Development. 2022. Cobblestone Tiger Beetle, *Cicindela marginipennis*, in New Brunswick: Status Report. NBDNRED, Fredericton, NB. 32 pp.
- [4] U.S. Fish and Wildlife Service. 2018. Species status assessment (SSA) report for the cobblestone tiger beetle (*Cicindela marginipennis*), November 2018. Version 1.1. Annapolis, M.D.

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