

**Ontario Species at Risk Evaluation Report for Lake  
Huron Grasshopper (*Trimerotropis huroniana*)**

Committee on the Status of Species at Risk in Ontario  
(COSSARO)

Assessed by COSSARO as Threatened

June 2016

Final

## Criquet du lac Huron (*Trimerotropis huronia*)

Le criquet du lac Huron est endémique sur la rive de certains des Grands Lacs (lac Huron, lac Michigan et Sud du lac Supérieur) en Ontario, au Wisconsin et au Michigan (COSEPAC, 2015). Sauterelle à la coloration cryptique et aux ailes présentant une rayure, le criquet du lac Huron possède des caractéristiques morphologiques qui le distinguent des espèces apparentées (COSEPAC, 2015). Son cycle de vie est d'un an, les adultes venant à maturité en juin-juillet, et poursuivant jusqu'à septembre-octobre (COSEPAC 2015). Son habitat est exclusivement les dunes, où se trouvent ses plantes favorites : l'ammophile à ligule courte (*Ammophila breviligulata*), l'armoise des champs (*Artemisia campestris*) et le calamovilfa à feuilles longues (*Calamovilfa longifolia*) (COSEPAC, 2015). L'espèce a une distribution éparse en raison de la nature discontinue des dunes, mais comme ils sont capables de voler, les adultes sont parvenus à coloniser des îles à plus de 10 km du rivage, ce qui laisse croire à la possibilité d'une dispersion sur de grandes distances (COSEPAC, 2015).

Le criquet du lac Huron est classé comme étant une espèce menacée vu la faible étendue de son habitat, son endémisme le long des Grands Lacs et les indicateurs de sa vulnérabilité et de celle de son habitat en raison de menaces précises et continues. Par ailleurs, l'espèce serait disparue de trois endroits.

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## Executive summary

The Lake Huron Grasshopper is endemic to shorelines of parts of the Great Lakes (Lake Huron, Lake Michigan, and southern Lake Superior) in Ontario, Wisconsin and Michigan (COSEWIC 2015). It is a cryptically-coloured, banded-winged grasshopper with distinct morphological characters separating it from closely-related species (COSEWIC 2015). Individuals of this species live for one year with adults occurring in June/July until September/October (COSEWIC 2015). It exclusively inhabits open dune habitat where its preferred food plants are located: Marram Grass (*Ammophila breviligulata*), Tall Wormwood (*Artemisia campestris*) and Long-leaved Reed Grass (*Calamovilfa longifolia*) (COSEWIC 2015). The species has a disjunct distribution due to the discontinuous nature of dunes, but adults are capable of flight and have colonized islands greater than 10 km offshore, suggesting that dispersal over long distances is possible (COSEWIC 2015).

The Lake Huron Grasshopper is assessed as Threatened due to its small geographical range, endemism to the Great Lakes and indicators that the species and its sand dune habitat are vulnerable to ongoing, defined threats. In addition, the species is apparently extirpated from three sites where it formerly occurred.

# 1. Background information

## 1.1. Current designations

- GRANK: G2 - Imperiled (NatureServe 2016)
- NRANK Canada: N2
- COSEWIC: Threatened (Nov 2015)
- SARA: No status, no schedule
- ESA 2007: None
- SRANK: S2 (Ontario)

## 1.2. Distribution in Ontario

The species is extant in Ontario (COSEWIC 2015). Of the eight extant sites, one is located on Pancake Bay on southern Lake Superior, one is on Great Duck Island, Lake Huron and the rest are found on Manitoulin Island along the shores of Lake Huron (COSEWIC 2015). Historically, the range extended farther south in Ontario and Michigan with records from Giant's Tomb Island, Wasaga Beach, and Sauble Beach (Southampton) (COSEWIC 2015). Surveys at these historical sites have failed to find this species since the 1990s and the subpopulations are considered extirpated (COSEWIC 2015).

From 1901- 2002 only three sites were known to contain this species (Sauble Beach, Wasaga Beach and Giant Tomb's Island) (COSEWIC 2015). In 2002 & 2003, Steve Marshall surveyed additional dune habitat and located a subpopulation in Carter Bay (Manitoulin Island) but also noted its local extirpation at Sauble Beach (COSEWIC 2015). It was located again in 2003 at Carter Bay and Providence Bay by Steve Paiero (COSEWIC 2015).

The remaining six sites were discovered in 2014 during targeted surveys for the species in preparation for the COSEWIC status report (COSEWIC 2015).

## 1.3. Distribution and status outside Ontario

The global range of Lake Huron Grasshopper is restricted to the shores of Lake Huron, Lake Michigan, and southern Lake Superior (COSEWIC 2015). Outside of Ontario, the species is extant at over 70 dune complexes in Michigan, and two in Wisconsin (COSEWIC 2015).

## 1.4. Ontario conservation responsibility

Lake Huron Grasshopper is of significance because it is endemic to the Great Lakes area in Ontario, Michigan and Wisconsin (COSEWIC 2015). Approximately 11% of this species' known current range occurs in Ontario (COSEWIC 2015).

## 1.5. Direct threats

The overall IUCN Threats Calculator performed for the COSEWIC assessment deemed threats to this species at Medium (COSEWIC 2015). Primary threats include damage to sensitive dune ecosystems by pedestrians, recreationalists and erosion. Pedestrian use of the shorelines is considered a significant threat at six of the eleven Ontario sites and is implicated to have caused the extirpations at Wasaga and Sauble beaches (COSEWIC 2015). Off-road vehicle use is also a threat at six of the eleven Ontario sites and all-terrain vehicles (ATVs) has been found to be linked to local extirpations in Michigan (COSEWIC 2015). Modification of dunes and beaches to remove vegetation and re-create more open, sandy conditions for recreational use is a potential threat at some privately owned sites on Manitoulin Island; one site with this species was tilled to remove beach vegetation in 2014 (COSEWIC 2015).

Another primary threat is the prevalence of invasive species which can outcompete native dune plants. In Michigan, Lake Huron Grasshoppers were found only at sites where dense stands of Spotted Knapweed (*Centaurea biebersteinii*) were absent, indicating they may be sensitive to the presence of this common invasive species (COSEWIC 2015). The Common Reed (*Phragmites australis*) is also a pervasive species which can alter dune ecosystems in the region. Both of these invasive plants represent a threat to all known Lake Huron Grasshopper sites as they are established nearby and could invade habitat currently occupied by it (COSEWIC 2015).

Residential expansion and development were likely primary causes of the loss of the Lake Huron Grasshopper subpopulations at Wasaga and Sauble Beaches (COSEWIC 2015). Currently, eight of the eleven dune sites inhabited by Lake Huron Grasshopper face at least a low level of threat from residential development and associated structures, but there have been no major changes since 1999 (COSEWIC 2015).

Natural expansions of Seaside Grasshopper (*Trimerotropis maritima*) and Mottled Sand Grasshopper (*Spharagemon collare*) may occur and threaten Lake Huron Grasshopper subpopulations through competition, but this has not yet been documented as a significant threat (COSEWIC 2015).

The Lake Huron Grasshopper occurs at 11 dune sites in Ontario and eight threat-based locations (defined to be those in close geographic proximity with vulnerability to the same, most plausible threat, in most cases off-road vehicle use) (COSEWIC 2015). Table 3 in COSEWIC (2015) lists all threats associated with each of the 11 Ontario sites.

## 1.6. Specialized life history or habitat use characteristics

This species is endemic to a small portion of the Great Lakes shorelines. It has only been found in Ontario, Michigan and Wisconsin along the shorelines of Lake Huron, Lake Michigan, and southern Lake Superior. It exclusively inhabits open dune habitat where its preferred food plants (Marram Grass, Tall Wormwood and Long-leaved Reed Grass) are located (COSEWIC 2015). Dune ecosystems are extremely sensitive to a variety of threats including erosion, development, ATVs, pedestrian use and invasive

species.

## 2. Eligibility for Ontario status assessment

### 2.1. Eligibility conditions

#### 2.1.1. Taxonomic distinctness

Yes, the species is considered distinct (Walker 1902).

#### 2.1.2. Designatable units

No designatable units other than the species-level population have been identified (COSEWIC 2015).

#### 2.1.3. Native status

Yes. The species was first detected and described from Ontario in 1902 (COSEWIC 2015).

#### 2.1.4. Occurrence

Extant. Individuals were detected in Ontario in 2014 (COSEWIC 2015).

### 2.2. Eligibility results

Lake Huron Grasshopper (*Trimerotropis huroniana*) is eligible for status assessment in Ontario.

## 3. Ontario status assessment

### 3.1. Application of endangered or threatened status in Ontario

#### 3.1.1. Criterion A – Decline in total number of mature individuals

Insufficient information. Population trends unknown.

#### 3.1.2. Criterion B – Small distribution range and decline or fluctuation

Meets Threatened B1ab(iii)+2ab(iii) since the EOO and IAO are both below the thresholds (3900 km<sup>2</sup> and 48 km<sup>2</sup> respectively), there are currently 8-11 locations and there is a continuing decline in the area, extent and quality of habitat (see Direct Threats section for details).

#### 3.1.3. Criterion C – Small and declining number of mature individuals

Insufficient information. Number of mature individuals is unknown.

### 3.1.4. Criterion D – Very small or restricted total population

Insufficient information. Number of mature individuals not known and IAO and number of locations exceed thresholds.

### 3.1.5. Criterion E – Quantitative analysis

Does not apply. Analysis has not been conducted.

## 3.2. Application of Special Concern in Ontario

Does not apply.

## 3.3. Status category modifiers

### 3.3.1. Ontario's conservation responsibility

While this species has a global rank of G2 (Imperiled), the majority of its current range and population are on the US shorelines of the Great Lakes. Thus, this modifier does not apply.

### 3.3.2. Rescue effect

While these insects can fly, and show moderate dispersal capabilities, rescue from Michigan and/or Wisconsin subpopulations is possible but unlikely. In Ontario, the habitat is still vulnerable to identified, ongoing threats and subpopulations in the US are also ranked as Threatened or Endangered. Thus, this modifier does not apply.

## 3.4. Other status categories

### 3.4.1. Data deficient

Does not apply.

### 3.4.2. Extinct or extirpated

Does not apply

### 3.4.3. Not at risk

Does not apply

## 4. Summary of Ontario status

Lake Huron Grasshopper (*Trimerotropis huroniana*) is classified as Threatened in Ontario based on the criterion B1ab(iii)+2ab(iii).

## 5. Information sources

COSEWIC. 2015. Assessment and status report for the Lake Huron Grasshopper. Environment Canada. 32 pp.

[NatureServe](#). 2016. Accessed June 5, 2016.

Walker, E.M. 1902. [Canadian species of \*Trimerotropis\*](#). The Canadian Entomologist 34(1): 6. Accessed June 21, 2016.

## Appendix 1: Technical summary for Ontario

Species: Lake Huron Grasshopper (*Trimerotropis huroniana*)

### Demographic information

Demographic attribute	Value
Generation time. Based on average age of breeding adult: age at first breeding = X year; average life span = Y years.	1 year
Is there an observed, inferred, or projected continuing decline in number of mature individuals?	Yes, inferred decline based on habitat decline and past population extirpations
Estimated percent of continuing decline in total number of mature individuals within 5 years or 2 generations.	Unknown
Observed, estimated, inferred, or suspected percent reduction or increase in total number of mature individuals over the last 10 years or 3 generations.	Unknown
Projected or suspected percent reduction or increase in total number of mature individuals over the next 10 years or 3 generations.	Unknown
Observed, estimated, inferred, or suspected percent reduction or increase in total number of mature individuals over any 10 years, or 3 generations, over a time period including both the past and the future.	Unknown
Are the causes of the decline a. clearly reversible and b. understood and c. ceased?	a. No b. Yes c. No
Are there extreme fluctuations in number of mature individuals?	Unlikely

### Extent and occupancy information in Ontario

Extent and occupancy attributes	Value
Estimated extent of occurrence. (Request value from MNR or use <a href="http://geocat.kew.org/">http://geocat.kew.org/</a> )	3900 km <sup>2</sup>
Index of area of occupancy (IAO). (Request value from MNR or use <a href="http://geocat.kew.org/">http://geocat.kew.org/</a> )	48 km <sup>2</sup>

Is the total population severely fragmented? (i.e. is >50% of its total area of occupancy is in habitat patches that are (a) smaller than would be required to support a viable population, and (b) separated from other habitat patches by a distance larger than the species can be expected to disperse?)	a. No b. No
Number of locations ( <i>as defined by COSEWIC</i> ).	8-11
Number of NHIC Element Occurrences ( <i>Request data from MNRF</i> )	No information received from MNRF
Is there an observed, inferred, or projected continuing decline in extent of occurrence?	Unknown
Is there an observed, inferred, or projected continuing decline in index of area of occupancy?	Unknown
Is there an observed, inferred, or projected continuing decline in number of populations?	Unknown
Is there an observed, inferred, or projected continuing decline in number of locations?	No
Is there an observed, inferred, or projected continuing decline in [area, extent and/or quality] of habitat?	Yes, inferred decline of currently occupied sand dunes
Are there extreme fluctuations in number of populations?	Unknown
Are there extreme fluctuations in number of locations?	No
Are there extreme fluctuations in extent of occurrence?	No
Are there extreme fluctuations in index of area of occupancy?	Unknown

Number of mature individuals in each sub-population or total population (if known)

Unknown.

Qualitative analysis (population viability analysis conducted)

Probability of extinction in the wild is: unknown, not conducted.

Rescue effect

Rescue effect attribute	Likelihood
Is immigration of individuals and/or propagules between Ontario and outside populations known or possible?	Possible
Would immigrants be adapted to survive in Ontario?	Yes
Is there sufficient suitable habitat for immigrants in Ontario?	Unknown

Is the species of conservation concern in bordering jurisdictions?	Yes
Is rescue from outside populations reliant upon continued intensive recovery efforts?	Likely

## Appendix 2: Adjoining jurisdiction status rank and decline

### Information regarding rank and decline for Lake Huron Grasshopper

Jurisdiction	Subnational rank	Population trend	Sources
Ontario	S2	n/a	NatureServe, 2016
Quebec	n/a	n/a	n/a
Manitoba	n/a	n/a	n/a
Michigan	S2S3 , THR	At-risk, but recent subpopulations located	NatureServe, 2016, COSEWIC 2015
Minnesota	n/a	n/a	n/a
Nunavut	n/a	n/a	n/a
New York	n/a	n/a	n/a
Ohio	n/a	n/a	n/a
Pennsylvania	n/a	n/a	n/a
Wisconsin	S1, END	At-risk of extinction	NatureServe, 2016, COSEWIC 2015

#### Acronyms:

AOO: area of occupancy

COSEWIC: Committee on the Status of Endangered Wildlife in Canada

COSSARO: Committee on the Status of Species at Risk in Ontario

EOO: extend of occurrence

END: endangered

ESA: Endangered Species Act

GRANK: global conservation status assessments

IAO: index of area of occupancy

MNRF: Ministry of Natural Resources and Forestry

NHIC: Natural Heritage Information Centre

NNR: Unranked

NRANK: National conservation status assessment

SARA: Species at Risk Act

SNR: unranked

SRANK: subnational conservation status assessment

S1: critically imperiled

S2 : Imperiled

S3: Vulnerable

THR : threatened