

**Ontario Species at Risk Evaluation Report for Hoptree
Borer (*Prays atomocella*)**

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

Assessed by COSSARO as Endangered

June 2016

Final

Perceur du ptéléa (*Prays atomocella*)

Le perceur du ptéléa est un papillon nocturne qui se nourrit exclusivement du ptéléa trifolié (*Ptelea trifoliata*); il est le seul membre de la famille des praydidés (*Lepidoptera*) présent au Canada.

L'adulte présente une coloration particulière et a une taille petite à moyenne (envergure de 17 à 20 mm et longueur d'environ 6 à 8 mm). Ses habitudes n'ont pas fait l'objet de suffisamment d'études, mais on pense qu'il se nourrit de certaines plantes nectarifères. Le ptéléa trifolié (aussi évalué par le CDSEPO, juin 2016) devient l'hôte des larves, qui sont monophages et d'apparence neutre (vert à marron avec de pâles lignes latérales, et pouvant atteindre 20 mm de longueur à maturité), et ont une façon particulière de s'alimenter. Ce papillon nocturne est un « foreur » : les larves se nourrissent de l'intérieur des petites branches de son hôte, provoquant la mort de ses ramifications. Les larves se pupifient sur la plante hôte, habituellement près du site d'alimentation larvaire.

Vu son comportement discret et énigmatique, on ne dispose d'aucune donnée sur la population du perceur du ptéléa. Bien que les adultes portent des marques distinctives, l'espèce n'a été recensée qu'à deux endroits du Sud de l'Ontario (les plus vieilles observations datant de 1927). Son aire de répartition limitée ou les lacunes dans les efforts de recherche peuvent l'expliquer, mais malgré de récents efforts de recensement, on n'a pu les observer hors de ces deux endroits dans d'autres régions du Sud de l'Ontario caractérisées par des peuplements importants de ptéléas trifoliés (soit le parc provincial Rondeau et la pointe Abino); pourtant la période d'échantillonnage était idéale. Les deux endroits où se trouve le perceur du ptéléa sont des zones protégées fédérale ou provinciale (l'île Pelée comprend un site secondaire hors de la zone protégée provinciale). Malgré cette protection, des inquiétudes subsistent quant à la perte potentielle de son habitat en raison de l'érosion et de ses répercussions sur le ptéléa trifolié.

Le perceur du ptéléa est classé par le CDSEPO comme étant une espèce menacée vu sa distribution restreinte dans le Sud-Ouest de l'Ontario, de son important degré de spécialisation et de la menace à l'égard de son habitat, notamment le degré d'érosion prévu dans la flèche de sable de la pointe Pelée et ses répercussions sur la population de la plante hôte.

Cette publication hautement spécialisée «COSSARO Candidate Species at Risk Evaluation for Hoptree Borer» n'est disponible qu'en anglais conformément au Règlement 671/92, selon lequel il n'est pas obligatoire de la traduire en vertu de la Loi sur les services en français. Pour obtenir des renseignements en français, veuillez communiquer avec le ministère des Richesses naturelles et des Forêts au recovery.planning@ontario.ca.

Executive summary

The Hoptree Borer is a moth that feeds exclusively on the Common Hoptree (*Ptelea trifoliata*), and is the only member of the family *Praydidae* (*Lepidoptera*) that occurs in Canada.

Adult moths are distinctively coloured, small to medium sized moths (17 mm to 20 mm wingspan or about 6 mm to 8 mm in length). The habits of the adults have not been adequately studied but they are expected to feed on some nectar source. The larvae are monophagous on the Common Hoptree (also assessed by COSSARO; June 2016) and while relatively non-descript in appearance (green to tan in colour with pale lateral lines, with mature larvae growing as large as 20 mm in length), they have a distinctive feeding behaviour. This moth is an internal feeder or “borer”; the larva feeds inside small branches, causing distinct die-off in the terminal parts of the host. Larvae pupate on the host plant, usually in close proximity to the larval feeding site.

Due to its rare and cryptic behaviour, there is no population data available. Although the adults are distinctly marked, Hoptree Borer has only been found in two localities in southern Ontario (with the oldest record dating back to 1927). Although this may be a result of its limited range or lack of search effort, recent efforts to document its occurrence have found larvae in both localities, but have not found any in other significant stands of Common Hoptree in southern Ontario (Rondeau Provincial Park and Point Abino), despite evidence that the sampling period was ideal. The two locations where the Hoptree Borer has been found are either federally or provincially protected areas (the Pelee Island locality includes one subsite that is not within the provincially protected lands). Despite this protection, there is concern regarding the potential of loss of habitat from erosion and its impact on Common Hoptree at these two locations.

The Hoptree Borer is assessed as Endangered by COSSARO based on its restricted distribution in southwestern Ontario, its high degree of specialization and the threat of habitat loss, with specific concern regarding the projected levels of erosion on the Point Pelee sand spit and its effect on the host plant population.

1. Background information

1.1. Current designations

- GRANK: GNR (NatureServe 2016)
- NRANK Canada: N_
- COSEWIC: Endangered (COSEWIC 2015a)
- SARA: No status (No Schedule). COSEWIC (2015a) indicates it is listed as Endangered and not indicated on SARA.
- ESA 2007: NR
- SRANK: SNR (as *Yponomeuta atomocella*, Brown-bordered Ermine Moth)

1.2. Distribution in Ontario

The distribution of *P. atomocellus* is extremely restricted in Ontario, occurring in only two locations. It was observed in Point Pelee National Park and, is suspected to occur on Pelee Island based on observations of distinctive feeding damage. The host, Common Hoptree (*Ptelea trifoliata*), is more widely distributed in Ontario, with 12 subpopulations (COSEWIC 2015a, COSEWIC 2015b), of which only two populations, noted above, have populations of the Hoptree Borer. Despite host plant presence along the northern edge of Lake Erie, the Hoptree Borer does not appear to be expanding its range.

1.3. Distribution and status outside Ontario

In North America, the Hoptree Borer has a range that extends from southern Ontario, in the northeast, to Texas, in the southwest. Although the host plant extends into Mexico, there is no data to indicate if the Hoptree Borer's range extends further south of the American border; this may be due to a lack of specimens/collections from this region or an actual absence. No data is available on the status of the populations outside of Ontario.

1.4. Ontario conservation responsibility

Ontario has the only population of Hoptree Borer known to occur in Canada, but in the U.S.A. its range is much more extensive (COSEWIC 2015a). Based on available distribution data, Ontario accounts for ~7% of the global population (COSEWIC 2015a).

1.5. Direct threats

COSEWIC (2015a) threat calculator lists loss of habitat, fire suppression, habitat shifting, storms, invasive and native species, and pesticides as being threats to the Hoptree Borer. Most of these threats are indirect, through impact on the host plant, with the exception of pesticide use (used to control Gypsy Moth populations). The greatest threat to Hoptree Borer is the loss of habitat at both localities. Recent trends in the

erosion of the soil (through altered water currents in Lake Erie, or by strong storm surges) threaten or are a presumed threat to the stands of Common Hoptrees occurring at both sites. The most apparent threat is that the Point Pelee Sand Spit is currently losing more sand than it is accumulating due to altered water currents and, as a result, Baird and Associates (2010) predict that a significant portion of the spit (126 ha) may be lost over the next 50 years. This area contains the largest Ontario subpopulation of the host plant (Common Hoptree). Although efforts to mitigate the erosion are ongoing, there is some possibility that this host tree population could be lost. Some possibility exists that if the host plant was able to colonize new habitat as this erosion/acumulation process proceeds. However, it is uncertain how quickly the Hoptree Borer might colonize these new sites as the suitable age of the host plant for the caterpillar is not known; young trees may be unsuitable hosts.

1.6. Specialized life history or habitat use characteristics

The larvae are strictly monophagous, feeding solely on Common Hoptree, making any threat to Common Hoptree a threat to the Hoptree Borer. It is unclear if the host plant needs to be a certain age (or with branches of what diameter) in order to a viable host for the Hoptree Borer. No record of adult feeding has been documented but the adults would need to feed on some source of nectar to provide the necessary nutritional requirements for reproduction.

2. Eligibility for Ontario status assessment

2.1. Eligibility conditions

2.1.1. Taxonomic distinctness

Yes. The Hoptree Borer is a valid and distinct insect species.

2.1.2. Designatable units

No subspecies or populations have been designated but some initial genetic comparisons between the Ontario populations and the nearest populations in Michigan and Ohio indicate that the Ontario population has a unique genetic profile.

2.1.3. Native status

Yes. There is no indication that this species has been artificially introduced to Canada. The Ontario populations, while representing the northern limit for Hoptree Borer, are consistent with the global range. Furthermore, historical records of it in Ontario date as far back as 1927 (COSEWIC 2015a), fulfilling the requirements of native species candidacy.

2.1.4. Occurrence

Extant. Surveys for Hoptree Borer in southern Ontario have found records as recently

as 2016. These recent records support the belief that there is an extant population at both locations (see Fig. 6, COSEWIC 2015a). Efforts by Dr. J.J. Dombroskie have found an additional site on Pelee Island since the COSEWIC report was made available (Kraus, pers. comm.). This new site may represent a new location as it is not coastal and is therefore not under the threat of habitat loss by erosion that threaten the other sites.

2.2. Eligibility results

Hoptree Borer (*Prays atomocella*) 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.

No studies have monitored the population of Hoptree Borer. All data is largely based presence/absence and is not sufficient enough to indicate an increase or decrease in the population size. Most available data comes from indirect evidence (distinctive larval feeding damage). As such, Criterion A does not apply.

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

Based on both B1ab(iii) and B2ab(iii), Hoptree Borer qualifies for Endangered status. Both the EOO and IAO are below the threshold for Endangered, and there are only two locations where the Hoptree Borer occurs. As the area and quality of the habitat are inferred to be declining (Baird & Associates, 2010; COSEWIC 2015a), with an emphasis on data regarding the erosion of the Point Pelee land spit, it fulfills the requirements of Endangered. This data is based on “probable” locations, as some of the records were based on indirect evidence (feeding damage) so the EOO and IAO would be smaller based solely on confirmed records of individuals.

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

Insufficient Information.

Although there are only two restricted subpopulations, there is no data on the total number of mature individuals excluding it from consideration in Criterion C.

3.1.4. Criterion D – Very small or restricted total population

Based on Criterion D2, Hoptree Borer qualifies for Threatened status. Although the index of area of occupancy is 28km², above the AOO threshold for threatened, there are only 2 locations (Fig. 6, COSEWIC 2015a). However, generation time is only 1-2 years so not considered.

3.1.5. Criterion E – Quantitative analysis

Insufficient Information
Population data is not available.

3.2. Application of Special Concern in Ontario

Not applicable.

3.3. Status category modifiers

Not applicable.

3.3.1. Ontario's conservation responsibility

Does not apply as NatureServe (2016) does not have a global ranking for the Hoptree Borer and the Ontario distribution represents less than 25% of the global range of this species.

3.3.2. Rescue effect

The Ontario population is unlikely to benefit from a rescue effect. The closest known record of the Hoptree Borer to the Ontario populations is over 200km away and preliminary genetic data indicates a unique haplotype for the Ontario population (COSEWIC 2015a). The apparent inability of the Hoptree Borer to expand its range to nearby host populations also suggests that rescue effects from outside populations are unlikely without anthropogenic assistance.

3.4. Other status categories

3.4.1. Data deficient

Not applicable.

3.4.2. Extinct or extirpated

Not applicable.

3.4.3. Not at risk

Not applicable.

4. Summary of Ontario status

The Hoptree Borer (*Prays atomocella*) is classified as Endangered in Ontario based on meeting criterion B1ab(iii) + B2ab(iii). This agrees with the COSWEIC assessment and confirms the vulnerability of this species.

5. Information sources

Baird, W.F., and Associates Coastal Engineers Ltd. 2010. Colchester to Southeast Shoal Beach Nourishment Study. Prepared for Essex Region Conservation Authority, Essex, Ontario. Project No. 11395.101. 78 pp. + Appendices A–D.

Committee on the Status of Endangered Wildlife in Canada (COSEWIC). 2015a. COSEWIC assessment and update status report on the Hoptree Borer. Ottawa. x + 41 pp.

Committee on the Status of Endangered Wildlife in Canada (COSEWIC). 2015b. COSEWIC assessment and update status report on the Common Hoptree. Ottawa. x + 33 pp.

Committee on the Status of Species At Risk in Ontario (COSSARO) 2016. Ontario Species at Risk Evaluation Report for Common Hoptree (*Ptelea trifoliata*). Toronto.

Kraus, P. *pers. comm.* Personal communication indicating an additional record of *P. atomocella* on Pelee Island by Dr. J.J. Dombroskie.

NatureServe. 2016. [NatureServe Explorer: An online encyclopedia of life \[web application\]](#). Version 6.1. NatureServe, Arlington, Virginia. Accessed May 2016.

Appendix 1: Technical summary for Ontario

Species: Hoptree Borer (*Prays atomocella*)

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?	Unknown
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?	Unknown as no population data is available.
Are there extreme fluctuations in number of mature individuals?	Unknown

Extent and occupancy information in Ontario

Extent and occupancy attributes	Value
Estimated extent of occurrence. (Request value from MNR or use http://geocat.kew.org/)	148km ² (based on both confirmed and "probable" site information)
Index of area of occupancy (IAO). (Request value from MNR or use http://geocat.kew.org/)	28km ² (based on both confirmed and "probable" site information)

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. Unknown but likely no b. Unknown
Number of locations (<i>as defined by COSEWIC</i>).	2 (3?) With additional record by Dombroskie)
Number of NHIC Element Occurrences (<i>Request data from MNR</i>)	Data not available
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 in area.
Are there extreme fluctuations in number of populations?	Unknown
Are there extreme fluctuations in number of locations?	Unknown but not likely
Are there extreme fluctuations in extent of occurrence?	Unknown but not likely
Are there extreme fluctuations in index of area of occupancy?	Unknown

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

Sub-Population (or Total Population)	N of Mature Individuals
Point Pelee	Unknown
Pelee Island	Unknown

Quantitative analysis (population viability analysis conducted)

Probability of extinction in the wild is at least [20% within 20 years or 5 generations, or 10% within 100 years]. Unknown.

Rescue effect

Rescue effect attribute	Likelihood
Is immigration of individuals and/or propagules between Ontario and outside populations known or possible?	Unknown but unlikely

Would immigrants be adapted to survive in Ontario?	Probably
Is there sufficient suitable habitat for immigrants in Ontario?	Probably
Is the species of conservation concern in bordering jurisdictions?	No
Is rescue from outside populations reliant upon continued intensive recovery efforts?	No

Appendix 2: Adjoining jurisdiction status rank and decline

Information regarding rank and decline for Hoptree Borer

Jurisdiction	Subnational rank	Population trend	Sources
Ontario	Not previously listed.	Unquantified	COSEWIC 2015a
Quebec	Not Present	n/a	n/a
Manitoba	Not Present	n/a	n/a
Michigan	SNR	Unquantified	COSEWIC 2015a; NatureServe 2016
Minnesota	SNR	Unquantified	COSEWIC 2015a; NatureServe 2016
Nunavut	Not Present	n/a	n/a
New York	Not Present	n/a	n/a
Ohio	SNR	Unquantified	COSEWIC 2015a; NatureServe 2016
Pennsylvania	Not Present	n/a	n/a
Wisconsin	SNR	Unquantified	COSEWIC 2015a; NatureServe 2016

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

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