

Recovery Strategy for the Macropis Cuckoo Bee (*Epeoloides pilosulus*) in Canada

Macropis Cuckoo Bee



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For copies of the recovery strategy, or for additional information on species at risk, including the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) Status Reports, residence descriptions, action plans, and other related recovery documents, please visit the [Species at Risk \(SAR\) Public Registry](#)¹.

Cover illustration:

Macropis Cuckoo Bee (male). Photo by Sam Droege

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¹ www.canada.ca/en/environment-climate-change/services/species-risk-public-registry.html

Preface

The federal, provincial, and territorial government signatories under the [Accord for the Protection of Species at Risk \(1996\)](#)² agreed to establish complementary legislation and programs that provide for effective protection of species at risk throughout Canada. Under the *Species at Risk Act* (S.C. 2002, c.29) (SARA), the federal competent ministers are responsible for the preparation of recovery strategies for listed Extirpated, Endangered, and Threatened species and are required to report on progress within five years after the publication of the final document on the SAR Public Registry

The Minister of Environment and Climate Change and Minister responsible for the Parks Canada Agency is the competent minister under SARA for the Macropis Cuckoo Bee and has prepared this recovery strategy, as per section 37 of SARA. To the extent possible, it has been prepared in cooperation with the provinces of Ontario, Quebec, and Nova Scotia, as per section 39(1) of SARA.

It was determined that the recovery of the Macropis Cuckoo Bee in Canada is not technically or biologically feasible. The species still may benefit from general conservation programs in the same geographic area and will receive protection through SARA and other federal, and provincial or territorial, legislation, policies, and programs.

The feasibility determination will be re-evaluated as part of the report on implementation of the recovery strategy, or as warranted in response to changing conditions and/or knowledge.

The recovery strategy sets the strategic direction to arrest or reverse the decline of the species, including identification of critical habitat to the extent possible. It provides all Canadians with information to help take action on species conservation. When critical habitat is identified, either in a recovery strategy or an action plan, SARA requires that critical habitat then be protected.

In the case of critical habitat identified for terrestrial species including migratory birds SARA requires that critical habitat identified in a federally protected area³ be described in the *Canada Gazette* within 90 days after the recovery strategy or action plan that identified the critical habitat is included in the public registry. A prohibition against destruction of critical habitat under ss. 58(1) will apply 90 days after the description of the critical habitat is published in the *Canada Gazette*.

² www.canada.ca/en/environment-climate-change/services/species-risk-act-accord-funding.html#2

³ These federally protected areas are: a national park of Canada named and described in Schedule 1 to the *Canada National Parks Act*, The Rouge National Park established by the *Rouge National Urban Park Act*, a marine protected area under the *Oceans Act*, a migratory bird sanctuary under the *Migratory Birds Convention Act, 1994* or a national wildlife area under the *Canada Wildlife Act* see ss. 58(2) of SARA.

For critical habitat located on other federal lands, the competent minister must either make a statement on existing legal protection or make an order so that the prohibition against destruction of critical habitat applies.

If the critical habitat for a migratory bird is not within a federal protected area and is not on federal land, within the exclusive economic zone or on the continental shelf of Canada, the prohibition against destruction can only apply to those portions of the critical habitat that are habitat to which the *Migratory Birds Convention Act, 1994* applies as per SARA ss. 58(5.1) and ss. 58(5.2).

For any part of critical habitat located on non-federal lands, if the competent minister forms the opinion that any portion of critical habitat is not protected by provisions in or measures under SARA or other Acts of Parliament, or the laws of the province or territory, SARA requires that the Minister recommend that the Governor in Council make an order to prohibit destruction of critical habitat. The discretion to protect critical habitat on non-federal lands that is not otherwise protected rests with the Governor in Council.

Acknowledgments

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Executive Summary

The Macropis Cuckoo Bee is a distinctive nest parasite of *Macropis* (specifically of highly specialized “oil bees”). A small number of occurrences are known historically from much of eastern and central Canada but the 14 specimens collected between 1915 and 2010 were from southern Canada (Nova Scotia and from Quebec to Alberta). The four individuals collected in Canada in the last fifty years were from Elk Island National Park, Alberta (2010); near Middleton, Nova Scotia (two collections from one site in 2002); and Milton, Ontario (1978). Macropis Cuckoo Bee was listed as Endangered on Schedule 1 of the *Species at Risk Act* on May 30, 2018. In the United States, three individuals were collected from Connecticut (2006), New York State (2014), and Maine (2016).

Cuckoo bees exhibit one of the most specialized sets of ecological relationships known for bees and as such, they are highly vulnerable to any changes in populations of *Macropis* which exhibit a narrow, specialized preference for oil-producing loosestrifes (*Lysimachia*). Loss of large stands of *Lysimachia* and resulting fragmentation are likely affecting populations of *Macropis*, which in turn is probably the main factor contributing to the rarity of Macropis Cuckoo Bee. It may be possible to mitigate the threats to habitat but the population’s extremely small size reduces its potential for recovery.

The recovery of the Macropis Cuckoo Bee was deemed not feasible at this time but this will be re-evaluated in response to changing conditions and/or knowledge.

Critical habitat cannot be identified at this time due to inadequate information. Although *Lysimachia* and *Macropis* occur from Nova Scotia to British Columbia, the paucity of recent Macropis Cuckoo Bee records and only a few historical records make it impossible to reasonably identify those *Lysimachia* stands necessary for the survival or recovery of the species. Should inventories document viable populations of Macropis Cuckoo Bees, critical habitat identification may be re-considered in a revised recovery strategy.

Recovery Feasibility Summary

Based on the following four criteria that Environment and Climate Change Canada uses to establish recovery feasibility, recovery of the Macropis Cuckoo Bee has been determined not to be biologically or technically feasible at this time. Recovery is considered not feasible when the answer to any of the following questions is “no”.

1. Individuals of the wildlife species that are capable of reproduction are available now or in the foreseeable future to sustain the population or improve its abundance.

Unknown. The species was thought to be extirpated from Canada until two males were collected in 2002 in Nova Scotia. Searches between 2004 and 2008 at the Nova Scotia collection site and in nearby areas did not record additional Macropis Cuckoo Bees. Two additional records have come to light since the COSEWIC status report (2011) was published. An adult was collected in Elk Island National Park in Alberta in 2010 and a female specimen was discovered in a collection from Milton, Ontario in 1978. Only three individuals have been collected in the United States (Connecticut, New York, and Maine) in the last sixty years; making the possibility of rescue from elsewhere unlikely.

The extreme rarity of the species and the widespread occurrence of historical records, combined with a lack of detailed survey work in areas for the species other than in Nova Scotia, makes it possible that the species occurs elsewhere (COSEWIC 2011).

2. Sufficient suitable habitat is available to support the species or could be made available through habitat management or restoration.

Unknown. The Macropis Cuckoo Bee depends on highly specialized host “oil bees” (*Macropis*) which in turn require stands of oil-producing loosestrifes (*Lysimachia*). The Macropis Cuckoo Bee is a distinctive kleptoparasite⁴ of *Macropis*. Macropis Cuckoo Bees deposit their eggs within the host bee’s nest, where the cuckoo larvae consume the food provisions intended for the host bee’s offspring. Two species of *Macropis* are known from Canada (*M. ciliata* and *M. nuda* (Michez and Patiny 2005)). *Macropis nuda* is the main species known from much of the Macropis Cuckoo Bee’s Canadian range (Michez and Patiny 2005) and is a likely host for Macropis Cuckoo Bee (not confirmed). *Macropis ciliata*, recorded in Quebec (Michez and Patiny 2005), could be a possible host for Macropis Cuckoo Bee.

Over 20 sites were searched for Macropis Cuckoo Bee between 2004 and 2008 in Nova Scotia without success. The host bee, *Macropis nuda*, was collected at all sites (COSEWIC 2011). The site in Alberta has not been revisited for inventories. The distribution of *Lysimachia* is much more widespread than either *Macropis* or the Macropis Cuckoo Bee. Despite the commonness of *Lysimachia*, records of Macropis Cuckoo Bee are extremely rare and the reasons for this are not fully understood

⁴ Kleptoparasite bees lay their eggs inside nests constructed by other bee species (i.e., their host bees).

(COSEWIC 2011). Macropis Cuckoo Bee exhibits one of the most specialized sets of ecological relationships known for bees and as such, they are highly vulnerable to any changes in populations of *Macropis* which exhibit a narrow, specialized preference for oil-producing loosestrifes (*Lysimachia*).

3. The primary threats to the species or its habitat (including threats outside Canada) can be avoided or mitigated.

Unknown. Threats to habitat, namely habitat loss and encroachment of invasive weed species, can be mitigated but the species' extreme rarity (and the rarity of its host bees) vastly reduces its potential for recovery

4. Recovery techniques exist to achieve the population and distribution objectives or can be expected to be developed within a reasonable timeframe.

No. While wetland conservation and management of invasive vegetation are reasonable and relatively easy recovery techniques to implement at this time, the extreme rarity of recent records for this species (COSEWIC 2011, Sheffield and Heron 2018) makes it unlikely that recovery techniques could be used to achieve objectives.

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1. COSEWIC* Species Assessment Information⁵

Date of Assessment: May 2011

Common Name (population): Macropis Cuckoo Bee

Scientific Name: *Epeoloides pilosulus*

COSEWIC Status: Endangered

Reason for Designation: This species is a habitat specialist, requiring both a suitable host (*Macropis* bees) and their host's foodplant. The foodplant requires moist habitat and the host bee requires sunny, sandy slopes for its nest site. Historically in Canada, this species was known from six sites across five provinces. Despite recent increases in bee surveying activity nationwide, it has been found in Canada only once in the past fifty years and has not been seen again at this locality or nearby despite recent extensive searches. With only one location and a predicted continuing decline in habitat area and quality, this species is at imminent risk of extinction.

Canadian Occurrence: Nova Scotia

COSEWIC Status History: Designated Endangered in May 2011.

* COSEWIC (Committee on the Status of Endangered Wildlife in Canada)

2. Species Status Information

Macropis Cuckoo Bee was assessed by COSEWIC as Endangered in 2011 and listed in Schedule 1 of the *Species at Risk Act* (SARA) in 2018. The species was assessed by the Committee on the Status of Species at Risk in Ontario in 2010 as Data Deficient. As such, it does not receive any special protection in Ontario under the Endangered Species Act. Currently, this species is not designated in Quebec under the threatened or vulnerable Species Act (LEMV; <http://www3.mffp.gouv.qc.ca/faune/especes/menacees/liste.asp>). In addition, it is not on the list of species likely to be designated as threatened or vulnerable, produced under this Act. (<http://www3.mffp.gouv.qc.ca/faune/especes/menacees/liste.asp#insectes>). The species is protected under the Nova Scotia Endangered Species Act.

Global, national, and sub-national ranks are in Table 1. The distribution data is known to be incomplete or has not been reviewed for this taxon (NatureServe 2018).

⁵ An additional individual was collected in 2010 from Elk Island National Park, Alberta (described since the species' COSEWIC report).

Table 1. List and description of various conservation status ranks for the Macropis Cuckoo Bee (MB, QC, NS, CT, ME, WI: NatureServe 2018, AB: G. Court pers. comm SK: Saskatchewan Conservation Data Centre 2018, ON: Natural Heritage Information Centre 2018; NY: E. White pers. comm. 2019)

G-Rank ^a	N-Rank ^b	S-Rank ^c
GU	Canada: N1	AB (S1S2), SK (S1), MB (S1), ON (S1), QC (SNR), NS (S1)
	United States: NH	CT (S1S2), NY (S1), ME (SNR), WI (SH)

^a G-Rank — Global Conservation Status Rank: GU = unrankable; G1 = species is critically imperiled; G2 = species is imperiled, G3 = species is vulnerable.

^b N-Rank — National Conservation Status Rank: N1 = population within the nation is Critically Imperiled; N2 = population within the nation is Imperiled, N3 = population within the nation is Vulnerable, NH = Possibly Extirpated (Historical).

^c S-Rank — sub-national (provincial/territorial/state) ranks: S1 = Critically Imperiled; S2 = Imperiled; SH = Possibly Extirpated (historical) - species occurred historically in the province, and there is some possibility that it may be rediscovered; S3 = Vulnerable, S4 = Apparently Secure; SNR = Unranked; SU = Unrankable due to a lack of information or conflicting information; SX = Presumed Extirpated.

3. Species Information

The following sections summarize species information; additional information is available in the COSEWIC Assessment and Status Report on the Macropis Cuckoo Bee *Epeoloides pilosulus* in Canada (COSEWIC 2011).

3.1 Species Description

The Macropis Cuckoo Bee is generally accepted to be an obligate kleptoparasite⁶ of *Macropis* based on known European associations (Ascher 2005). Its hard exoskeleton (integument) is smooth and shiny black and completely lacks the red and/or yellow markings of other wasp-like kleptoparasites.

3.2 Species Population and Distribution

Macropis Cuckoo Bee distribution in North America is closely tied to that of its uncommon host bees (*Macropis*) which falls within the range of oil-producing species of native yellow loosestrife (*Lysimachia*). A small number of occurrences are known historically from much of eastern and central Canada (Sheffield and Heron 2018, COSEWIC 2011, Figure 1, see Appendix B).

⁶ Kleptoparasite bees lay their eggs inside nests constructed by other bee species (i.e., their host bees) ,

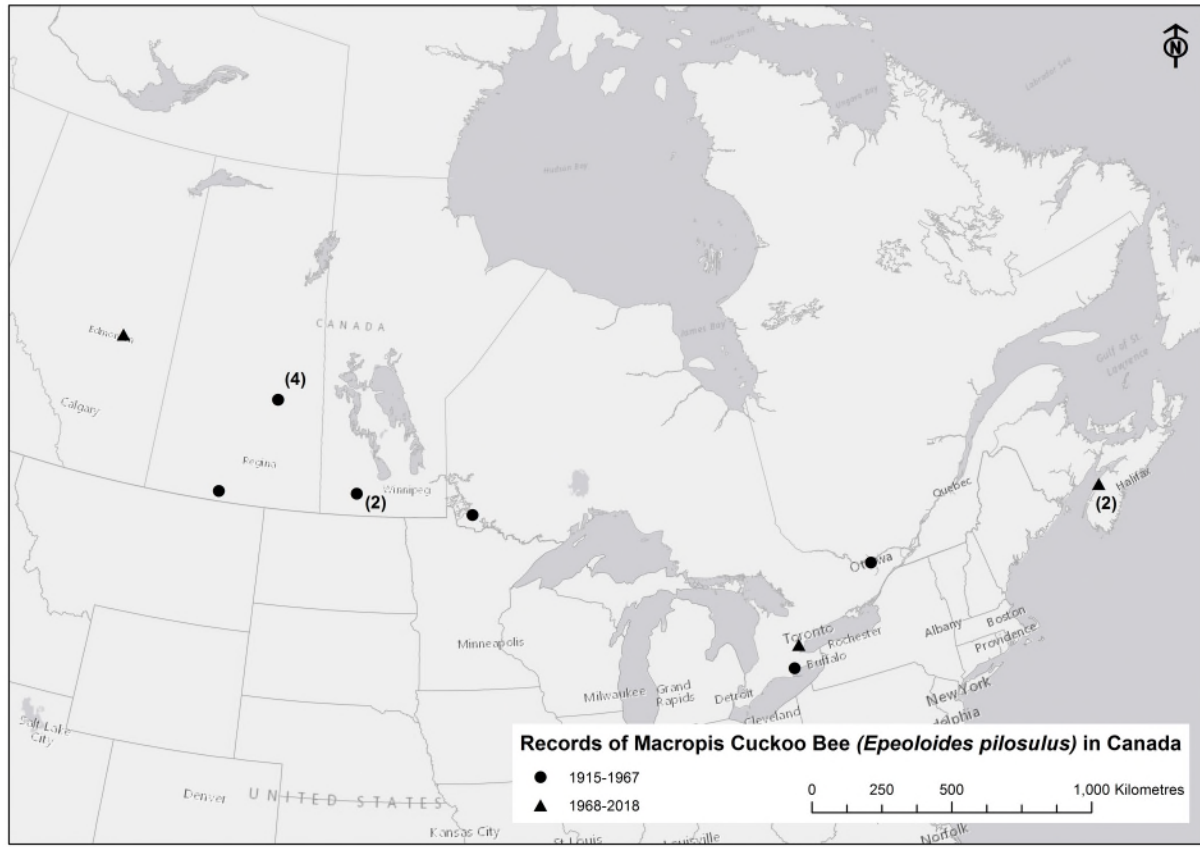


Figure 1. Recent (black triangles) and historical (circles) records of Macropis Cuckoo Bee in Canada (see Appendix B for more details).

Three individuals were collected in the United States in recent years: Connecticut in 2006 (Wagner and Ascher 2008), New York in 2014 (Gibbs et al. 2017), and Maine in 2016 (Dibble et al. 2017). Four individuals were collected in Canada in the past fifty years (see Appendix B for Canadian collections). One individual was collected in 2010 in Elk Island National Park, Alberta (described since the species' COSEWIC report) and this discovery extends the species known range westwards (Sheffield and Heron 2018). Two males were collected in 2002 from a site near Middleton, Nova Scotia (Sheffield and Heron 2018). Over 20 sites were searched for Macropis Cuckoo Bees between 2004 and 2008 in southern and northwestern Nova Scotia. The host bee, *Macropis nuda*, was collected at all sites (COSEWIC 2011) and the population of *Lysimachia terrestris* at the site near Middleton was still present (Sheffield, unpublished observation). Despite this, Macropis Cuckoo Bee has not been re-found at the original Nova Scotia collection site or nearby since the collection in 2002 (COSEWIC 2011). The fourth specimen (described since the species' COSEWIC report) was discovered in a collection from Milton, Ontario taken in 1978. It is unclear whether bee surveys in suitable habitat were completed in this location since 1978.

Macropis Cuckoo Bee is a conspicuous and readily identified bee. Many major North American bee collections have been checked for this species, so the paucity of

recent records is real. In contrast, numerous specimens were collected by non-specialists in the late 19th and early 20th Century (Ascher 2005).

3.3 Needs of the Macropis Cuckoo Bee

Macropis Cuckoo Bees are obligate kleptoparasites of specialised “oil bees” (*Macropis*) which are, in turn, entirely dependent on their floral host (oil-producing loosestrifes (*Lysimachia*)). Refer to Sheffield and Heron (2018) for a list of *Lysimachia* in North America). Macropis Cuckoo Bees deposit their eggs within the host bee’s nest, where the cuckoo larvae consume the food provisions intended for the host bee’s offspring. Two species of *Macropis* are known from Canada (*M. ciliata* and *M. nuda*) (Michez and Patiny 2005, Sheffield and Perron 2014, Sheffield et al. 2017). *Macropis nuda* is the main species known from much of the Macropis Cuckoo Bee’s Canadian range (Michez and Patiny 2005). *Macropis ciliata* occurs in Quebec (Michez and Patiny 2005) and could be a possible host for Macropis Cuckoo Bees. The majority of native Canadian *Lysimachia* grow in swampy or moist habitats. The distribution of *Lysimachia* is much more widespread than either *Macropis* or Macropis Cuckoo Bee (COSEWIC 2011).

Female *Macropis* typically dig their nests in the ground of sloping banks in sunny areas with sandy, well-drained soil, often in the midst of their floral host.

4. Threats

4.1 Threat Assessment

The Macropis Cuckoo Bee threat assessment is based on the IUCN-CMP (World Conservation Union–Conservation Measures Partnership) unified threats classification system. Threats are defined as the proximate activities or processes that have caused, are causing, or may cause in the future the destruction, degradation, and/or impairment of the entity being assessed (population, species, community, or ecosystem) in the area of interest (global, national, or subnational). Limiting factors are not considered during this assessment process. For purposes of threat assessment, only present and future threats are considered. Historical threats, indirect or cumulative effects of the threats, or any other relevant information that would help understand the nature of the threats are presented in the Description of Threats section.

The scope (i.e. proportion of the species that can reasonably be expected to be affected by the threat within 10 years) of this assessment was determined to be “unknown” because the number of individuals persisting in Canada is unknown. Only four specimens were collected in Canada in the past fifty years and the area where two of these individuals were collected in Nova Scotia was thoroughly re-surveyed over multiple years (2004-2008) without finding the species. Due to the extreme rarity of this bee and only one known location in the past 10 years (Elk Island National Park, Alberta), it is not possible to determine the population size of this species.

Table 2. Threat calculator assessment.

Threat #	Threat description	Impact ^a	Scope ^b	Severity ^c	Timing ^d	Detailed threats
7	Natural system modifications	Unknown	Unknown	Unknown	High (Continuing)	
7.2	Dams & water management/use	Unknown	Unknown	Unknown	High (Continuing)	wetland conversion: loss/ reduction/ fragmentation of stands of <i>Lysimachia</i> leading to the loss or reduction of <i>Macropis</i> and their nests
8	Invasive & other problematic species & genes	Unknown	Unknown	Unknown	High (Continuing)	
8.1	Invasive non-native/alien species	Unknown	Unknown	Unknown	High (Continuing)	e.g., Purple Loosestrife, Common Reed
9	Pollution	Unknown	Unknown	Unknown	High (Continuing)	
9.3	Agricultural & forestry effluents	Unknown	Unknown	Unknown	High (Continuing)	<i>Macropis</i> Cuckoo Bee and their hosts may be vulnerable to insecticides used for mosquito control
11	Climate change & severe weather	Unknown	Unknown	Unknown	High (Continuing)	
11.1	Habitat shifting & alteration	Unknown	Unknown	Unknown	High (Continuing)	Timing mismatch between emergence of floral host, host bees, and/or <i>Macropis</i> Cuckoo Bee (e.g., host bees emerge before floral resources are available or due to an earlier snow melt, floral hosts emerge earlier resulting in host bees having access to fewer floral resources)
11.2	Droughts	Unknown	Unknown	Unknown	High (Continuing)	Droughts affect floral resources of host bees

^a **Impact** – The degree to which a species is observed, inferred, or suspected to be directly or indirectly threatened in the area of interest. The impact of each threat is based on Severity and Scope rating and considers only present and future threats. Threat impact reflects a reduction of a species population or decline/degradation of the area of an ecosystem. The median rate of population reduction or area decline for each combination of scope and severity corresponds to the following classes of threat impact: Very High (75% declines), High (40%), Medium (15%), and Low (3%). Unknown: used when impact cannot be determined (e.g., if values for either scope or severity are unknown); Not Calculated: impact not calculated as threat is outside the assessment timeframe (e.g., timing is insignificant/negligible or low as threat is only considered to be in the past); Negligible: when scope or severity is negligible; Not a Threat: when severity is scored as neutral or potential benefit.

^b **Scope** – Proportion of the species that can reasonably be expected to be affected by the threat within 10 years. Usually measured as a proportion of the species' population in the area of interest. (Pervasive = 71–100%; Large = 31–70%; Restricted = 11–30%; Small = 1–10%; Negligible < 1%).

^c **Severity** – Within the scope, the level of damage to the species from the threat that can reasonably be expected to be affected by the threat within a 10-year or three-generation timeframe. Usually measured as the degree of reduction of the species' population. (Extreme = 71–100%; Serious = 31–70%; Moderate = 11–30%; Slight = 1–10%; Negligible < 1%; Neutral or Potential Benefit ≥ 0%).

^d **Timing** – High = continuing; Moderate = only in the future (could happen in the short term [< 10 years or 3 generations]) or now suspended (could come back in the short term); Low = only in the future (could happen in the long term) or now suspended (could come back in the long term); Insignificant/Negligible = only in the past and unlikely to return, or no direct effect but limiting.

4.2 Description of Threats

7.2 Dams & water management/use (wetland conversion: loss/ reduction/ fragmentation of *Lysimachia* leading to the loss or reduction of *Macropis* and their nests)

Due to the dependence of Macropis Cuckoo Bee's host bees on *Lysimachia*, the survival of the Macropis Cuckoo Bee is also linked to the abundance and distribution of these plant species. Most Canadian species of *Lysimachia* grow in swampy or moist habitats and established populations may be vulnerable to loss and degradation of suitable habitat (e.g. swamps, and stream, pond, and lake margins) (COSEWIC 2011). Indeed, wetland habitat continues to decline over much of the Macropis Cuckoo Bee's historical Canadian range (COSEWIC 2011).

8.1 Invasive non-native/alien species (usurpation of *Lysimachia* habitat)

Alien invasive weeds such as Purple Loosestrife (*Lythrum salicaria*) and Common Reed (*Phragmites australis*) are known to usurp the habitat of *Lysimachia* and can effectively choke wetlands. Four species of *Lysimachia* are introduced to North America and it is not known whether these species are suitable food plants for *Macropis*. If they are not suitable floral hosts and they are able to outcompete native *Lysimachia* in appropriate habitat, they would be a threat to the Macropis Cuckoo Bee.

9.3 Agricultural & Forestry Effluents

In the European Food Safety Authority's risk assessment (2013), worker bees, queens, and larvae of bumble bees and adult females and larvae of solitary bees were considered to be categories of bees that are most exposed to pesticides via ingestion. Specifically, larvae of solitary bees (i.e., *Macropis* and Macropis Cuckoo Bees) are provisioned with large amounts of unprocessed pollen and are more exposed to residues in pollen and oil. Additionally, solitary bees may be further exposed by contact with nesting material (soil or floral resources).

Because they occur in wetland margins, *Macropis* and Macropis Cuckoo Bee may be especially vulnerable to insecticides used for mosquito control (Asher 2005).

11 Climate Change & Severe Weather

Climate Change may disrupt the relationships between *Lysimachia*, *Macropis*, and Macropis Cuckoo Bee as it is likely their individual responses to Climate Change will be different. As temperatures rise, flowers may bloom earlier in the spring or bees may emerge earlier in response to warm daytime temperatures; either situation potentially creates a mismatch in timing between when flowers produce oil and pollen and when host bees are able to exploit such floral resources.

Hotter, drier summers (drought) may lead to increased stress on flowering plants and may affect the quantity and/or quality of floral resources for *Macropis* (Phillips et al. 2018).

5. Critical Habitat

5.1 Identification of the Species' Critical Habitat

Critical habitat cannot be identified at this time due to inadequate information. The last known individuals of this species from Nova Scotia were collected in 2002 and despite thorough searches of the original collection site and nearby from 2004-2008, the species has not been re-found in Nova Scotia (COSEWIC 2011). At this time, it is unknown whether the species persists in Nova Scotia. Although *Lysimachia* and *Macropis* occur in Nova Scotia, the absence of individual Macropis Cuckoo Bees and the paucity of historical records make it impossible to reasonably identify *Lysimachia* stands necessary for the survival or recovery of the species. The site of the Alberta collection has not been resurveyed for bees but presumably the habitat remains intact. Should inventories document viable populations of Macropis Cuckoo Bees in Canada, critical habitat identification may be re-considered in a revised recovery strategy.

6. Conservation Approach

A priority for research is to locate viable population of Macropis Cuckoo Bee in association with *Macropis* nest sites. Surveys for *Lysimachia* and *Macropis* in suitable habitat in Nova Scotia, and the northern Great Plains and adjacent areas (e.g., southcentral Canada from western Ontario to Alberta) would be particularly worthwhile.

The Alberta specimen was collected in Elk Island National Park. Elk Island National Park protects a representative portion of the Southern Boreal Plains and Plateaux Natural Region. If Macropis Cuckoo Bee (with associated *Macropis*) is confirmed in Elk Island National Park, the *National Parks Act* will benefit the Macropis Cuckoo Bee, its host bees (*Macropis*), and its *Lysimachia* habitat.

The Nova Scotia Wetland Conservation Policy may provide for the conservation and management of wetlands in Nova Scotia. If Macropis Cuckoo Bees are present in Nova Scotia, the Nova Scotia Wetland Conservation Policy and the promotion of wetland stewardship may benefit the Macropis Cuckoo Bee, its *Macropis* hosts, and its *Lysimachia* habitat.

The determination of recovery feasibility will be re-evaluated in response to changing conditions and/or knowledge (i.e., if viable populations of Macropis Cuckoo Bees are observed during inventories).

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Appendix A: Effects on the Environment and Other Species

A strategic environmental assessment (SEA) is conducted on all SARA recovery planning documents, in accordance with the [Cabinet Directive on the Environmental Assessment of Policy, Plan and Program Proposals](#)⁷. The purpose of a SEA is to incorporate environmental considerations into the development of public policies, plans, and program proposals to support environmentally sound decision-making and to evaluate whether the outcomes of a recovery planning document could affect any component of the environment or any of the [Federal Sustainable Development Strategy](#)'s⁸ (FSDS) goals and targets.

Recovery planning is intended to benefit species at risk and biodiversity in general. However, it is recognized that strategies may also inadvertently lead to environmental effects beyond the intended benefits. The planning process based on national guidelines directly incorporates consideration of all environmental effects, with a particular focus on possible impacts upon non-target species or habitats. The results of the SEA are incorporated directly into the strategy itself, but are also summarized below in this statement.

This recovery strategy concludes that recovery for the Macropis Cuckoo Bee is not feasible at this time. The recovery strategy does not include population and distribution objectives or a recovery planning table and critical habitat cannot be identified at this time. As such, there is no risk for the implementation of this strategy to inadvertently lead to adverse effects on other species.

⁷ www.canada.ca/en/environmental-assessment-agency/programs/strategic-environmental-assessment/cabinet-directive-environmental-assessment-policy-plan-program-proposals.html

⁸ www.fsds-sfdd.ca/index.html#/en/goals/

Appendix B: Documented records of Macropis Cuckoo Bee in Canada

(accessed 06-Jun-2018: doi: <https://doi.org/10.5886/vfi8nn>)

Recorded By	Individuals	Collection date	Year	Country	Province	Locality	Identified by
Collector(s): L. Provancher	1	unknown	unknown; pre 1900	Canada	Québec	Cap Rouge	L. Provancher
Collector(s): L. Provancher	1	unknown	unknown; pre 1900	Canada	Québec	Cap Rouge	L. Provancher
Collector(s): F.W.L. Sladen	1	21/06/1915	1915	Canada	Québec	Aylmer	H.L. Viereck
Collector(s): G.J. Spencer	1	02/07/1915	1915	Canada	Ontario	Simcoe	R. Lambert
Collector(s): F.W.L. Sladen	1	13/07/1919	1919	Canada	Manitoba	Aweme	T. Romankova
Collector(s): R.D. Bird	1	06/07/1924	1924	Canada	Manitoba	Aweme	H.L. Viereck
Collector(s): J.D. Ritchie	1	16/07/1942	1942	Canada	Saskatchewan	Wallwort	C.D. Michener
Collector(s): J.D. Ritchie	1	17/07/1942	1942	Canada	Saskatchewan	Wallwort	C.D. Michener
Collector(s): J.D. Ritchie	1	20/07/1942	1942	Canada	Saskatchewan	Wallwort	C.D. Michener
Collector(s): J.D. Ritchie	1	10/07/1942	1942	Canada	Saskatchewan	Wallwort	C.S. Sheffield
Collector(s): A.R. Brooks	1	05/08/1955	1955	Canada	Saskatchewan	Wood Mountain	T. Romankova
Collector(s): S.M. Clark	1	24/07/1960	1960	Canada	Ontario	One Sided Lake	T. Griswold
Collector(s): D. Morris	1	06/07/1978	1978	Canada	Ontario	Milton	T. Romankova
Collector(s): C.S. Sheffield	1	17/07/2002	2002	Canada	Nova Scotia	near Middleton	C.S. Sheffield
Collector(s): C.S. Sheffield	1	11/07/2002	2002	Canada	Nova Scotia	near Middleton	C.S. Sheffield
Collector(s): BIObus 2010	1	11/08/2010	2010	Canada	Alberta	Elk Island National Park	J.K. Stahlhut