Ministry of the Environment, Conservation and Parks
2018

Gypsy Cuckoo Bumble Bee

Ontario Government

Response Statement


Photo: Sheila Colla

Protecting and Recovering Species at Risk in Ontario

Species at risk recovery is a key part of protecting Ontario's biodiversity. *The Endangered Species Act, 2007* (ESA) is the Government of Ontario's legislative commitment to protecting and recovering species at risk and their habitats.

Under the ESA, the Government of Ontario must ensure that a recovery strategy is prepared for each species that is listed as endangered or threatened. A recovery strategy provides science-based advice to government on what is required to achieve recovery of a species.

Within nine months after a recovery strategy is prepared, the ESA requires the government to publish a statement summarizing the government's intended actions and priorities in response to the recovery strategy. The response statement is the government's policy response to the scientific advice provided in the recovery strategy. In addition to the strategy, the government response statement considered (where available) input from Indigenous communities and organizations, stakeholders, other jurisdictions, and members of the public. It reflects the best available local and scientific knowledge, including Traditional Ecological Knowledge where it has been shared by communities and Knowledge Holders, as appropriate and may be adapted if new information becomes available. In implementing the actions in the response statement, the ESA allows the government to determine what is feasible, taking into account social, cultural and economic factors.

The Recovery Strategy for the Gypsy Cuckoo Bumble Bee (*Bombus bohemicus*) in Ontario was completed on December 13, 2017.

Gypsy Cuckoo Bumble Bee is a medium-sized bumble bee with a distinctive white tail and black head. Formerly widespread, the species has undergone significant declines. The last record in Ontario of the species was in 2008 at Pinery Provincial Park.

Ontario

Protecting and Recovering Gypsy Cuckoo Bumble Bee

Gypsy Cuckoo Bumble Bee is listed as an endangered species under the ESA, which protects both the animal and its habitat. The ESA prohibits harm or harassment of the species and damage or destruction of its habitat without authorization. Such authorization would require that conditions established by the Ontario government be met.

Gypsy Cuckoo Bumble Bee has been found throughout the majority of northern continents of the world, occurring throughout Canada, the northern United States, as well as most of Europe and across Asia. It previously had an extensive range in Canada and has been recorded in all provinces and territories except Nunavut; however in the recent past, the species has only been recorded in Ontario, Québec, Nova Scotia and northern Canada. In the last decade the species has only been found in the Yukon and Northwest Territories. The Gypsy Cuckoo Bumble Bee has suffered drastic declines throughout its Canadian and U.S. range but is still common in Europe and Asia.

Gypsy Cuckoo Bumble Bee likely occurred throughout much of the province in Ontario, although the central and northern portions of the province have been poorly surveyed. Recently, the species has been documented from only four locations in southern Ontario. Despite high search effort in southern Ontario within the last ten years, the last record of this species in Ontario was in 2008 at Pinery Provincial Park.

Gypsy Cuckoo Bumble Bees are entirely dependent on the presence of host nests and follow the same life cycle pattern of its host bumble bee species. Gypsy Cuckoo Bumble Bee is a nest parasite of other bumble bees of the subgenus *Bombus* in North America. In the spring, female Gypsy Cuckoo Bumble Bees invade the nests of host species and displace the resident queen by either killing or injuring her. The workers of the host queen are then used to rear the offspring of the Gypsy Cuckoo Bumble Bee. In Ontario, the host species for Gypsy Cuckoo Bumble Bee are the Rusty-patched Bumble Bee (*Bombus affinis*) and the Yellow-banded Bumble Bee (*Bombus terricola*), both of which are known to be in decline and are listed on the Species at Risk in Ontario List as endangered and special concern respectively. Since 2002, the only known occurrence of the Rusty-patched Bumble Bee in Canada is at Pinery Provincial Park in Lambton County. In southern Ontario, the Yellow-banded Bumble Bee is still observed but is less common than it was historically. The status of Yellow-banded Bumble Bee in central and northern Ontario is not fully understood as these areas have been less well surveyed.

Gypsy Cuckoo Bumble Bee occurs in diverse habitats, including open meadows, mixed farmlands, urban areas, open woodlands and boreal forest, where their host species occur. The species feeds on pollen and nectar from a variety of plant species and in Ontario has mostly been detected within or near wooded areas. Foraging habitat occurs in old fields, grasslands, dunes, alvars, woodlands (especially in the spring) and road sides. Overwintering habitat may include rotting logs, leaf litter and mulch, burrows in soil, and garden compost. Nesting habitat requirements are those of its host species, which primarily use rodent burrows as nest sites.

There are many knowledge gaps which exist for this and other native bumble bee species. Specifically, further research is needed on ecological and habitat requirements, the extent of environmental stressors, and the necessity and feasibility of additional population management tools (e.g., translocation, augmentation).

The major threat to this species' survival is the decline of its host species and both Gypsy Cuckoo Bumble Bee and its host species face many similar threats. The scope and severity of threats are difficult to quantify as much of the species' range has not been surveyed. Potential threats include pesticide use (particularly neonicotinoids which are harmful to bees even in very low concentrations), habitat loss, fragmentation and degradation, and pathogen spillover from managed bees. Spillover occurs when managed populations introduce new pathogens to wild populations or amplify pathogens which may have been naturally in lower abundance. Pathogen spillover from managed bees is cited to explain declines of Gypsy Cuckoo Bumble Bee's two host species in Ontario although the relative impact of this threat over others is unknown.

As Gypsy Cuckoo Bumble Bees depend on the worker caste of other bumble bee species to rear their young, populations of this species are limited by nest densities of their host species. Stable populations of Yellow-banded and Rusty-patched Bumble Bee will therefore be required to sustain populations of the Gypsy Cuckoo Bumble Bee; focusing recovery actions on areas where the host species are found will also benefit Gypsy Cuckoo Bumble Bee.

Given some uncertainties in the distribution of this species in Ontario, it is difficult to determine the current population level and whether it is sufficient to maintain a self-sustaining population in Ontario. In addition, many knowledge gaps on the species' biology and threats must be addressed in order to understand the most significant threats to this species' survival and inform recovery planning. Surveys in under-sampled areas and ongoing

monitoring and research is recommended to fill these knowledge gaps. In the meantime, focusing recovery and stewardship efforts in areas of historical Gypsy Cuckoo Bumble Bee populations and areas with known extant host populations (i.e., Rusty-patched Bumble Bee and Yellow-banded Bumble Bee) may help minimize further declines. Given that significant search effort in recent years has failed to detect the species, additional research and recovery efforts may be needed to maintain the persistence of species in Ontario.

The biological and technical feasibility of reintroducing or augmenting Gypsy Cuckoo Bumble Bee are unknown. Further research is needed to determine whether reintroduction or augmentation are necessary and feasible to support the recovery of the species. In determining whether reintroduction or augmentation are necessary and feasible, social and economic factors, the likelihood of success, long-term contribution to species recovery, and the resources required may be considered, at the appropriate scale, in addition to biological and technical feasibility.

Government's Recovery Goal

The government's short-term goal for the recovery of Gypsy Cuckoo Bumble Bee is to support the persistence of the species and its host species at existing locations in Ontario while filling knowledge gaps related to the species' distribution and the presence and severity of threats.

The long-term goal is to support a self-sustaining Gypsy Cuckoo Bumble Bee population in Ontario by reducing threats to the species and its habitat and encouraging the expansion of populations into suitable areas of its current and known historic range. The government supports investigating the necessity and feasibility of reintroduction, and of augmenting existing populations of Gypsy Cuckoo Bumble Bee and their host species.

Actions

Protecting and recovering species at risk is a shared responsibility. No single agency or organization has the knowledge, authority or financial resources to protect and recover all of Ontario's species at risk. Successful recovery requires inter-governmental co-operation and the involvement of many individuals, organizations and communities. In developing the government response statement, the government considered what actions are feasible for the government to lead directly and what actions are feasible for the government to support its conservation partners to undertake.

Government-led Actions

To help protect and recover Gypsy Cuckoo Bumble Bee, the government will directly undertake the following actions:

- Continue park restoration efforts in habitat where the Gypsy Cuckoo Bumble Bee and its host species have been found in Pinery Provincial Park.
- Work with partners and stakeholders to support pollinator health in Ontario through actions such as integrated pest management and education.
- Educate other agencies and authorities involved in planning and environmental assessment processes on the protection requirements under the ESA.
- Encourage the submission of Gypsy Cuckoo Bumble Bee data to Ontario's central repository through the citizen science projects that they receive data from (e.g., iNaturalist) and directly through the Natural Heritage Information Centre.
- Undertake communications and outreach to increase public awareness of species at risk in Ontario.
- Continue to protect Gypsy Cuckoo Bumble Bee and its habitat through the ESA.
- Support conservation, agency, municipal and industry partners, and Indigenous communities and organizations to undertake activities to protect and recover Gypsy Cuckoo Bumble Bee. Support will be provided where appropriate through funding, agreements, permits (including conditions) and/or advisory services.
- Encourage collaboration, and establish and communicate annual priority actions for government support in order to reduce duplication of efforts.

Government-supported Actions

The government endorses the following actions as being necessary for the protection and recovery of Gypsy Cuckoo Bumble Bee. Actions identified as "high" may be given priority consideration for funding under the ESA. Where reasonable, the government will also consider the priority assigned to these actions when reviewing and issuing authorizations under the ESA. Other organizations are encouraged to consider these priorities when developing projects or mitigation plans related to species at risk.

Focus Area: **Inventory and Monitoring**
Objective: Increase knowledge of the distribution and abundance of Gypsy Cuckoo Bumble Bee and its host species.

Gypsy Cuckoo Bumble Bee likely occurred throughout much of the province of Ontario previously, although the central and northern portions are under-surveyed. The distribution of Gypsy Cuckoo Bumble Bee is likely determined primarily by the distribution and abundance of its host bumble bee species. While Rusty-patched Bumble Bee is increasingly rare, there are still numerous, small populations of Yellow-banded Bumble Bee. Confirming the presence/absence of Gypsy Cuckoo Bumble Bee at these locations where hosts are known to exist, as well as at historic locations of Gypsy Cuckoo Bumble Bee (such as Presqu'ile Provincial Park, Dunks Bay and Oliphant Fen), will help determine where recovery efforts are best focused.

Actions:

1. **(High)** Develop and implement a standardized survey and monitoring program for Gypsy Cuckoo Bumble Bee and its host species, prioritizing surveys in under-sampled areas, historical Gypsy Cuckoo Bumble Bee sites and areas with known extant host populations (i.e., Rusty-patched Bumble Bee and Yellow-banded Bumble Bee), and monitoring in locations where the species is present.
2. Develop identification tools (e.g., photo-based field guide) for Gypsy Cuckoo Bumble Bee and its host species, to facilitate occurrence submissions through formal monitoring programs or additional observations.
3. Engage volunteers throughout the province to participate in citizen science survey and monitoring efforts for native bumble bees, including Gypsy Cuckoo Bumble Bee (i.e., BumbleBeeWatch, iNaturalist).

Focus Area: **Habitat and Threat Management**
Objective: Maintain or improve habitat and reduce threats to Gypsy Cuckoo Bumble Bee and its host species in or near Pinery Provincial Park, and additional sites if occupied or identified for recovery purposes.

Bumble bees (including the Gypsy Cuckoo Bumble Bee) are vulnerable to environmental stressors such as pesticide use (e.g., neonicotinoids), habitat loss and degradation, disease and parasite dynamics, and climate change. These factors may impact the Gypsy Cuckoo Bumble Bee directly or cause declines of its host species. Collaborative efforts amongst individuals, organizations, industries and Indigenous communities and organizations in areas where the species exist will support effective recovery implementation. Developing and promoting actions that individuals, farmers and greenhouse managers can undertake to minimize potential threats, such as the impact of

exposure to harmful pesticides, will help support the protection and recovery of Gypsy Cuckoo Bumble Bee and its host species. Promoting beneficial actions that individuals can take proactively to enhance habitat of the host species is also encouraged.

Actions:

4. **(High)** Develop, promote and implement best management practices for landowners, farmers and greenhouse managers surrounding Pinery Provincial Park, and additional sites if occupied or identified for recovery purposes, to reduce potential threats, such as the spread of pathogens and the effects of harmful pesticides or herbicides. Actions may include:
   - minimizing the use of pesticides (e.g., neonicotinoids) and minimizing the impact of herbicides on potential pollen/ nectar sources;
   - preventing escape of managed bumble bees (e.g., sealing of gaps in greenhouses, freezing colonies before dispersal);
   - monitoring disease and parasite occurrences;
   - minimizing the possibility of managed bees foraging at sites occupied by Gypsy Cuckoo Bumble Bee;
   - developing guidance on how to assess possible impacts to native pollinators when considering the use of herbicides and pesticides; and,
   - promoting buffer zones according to pesticide label statements.
5. **(High)** Initiate or continue habitat management efforts within suitable habitat where Gypsy Cuckoo Bumble Bee and its hosts have been found (e.g., ensure blooming plants are available from early spring to late autumn, develop habitat management plans to reduce threats and improve habitat suitability).
6. Develop habitat creation and enhancement guides for Gypsy Cuckoo Bumble Bee and its host species (e.g., for use in aggregate and mine site closure and restoration plans).

Focus Area: **Research**
Objective: Improve knowledge of the Gypsy Cuckoo Bumble Bee and its host species and the threats impacting them.

It is likely that there are multiple direct and indirect threats that are having a combined impact on Gypsy Cuckoo Bumble Bee. The significance and severity of these threats, aside from the decline of the host species, are

largely unknown. Research is required to understand the causal factors and the magnitude of threats causing the decline. As well, investigating the species' response to various stressors will also help focus recovery efforts on actions that will have the most benefit for the species. Addressing these knowledge gaps will provide information to determine the species' ability to maintain self-sustaining populations. Further research and investigation into the feasibility and necessity of reintroducing or augmenting populations will inform future recovery efforts for Gypsy Cuckoo Bumble Bee in Ontario. Research will also include assessment and consideration of potential impacts of recovery actions on other species.

Actions:

7. **(High)** Investigate the necessity and feasibility of reintroducing or augmenting Gypsy Cuckoo Bumble Bee and its host species populations through captive breeding and release or translocation. Actions could include:
   - determining the minimum viable population size and minimum required host abundance to maintain a sustainable Gypsy Cuckoo Bumble Bee population;
   - determining habitat requirements and the minimum habitat area required to maintain a sustainable population;
   - developing disease screening and gene tracking methods;
   - evaluating whether threats can be effectively mitigated at potential recovery sites; and,
   - developing best practices for bumble bee translocation and captive-rearing.
8. Undertake research on basic biology such as forage requirements/behaviour, response to restoration practices, overwintering requirements, mating behaviour, population dynamics and nesting requirements.
9. Determine the impacts of stressors and combinations of them, such as climate change, insecticides, honey bees and disease.
10. Research potential best management practices for prescribed burns that consider and mitigate potential impacts to invertebrates with limited dispersal capacity.
11. As appropriate, encourage the recording, sharing and transfer of Traditional Ecological Knowledge on Gypsy Cuckoo Bumble Bee, where it has been shared by communities, to increase knowledge of the species and support future recovery efforts.

Implementing Actions

Financial support for the implementation of actions may be available through the Species at Risk Stewardship Program. Conservation partners are encouraged to discuss project proposals related to the actions in this response statement with program staff. The Ontario government can also advise if any authorizations under the ESA or other legislation may be required to undertake the project.

Implementation of the actions may be subject to changing priorities across the multitude of species at risk, available resources and the capacity of partners to undertake recovery activities. Where appropriate, the implementation of actions for multiple species will be co-ordinated across government response statements.

Reviewing Progress

The ESA requires the Ontario government to conduct a review of progress towards protecting and recovering a species not later than five years from the publication of this response statement. The review will help identify if adjustments are needed to achieve the protection and recovery of Gypsy Cuckoo Bumble Bee.

Acknowledgement

We would like to thank all those who participated in the development of the Recovery Strategy for the Gypsy Cuckoo Bumble Bee (*Bombus bohemicus*) in Ontario for their dedication to protecting and recovering species at risk.

For additional information:
Visit the species at risk website at ontario.ca/speciesatrisk
Contact your MNRF district office
Contact the Natural Resources Information Centre
1-800-667-1940
TTY 1-866-686-6072
nrisc@ontario.ca