

**Ontario Species at Risk Evaluation Report for
American Bumble Bee
Bourdon américain
(*Bombus pensylvanicus*)**

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

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Assessed by COSSARO as Special Concern

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Bourdon américain (*Bombus pensylvanicus*)

Le bourdon américain (*Bombus pensylvanicus*) est classé dans la catégorie des espèces préoccupantes en Ontario par le CDSEPO.

Le bourdon américain (*Bombus pensylvanicus*) est un bourdon de taille moyenne dont la tête et la langue sont relativement longues par rapport à celles de nombreuses autres espèces de bourdons au Canada. Les ailes foncées et le patron de coloration à bandes abdominales jaunes et noires des femelles sont des caractères distinctifs et constants à l'échelle de l'aire de répartition canadienne de l'espèce.

Le bourdon américain est considéré comme un important pollinisateur de nombreuses espèces de plantes. Bien que cette espèce ne réponde pas aux critères des catégories des espèces menacées ou en voie de disparition, les menaces qui pèsent sur la persistance de cette espèce – individuellement ou collectivement – demeurent en Ontario, ce qui justifie son classement dans la catégorie des espèces préoccupantes.

Cette publication hautement spécialisée 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 l'Environnement, de la Protection de la nature et des Parcs au cossarosecretariat@ontario.ca

Executive summary

The American Bumble Bee (*Bombus pensylvanicus*) is a medium-sized bumble bee with a relatively long head and tongue length compared to many other bumble bee species in Canada. The distinctive dark wings and characteristic yellow and black abdominal banding pattern of females are diagnostic, and consistent throughout its Canadian range. The American Bumble Bee is considered an important pollinator of a variety of plant species. While the species does not meet criteria for Threatened and Endangered in Ontario, threats to the species persistence – acting alone or in combination – remain in Ontario, and thus the species qualifies for Special Concern.

1. Eligibility for Ontario status assessment

1.1. Eligibility conditions

1.1.1. Taxonomic distinctness

The American Bumble Bee (*Bombus pensylvanicus*) is a valid and accepted taxonomic species that naturally occurs in Canada. There are two subspecies that occur in North America (*B. p. pensylvanicus* and *B. p. Sonorous*) but only *B. p. pensylvanicus* occurs in Canada and Ontario (COSEWIC 2018).

1.1.2. Designatable Units

Although two subspecies are extant in North America, there is only one subspecies (*B. pensylvanicus*) extant in Canada, the entire range of which is the single designatable unit recognized in Canada and Ontario.

1.1.3. Native status

The American Bumble Bee (*Bombus pensylvanicus*) is native to Canada and Ontario, and very little of its global breeding range occurs in Canada (COSEWIC 2018, NatureServe 2018).

1.1.4. Occurrence

The American Bumble Bee (*Bombus pensylvanicus*) is known to occur in Ontario.

1.2. Eligibility results

The American Bumble Bee (*Bombus pensylvanicus*) is eligible for status assessment in Ontario.

2. Background information

2.1. Current designations

- GRANK: G3, Vulnerable (NatureServe 2018)
- IUCN: VU, Vulnerable
- NRANK Canada: N3, Vulnerable
- COSEWIC: Special Concern (COSEWIC 2018)
- SARA: Under Consideration for Addition
- ESA 2007: Not Listed
- SRANK: S3, Vulnerable

2.2. Distribution in Ontario

The Canadian range of American Bumble Bee is within the southern portion of Ontario and a small portion of Québec. The species ranges across most of southern Ontario, from the southwestern areas east to Ottawa, and largely within the Mixedwood Plains Ecozone, with only one confirmed record north of this in the southern portion of the Boreal ecological area (COSEWIC 2018).

2.3. Distribution, status and the broader biologically relevant geographic range outside Ontario

The northern limit of the American Bumble Bee (*Bombus pensylvanicus*) is in southern Ontario and a small portion of south western Quebec. However, the American Bumble Bee is a wide-ranging species. Its range broadens farther south, spanning the continent from the east coast to Washington state. Southwards, the species ranges into Mexico, with a few specimens recorded from Central America as far south as Costa Rica. The ranges of the two subspecies likely overlap: American Bumble Bee (*B. p. pensylvanicus*) occurring in southern Canada and the eastern United States, and Sonoran Bumble Bee (*B. p. sonorus*) occurring in the western United States, Mexico and into Central America.

Canadian range and extent of occurrence (EOO) of American Bumble Bee, based on databased museum collections (1882 to 2016), suggests that the EOO is 183,848 km² based on a minimum convex polygon within Canada's extent of jurisdiction, and IAO is 328 km².

Current data suggests the American Bumble Bee has not been commonly collected within its Canadian range either historically or during the recent decade (that is, 0.7% of all species) Published studies suggests there is an overall decline in relative abundance and/or number of subpopulations throughout its range in Canada. However, the American Bumble Bee appears to be persisting throughout most of its Canadian range (that is, no range collapse) with no consistent declines in EOO. Fluctuations in IAO over time may be reflective of sampling intensity within these sampling periods and does not necessarily represent an actual decline of IAO.

2.4. Ontario conservation responsibility

Ontario's conservation responsibility for the American Bumble Bee (*Bombus pensylvanicus*) is limited, with somewhat less than 2.3% of the global range of both subspecies occurring in the province. Ontario has a slightly larger conservation responsibility for the subspecies in eastern North America, with somewhat less than 7.1% of its 2,950,000 km² range occurring in the province.

Outside of Ontario, the eastern subspecies is either critically imperiled (S1) in Michigan, New York, and Wisconsin, or unranked in all other jurisdictions that are within its range.

Table 1. Condition of the Species in Adjacent Jurisdictions and Broader Biologically

Relevant Geographic Range

Adjacent Jurisdictions	Biologically Relevant to Ontario (n/a, yes, no)	Condition	Notes & Sources
Quebec	Yes	SNR	NatureServe 2018
Manitoba	No	n/a	
Michigan	Yes	S1	NatureServe 2018
Minnesota	No	SNR	NatureServe 2018
Nunavut	No	n/a	
New York	Yes	S1	NatureServe 2018
Ohio	Yes	SNR	NatureServe 2018
Pennsylvania	Yes	SNR	NatureServe 2018
Wisconsin	Yes	S1	NatureServe 2018
<i>Other Relevant Jurisdiction</i>			

2.5. Direct threats

Direct threats to the American Bumble Bee are unknown, although it is generally accepted that its decline is related to a combination of factors. American Bumble Bees are susceptible to pesticide use, land use activities that reduce floral resources and/or nesting site availability, and pathogens. American Bumble Bee is also thought to have low genetic diversity, which may be contributing to its decline and increases the production of sterile males. However, the IUCN threats calculator listed all threats combined as medium to low.

2.6 Specialized life history or habitat use characteristics

The American Bumble Bee is an ecologically significant pollinator in natural ecosystems, pollinating various native plants throughout its range (Williams et al. 2014). Bumble bees typically fly during inclement weather conditions when other bees and many other winged insects cannot. American Bumble Bee is also unique in that it is one of the few bumble bee species that builds its nest at or above ground level (as opposed to underground, like numerous other bumble bees), and will on occasion use abandoned bird nests (Rau 1922, 1924; COSEWIC 2018).

3. Ontario status assessment

3.1. Application of endangered/threatened status in Ontario

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

There has been no inferred or suspected reduction in total number of mature individuals over the last 10 years based on estimates of EOO or IAO (COSEWIC 2018).

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

Not applicable. The most recent IAO is less than 500 km², but the species does not meet any of the sub-criteria.

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

Not applicable.

3.1.4. Criterion D – Very small or restricted total population

Not applicable.

3.1.5. Criterion E – Quantitative analysis

Not applicable.

3.2. Application of Special Concern in Ontario

The species does not qualify for any threatened status above. However, the species may become Threatened if factors such as pesticide use, and land use activities that reduce floral resources, which are suspected of either individually or in combination negatively influencing the persistence of the American Bumble Bee are neither reversed nor managed with demonstrable effectiveness.

3.3. Status Category Modifiers

3.3.1. Ontario's conservation responsibility

Ontario's conservation responsibility is relatively low, with somewhat less than 7.1% of *B. p. pennsylvanicus* 2,950,000 km² range occurring in the province.

3.3.2. Status modification based on rescue effect or level of risk in broader biologically relevant geographic range

Although populations do persist in adjacent jurisdictions, they are either considered critically imperilled or have not been assessed, and as a result rescue effect is unlikely.

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

American Bumble Bee (*Bombus pensylvanicus*) is classified as Special Concern, in Ontario based on the persistent threats related to pesticide use, and land use activities that reduce floral resources. This assessment consistent with the COSEWIC assessment of Special Concern.

This status of this species is consistent with the definition of Special Concern under the Endangered Species Act, 2007.

5. Information sources

COSEWIC. 2018. COSEWIC assessment and status report on the American Bumble Bee *Bombus pensylvanicus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. x + 52 pp. ([Species at Risk Public Registry](#)).

Rau, P. 1922. Ecological and behavior notes on Missouri insects. Transactions of the Academy of Sciences of St. Louis 24:1–71

Williams, P.H., R.W. Thorp, L.L. Richardson, and S.R. Colla. 2014. The Bumble Bees of North America: an identification guide. Princeton University Press. NY, USA. 208 pp.

¹ A change in the classification of a species during reassessment by COSSARO may be for genuine or non-genuine reasons. Genuine reasons may include a reduction in threats to a species such that status of the species has improved, or the continuation of threats to the species such that the status of the species has further deteriorated. Non-genuine reasons may include new information on population size or threats that was not available during a previous assessment, the use of previous COSSARO criteria that may have yielded a different result or, taxonomic revisions that result in changes in range, population sizes or designatable units.

Appendix 1: Technical summary for Ontario

Species: American Bumble Bee (*Bombus pensylvanicus*)

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 years
Is there an observed, inferred, or projected continuing decline in number of mature individuals?	Insufficient data
Estimated percent of continuing decline in total number of mature individuals within 5 years or 2 generations.	Insufficient data
Observed, estimated, inferred, or suspected percent reduction or increase in total number of mature individuals over the last 10 years or 3 generations.	Insufficient data
Projected or suspected percent reduction or increase in total number of mature individuals over the next 10 years or 3 generations.	Insufficient data
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.	Insufficient data
Are the causes of the decline (a) clearly reversible, and (b) understood, and (c) ceased?	a. No b. No c. No
Are there extreme fluctuations in number of mature individuals?	Insufficient data

Extent and occupancy information in Ontario

Extent and occupancy attributes	Value
Estimated extent of occurrence (EOO). <i>If value in COSEWIC status report is not applicable, then use geocat.kew.org. State source of estimate.</i>	183,848 km ²
Index of area of occupancy (IAO). <i>If value in COSEWIC status report is not applicable, then use geocat.kew.org. State source of estimate.</i>	328 km ²
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	a. No b. No

Extent and occupancy attributes	Value
(b) separated from other habitat patches by a distance larger than the species can be expected to disperse?	
Number of locations. <i>See Definitions and Abbreviations on COSEWIC and IUCN websites for more information on the term "location". Use plausible range to reflect uncertainty if appropriate.</i>	Not applicable
Number of NHIC Element Occurrences <i>Request data from MNRF.</i>	10
Is there an observed, inferred, or projected continuing decline in extent of occurrence?	No
Is there an observed, inferred, or projected continuing decline in index of area of occupancy?	No
Is there an observed, inferred, or projected continuing decline in number of sub-populations or EOs?	No
Is there an observed, inferred, or projected continuing decline in number of locations?	Unknown
Is there an observed, inferred, or projected continuing decline in [area, extent and/or quality] of habitat?	No
Are there extreme fluctuations in number of populations?	No
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?	No

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

Not applicable

Quantitative analysis (population viability analysis conducted)

N/A

Threats

Insert text here.

Rescue effect

Rescue effect attribute	Value
Does the broader biologically relevant geographic range for this species extend beyond Ontario?	Yes
Status of outside population(s) most likely to provide immigrants to Ontario	Status not ranked in Quebec, Minnesota, Ohio and Pennsylvania; see Table 1 for status ranks elsewhere within its range
Is immigration of individuals and/or propagules between Ontario and outside populations known or possible?	Not likely.
Would immigrants be adapted to survive in Ontario?	Yes
Is there sufficient suitable habitat for immigrants in Ontario?	Yes
Are conditions deteriorating in Ontario?	Unknown
Is the species of conservation concern in bordering jurisdictions?	Yes
Is the Ontario population considered to be a sink?	unknown
Is rescue from outside populations likely?	Not likely

Sensitive species

No.

Acronyms

COSEWIC: Committee on the Status of Endangered Wildlife in Canada
COSSARO: Committee on the Status of Species at Risk in Ontario
ESA: Endangered Species Act
EO: Element occurrence (as defined by NHIC)
EOO: extent of occurrence
GRANK: global conservation status assessments
IAO: index of area of occupancy
IUCN: International Union for Conservation of Nature and Natural Resources
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
S4: Apparently Secure
S5: Secure
IUCN: International Union for Conservation of Nature and Natural Resources
CDSEPO: Le Comité de détermination du statut des espèces en péril en Ontario