

**Ontario Species at Risk Evaluation Report for
Gillman's Goldenrod (*Solidago gillmanii*)**

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

Assessed by COSSARO as Endangered

September 2020

Final

Verge d'or de Gillman (*Solidago gillmanii*)

La verge d'or de Gillman est une plante herbacée vivace qui atteint 30 cm à 120 cm de hauteur. Elle se pare de petites fleurs jaunes, formant des grappes à sa tête. Cette plante est endémique des Grands Lacs. Elle se trouve uniquement sur les dunes sablonneuses des Grands Lacs présentant une végétation parsemée et des parcelles de sable dénudées des rives du lac Michigan et au nord du lac Huron, au Wisconsin, au Michigan, en Indiana et en Ontario. Dans cette province, elle est présente sur l'île Great Duck, au nord du lac Huron, au sud de l'île Manitoulin. Un spécimen prélevé en 1976 montre qu'une sous-population a déjà existé sur la baie Deans de l'île Manitoulin, mais qu'elle a disparu avant 2000. On ignore pourquoi la verge d'or de Gillman est absente des plus de 30 sites dunaires apparemment convenables du littoral sud des îles Manitoulin et Cockburn.

Après son évaluation, le CDSEPO a classé la verge d'or de Gillman dans la catégorie des espèces en voie de disparition en Ontario. Cette classification s'explique par sa présence connue uniquement à deux emplacements sur l'île Great Duck et la dégradation observée de la qualité de son habitat en raison d'espèces envahissantes. La gypsophile à feuilles de scorsonère, une espèce envahissante, est la plus grande menace qui pèse sur la verge d'or de Gillman puisqu'elle est maintenant établie dans un des endroits où cette dernière pousse en Ontario.

Cette publication hautement spécialisée «COSSARO Candidate Species at Risk Evaluation for Gillman's Goldenrod» 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

Gillman's Goldenrod is an herbaceous perennial plant that grows to 30-120 cm in height. It has tiny yellow flowers clustered into heads. This plant is a Great Lakes endemic. It is only found in open Great Lakes sand dunes with sparse vegetation and patches of bare sand on the shores of Lake Michigan and northern Lake Huron in Wisconsin, Michigan, Indiana, and Ontario. In Ontario it currently occurs on Great Duck Island in northern Lake Huron south of Manitoulin Island. A collection from 1976 shows a subpopulation once occurred at Deans Bay on Manitoulin Island but was extirpated prior to 2000. It is unknown why Gillman's Goldenrod does not occur at any of the more than 30 apparently suitable dune sites across the south shores of Manitoulin and Cockburn island.

Gillman's Goldenrod is Endangered in Ontario. It is only known from two locations on Great Duck Island and there has been an observed decline in habitat quality due to invasive species. The greatest threat to Gillman's Goldenrod is the invasive Glandular Baby's Breath. This species is now established at one of the locations where Gillman's Goldenrod occurs in Ontario.

1. Eligibility for Ontario status assessment

1.1. Eligibility conditions

1.1.1. Taxonomic distinctness

Gillman's Goldenrod is a valid taxon that has been recently classified as a distinct species (COSEWIC 2019). Past classifications of Gillman's Goldenrod have included it as a variety within the *Solidago simplex* complex.

1.1.2. Designatable units

The Ontario range of Gillman's Goldenrod only occurs in northern Lake Huron and is considered a single population.

1.1.3. Native status

Gillman's Goldenrod was first collected in Ontario in 1976.

1.1.4. Occurrence

Gillman's Goldenrod sites were surveyed in 2018 (COSEWIC 2019).

1.2. Eligibility results

Gillman's Goldenrod (*Solidago gillmanii*) is eligible for status assessment in Ontario.

2. Background information

2.1. Current designations

- GRANK: G5T3 (NatureServe 2020) (for *Solidago simplex* var. *gillmanii*)
- IUCN: Status (date assessed)
- NRANK Canada: N1
- COSEWIC: Endangered (November 2019)
- SARA: under review
- ESA 2007: not previously assessed
- SRANK: S1

2.2. Distribution in Ontario

Gillman's Goldenrod is a Great Lakes endemic. In Ontario it currently occurs in two subpopulations on Great Duck Island in northern Lake Huron south of Manitoulin Island. A collection from 1976 shows a subpopulation once occurred at Deans Bay on Manitoulin Island but was extirpated prior to 2000. It is unknown why Gillman's

Goldenrod does not occur at any of the more than 30 apparently suitable dune sites across the south shores of Manitoulin and Cockburn islands (COSEWIC 2019).

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

Gillman's Goldenrod is only found on sand dunes on the shores of Lake Michigan and northern Lake Huron in Wisconsin, Michigan, Indiana, and Ontario. Most of the global population occurs in Michigan. Sites range from a few individuals to multiples dozens with large robust plants. Many of the sites in Michigan are in protected areas (Semple pers. comm.).

2.4. Ontario conservation responsibility

Not calculated. Probably under 10% given the large number of occurrences in Michigan.

2.5. Direct threats

The greatest threat to Gillman's Goldenrod is the invasive Glandular Baby's Breath (*Gypsophila scorzonerifolia*). This species is now established at one of the two locations where Gillman's Goldenrod occurs in Ontario (COSEWIC 2019).

2.6. Specialized life history or habitat use characteristics

Gillman's Goldenrod is only found in open Great Lakes sand dunes with sparse vegetation and patches of bare sand. This community is of provincial conservation concern and is rare in Ontario (Bakowsky and Henson 2014).

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

Insufficient information.

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

Meets Endangered, B1ab(iii)+2ab(iii).

The Extent of Occurrence (EOO) and Index of Occupancy (IAO) are well below the threshold for Endangered, there are fewer than five locations, and there has been an observed decline in habitat quality due to invasive species.

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

Insufficient information. Meets the threshold for Threatened C1 based on small number of individuals but the rates of decline in number of mature individuals is uncertain.

3.1.4. Criterion D – Very small or restricted total population

Meets threshold for D2 (Threatened). IAO is under 20 km² and there are under 5 locations.

3.1.5. Criterion E – Quantitative analysis

Insufficient information. Quantitative analysis not done.

3.2. Application of Special Concern in Ontario

Not applicable. Meets criteria for Endangered.

3.3. Status category modifiers

3.3.1. Ontario's conservation responsibility

Not calculated. Probably under 10% given the large number of occurrences in Michigan.

3.3.2. Status modification based on rescue effect

Not applicable. Despite its wide distribution along the coast of Michigan it has not dispersed to many suitable locations on Manitoulin and Cockburn islands. The Ontario population appears to be isolated and dispersal events between Ontario and populations in the US are rare.

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

Gillman's Goldenrod (*Solidago gillmanii*) is classified as Endangered in Ontario based on meeting criterion B1ab(iii)+2ab(iii).

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

5. Information sources

Bakowsky, W. and B. Henson (2014). "Rare communities of Ontario: freshwater coastal dunes." Natural Heritage Information Centre, Ontario Ministry of Natural Resources.

COSEWIC (2019). COSEWIC assessment and status report on the Gillman's Goldenrod *Solidago gillmanii* in Canada. Ottawa, Committee on the Status of Endangered Wildlife in Canada: x + 43.

Indiana Department of Natural Resources. (2020). "Endangered, Threatened, and Extirpated Plants of Indiana." Retrieved September, 2020, from <https://www.in.gov/dnr/naturepreserve/files/np-etrplants.pdf>.

Wisconsin Department of Natural Resources. (2020). "Wisconsin's rare plants." Retrieved September, 2020, from <https://dnr.wi.gov/topic/EndangeredResources/Plants.asp>.

Appendix 1: Technical summary for Ontario

Species: Gillman's Goldenrod (*Solidago gillmanii*)

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.	5-15 years
Is there an observed, inferred, or projected continuing decline in number of mature individuals?	Yes, based on projected decline due to invasive species.
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. Yes b. Yes c. No
Are there extreme fluctuations in number of mature individuals?	No

Extent and occupancy information in Ontario

Extent and occupancy attributes	Value
Estimated extent of occurrence (EEO). <i>If value in COSEWIC status report is not applicable, then use geocat.kew.org. State source of estimate.</i>	8 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>	8 km ²
Is the total population severely fragmented? i.e., is >50% of its total area of occupancy in habitat patches that are: (a) smaller than would be required to support a viable population, and	a. No b. Unknown, dispersal from populations in the US appears to be very infrequent

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>	2
Number of NHIC Element Occurrences <i>Request data from MNRF.</i>	2?
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?	No
Is there an observed, inferred, or projected continuing decline in [area, extent and/or quality] of habitat?	Yes (Observed decline at Horseshoe Bay location due to invasive species)
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)

Sub-population (or total population)	Number of mature individuals
<i>Desert Point, Great Duck Island</i>	<i>5000 (approx.)</i>
<i>Horseshoe Bay, Great Duck Island</i>	<i>1500 (approx.)</i>
<i>Total</i>	<i>6500 (approx.)</i>

Quantitative analysis (population viability analysis conducted)

Probability of extinction in the wild is unknown.

Threats

The greatest threat to Gillman's Goldenrod is the invasive Glandular Baby's Breath (*Gypsophila scorzonrifolia*). This species is now established at one of the two locations where Gillman's Goldenrod occurs in Ontario. This threat was ranked as medium-low using the threats calculator.

Rescue effect and broader biologically relevant geographic range

Rescue effect attribute	Value
Does the broader biologically relevant geographic range for this species extend beyond Ontario?	No
Status of outside population(s) most likely to provide immigrants to Ontario	T3 (Michigan)
Is immigration of individuals and/or propagules between Ontario and outside populations known or possible?	Possible, but it remains absent from many sites in Ontario with suitable habitat
Would immigrants be adapted to survive in Ontario?	Yes
Is there sufficient suitable habitat for immigrants in Ontario?	Yes (many sites with suitable habitat that are unoccupied)
Are conditions deteriorating in Ontario?	Yes (invasive species)
Is the species of conservation concern in bordering jurisdictions?	Yes
Is the Ontario population considered to be a sink?	No
Is rescue from outside populations likely?	No

Sensitive species

Not data sensitive.

Appendix 2: Broader biologically relevant geographic range

Information regarding rank and decline for Gillman's Goldenrod (*Solidago gillmanii*)

Adjacent Jurisdictions	Biologically Relevant to Ontario (n/a, yes, no)	Status & Trends	Condition	Notes & Sources
Quebec	n/a	Not present		
Manitoba	n/a	Not present		
Michigan	Yes	SNR Trend unknown	Not tracked (assume S3 given national rank in US of N3?)	
Minnesota	n/a	Not present		
Nunavut	n/a	Not present		
New York	n/a	Not present		
Ohio	n/a	Not present		
Pennsylvania	n/a	Not present		
Wisconsin	No	S2 State Threatened Trend unknown	(12 extant occurrences, 4 historical)	<u>(Wisconsin Department of Natural Resources 2020)</u>
Indiana	No	S2 State Threatened Trend unknown	4 extant/post-1970, 8 historical	(Indiana Department of Natural Resources 2020)

Broader Biologically Relevant Geographic Range in Other Jurisdictions

None. Gillman's Goldenrod only occurs in Ontario, Michigan, Indiana and Wisconsin.

Global Status and Trends

Gillman's Goldenrod is treated as a variety by NatureServe and ranked T3. Trends are unknown. Although not ranked, it appears to be relatively secure in Michigan. It occurs in many protected areas, although some of these sites have invasive species, including Glandular Baby's Breath (*Gypsophila scorzonerifolia*). Several locations are now historic.

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