

**Ontario Species at Risk Evaluation Report for
Western Silvery Aster**

**Aster Soyeux
(*Symphotrichum sericeum*)**

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

Assessed by COSSARO as Threatened

September 2021

Aster soyeux (*Symphotrichum sericeum*)

L'aster soyeux (*Symphotrichum sericeum*) est classé dans la catégorie des espèces menacées en Ontario par le CDSEPO.

L'aster soyeux est une plante herbacée vivace qui produit de 1 à 5 tiges dressées, faiblement ramifiées et hautes de 30 à 70 cm, dont les capitules sont de type marguerite, composées de rayons violet-rose et de fleurs tubulaires jaunes. Ses feuilles sont alternes, lancéolées et recouvertes de poils soyeux argentés distinctifs, et leur taille diminue progressivement du bas vers le haut de la tige (COSEPAC, 2021).

L'aster soyeux se reproduit au moyen de ses petites graines dispersées par le vent dans un rayon de 14 à 50 m à partir de la plante mère. Son habitat est généralement associé aux prairies sèches, aux savanes à chênes, aux champs et, parfois, aux boisés clairsemés. En Ontario, l'aster soyeux se rencontre dans la région forestière des Grands Lacs et du fleuve Saint-Laurent, où il pousse dans la savane sèche à chêne à gros fruits, type d'habitat rare dans la province (COSEPAC, 2021).

L'aster soyeux est classé par le CDSEPO dans la catégorie des espèces menacées, alors qu'il est conforme aux critères de la catégorie des espèces en voie de disparition, mais son classement a été modifié pour tenir compte de sa situation dans son aire de répartition plus vaste pertinente sur le plan biologique. L'aster soyeux respecte les critères de la catégorie des espèces en voie de disparition, en raison de sa petite zone d'occurrence et de son indice de zone d'occupation pour trois localités et d'un déclin déduit de la qualité de son habitat et de la diminution de son nombre d'individus matures.

Son statut a été modifié parce que cette espèce est généralement considérée comme relevant de la catégorie des espèces menacées dans son aire de répartition plus vaste pertinente sur le plan biologique, soit au Manitoba et, aux États-Unis, dans 14 États, depuis le Dakota du Nord jusqu'à l'Arkansas et à l'Oklahoma, et depuis le Michigan jusqu'à l'Indiana avec, de plus, des occurrences isolées dans le centre du Texas (COSEPAC, 2021). Il est le plus répandu dans les prairies à herbes hautes, et, plus particulièrement, dans le Minnesota et l'Iowa (*NatureServe, 2021; Wilsey et al, 2019; Kartesz, 2013*). Cette classification est conforme à la classification fédérale de cette espèce par le COSEPAC (2021).

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Executive summary

Western Silvery Aster is an herbaceous perennial that produces 1-5 sparsely branched upright ascending or sprawling stems, 30 to 70 cm tall, with flower heads that are daisy-like with ray florets that are rose-purple and tubular florets that are yellow. Its alternately arranged lance-shaped leaves have distinctive silvery-silky hairs and are reduced in size ascending the stem (COSEWIC, 2021).

Western Silvery Aster reproduces from small wind-dispersed seeds with a maximum dispersal of 14-50m from the parent plant. Habitat is typically associated with dry prairies, oak savannahs, fields, and occasionally open woods. In Ontario, it occurs within the Great Lakes- St. Lawrence Forest region, in provincially rare dry Bur Oak savannah habitat (COSEWIC, 2021).

Western Silvery Aster is classified by COSSARO as Threatened where it meets the criteria for Endangered but has been modified to Threatened based on its status in the broader biologically relevant range. Western Silvery Aster meets Endangered based on its small extent of occurrence and its index of area of occupancy for 3 locations and an inferred decline of habitat quality and decrease in the number of mature individuals. Its status has been modified to Threatened, because it is generally considered Threatened within its broader biologically relevant range where it occurs in Manitoba and fourteen states from North Dakota south to Arkansas and Oklahoma, east to Michigan and Indiana with isolated occurrences in central Texas (COSEWIC, 2021). It is most prevalent where there is tall-grass prairie, especially in Minnesota and Iowa (NatureServe, 2021; Wilsey et al, 2019; Kartesz, 2013). This classification is consistent with the federal classification of this species by COSEWIC (2021).

1. Eligibility for Ontario status assessment

1.1. Eligibility conditions

1.1.1. Taxonomic distinctness

Western Silvery Aster is part of the family Asteraceae and the genus *Virgulus* within *Symphyotrichum*. Western Silvery Aster was previously recognized by COSEWIC (1988) under the name *Virgulus sericeus* as treated by Semple and Heard (1987). Western Silvery Aster has no infraspecific taxa (subspecies or varieties) in Canada.

1.1.2. Designatable units

Western Silvery Aster is considered to represent a single designatable unit throughout its Canadian Range (COSEWIC, 2021). No genetic and morphological characteristics, dispersal history or pre-settlement distributional evidence exists to characterize any subpopulation as being discrete or evolutionarily significant (COSEWIC, 2021).

1.1.3. Native status

Western Silvery Aster was first collected in Canada by John Richardson in Rainy River District, Ontario, 1827. The precise location of the original record is unknown (COSEWIC, 2021).

1.1.4. Occurrence

Western Silvery Aster is known to occur at three extant subpopulations in Ontario; Rainy River District, Kenora District and near French Portage Narrows (COSEWIC, 2021).

1.2. Eligibility results

Western Silvery Aster (*Symphyotrichum sericeum*) is eligible for status assessment in Ontario.

2. Background information

2.1. Current designations

- GRANK: G5 (NatureServe 2021)
- IUCN: na
- NRANK Canada: N2N3
- COSEWIC: Threatened (In Press, 2021)
- SARA: Threatened on Schedule 1
- ESA 2007: Endangered
- SRANK: S1 (2015)

2.2. Distribution in Ontario

There are three currently known subpopulations: one subpopulation occurs on the southeastern shore in Rainy River District at Budreau’s Beach, in Big Traverse Bay, and has been observed since 1981; two subpopulations are from islands in Kenora District, at Cliff Island and near French Portage Narrows (COSEWIC, 2021).

There are four element occurrence records and twenty-four observations documented in NHIC between 1827 and 2020.

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

Western Silvery Aster is found in biologically-diverse prairie and savannah communities and is considered a prairie specialist species (COSEWIC, 2021). Its distribution within Canada, outside of Ontario, includes remnant tall-grass prairie sites /oak woodlands concentrated within southeast Manitoba. Within the United States, it is confirmed in 14 states from North Dakota south to Arkansas and Oklahoma, east to Michigan and Indiana, with isolated occurrences in central Texas (COSEWIC, 2021). Western Silvery Aster is most prevalent within areas where there is tall-grass prairie, especially in Minnesota and Iowa (NatureServe, 2021; Wilsey et al, 2019; Kartesz, 2013; personnel communication with Minnesota Department of Natural Resources).

Table 1. Condition of Western Silvery Aster in Adjacent Jurisdictions and Broader Biologically Relevant Geographic Range

| Adjacent Jurisdictions | Biologically Relevant to Ontario (n/a, yes, no) | Condition | Notes & Sources |
|-------------------------------------|--|-------------------------------|--|
| Quebec | n/a | n/a | n/a |
| Manitoba | Yes | Threatened | Manitoba Conservation Wildlife and Ecosystem Protection Branch |
| Michigan | Yes | Threatened | Michigan Natural Features Inventory |
| Minnesota | Yes | Apparently Secure/ Not listed | NatureServe, Minnesota Department of Natural Resources |
| Nunavut | No | n/a | n/a |
| New York | No | n/a | n/a |
| Ohio | Yes | SNR | NatureServe |
| Pennsylvania | No | n/a | n/a |
| <i>Other Relevant Jurisdictions</i> | | | |
| Wisconsin | Yes | SNR | NatureServe |
| North Dakota | Yes | S2 | NatureServe |

| Adjacent Jurisdictions | Biologically Relevant to Ontario (n/a, yes, no) | Condition | Notes & Sources |
|-------------------------------|--|------------------|----------------------------|
| South Dakota | Yes | SNR | NatureServe |
| Iowa | Yes | S4 | NatureServe |
| Nebraska | Yes | SNR | NatureServe |
| Indiana | Yes | S2 | NatureServe |
| Illinois | Yes | SNR | NatureServe |
| Missouri | Yes | SNR | NatureServe |
| Kansas | Yes | SNR | NatureServe |
| Tennessee | Yes | SNR | NatureServe |
| Arkansas | Yes | S2 | NatureServe |
| Texas | Yes | SNR | NatureServe |
| Oklahoma | Yes | S1 | NatureServe |

2.4. Ontario conservation responsibility

Estimated to be less than one percent given the global range for Western Silvery Aster.

2.5. Direct threats

Habitat loss and alteration by human activities including development, and maintenance of roadsides and rights-of-way are the most significant threats to Western Silvery Aster. Subpopulations that are along roadsides are particularly vulnerable to maintenance operations (COSEWIC, 2021).

A threats calculation with an assigned threat impact of Very High was completed for Western Silvery Aster as part of the COSEWIC (2021) report as follows:

- i) Mining & Quarrying – High Impact
- ii) Roads & Railroads; Other ecosystem modifications; Invasive non-native species – Medium Impact
- iii) Agriculture & forestry effluents; Livestock farming & ranching – Medium-low Impact
- iv) Annual & perennial non-timber crops; Housing & urban areas; Commercial & industrial areas; Tourism & recreation areas; Utility & service lines; Recreational activities – Low Impact
- v) Fire suppression; Droughts – unknown impact

2.6. Specialized life history or habitat use characteristics

Western Silvery Aster is an herbaceous perennial that produces 1-5 sparsely branched upright ascending or sprawling stems, 30 to 70 cm tall, from corm-like rootstock, with short rhizomes. Its alternately arranged lance-shaped leaves have distinctive silvery-

silky hairs and are reduced in size ascending the stem. Flower heads are daisy-like, composed of two flower types: strap-shaped ray florets ring the outer margin and are rose-purple to deep purple; the central disc is formed of yellow tubular florets. Flower heads are arranged in arching, open arrays. Each flower produces an obovoid single-seeded cypsela that is 2-3mm long, with a whitish or tawny pappus about 6-7mm long (COSEWIC, 2021).

Western Silvery Aster reproduces from small wind-dispersed seeds where flowering takes place from early August to mid-September with seeds produced by early October. Each flowering stem produces between one and five heads with about 30 seeds per head. Vegetative reproduction can occur via cloning from horizontal rhizomes. Studies completed on Asteraceae with similar plant heights and seed morphology to Western Silvery Aster showed that most seeds dispersed short distances, with a maximum dispersal of 14-50m from the parent plant. Storms may account for long distance dispersal. In a pollination comparison study, insect visitors to Western Silvery Aster numbered 22 insect taxa from three different orders: Diptera; Hymenoptera; and Lepidoptera (COSEWIC, 2021).

Habitat is typically associated with dry prairies, oak savannahs, fields, and occasionally open woods. In Ontario, it occurs within the Great Lakes- St. Lawrence Forest region, in provincially rare dry Bur Oak savannah habitat. The site of an extensive Western Silvery Aster occurrence at Budreau's Beach overlies calcareous till and sandy silt, and bedrock ridges within a very thin veneer of lacustrine sands, silts, and clays in low areas, related to late glacial water level fluctuations in the lake Agassiz basin (COSEWIC, 2021).

The species can tolerate lower soil fertility and has evolved a woody cormoid rootstock, enabling the species to tolerate normal seasonal ground fires and drought (COSEWIC, 2021).

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

Not applicable. Baseline estimates of abundance, and whole or partial counts of subpopulations, are available for some survey years for most extant occurrences, however sampling effort is not consistent over time.

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

Meets Endangered B1ab(iii)(v) + B2ab(iii)(v). The EOO is 435 km², the AOO is 12 km², there are 3 locations, an inferred decline of habitat quality based on a number of threats and an inferred decrease in the number of mature individuals.

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

Not applicable. Number of mature individuals is conservatively estimated to be approximately 2,359 within Ontario. Subpopulations are estimated to contain individuals totalling 2,200 (Budreau's Beach); 109 (Cliff Island); and 50 (French Portage Narrows). The Budreau's Beach subpopulation is approximately 93% of all mature individuals in Ontario. There are no extreme fluctuations in number of mature individuals.

3.1.4. Criterion D – Very small or restricted total population

Meets Threatened D2. There are 3 locations that are prone to the effects of human activities.

3.1.5. Criterion E – Quantitative analysis

A quantitative analysis has not been completed.

3.2. Application of Special Concern in Ontario

Not applicable.

3.3. Status category modifiers

3.3.1. Ontario's conservation responsibility

Not applicable.

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

Rescue effect is unknown but unlikely given the low probability of long distance seed dispersal.

Status modification applies based on level of risk in broader biologically relevant geographic range. Broader biologically relevant geographic range includes tallgrass prairie and oak savannah habitats extending south to central United States. The area where Western Silvery Aster is most prevalent and considered apparently secure is the area where tallgrass prairie habitat is the most prevalent in Minnesota and Iowa. Otherwise it is generally considered imperiled/ threatened. Note that habitat availability, in particular tallgrass prairie and oak forests, is in decline (Rodewald, 2003; Rodger, 1998).

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

Western Silvery Aster (*Symphyotrichum sericeum*) is classified as Threatened in Ontario based on meeting criterion B1ab(iii)(v) and B2ab(iii)(v) for Endangered and modified to Threatened based on its status in the broader biologically relevant range.

Western Silvery Aster meets Endangered based on its small extent of occurrence and its index of area of occupancy for 3 locations and an inferred decline of habitat quality and decrease in the number of mature individuals. It's status has been modified to Threatened, because it is generally considered Threatened within its broader biologically relevant range where it occurs in Manitoba and fourteen states from North Dakota south to Arkansas and Oklahoma, east to Michigan and Indiana with isolated occurrences in central Texas (COSEWIC, 2021). It is most prevalent where there is tall-grass prairie, especially in Minnesota and Iowa (NatureServe, 2021; Wilsey et al, 2019; Kartesz, 2013). This classification is consistent with the federal classification of this species by COSEWIC (2021).

5. Information sources

COSEWIC. 2021. IN PRESS. COSEWIC assessment and status report on Western Silvery Aster *Symphyotrichum sericeum* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xii + 44pp.

(<http://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry.html>).

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North American Atlas. 2006. Ecological Regions of North America: Level I-III. In partnership with: cec.org; atlas.gc.ca; nationalatlas.gov; www.inegi.gov.mx. Website: <https://www.epa.gov/eco-research/ecoregions-north-america>

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Appendix 1: Technical summary for Ontario

Species: Western Silvery Aster (*Symphyotrichum sericeum*)

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. | Likely 7-10 years 3+ years for a seed to germinate and reach maturity. |
| Is there an observed, inferred, or projected continuing decline in number of mature individuals? | Yes, inferred from impacts of on-going threats. |
| 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. | Suspected decline of > 30% based on impact of threats. |
| 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. | Suspected decline of > 30% based on impact of threats. |
| 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> | 435 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> | 12 km ² |
| Is the total population severely fragmented? i.e., is >50% of its total area of occupancy in habitat patches that are: | a. No b. Yes |

| Extent and occupancy attributes | Value |
|---|--------------|
| (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? | |
| 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> | 3 locations |
| Number of NHIC Element Occurrences <i>Request data from MNRF.</i> | 4 NHIC EOs |
| 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 |
| 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)

Number of mature individuals total approximately 2,627.

| Sub-population (or total population) | Number of mature individuals |
|---|-------------------------------------|
| <i>Budreau's Beach</i> | <i>2,200</i> |
| <i>Cliff Island</i> | <i>109-300</i> |
| <i>French Portage Narrows</i> | <i>50-127</i> |

Quantitative analysis (population viability analysis conducted)

No population viability analysis has been conducted.

Threats

A threats calculation with an assigned threat impact of Very High was completed for Western Silvery Aster as part of the COSEWIC (2021) report as follows:

- i) Mining & Quarrying – High Impact
- ii) Roads & Railroads; Other ecosystem modifications; Invasive non-native species – Medium Impact
- iii) Agriculture & forestry effluents; Livestock farming & ranching – Medium-low Impact
- iv) Annual & perennial non-timber crops; Housing & urban areas; Commercial & industrial areas; Tourism & recreation areas; Utility & service lines; Recreational activities – Low Impact
- v) Fire suppression; Droughts – unknown impact

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 | Minnesota S4 and North Dakota S2 |
| Is immigration of individuals and/or propagules between Ontario and outside populations known or possible? | Long distance seed dispersal unlikely. |
| Would immigrants be adapted to survive in Ontario? | Yes |
| Is there sufficient suitable habitat for immigrants in Ontario? | Yes |
| Are conditions deteriorating in Ontario? | Yes |
| 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? | Unknown |

Sensitive species

Not a data sensitive species group.

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