

**Ontario Species at Risk Evaluation Report for**  
**Willowleaf Aster**  
**Aster très élevé**  
**(*Symphotrichum praealtum*)**

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

Assessed by COSSARO as Special Concern

October 2024

Final

## Executive summary

The Willowleaf Aster (*Symphyotrichum praealtum*) is a native perennial plant within the Asteraceae family. Known for its tall growth and narrow leaves, it thrives in open habitats such as tallgrass prairies, savannas, and anthropogenically disturbed areas like roadsides. The plant reproduces primarily through clonal growth and has limited dispersal capabilities. In Ontario, the Willowleaf Aster is restricted to the Great Lakes Plains, with seven subpopulations currently extant. Over 98% of mature individuals are concentrated in a single subpopulation located in Windsor-LaSalle.

The species' extent of occurrence in Ontario is 7,872 km<sup>2</sup>, with an index of area of occupancy of 72 km<sup>2</sup>. Both measurements fall below thresholds for Threatened status. Despite this, the population is not severely fragmented, and no extreme fluctuations have been observed. Globally, the Willowleaf Aster is secure, with its range spanning central and eastern North America, from northern Mexico to southern Ontario. In Michigan, the closest region biologically relevant to Ontario, the species is considered vulnerable (S3). However, the potential for migration from Michigan to Ontario is limited by habitat fragmentation and dispersal limitations.

The Willowleaf Aster is dependent on ecological disturbances such as fire or grazing to maintain its open habitats. Without these disturbances, habitat succession results in encroachment by woody vegetation, which significantly reduces habitat suitability. In Ontario, the species' reliance on a single dominant subpopulation and its restricted habitat make it particularly vulnerable. Historical declines have been observed in its extent of occurrence (36% reduction since 1999) and the number of subpopulations. These declines are largely attributed to habitat loss and natural succession. Despite these challenges, recent increases in the total number of mature individuals, driven by monitoring and transplanting efforts, suggest some recovery potential.

The Willowleaf Aster remains at risk of further decline without continued conservation measures to address ongoing threats such as habitat succession, urban development, and fire suppression. Conservation actions focusing on habitat management and restoration will be essential to secure the long-term viability of this species in Ontario. Willowleaf Aster was previously assessed as Special Concern in Ontario. It has been reassessed and classified as Threatened based on an increase in estimate of abundance and the identification of additional subpopulations.

# 1. Eligibility for Ontario status assessment

## 1.1. Eligibility conditions

### 1.1.1. Taxonomic distinctness

Willowleaf Aster (*Symphyotrichum praealtum*) is taxonomically distinct and eligible for assessment.

### 1.1.2. Designatable units

The Willowleaf Aster in Canada is found exclusively within the Great Lakes Plains and is classified as a single Designatable Unit (DU). The Canadian population consists of the *praealtum* variety and comprises 15 closely clustered subpopulations in Southern Ontario.

### 1.1.3. Native status

Willowleaf Aster is native to Canada.

### 1.1.4. Occurrence

The Willowleaf Aster is native to North America, ranging from northern Mexico to southern Ontario. In Ontario, its occurrence is restricted to the Great Lakes Plains ecological area. It is also known to be cultivated and introduced in some areas outside its native range. There are seven extant subpopulations in Ontario; however, over 98% of mature individuals are estimated to occur within a single subpopulation in Windsor and Lasalle (COSEWIC 2024, IN PRESS). Two additional subpopulations on Walpole Island are also assumed to be extant.

## 1.2. Eligibility results

Willowleaf Aster (*Symphyotrichum praealtum*) is eligible for status assessment in Ontario.

# 2. Background information

## 2.1. Current designations

- GRANK: G5 (NatureServe 2024)
- IUCN: LC (Assessed 2016)
- NRANK Canada: N2 (NatureServe 2024)
- COSEWIC: SC (May 2024)
- SARA: THR (Schedule 1 in 2005)
- ESA 2007: THR (2008)
- SRANK: S2 (ranked in 2015)

## 2.2. Distribution in Ontario

The Willowleaf Aster is found in Canada only in Ontario, where all references pertain to the sole known variety, var. *praealtum*.

The Ontario population consists of 15 subpopulations (7 extant as of the 2024 assessment) situated in close proximity within southern Ontario, with the greatest distance between subpopulations being approximately 65 km.

Locations are defined based on threats, and COSEWIC (2024, IN PRESS) identified more than 10 locations in Ontario, with the potential for hundreds, depending on land ownership considerations.

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

The Willowleaf Aster is found in Canada only in Ontario. It has a wide distribution across central and eastern North America, spanning the Great Plains, Midwest, and northeastern and southeastern United States. The species is primarily associated with tallgrass prairies, oak savannas, open woodlands, and anthropogenically disturbed habitats such as roadsides and meadows. In southern Ontario, it is found in remnant prairie and savanna ecosystems within the Great Lake Plains.

In much of its U.S. range, the species' conservation status is unranked, including in New York and Ohio. In Michigan, it is ranked S3 (Vulnerable), while in Pennsylvania, it is ranked S4.

The Broader Biologically Relevant Geographic Range (BBRGR) includes Michigan due to its proximity to the closest Ontario subpopulation and the species' limited dispersal ability. However, migration between subpopulations in Michigan and Ontario is expected to be minimal due to habitat fragmentation, the distance between subpopulations, and potential barriers.

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

<b>Adjacent Jurisdictions</b>	<b>Biologically Relevant to Ontario (n/a, yes, no)</b>	<b>Condition</b>	<b>Notes &amp; Sources</b>
Michigan	Yes	S3	NatureServe 2024
West Virginia	No	S3	NatureServe 2024
Iowa, Pennsylvania	No or unlikely	S4	NatureServe 2024
New York	No or unlikely	SNR	NatureServe 2024
Alabama, Arkansas, Florida, Illinois, Indiana, Kansas, Kentucky, Louisiana, Maine, Minnesota,	No	SNR	NatureServe 2024

<b>Adjacent Jurisdictions</b>	<b>Biologically Relevant to Ontario (n/a, yes, no)</b>	<b>Condition</b>	<b>Notes &amp; Sources</b>
Mississippi, Missouri, Nebraska, New Hampshire, New Jersey, New Mexico, North Carolina, Ohio, Oklahoma, Rhode Island, South Dakota, Texas, Vermont, Wisconsin			
Maryland, Massachusetts, Tennessee, Virginia	No	S1	NatureServe 2024
Georgia	No	S1?	NatureServe 2024
Connecticut	No	S2	NatureServe 2024
District of Columbia	No	SX	NatureServe 2024

## 2.4. Ontario conservation responsibility

Less than 1% of the global range of Willowleaf Aster occurs in Ontario. Ontario's conservation responsibility is considered to be low.

## 2.5. Direct threats

COSEWIC completed a threats assessment for Willowleaf Aster and determined the overall threat level to the species to be medium to low (COSEWIC 2024, IN PRESS).

Direct threats from highest to least are as follows:

- The highest impact is identified as natural succession from open habitat to thickets or shaded habitat, with encroachment of woody vegetation observed at seven extant subpopulations.
- Road maintenance and mowing is identified as medium to low impact. Fire suppression is considered low impact.
- Housing and urban areas are identified as a low impact, as many of the extant locations for Willowleaf Aster are within conservation or recreation lands. On private land, threats still exist from development.
- Tourism and recreation areas are identified as low impact, largely from trail paving.
- Problematic native species are identified as low impact, including native shrubs which impact the species through succession, shading out, or by outcompeting the plant.

The number of locations for Willowleaf Aster is considered to be greater than 10, but possibly in the order of several hundred (COSEWIC 2024, IN PRESS). Threat locations were estimated based on threats observed at each subpopulation, number of occurrences and ownership types.

## 2.6. Specialized life history or habitat use characteristics

The Willowleaf Aster is particularly vulnerable due to its dependence on rare and disturbance-dependent habitats such as tallgrass prairies and savannas, which are critically imperiled in Ontario. The species requires periodic ecological disturbances like fire or grazing to maintain open, sunlit conditions essential for its growth. In the absence of these disturbances, habitat succession leads to encroachment by woody vegetation, reducing habitat suitability. Willowleaf Aster is likely to have fairly short dispersal distances. In Ontario, over 98% of mature individuals occur in one sub-population.

## 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

Does not apply. There is no evidence of decline in total number of mature individuals. COSEWIC (2024, IN PRESS) reports an increased number of individuals since the 1999 assessment, largely due to intensive monitoring efforts associated with transplanting.

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

Does not apply. The extent of occurrence (EOO) of 7,872km<sup>2</sup> is below the threshold for Threatened and index area of occurrence (IAO) at 72km<sup>2</sup> is below the threshold for Endangered, but the population is not considered to be severely fragmented or experience extreme fluctuations.

There was a decline in EOO identified through the status assessment work (COSEWIC, 2024, IN PRESS.) and a continued decline considered possible in the IAO, number of subpopulations and number of locations.

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

Does not apply. The number of mature individuals is estimated at 210,530.

#### 3.1.4. Criterion D – Very small or restricted total population

Does not apply. Number of mature individuals at 210,530 and IOA of 72km<sup>2</sup> exceeds threshold for Threatened.

#### 3.1.5. Criterion E – Quantitative analysis

Does not apply. Analysis not conducted.

### 3.2. Application of Special Concern in Ontario

The status modifier of Special Concern is applicable. Under criteria c, the species is near to qualifying under any criteria as Threatened Status (such as under Criteria B1b, B2b).

This assessment indicates a status change from Threatened under prior assessment due to an increase in number of individuals documented in the population and new subpopulations being identified. However, threats are considered to persist including threats from habitat modification due to natural succession, fire suppression and housing developments. A single subpopulation contains over 98% of individuals in the population, and there is a reported decline in EOO of 36% since the last COSEWIC assessment, which is expected to continue.

### 3.3. Status category modifiers

#### 3.3.1. Ontario's conservation responsibility

Ontario's conservation responsibility is low at less than 1% of the global range.

#### 3.3.2. Status modification based on level of risk in broader biologically relevant geographic range

Does not apply. Status modifiers based on broader biologically relevant geographic range (BBRGR) have not been considered. Willowleaf Aster is considered similarly vulnerable or rare in Michigan where the closest subpopulation occurs. It is not ranked in other states bordering Canada. The status in the BBRGR has not been used to modify the species status in Ontario, as species immigration or gene flow is not known to occur and dispersal capabilities remain unknown.

#### 3.3.3. Rescue Effect

No modifier has been applied for rescue effect. The closest subpopulation of the species is in Michigan, within 5km of the Windsor-LaSalle subpopulation. Natural dispersal is considered possible, but unknown. Immigrants would be adapted to survive in Ontario, and suitable habitat exists. Conditions in Ontario are considered to be deteriorating, but it is unknown of the status of conditions in Michigan, where the species is currently S3 or vulnerable.

### 3.4. Other status categories

#### 3.4.1. Data deficient

Does not apply.

#### 3.4.2. Extinct or extirpated

Does not apply.

### 3.4.3. Not at risk

Does not apply.

## 4. Summary of Ontario status

Willowleaf Aster (*Symphyotrichum praealtum*) is classified as Special Concern in Ontario based on meeting criterion b and c. The species is at risk of becoming Threatened (THR) if current factors persist (b). Several subpopulations have been extirpated since the 2003 assessment, with over 98% of individuals now concentrated in a single subpopulation. It is close to meeting the criteria for Threatened under any criterion (c) and meets criteria under B1 and B2. The species' EOO has declined by 36.3%, from 12,358 km<sup>2</sup> in 1999 to 7,872 km<sup>2</sup>, compared to a historical EOO of 13,319 km<sup>2</sup>.

The most recent COSEWIC assessment re-assessed the species as Special Concern.

The status was not modified based on the BBRGR due to the rare status in the closest neighboring subpopulation.

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

The change in status of this species from the 2004 assessment is considered a non-genuine<sup>1</sup> change based on higher abundance estimates and new subpopulations being identified.

## 5. Information sources

COSEWIC. 2024. IN PRESS. COSEWIC assessment and status report on the Willowleaf Aster *Symphyotrichum praealtum* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 44 pp. (<https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry.html>)

COSEWIC 2003. COSEWIC assessment and status report on the willowleaf aster *Symphyotrichum praealtum* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 16 pp.

Jones, J. 2013. Recovery strategy for the Willowleaf Aster (*Symphyotrichum praealtum*) in Ontario. Ontario Recovery Strategy Series. Prepared for the Ontario Ministry of Natural Resources, Peterborough, Ontario. vi + 29 pp.

MICHIGAN FLORA ONLINE. A. A. Reznicek, E. G. Voss, & B. S. Walters. February 2011. University of Michigan. Web. October, 12, 2024 (<https://lsa-miflora-p.lsa.umich.edu/#/record/491>)



Michigan Natural Features Inventory MSU Extension.  
(<https://mnfi.anr.msu.edu/species/description/13438/Symphotrichum-praealtum>) Web.  
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Zhang, J.J. 1999. COSEWIC status report on the willowleaf aster *Symphotrichum praealtum* in Canada, in COSEWIC assessment and status report on the willowleaf aster *Symphotrichum praealtum* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. 1-16 pp.

<sup>1</sup> 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: Willowleaf Aster (*Symphotrichum praealtum*)

### 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.	Approximately 3 years
Is there an observed, inferred, or projected continuing decline in number of mature individuals?	No, based on observed increase in number of individuals largely associated with transplant and monitoring efforts.
Estimated percent of continuing decline in total number of mature individuals within 5 years or 2 generations.	n/a
Observed, estimated, inferred, or suspected percent reduction or increase in total number of mature individuals over the last 10 years or 3 generations.	n/a
Projected or suspected percent reduction or increase in total number of mature individuals over the next 10 years or 3 generations.	Unknown as historical data are incomplete
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 as historical data are incomplete
Are the causes of the decline (a) clearly reversible, and (b) understood, and (c) ceased?	a. Yes b. Yes c. Unknown
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 (EOO).	7,872 km <sup>2</sup>
Index of area of occupancy (IAO).	72 km <sup>2</sup>
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. No

<b>Extent and occupancy attributes</b>	<b>Value</b>
(b) separated from other habitat patches by a distance larger than the species can be expected to disperse?	
Number of locations.	>10
Number of NHIC Element Occurrences	18 total, 10 are considered historical and 1 extirpated
Is there an observed, inferred, or projected continuing decline in extent of occurrence?	Yes
Is there an observed, inferred, or projected continuing decline in index of area of occupancy?	Yes
Is there an observed, inferred, or projected continuing decline in number of sub-populations or EOs?	Yes
Is there an observed, inferred, or projected continuing decline in number of locations?	Yes
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)

Number of Mature Individuals (by subpopulation) (COSEWIC 2024, IN PRESS):

1. Point Edward	410	Numbers are based on field observations in 2022 of flowering stems except for Windsor-LaSalle where the number was inferred based on field observations supplemented with external data.
2. Squirrel Island	Unknown	
3. Walpole Island	Unknown	
4. Port Stanley	1,000	
5. Cedar Creek	1,000	
6. Big Creek Conservation Area	200	
7. Marshfield Woods	100	
8. 6th Concession Colchester	140	
9. Windsor-LaSalle	207,680*	
Total	Minimum of 210,530	Based on field work and supplemented with external data
*This represents 181,196 at transplanted sites and 26,484 in other sites.		

## Quantitative analysis (population viability analysis conducted)

The probability of extinction in the wild is unknown, as a quantitative analysis was not undertaken.

## Threats

A threat calculator was prepared by COSEWIC (2024, IN PRESS). Key threats were identified as:

- i. Other Ecosystem Modifications (IUCN Threat 7.3, Medium-Low Impact)
- ii. Fire & Fire Suppression (IUCN Threat 7.1, Low Impact)
- iii. Housing & Urban Areas (IUCN Threat 1.1, Low Impact)
- iv. Tourism & Recreation Areas (IUCN Threat 1.3, Low Impact)
- v. Problematic Native Species (IUCN Threat 8.2, Low Impact)

## Rescue effect

<b>Rescue effect attribute</b>	<b>Value</b>
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	Michigan S3 Vulnerable
Is immigration of individuals and/or propagules between Ontario and outside populations known or possible?	Possible, but not known.
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 (Natural succession)
Is the species of conservation concern in bordering jurisdictions?	Unknown, however, the closest known occurrence of the species is in Michigan (S3) at approximately 5km from the Windsor-LaSalle population.
Is the Ontario population considered to be a sink?	Unknown
Is rescue from outside populations likely?	Unknown

## Sensitive species

Willowleaf Aster is not a data sensitive species.

## **Acronyms**

BBRGR: Broader Biological Relevant Geographic Range  
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  
MNR: Ministry of Natural Resources  
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