

Ontario Species at Risk Evaluation Report for
White Wood Aster
Aster à rameaux étalés
(*Eurybia divaricata*)

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

Assessed by COSSARO as Special Concern

April 2024

Final

Executive summary

White Wood Aster (*Eurybia divaricata*) is a perennial that grows 30 to 90 cm tall, with leaves deeply and irregularly serrated, with lower heart-shaped leaves and upper elongated leaves. It flowers in the fall with yellow and purple florets. The species thrives in dry to moist woodland habitats, often found on well-drained, sandy soils. It may also be found in rich, moist soils in Ontario. It is a species that takes advantage of openings in forests and is often found along edges of forests and trails. White Wood Aster is found in forests across Eastern North America, primarily in the Carolinian Zone of Canada and specifically in the Niagara Region of Ontario and southwestern Quebec (O'Hara 2022; COSEWIC 2023, IN PRESS). In Ontario, White Wood Aster is found in Niagara, Norfolk County and City of Quinte West regions. There are 46 subpopulations in Ontario, 38 extant, 2 historical and 6 extirpated (COSEWIC 2023, IN PRESS).

The recent COSEWIC reassessment resulted in the discovery of many new locations. However, despite the increase in number of subpopulations in Ontario, persistent and ongoing threats to White Wood Aster are considered to affect Ontario to a greater extent than the rest of the Canadian population, which occurs in Quebec. The additional locations considered result in the species not meeting criteria for Endangered or Threatened. However, ongoing threats and management of the species under individual landowners may mean the species may become threatened if threats are not reversed or managed. The species qualifies for the application of Special Concern in Ontario. White Wood Aster was previously classified as Threatened in Ontario. The result of reclassification is considered non-genuine, reflecting an increase in number of known populations since the last assessment.

1. Eligibility for Ontario status assessment

1.1. Eligibility conditions

A single species of White Wood Aster (*Eurybia divaricata*) occurs in Canada and is eligible for assessment.

1.1.1. Taxonomic distinctness

There are no recognized subspecies/varieties or discrete/ evolutionarily significant differences among subpopulations in Canada.

1.1.2. Designatable units

The occurrence of White Wood Aster in Canada is considered one designatable unit (DU).

1.1.3. Native status

White Wood Aster is a native species to Ontario.

1.1.4. Occurrence

The species occurs in eastern North American and occurs towards the northern end of its range in Ontario and Quebec.

1.2. Eligibility results

White Wood Aster (*Eurybia divaricata*) is eligible for status assessment in Ontario. Background information

2. Background Information

2.1. Current designations

- GRANK: G5 (NatureServe 2024)
- IUCN: n/a
- NRANK Canada: N3 Vulnerable (NatureServe 2024)
- COSEWIC: Special Concern (December 2023)
- SARA: Threatened (Schedule 1 in 2005)
- ESA 2007: Threatened (added to ESA in 2008)
- SRANK: S3 (ranked in 2019)

2.2. Distribution in Ontario

In Ontario, White Wood Aster is found in Niagara, Norfolk County and City of Quinte West regions. There are 46 subpopulations in Ontario, 38 extant, 2 historical and 6

extirpated (COSEWIC 2023, IN PRESS). Of the estimated 101,000 flowering stems in Canada, 97,150 are in Ontario (COSEWIC 2023, IN PRESS). The number of locations coincides with the number of subpopulations generally, with an estimated 70 to 80 locations in Canada. Based on the number of landowners, 64 identified landowners are located in Ontario (COSEWIC 2023, IN PRESS).

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

White Wood Aster is found in forests across Eastern North America, primarily in the Carolinian Zone of Canada and specifically in the Niagara Region of Ontario and southwestern Quebec (O’Hara 2022; COSEWIC 2023, IN PRESS). Within Quebec, the species is considered imperiled (S2), whereas across the range in the USA the species is considered Secure (S5), Apparently Secure (S4) or no status rank is assigned. One exception is Maine, which lists the species as Vulnerable (S3).

For the purposes of this assessment, the Broader Biologically Relevant Geographic Range (BBRGR) outside of Ontario is considered to include the immediately adjacent provinces and states to the species range in Canada, including Quebec, New York, Vermont, New Hampshire and Maine. For immigration to be possible, geographically the source would need to be very close or aided by human actions. It is noted that in Ontario in particular, for subpopulations within 5 km of each other, pollination and production of viable seeds is considered possible (COSEWIC 2023, IN PRESS).

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 | Imperiled (S2) | NatureServe 2024 |
| Maine | Yes | Vulnerable (S3) | NatureServe 2024 |
| New Hampshire | Yes | No Status Rank | NatureServe 2024 |
| Vermont | Yes | No Status Rank | NatureServe 2024 |
| New York | Yes | Secure (S5) | NatureServe 2024 |
| Pennsylvania | Yes | No Status Rank | NatureServe 2024 |

2.4. Ontario conservation responsibility

Ontario’s conservation responsibility is low. The Global Range for the species is less than 5% for all of Canada (COSEWIC 2023, IN PRESS).

2.5. Direct threats

A threats assessment was completed in COSEWIC 2023 (IN PRESS). Habitat loss and fragmentation, and disturbance by human activities (trails, yard waste, dumping, trampling) are identified as direct threats to White Wood Aster. Habitat loss through land development and conversion to agriculture is identified. Logging activities may impact the species. Recreational activities may lead to trampling by hikers or ATV use. Ecosystem modifications by invasive species are a threat, including species such as Garlic Mustard (*Alliaria petiolate*) and European Common Reed (*Phragmites australis* subsp. *australis*). Browsing by insects or White-tailed Deer (*Odocoileus virginianus*) is considered to likely pose a threat in Ontario.

The overall threat impact for White Wood Aster is considered to be medium, with an anticipated decline of between 3 to 30%, with a median range of 12-19% in the next 10 years (or 3 generations) (COSEWIC 2023, IN PRESS).

Locations are defined by each landowner, as land management is based by individual owner. Five locations occur in conservation lands, parks or land reserves in Ontario.

2.6. Specialized life history or habitat use characteristics

White Wood Aster is a perennial, that grows 30 to 90 cm tall, with leaves deeply and irregularly serrated, with lower heart-shaped leaves and upper elongated leaves. It flowers in the fall with yellow and purple florets. It's a species that grows in colonies, spreading through root-like stems, but is also capable of sexual reproduction in appropriate conditions. The species thrives in dry to moist woodland habitats, often found on well-drained, sandy soils. It may also be found in rich, moist soils in Ontario. It is a species that takes advantage of openings in forests and is often found along edges of forests and trails.

Dispersal via cloning is very slow for this species, estimated at 0.2 to 0.3 metres per year (Singleton et al. 2001, as cited in COSEWIC 2023, IN PRESS). Seeds are able to disperse, and forest leaf litter depth is thought to be important to overwintering and establishment. White Wood Aster is considered to have low colonization distances.

2.7. Existing Conservation and Recovery Actions

Ontario has developed a Government Response Statement (Ontario 2020) for White Wood Aster, which summarizes intended conservation actions for the protection and recovery of the species, including the undertaking research, monitoring management, communication and outreach. Since 2006, the federal Habitat Stewardship Program (HSP) for Species at Risk has supported efforts in Ontario (and Quebec) aimed at the recovery of the White Wood Aster. In Ontario, organizations like the Niagara Parks Commission, Nature Conservancy of Canada, and the Carolinian Canada Coalition have worked on conservation agreements, easements, and land acquisitions to protect the habitat of the White Wood Aster. They've also engaged in habitat restoration, monitoring, and outreach activities. Additionally, broader ecosystem management initiatives in Ontario, such as the National Recovery Strategy for Carolinian Woodlands, have aided in the species' recovery. Conservation and recovery actions have included the development of a recovery strategy and critical habitat for the species (ECCC 2018;

MECP 2021). Habitat Stewardship Program funding and natural area inventories have contributed to identification of additional subpopulations. In particular, effort in 2018 and 2021 by O'Hara (2022), increased the number of subpopulations documented in Ontario from 15 in 2002 to 64 in the most recent assessment (COSEWIC 2023, IN PRESS).

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

Population size reduction does not meet the threshold for Threatened or Endangered. The criterion is not applicable.

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

The EOO is slightly less than 20,000 km² and AOO is 240 km². There is continuing decline in extent and quality of habitat. However, the population is not considered severely fragmented, as it occurs at more than 10 locations in Ontario, and no evidence of extreme fluctuations (COSEWIC 2023, IN PRESS). The criterion is not applicable.

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

Over 90,000 individuals are reported for Ontario. The criteria does not apply.

3.1.4. Criterion D – Very small or restricted total population

The criteria does not apply.

3.1.5. Criterion E – Quantitative analysis

Unknown. Quantitative analysis not conducted.

3.2. Application of Special Concern in Ontario

In 2018 and 2021, O'Hara (2022) investigated areas of Niagara Region and identified a number of new subpopulations/locations for the species in Ontario. Additional searching is anticipated to identify more locations. However, despite the increase in number of subpopulations in Ontario, persistent and ongoing threats to White Wood Aster are considered to affect Ontario to a greater extent than the rest of the Canadian population in Quebec. O'Hara (2022) also confirmed local extirpation from 11 sites where White Wood Aster was confirmed in the past. Although not previously assessed for Ontario, EOO and AOO are nearing thresholds for Threatened and Endangered respectively, and observed decline of quality of habitat and number of mature individuals has been documented (O'Hara 2022, COSEWIC 2023, IN PRESS). Increases in subpopulation locations and stem counts are reflective of increased effort as opposed to a true increase in population. Most subpopulations are geographically separate enough that

gene exchange is not expected, although subpopulations do not meet criteria for severely fragmented (as there are more than 10 locations). Some locations have very small numbers of stems that could be easily extirpated locally by identified threats.

Given that the threats assessment has identified the overall threat as medium to the species, that threats are more likely to affect the Ontario population, and that threats continue, the species may be considered Threatened if threats are not reversed or managed with demonstrable effectiveness. This species qualifies for the application of Special Concern in Ontario.

3.3. Status category modifiers

3.3.1. Ontario's conservation responsibility

Does not apply.

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

Given the status in New York state as Secure, there could be an opportunity to downgrade or consider lower status for the species in Ontario. However, as a species with limited dispersal capacity and subpopulations with little evidence of genetic exchange, the status across the BBRGR is not likely to influence the Ontario subpopulations without active recovery actions.

3.3.3. Rescue Effect

There is no evidence of rescue effect. Does not apply.

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, given recommendation for Special Concern.

4. Summary of Ontario status

White Wood Aster (*Eurybia divaricata*) is classified as Special Concern in Ontario based on the Special Concern modifier criteria.

5. Information sources

COSEWIC 2002. COSEWIC assessment and update status report on the white wood aster *Eurybia divaricata* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 23 pp.

COSEWIC. 2023. IN PRESS. COSEWIC assessment and status report on the White Wood Aster *Eurybia divaricata* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 34 pp.
(<https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry.html>).

Environment and Climate Change Canada (ECCC). 2018. Recovery Strategy for the White Wood Aster (*Eurybia divaricata*) in Canada, Species at Risk Act Recovery Strategy Series. Environment and Climate Change Canada, Ottawa, viii + 67 pp.

Ministry of the Environment, Conservation and Parks. 2019. Recovery Strategy for the White Wood Aster (*Eurybia divaricata*) in Ontario. Ontario Recovery Strategy Series. Prepared by the Ministry of the Environment, Conservation and Parks, Peterborough, Ontario. iv + 7 pp. + Appendix. Adoption of the Recovery Strategy for White Wood Aster (*Eurybia divaricata*) in Canada (Environment and Climate Change Canada 2018).

NatureServe. 2024. NatureServe Network Biodiversity Location Data accessed through NatureServe Explorer [web application]. NatureServe, Arlington, Virginia. Available <https://explorer.natureserve.org/>. (Accessed: March 22, 2024).

O'Hara, P. 2022. 2018 / 2021 White Wood Aster (*Eurybia divaricata*) Survey Final Report. Ministry of Natural Resources and Forestry Species At Risk Stewardship Fund (SARSF) _8_18_BONL Final Report, February 28, 2022. Blue Oak Native Landscapes, 113 Locke Street North, Hamilton, ON.

Ontario. 2020. White Wood Aster government response statement Ontario's policy direction for the protection and recovery of White Wood Aster. Accessed online at: <https://files.ontario.ca/mecp-1/mecp-white-wood-aster-grs-en-2020-09-04.pdf>

Werier, David, Kyle Webster, Troy Weldy, Andrew Nelson, Richard Mitchell†, and Robert Ingalls. 2024 New York Flora Atlas. S. M. Landry and K. N. Campbell (original application development), USF Water Institute. University of South Florida. New York Flora Association, Albany, New York. Accessed online at: <https://newyork.plantatlas.usf.edu/plant.aspx?id=507>

Appendix 1: Technical summary for Ontario

Species: White Wood Aster (*Eurybia divaricata*)

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. | 10+ years |
| Is there an observed, inferred, or projected continuing decline in number of mature individuals? | Yes (reflecting subpopulation declines and extirpations, whereas population increase reflects greater survey effort) |
| 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. No 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 (EOO). | 19,330 km ² when all of NHIC EO included, including Kingston location |
| Index of area of occupancy (IAO). | 216 km ² (COSEWIC 2023, IN PRESS) or 236 km ² using NHIC EO data |
| 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 (b) separated from other habitat patches by a distance larger than the species can be expected to disperse? | a. No b. Yes (subpopulations separated by large areas) |
| Number of locations. | >10, estimated at 64 for Ontario by individual properties listed in COSEWIC 2023 (IN PRESS). |
| Number of NHIC Element Occurrences | 25 |
| 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 – habitat lost both inferred and projected |
| 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 |
|---|-------------------------------------|
| >100,000 in total population | >90,000 in Ontario |

Quantitative analysis (population viability analysis conducted)

Probability of extinction in the wild is unknown, a population viability analysis was not conducted.

Threats

A threats assessment was completed in COSEWIC 2023 (IN PRESS). Key threats were identified as:

- i. Housing & urban areas (IUCN 1.1) – low impact,
- ii. Annual & perennial non-limber crops (IUCN 2.1) – low impact,
- iii. Logging & wood harvesting (IUCN 5.3) – low impact,
- iv. Recreational activities (IUCN 6.1) – low impact,
- v. Other ecosystem modifications (IUCN 7.3) – low impact,
- vi. Problematic native species/diseases (IUCN 8.2) – low impact, and,
- vii. Invasive non-native/alien species/diseases (IUCN 8.1) – 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 | New York (S5 Secure); Maine (S3 Vulnerable); Vermont and New Hampshire (No Status Rank). The only likelihood of immigrants is New York state as there is no evidence of extant populations near the Kingston area on the US side. |
| 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 |
| Is the species of conservation concern in bordering jurisdictions? | Yes, imperiled in Quebec. |
| Is the Ontario population considered to be a sink? | No |
| Is rescue from outside populations likely? | Unknown, but unlikely |

Sensitive species

This 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
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