Ontario Species at Risk Evaluation Report for Provancher's Fleabane

Vergerette de Provancher

(*Erigeron philadelphicus var. provancheri)*

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

Assessed by COSSARO as Data Deficient

November 2023
Final

Executive summary

Provancher's Fleabane is a small perennial herbaceous plant belonging to the Aster family. This taxon is characterized by 3 to 20 hairless or nearly hairless leaves, which form a basal rosette. The inflorescence consists of 1 to 20 flower heads with white or pale pink petals. The often-hairless stem may be up to 20 cm long and arises from the center of the rosette. The fruits are achenes, crowned with silky whitish hairs.

Provancher's Fleabane is endemic to northeastern North America. This taxon has been recorded from five subpopulations in Ontario, composed of 28 known sites on the Bruce Peninsula and adjacent Lake Huron islands. It may also occur in the Waterloo area and near Lake Erie.

Provancher's Fleabane typically grows in crevices in calcareous rocks or pavement along rivers and Great Lakes. This taxon appears to be closely associated with underlying calcareous sedimentary bedrock and surface materials with an alkaline to circumneutral pH. In Ontario, this taxon often occupies the upper, well-drained portions of shorelines, however Provancher's Fleabane also appears to be adaptable to a variety of natural and anthropogenic habitats.

A threats assessment assigned an overall threat impact for this taxon as low. Invasive non-native plants and introduced genetic material from the Philadelphia Fleabane are considered to be the main threats to this taxon, with trampling and recreational activities also reported as threats to some subpopulations.

There has been controversy regarding the taxonomy of this taxon since it was first described in 1940. Detailed genetic and ecophysiological studies are required to determine if the Ontario occurrences of this taxon represent *Erigeron philadelphicus var. provancheri.* Because of this uncertainty, Provancher's Fleabane is classified as Data Deficient in Ontario.

1. Eligibility for Ontario status assessment

1.1. Eligibility conditions

1.1.1. Taxonomic distinctness

Provancher's Fleabane is a member of the genus *Erigeron*, which includes 173 species in North America and approximately 390 globally (Nesom 2006). There has been controversy regarding the taxonomy of this taxon since it was first described in 1940. Because of this uncertainty, COSEWIC (2023) decided that only detailed genetic and ecophysiological studies would settle the taxonomic issue of this plant on whether the Ontario and Quebec subpopulations represent the same taxon.

1.1.2. Designatable units

For the purposes of this assessment, the occurrences of Provancher's Fleabane in Ontario are considered to be a single designatable unit.

1.1.3. Native status

The taxon currently described as Provancher's Fleabane (*Erigeron philadelphicus var. provancheri*) is native to Ontario.

1.1.4. Occurrence

Provancher's Fleabane is endemic to northeastern North America. In Canada, it is known to occur in Ontario and Quebec (COSEWIC 2023). Occurrences have also been reported in New York State and Vermont (Nesom 2006). The taxon may also be in Michigan and Ohio, but this taxon is not tracked due to taxonomic uncertainty (COSEWIC 2023).

1.2. Eligibility results

The taxon currently described as Provancher's Fleabane (*Erigeron philadelphicus var. provancheri*) is eligible for assessment in Ontario, however further study is required to determine if the Ontario occurrences represent *Erigeron philadelphicus var. provancheri*.

2. Background information

2.1. Current designations

- GRANK: G5T3 (NHIC 2023)
- IUCN: Not listed
- NRANK Canada: N3
- COSEWIC: Data Deficient (May 2023)

- SARA: Special Concern (Schedule 3)
- ESA 2007: Not at risk
- SRANK: SU (rank updated in 2023 due to taxonomic uncertainty)

2.2. Distribution in Ontario

In Ontario, this taxon has been recorded from five subpopulations, composed of 28 known sites on the Bruce Peninsula and adjacent Lake Huron islands (COSEWIC 2023). There are other potential observations as far south as Dyers Bay on the eastern shore of the peninsula and down to Pike Bay on the western shore of the peninsula (COSEWIC 2023). COSEWIC (2023) also reported a collection from the Waterloo area and unconfirmed reports near Lake Erie.

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

Provancher's Fleabane is only known to occur in northeastern North America, with subpopulations of this taxon recorded in Quebec, New York and Vermont. Provancher's Fleabane is ranked S3 in Quebec, ranked S3 and designated as Threatened in New York and ranked S1 in Vermont (see Table 1). This taxon may also occur in Michigan and Ohio, but has not been verified or ranked in these jurisdictions.

For the purposes of this assessment, the broader biologically relevant geographic range (BBRGR) for Provancher's Fleabane is considered to include Quebec, Vermont and New York. Although rescue effect from subpopulations in these jurisdictions is unlikely, individuals of this taxon are likely to be capable of surviving and reproducing in Ontario.

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	S3	NatureServe 2023
New York	Yes	S2 (Threatened)	NatureServe 2023 Werier et al. 2023
Vermont	Yes	S1	NatureServe 2023

2.4. Ontario conservation responsibility

Ontario's conservation responsibility is unknown. Additional research is required to determine if the taxon recorded in Ontario represents *Erigeron philadelphicus var. provancheri.*

2.5. Direct threats

A threats assessment was conducted by COSEWIC (2023), which assigned an overall threat impact for this taxon as low. Known threats are listed below.

Natural System Modifications (Low threat impact)

Coltsfoot (*Tussilago farfara*) is the species that occurs most often in Provancher's Fleabane habitat in Quebec and may also impact potential Provancher's Fleabane habitat in Ontario. Coltsfoot appears to be harmful on vertical rock walls where it may shade or outcompete Provancher's Fleabane (COSEWIC 2023).

Reed Canarygrass (*Phalaris arundinacea var. arundinacea*) does not generally utilize the same rocky habitat preferred by Provancher's Fleabane, but may impact some subpopulations along riverbanks. Provancher's Fleabane appears to be protected to some degree from invasive species at sites that are subject to significant flooding or ice scouring or on rock outcrops with little soil (COSEWIC 2023).

European Reed (*Phragmites australis ssp. Australis*) is being monitored and managed along sections of the Lake Huron and Georgian Bay shorelines. Many of these infestations do not overlap with the ideal suitable habitat of Provancher's Fleabane, however several infestations are growing in the moist interface of the Lake Huron edge and limestone rock barrens/alvars, boulder/cobble and wet crevasses, which would negatively impact suitable habitat and or stands of Provancher's Fleabane where they coexist (COSEWIC 2023).

Mossy Stonecrop (*Sedum acre*) is also known to occur in suitable island shoreline habitat in Lake Huron. The infestations are being monitored and have yet to be managed. Mossy Stonecrop has a local tendency to dominate dry and/or wet limestone shorelines, crevasses and alvars, which has the potential to negatively impact suitable habitat of Provancher's Fleabane (COSEWIC 2023).

Introduced Genetic Material (Low threat impact)

Introgression between Provancher's Fleabane and typical Philadelphia Fleabane occurs wherever the two grow in close proximity (Morton 1988). This often happens because Provancher's Fleabane grows in storm-lashed rocky crevices near Lake Huron and Philadelphia Fleabane occurs in nearby open habitats immediately behind the shore (COSEWIC 2023). The risk of hybridization exists within the Bruce Peninsula area, where high water levels within Lake Huron is resulting in a reduction or shifting of suitable habitat for Provancher's Fleabane closer to the forest edge where Philadelphia Fleabane often occurs (COSEWIC 2023). Increased proximity increases the potential for cross-pollination.

Recreational activities (Negligible Threat Impact)

Recreational activities along shorelines have the potential to impact Provancher's Fleabane. Bonfires on the shorelines of rivers have a local impact on a few individuals

at some sites, as has trampling associated with swimming and sunbathing activity (COSEWIC 2023). The impact of recreational activities on Provancher's Fleabane is generally negligible wherever the plant is growing on vertical rock walls.

2.6. Specialized life history or habitat use characteristics

Provancher's Fleabane is a small perennial herbaceous plant belonging to the Aster family. This taxon is characterized by 3 to 20 hairless or nearly hairless leaves, which form a basal rosette (COSEWIC 2023). The inflorescence consists of 1 to 20 flower heads with white or pale pink petals (COSEWIC 2023). The often-hairless stem may be up to 20 cm long and arises from the center of the rosette. The fruits are achenes, crowned with silky whitish hairs.

Provancher's Fleabane typically grows in crevices in calcareous rocks or pavement along rivers and Great Lakes (COSEWIC 2023). This taxon appears to be closely associated with underlying calcareous sedimentary bedrock and surface materials with an alkaline to circumneutral pH.

In Ontario, this taxon occupies the upper, well-drained portions of shorelines (COSEWIC 2023), however Provancher's Fleabane also appears to be adaptable to a variety of natural and anthropogenic habitats. Provancher's Fleabane occurs in riparian habitat that may be submerged during flooding events, as well as areas located on vertical escarpments or cliffs extending above the natural high-water line (COSEWIC 2023). Provancher's Fleabane is also capable of colonizing, and persisting in, open anthropogenic habitats adjacent to natural habitats.

The absence of dense vegetation cover seems to be an important factor in habitat suitability for Provancher's Fleabane. The ability of Provancher's Fleabane to become established and reproduce seems to depend on a natural disturbance regime of seasonal flooding, water erosion and ice scouring (COSEWIC 2023).

Provancher's Fleabane appears to spread vegetatively, enabling the taxon to gradually colonize the available habitat. Sexual reproduction has also been documented at various sites, indicated by the presence of numerous isolated young rosettes dispersed around mature plants (COSEWIC 2023). Wind dispersal of seeds has been observed to a distance of up to 100 meters. Water dispersal of seeds during seasonal floods has not been formally documented, but it is possible that seeds could disperse by water over several kilometers.

2.7. Existing Conservation and Recovery Actions

Provancher's Fleabane is not currently designated as at risk in Ontario and no taxon specific recovery actions are underway. Detailed genetic and ecophysiological studies are required to determine the extent of this taxon within Ontario and to inform any necessary conservation and recovery actions.

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. Total number of mature individuals in Ontario not known. Insufficient information to apply criteria.

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

Not applicable. Distribution of individuals in Ontario unknown. Insufficient information to apply criteria.

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

Not applicable. Insufficient information to apply criteria.

3.1.4. Criterion D – Very small or restricted total population

Not applicable. Insufficient information to apply criteria.

3.1.5. Criterion E – Quantitative analysis

Not applicable. Insufficient information to apply criteria.

3.2. Application of Special Concern in Ontario

Insufficient information available to consider for Special Concern in Ontario.

3.3. Status category modifiers

3.3.1. Ontario's conservation responsibility

Unknown. Further study is required to determine if this taxon occurs in Ontario.

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

No status modifiers based on broader biologically relevant geographic range have been considered.

3.3.3. Rescue Effect

The potential for rescue effect from adjacent jurisdictions is unknown. Detailed genetic and ecophysiological studies are required to determine the extent of this taxon within Ontario and adjacent jurisdictions.

3.4. Other status categories

3.4.1. Data deficient

The data deficient designation is applicable and appropriate, due to the taxonomic uncertainty of individuals in Ontario.

3.4.2. Extinct or extirpated

Not applicable.

3.4.3. Not at risk

Not applicable.

4. Summary of Ontario status

Provancher's Fleabane (*Erigeron philadelphicus var. provancheri*) is classified as Data Deficient in Ontario based on the taxonomic uncertainty of individuals in Ontario.

5. Information sources

COSEWIC. 2023. IN PRESS. COSEWIC assessment and status report on the Provancher's Fleabane *Erigeron philadelphicus var. provancheri* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 40 pp. (https://www.canada.ca/en/environment-climate-change/services/speciesrisk-public-registry.html).

Morton, J.K. 1988. Variation in *Erigeron philadelphicus* (Compositae). Canadian Journal of Botany 66:298-302.

NatureServe. 2023. NatureServe Network Biodiversity Location Data accessed through NatureServe Explorer [web application]. NatureServe, Arlington, Virginia. Available https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.153135/Erigeron_philadelphicus_var_provancheri. (accessed October 29, 2023).

Nesom, G. L. 2006. *Erigeron*, in Flora of North America Editorial Committee, eds. 1993+. Flora of North America North of Mexico. 20+ vols. New York and Oxford. Vol. 20, p. 256-348.

Werier, D., K. Webster, T. Weldy, A. Nelson, R. Mitchell and R. Ingalls. 2023. New York Flora Atlas. https://newyork.plantatlas.usf.edu/plant.aspx?id=6987

Appendix 1: Technical summary for Ontario

Species: Provancher's Fleabane (*Erigeron philadelphicus var. provancheri*)

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.	3 years.
Is there an observed, inferred, or projected continuing decline in number of mature individuals?	Unknown.
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. No. c. No.
Are there extreme fluctuations in number of mature individuals?	Unknown.

Extent and occupancy information in Ontario

Extent and occupancy attributes	Value
Estimated extent of occurrence (EOO). *If value in COSEWIC status report is not applicable, then use geocat.kew.org. State source of estimate.*	Unknown
Index of area of occupancy (IAO). *If value in COSEWIC status report is not applicable, then use geocat.kew.org. State source of estimate.*	Unknown
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. Yes

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. *See Definitions and Abbreviations on COSEWIC and IUCN websites for more information on the term "location". Use plausible range to reflect uncertainty if appropriate.*	Unknown
Number of NHIC Element Occurrences *Request data from MNRF.*	Unknown
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. Encroachment of Coltsfoot and Reed Canarygass has reduced the quality and quantity of habitat as some sites.
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
Unknown	

Quantitative analysis (population viability analysis conducted)

Probability of extinction in the wild is unknown.

Threats

A threats calculation for this species was conducted by COSEWIC (2023) and assigned the overall threat impact as Low.

Other ecosystem modifications (Low – IUCN 7.3)

Introduced genetic material (Low – IUCN 8.3)

Recreational activities (Negligible – IUCN 6.1)

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	Quebec - S3 New York – S2 (Threatened) Vermont – S1
Is immigration of individuals and/or propagules between Ontario and outside populations known or possible?	Unknown, but 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?	Unknown
Is the species of conservation concern in bordering jurisdictions?	Yes. Threatened in New York.
Is the Ontario population considered to be a sink?	Unknown
Is rescue from outside populations likely?	Unknown, but unlikely.

Sensitive species

Not a data sensitive species.

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