

**Ontario Species at Risk Evaluation Report for Cupped
Fringe Lichen
(*Heterodermia hypoleuca*)**

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

Assessed by COSSARO as Endangered

January 2026

Final

Executive summary

Cupped Fringe Lichen (*Heterodermia hypoleuca*) occurs on tree bark and is the only apotheciate species in the genus with non-ascending lobes known to occur in North America. Its photosynthetic partner is a green unicellular coccoid alga in the genus *Trebouxia*, which is very common. Prior to 1998, Cupped Fringe Lichen was considered possibly extirpated in southern Ontario and Canada, however dedicated searches between 2012 and 2024 have resulted in the discovery of new subpopulations from Peterborough, Hastings, Frontenac, and Renfrew counties.

It occurs globally in temperate to subtropical humid forests and woodlands within Central and South America, east and south Africa, Australia, and eastern Asia. Its status is not ranked within its broader biologically relevant range which spans into the United States.

Cupped Fringe Lichen relies entirely on its host trees and occurs predominantly on ash species. As a result, its primary threat is the Emerald Ash Borer (*Agrilus planipennis*), which has been shown to cause rapid declines in ash once introduced. With this, it is projected that occupied ash trees will likely succumb to Emerald Ash Borer resulting in a loss of 74% of the Canadian population of Cupped Fringe Lichen.

Cupped Fringe Lichen is classified as Endangered based on meeting criteria A3bce+A4bce+C2a(i). This designation is due to the projected decline of Cupped Fringe Lichen over the next three generations due to the loss of ash host trees caused by Emerald Ash Borer. Also, the species' current population is small with no subpopulation containing more than 250 individuals. Cupped Fringe Lichen was not previously assessed by COSSARO.

1. Eligibility for Ontario status assessment

1.1. Eligibility conditions

1.1.1. Taxonomic distinctness

Cupped Fringe Lichen (*Heterodermia hypoleuca*) is considered taxonomically distinct and is within a genus of lichen which occur mostly on tree bark with approximately 175 species worldwide (COSEWIC 2025, IN PRESS).

1.1.2. Designatable units

There is no evidence to warrant separate designatable units within the species' range in Ontario. There is no recognized infraspecific taxa or varieties and genetic diversity has not been sufficiently studied to refute distinctness in any one region (COSEWIC 2025, IN PRESS).

1.1.3. Native status

Cupped Fringe Lichen is native to Ontario.

1.1.4. Occurrence

Cupped Fringe Lichen occurs in Ontario.

1.2. Eligibility results

Cupped Fringe Lichen (*Heterodermia hypoleuca*) is eligible for status assessment in Ontario.

2. Background information

2.1. Current designations

- GRANK: G5 (NatureServe 2026)
- IUCN: Not assessed
- NRANK Canada: N3 (NatureServe 2026)
- COSEWIC: Endangered (COSEWIC 2025, IN PRESS)
- SARA: Not listed on Schedule 1 (Under consideration for addition)
- MBCA protection: No
- Aquatic species under SARA: No
- COSSARO: Not previously assessed
- ESA 2007 (Species at Risk in Ontario List): Not listed
- SRANK: S2 (ranked in 2017, reviewed in 2023)

2.2. Distribution in Ontario

Prior to 1998, Cupped Fringe Lichen was considered possibly extirpated in southern Ontario and Canada, however dedicated searches of suitable swamp forest habitat completed for Flooded Jellyskin (*Leptogium rivulare*) and other targeted searches for Cupped Fringe Lichen from 2012 to 2019 and 2022 to 2024 resulted in the discovery of new subpopulations from Peterborough, Hastings, Frontenac, and Renfrew counties. There are 34 extant subpopulations representing 98% of the Canadian population with its range from Peterborough County east to the Ottawa River. A single small outlying subpopulation occurs on Manitoulin Island that could be considered extirpated (COSEWIC 2025, IN PRESS).

The extent of occurrence is 11,372 km² based on a minimum convex polygon that encompasses all verified records from the Natural Heritage Database. The current index area of occupancy is 32 km².

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

Cupped Fringe Lichen occurs in temperate to subtropical humid forests and woodlands. It has a disjunct global distribution and is found in montane regions of Central and South America, east and south Africa, Australia, and eastern Asia. In the United States, its range includes temperate areas of the Appalachian Mountains west locally through Ohio Valley to Minnesota and the Ozarks. In the northeast, records from New England are mostly historical with only two more recent collections from Maine. In the west, it occurs locally along the eastern border of the Sonoran Desert area and in the subtropical part of Baja California (COSEWIC 2025, 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	S3	Nature Serve, 2026
New Brunswick	Yes	SNR	Nature Serve, 2026
Michigan	Yes	SNR	Nature Serve, 2026
Minnesota	Yes	SNR	Nature Serve, 2026
Nunavut	No	n/a	n/a
New York	Yes	SNR	Nature Serve, 2026
Ohio	Yes	n/a	n/a
Pennsylvania	Yes	SNR	Nature Serve, 2026
Wisconsin	Yes	SNR	Nature Serve, 2026
West Virginia	Yes	SNR	Nature Serve, 2026

2.4. Ontario conservation responsibility

The Canadian range likely accounts for less than one percent of the global range. Therefore, the threshold for conservation responsibility is not met for Ontario.

2.5. Direct threats

Natural system modifications, specifically that of the Emerald Ash Borer (EAB), is a major threat to Cupped Fringe Lichen as its main host tree are ash species. Within the next three generations for Cupped Fringe Lichen, it is projected that all occupied ash trees will likely succumb to EAB, resulting in a loss of 74% of the Canadian population (COSEWIC 2025, IN PRESS).

Other threats include climate change and severe weather like the May 2022 Ontario-Québec derecho which caused extensive damage to forest cover and loss of mature trees hosting Cupped Fringe Lichen. Logging and wood harvesting and transportation and service corridors are also considered threats.

2.6. Specialized life history or habitat use characteristics

Cupped Fringe Lichen is entirely dependent on the host trees on which it grows and prefers bark of long-lived hardwood trees that occur in mature, productive forests with high humidity and canopy gaps, and frequently with old and leaning trees that often have bryophyte cover. Bark preferences are of trees with relatively thick, corky and often fissured bark which are likely to retain moisture suitable for establishment of dispersing propagules. Host tree species include Green Ash (*Fraxinus pennsylvanica*), Black Ash (*F. nigra*), Bur Oak (*Quercus macrocarpa*) and Red Oak (*Q. rubra*) (COSEWIC 2025, IN PRESS).

Cupped Fringe Lich appears to be a good indicator of mature, productive, 'high quality hardwood forests within its Canadian range. Most recent observations tend to occur in habitat that contains older and larger trees and typically have less sign of human disturbance (COSEWIC 2025, 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

Meets Endangered criterion A3bce +A4bce.

Based on survey data collected between 2012 and 2024, the Ontario population consists of 465 mature thalli distributed among 138 live trees at 34 extant subpopulations. Since Cupped Fringe Lichen can reproduce by fragmentation, all thalli encountered were included in the estimate. Observed decline in number of mature individual equivalents (the host trees) is projected to continue over the next three generations at a rate of 74%.

There has been no long-term monitoring of Cupped Fringe Lichen in Canada and therefore there are no observed data estimate trends over three generations in the past. However, decline can be inferred based on mortality of host trees by Emerald Ash Borer.

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

Meets Threatened criterion B1+B2ab(i)(ii)(iii)(iv)(v).

The extent of occurrence is 11,372 km² based on a minimum convex polygon that encompasses all verified records from 2002-2021. The current index area of occupancy is 32 km². There are 8 locations with verified EOs with extant subpopulations. Decline can be inferred based on mortality of host trees by Emerald Ash Borer.

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

Meets Endangered criterion C2a(i).

Total mature individuals is 465 on 276 trees (individual equivalents that are alive or dead) with no subpopulation containing greater than 250 individuals.

3.1.4. Criterion D – Very small or restricted total population

Meets Threatened criterion D1.

Estimated mature individual thalli is 465 on 276 trees (individual equivalents). IAO is 32 km². Number of locations is estimated to be more than 5.

3.1.5. Criterion E – Quantitative analysis

Does not apply. A quantitative analysis has not been undertaken.

3.2. Application of Special Concern in Ontario

Does not apply.

3.3. Status category modifiers

3.3.1. Ontario's conservation responsibility

Does not apply. The Canadian range likely accounts for less than one percent of the global range. Therefore, the threshold for conservation responsibility is not met for Ontario.

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

Does not apply. The level of risk in the broader biologically relevant geographic range has not been assessed.

3.3.3. Rescue Effect

Does not apply. Rescue from outside Ontario is unlikely. Populations in USA face the same threat posed by Emerald Ash Borer.

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

Cupped Fringe Lichen (*Heterodermia hypoleuca*) is classified as Endangered in Ontario based on meeting criteria A3bce+A4bce+C2a(i). This designation is due to the projected decline of Cupped Fringe Lichen over the next three generations due to the loss of ash host trees caused by Emerald Ash Borer. Also, the species' current population is small with no subpopulation containing more than 250 individuals. Cupped Fringe Lichen was not previously assessed by COSSARO.

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

5. Information sources

COSEWIC. 2025. IN PRESS. COSEWIC assessment and status report on the Cupped Fringe Lichen *Heterodermia hypoleuca* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xii+61pp.
(<https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry.html>).

IUCN. 2025. The IUCN Red List of Threatened Species. Version 2025-2.
Available at: <https://www.iucnredlist.org>.

NatureServe. 2026. NatureServe Explorer: An online encyclopedia of life [web application]. Web site:
<http://www.natureserve.org/explorer> [accessed January 2026].

Appendix 1: Technical summary for Ontario

Species: Cupped Fringe Lichen (*Heterodermia hypoleuca*)

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.	Unknown, estimated to be between 10-30 years based on other well-characterized lichen
Is there an observed, inferred, or projected continuing decline in number of mature individuals?	Yes, inferred based on declines from EAB and storm events causing windthrow.
Estimated percent of continuing decline in total number of mature individuals within 5 years or 2 generations.	No. Not estimated over 2 generations.
Observed, estimated, inferred, or suspected percent reduction or increase in total number of mature individuals over the last 10 years or 3 generations.	4% observed reduction in number of mature individuals based on declines at three subpopulations.
Projected or suspected percent reduction or increase in total number of mature individuals over the next 10 years or 3 generations.	74% projected decline over next 3 generations based on number of trees lost to EAB.
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.	74% projected decline over next 3 generations based on number of trees lost to EAB.
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).	11,372 km ²
Index of area of occupancy (IAO).	32 km ²

Extent and occupancy attributes	Value
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 (b) separated from other habitat patches by a distance larger than the species can be expected to disperse?	a. No b. No
Number of locations.	8 locations
Number of NHIC Element Occurrences	13
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?	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)

Sub-population (or total population)	Number of mature individuals
Beaver Creek A	6 trees 18 thalli
Beaver Creek B	1 tree 12 thalli
Beckwith	~10 trees ~40 thalli
Belmont Lake	12 trees 19 thalli
Block 509	1 tree 1 thalli
Bolingbroke Rd.	1 tree 1 thalli
Cassidy Block	2 trees 6 thalli
Charleston Lake PP	2 trees 2 thalli
Constant Creek CR	16 trees 53 thalli
County Forest East	1 tree 5 thalli
Crow Lake	2 trees 2 thalli
Deseronto Rd.	?1tree and ?1 thalli
Frontenac PP	~2 trees and ~3 thalli
Glanmire	1 tree and 1 thalli
H.R. Frink CA	2 trees and 4 thalli
Kip Fleming Tract	1 tree and 1 thalli

Massassauga Point	1 tree 18 thalli
Moira River	4 trees 5 thalli
Mosque Lake Rd.	1 tree 1 thalli
Murphy's Point PP	5 trees 27 thalli
Oatbox	5 trees 14 thalli
OR Agreement Forest	1 tree and 2 thalli
Ottawa River	6 trees and 29 thalli
Lavant	4 trees and 8 thalli
Rawdon Block	5 trees and 18 thalli
S of Marmora	~1 tree and ~1 thalli
S. of Quackenbush	~1 tree and ~1 thalli
Sharbot Lake PP	1 tree and 2 thalli
Shaw Woods	1 tree and 1 thalli
Silver Lake PP	6 trees and 12 thalli
Squirrel Creek	2 trees and 4 thalli
Vanderwater CA	1 tree and 3 thalli
Westmeath PP	22 trees and 122 thalli
Total	276 trees (live and dead) and 465 thalli

Quantitative analysis (population viability analysis conducted)

Probability of extinction in the wild is unknown.

Threats

A threats calculator was completed by COSEWIC. Key threats were:

- Natural system modifications (very high-high)
- Climate Change and Severe Weather (unknown to high)
- Biological resource use (logging) (medium to low)
- Transportation and service corridors (low)
- Pollution (unknown)

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	Unknown
Is immigration of individuals and/or propagules between Ontario and outside populations known or possible?	Unknown
Would immigrants be adapted to survive in Ontario?	Unknown

Rescue effect attribute	Value
Does the broader biologically relevant geographic range for this species extend beyond 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?	Unknown
Is the Ontario population considered to be a sink?	No
Is rescue from outside populations likely?	Unknown

Sensitive species

Not considered 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
MBCA: Migratory Birds Convention Act
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