

**Ontario Species at Risk Evaluation Report for  
Golden-eye Lichen (*Teloschistes chrysophthalmus*)**

**Prairie / Boreal population**

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

Assessed by COSSARO as Not at Risk

August 2020

## Téloschiste ocellé (*Teloschistes chrysophthalmus*)

Le téloschiste ocellé est un lichen dont la coloration distinctive varie de l'orange vif au gris verdâtre. L'espèce se distingue des autres espèces du même genre par ses abondants organes de fructification de couleur orangée, aux marges ciliées. L'Ontario compte deux populations de téloschiste ocellé : la population boréale et des Prairies et la population des Grands Lacs. La première occupe des zones localisées s'étalant de la frontière du Manitoba jusqu'au lac Rainy et à Dryden à l'est. La seconde, auparavant plus répandue dans le sud de l'Ontario, se limite maintenant au parc provincial Sandbanks du lac Ontario.

Le téloschiste ocellé a besoin d'habitats ouverts et humides, fréquemment situés le long des rives. Dans le nord-ouest de l'Ontario, il pousse habituellement dans des forêts relativement ouvertes, dominées par les conifères, et dans les toundras rocheuses, sur les épinettes blanches, les peupliers faux-trembles, les pins gris, les sapins baumiers et les chênes à gros fruits. Il est aussi présent dans des landes rocheuses et un cimetière. Dans le sud de la région ontarienne des Grands Lacs, le seul peuplement extant pousse sur l'écorce de chênes rouges, dans les vestiges d'une ancienne forêt caducifoliée du littoral.

À l'échelle nationale, l'évaluation de la population boréale et des Prairies lui a valu un statut d'espèce préoccupante, principalement attribuable à sa petite aire de répartition et aux menaces de suppression par le feu qui pèsent sur la population des Prairies. Une évaluation antérieure avait classé la population des Grands Lacs dans la catégorie des espèces en voie de disparition au Canada et en Ontario.

Une évaluation du téloschiste ocellé (population boréale et des Prairies) indique qu'il n'est pas en péril en Ontario. Même s'il est actuellement observé dans une région relativement limitée du nord-ouest de l'Ontario, il s'y trouve dans plus de 20 emplacements et ne semble pas en déclin ou menacé de le devenir. D'autres relevés réalisés après la publication du rapport du COSEPAC en 2016 ont révélé la présence de deux fois plus d'individus que les enregistrements précédents et un important élargissement de l'aire de répartition connue de cette espèce.

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## Executive summary

Golden-eye Lichen (*Teloschistes chrysophthalmus*) is a distinctive bright orange to greenish-grey lichen. The abundant orange fruiting bodies with fine hairs along the margins distinguish this species. There are two populations of Golden-eye Lichen in Ontario: Prairie/Boreal and Great Lakes. The Prairie/Boreal population occurs in localized areas from the Manitoba border east to Rainy Lake and Dryden. The Great Lakes population was once more widespread in southern Ontario but is now restricted to Sandbanks Provincial Park on Lake Ontario.

Golden-eye Lichen requires open, humid habitats and is often found along shorelines. In northwestern Ontario, it generally grows in relatively open, conifer-dominated woods and rocky barrens on White Spruce, Trembling Aspen, Jack Pine, Balsam Fir and Bur Oak. It has also been found in rocky barrens and in a cemetery. In the southern Great Lakes region of Ontario, the only extant site grows on the bark of Red Oak in a remnant old-growth coastal deciduous forest.

Nationally, the Prairie/Boreal population has been assessed as Special Concern, primarily because of its small range and threats to the Prairie population from fire suppression. The Great Lakes population has been assessed as Endangered in Canada and Ontario.

Golden-eye Lichen (Prairie/Boreal population) is classified as Not at Risk in Ontario. Although it is currently only known from a relatively small region in northwestern Ontario, there are over 20 locations, and these do not appear to be declining or threatened with decline. Additional survey work conducted since the COSEWIC report was published in 2016 revealed more than twice as many individuals than previously documented, and significantly increased the known range of this species. As the Prairie/Boreal population has been assessed as Special Concern nationally, it is anticipated there will be additional field surveys and an opportunity for re-assessment in the next 10 years.

# 1. Eligibility for Ontario status assessment

## 1.1. Eligibility conditions

### 1.1.1. Taxonomic distinctness

There is no taxonomic uncertainty around the status of Golden-eye Lichen Prairie/Boreal population (COSEWIC 2016).

### 1.1.2. Designatable units

Two populations have been identified in Canada: Prairie/Boreal and Great Lakes populations. Prairie and Boreal subpopulations have been grouped into a single population and designatable unit (DU1) by COSEWIC, and the Great Lakes population is a separate designatable unit (DU2).

The Prairie subpopulation of the Prairie/Boreal population is the largest and is concentrated in the central portion of the Assiniboine Delta of southcentral Manitoba. The Prairie/Boreal population also appears to extend south into the U.S.

The Boreal subpopulation of the Prairie/Boreal population is much more diffuse and scattered in eastern Manitoba and in northwestern Ontario. It ranges from southeastern Manitoba and extends into northwestern Ontario in the Lake of the Woods and Rainy Lake regions, bordering Voyageurs National Park in northern Minnesota. The gap between the Prairie/Boreal population seems, in part, due to a lack of White Spruce (*Picea glauca*) in southern Manitoba along with extensive habitat loss throughout the prairie region.

The Great Lakes population is currently confined to the shoreline of eastern Lake Ontario but historically included Lake Erie and Niagara Falls, now represented only by 19th century herbarium specimens

### 1.1.3. Native status

The Golden-eye Lichen (Prairie/Boreal population) is native to Ontario. It was first documented in Ontario in 1868 (Great Lakes population) and in Manitoba in 1881. Although the species was not documented in northwestern Ontario until 2013, it is undoubtedly native given its early discovery in Manitoba and wide distribution.

### 1.1.4. Occurrence

Golden-eye Lichen currently occurs in Ontario. There are observations from Prairie/Boreal population as recent as June 2020 in iNaturalist.

## 1.2. Eligibility results

The Prairie/Boreal population of Golden-eye Lichen (*Teloschistes chrysophthalmus*) is

eligible for status assessment in Ontario.

## 2. Background information

### 2.1. Current designations

GRANK: G4G5 (Apparently Secure to secure) (NatureServe 2017)

NRANK Canada: N3N4 (Vulnerable to Apparently Secure)

COSEWIC: Special Concern (Prairie/Boreal population), Endangered (Great Lakes population) (November, 2016)

SARA: pending

ESA 2007: Not assessed

SRANK: S2S3 (ranked in 2013)

### 2.2. Distribution in Ontario

In Ontario, the Golden-eye Lichen (Prairie/Boreal population) occurs in the northwest from the Manitoba border east to Rainy Lake and Dryden.

There are approximately 26 locations of the Prairie/Boreal Golden-eyed Lichen population in Ontario (Appendix 1). The number of locations is based on the number of occurrences and the most probable threats. Although some of the occurrences are in close proximity, they are each considered a separate location because the most likely threats are cottage development and forestry. These threats are likely to only affect each location independently. This definition of location is consistent with the national assessment (COSEWIC, 2016).

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

Golden-eye Lichen is found on all continents, except for Asia and Antarctica. It occurs throughout North America and in scattered occurrences in South America, primarily in Argentina and Chile. Other records include the southern portions of Australia and New Zealand, North Africa, the Canary and Cape Verde Islands as well as western, central and southern Europe.

In North America, most recent Golden-eye Lichen records occur from Manitoba south to Texas, in the Great Lakes region and from coastal California and Mexico. On the east coast of the U.S., there are historical records from Maine south to New Jersey with recent sightings only in North Carolina. The Prairie/Boreal population extends into the U.S. but appears to be poorly documented in most states (see Appendix 1).

### 2.4. Ontario conservation responsibility

Not calculated, but clearly less than one percent given the global range and abundance for the global population.

## 2.5. Direct threats

The results of the COSEWIC threats calculator assessment indicate that threats to the entire Golden-eye Lichen Prairie/Boreal population in Canada are “medium to high”. This assessment did not include the new locations that were discovered as a result of additional search effort by the Ontario Natural Heritage Information Centre in northwestern Ontario in 2017. The COSEWIC threats assessment identified the highest threats to the Canadian population to be fire/fire suppression. This threat primarily applies to the Prairie portion of the population and the recruitment of White Spruce (*Picea glauca*), the dominant host tree for this species in Manitoba.

Climate change could impact the Ontario portion of the Prairie/Boreal population, but this threat was ranked as low. The COSEWIC assessment ranked all other threats that apply to this species in Ontario as negligible. These include tree clearing for cottage development (particularly in the Lake of the Woods area), commercial forestry and construction of roads for forestry. Although the new locations discovered in 2017 were not included in the COSEWIC threats assessment, the low level of threat likely applies across the range of this population in Ontario.

## 2.6. Specialized life history or habitat use characteristics

Golden-eye Lichen appears to have a narrow range of habitat parameters including humid, stable microsites. However, these habitat conditions are not uncommon in northwestern Ontario from where it occurs. It is unknown why, despite targeted searches, it has not been found in other locations that appear to provide suitable habitat (e.g. shores of Lake Superior).

Lichens are a symbiotic relationship between a green alga or bacteria and fungus. Golden-eyed Lichen is only compatible with algae in the genus *Trebouxia*.

## 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

Insufficient information. Population trends are unknown as most Ontario populations have only been recently documented.

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

Does not apply. Extent of occurrence meets threshold for Threatened (17 275 km<sup>2</sup>, which is below the threshold of 20,000 km<sup>2</sup>) (B1) and index of area of occupancy meets threshold for Endangered (132 km<sup>2</sup>, which is below threshold of 500km<sup>2</sup>) (B1). However, there are more than 10 locations, and there is currently no evidence of a continuing

decline or extreme fluctuation.

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

Insufficient information. Population trends are unknown as most Ontario populations have only been recently documented.

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

Does not apply. There are >1000 thalli documented from the Ontario portion of the Prairie/Boreal population.

### 3.1.5. Criterion E – Quantitative analysis

Insufficient information.

## 3.2. Application of Special Concern in Ontario

Although the Prairie/Boreal Population (DU1) of Golden-eye Lichen is possibly approaching the threshold for Threatened under Criterion D (<1000), the additional survey work conducted since the COSEWIC report was written revealed more than twice as many thalli as were previously documented. This suggests that, in addition to being more abundant than previously documented, additional surveys in northwestern Ontario may document additional locations. Potential for rescue effect from Manitoba and Minnesota also applies to the population of this species in Ontario.

## 3.3. Status category modifiers

### 3.3.1. Ontario's conservation responsibility

Not calculated, but less than one percent of range of Golden-eye Lichen occurs in Ontario. Less than 25% for the Prairie/Boreal Population would occur in Ontario as the range extends from western Ontario and Manitoba to Texas. Therefore, this status modifier does not apply.

### 3.3.2. Rescue effect

Rescue for the Prairie/Boreal population outside of Ontario is probable. There are occurrences in Manitoba immediately adjacent to Ontario, and in Minnesota that could provide a source of spores, when the prevailing winds are from the south and west during the spring and summer months.

## 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

The Prairie-Boreal population of Golden-eye Lichen in Ontario does not qualify under any of the risk categories. There is no evidence of decline and recent targeted survey effort suggests a larger population in northwestern Ontario than expected at the time of the COSEWIC assessment for this population.

This assessment for Ontario differs from the national assessment by COSEWIC. This is because new survey information was available after the COSEWIC report was published. Additional survey work revealed more than twice as many individuals than previously reported. This additional work was conducted over just a week by one observer, suggesting that more sites remain to be documented. In addition, the COSEWIC evaluation assessed the greatest threat to the overall Canadian population to be fire/fire suppression, which primarily applied to the Prairie subpopulation and the recruitment of White Spruce in Manitoba. The recruitment of White Spruce is not be a significant threat to the Boreal subpopulation in Ontario (OMNRF, 2016). There is also a high probability of a rescue effect to the Ontario population from occurrences in Manitoba and Minnesota that occur along the border.

## 4. Summary of Ontario status

Golden-eye Lichen (Prairie/Boreal population) is classified as Not at Risk in Ontario. Although it is currently only known from a relatively small region in northwestern Ontario, there are over 20 locations, and these do not appear to be declining or threatened with decline. Additional survey work conducted since the COSEWIC report was published revealed more than twice as many individuals than previously documented, and significantly increased the known range of this species. As the Prairie/Boreal population has been assessed as Special Concern nationally, there will be additional field surveys and an opportunity re-assessment in the next 10 years.

## 5. Information sources

Consortium of North American Lichen Herbaria. (2018). *Golden-eye Lichen*. Retrieved from <http://lichenportal.org/portal/taxa/index.php?taxon=56375>

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## Appendix 1: Technical summary for Ontario

Species: Golden-eye Lichen (*Teloschistes chrysophthalmus*) (Prairie/ Boreal population) (DU1)

### 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?	No
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?	Not applicable. No known decline.
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).	17,272 km <sup>2</sup>
Index of area of occupancy (AOO).	132 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 (b) separated from other habitat patches by a distance larger than the species can be expected to disperse?	a. No b. No

<b>Extent and occupancy attributes</b>	<b>Value</b>
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>	26
Number of NHIC Element Occurrences *There are additional recent observations in iNaturalist.	26*
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 populations?	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?	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)

The total population of Golden-eye Lichen (Prairie/Boreal population) is (based on the approximate number of observed thalli) is >1000.

Occurrence	Approx. Number of Thalli
1. 2.5 km W of Keewatin	<50
2. Arnot Island, Rainy Lake	<50
3. Bigsby Island, Lake of the Woods	Unknown
4. Brown Rd	2
5. Byrnes Rd	Several
6. Cedarskirt Lake	1
7. Drum Island, Shoal Lake	300-500
8. Hwy 11/17, just west of MB border	<10
9. Hwy 617	10-15
10. Hwy 619	2
11. Kellys Point, Shoal Lake	several hundred
12. Kreger Rd Prairie (1)	no count
13. Kreger Rd Prairie (2)	Rare
14. Lake of the Woods (1)	no count
15. Lake of the Woods (2)	no count
16. Lake of the Woods (3)	Several
17. Lake of the Woods (4)	1
18. Lake of the Woods Lewis (N. of Aulneau)	<100
19. Morley Park	Rare
20. NCC Oak Grove Property	Rare
21. Sherwood Lake Rd	<50
22. Shoal Lake	<100
23. Sioux Narrows	4
24. Sioux Narrows Provincial Park	<50
25. Stratton Cemetery	no count
26. Wabigoon Lake	10
TOTAL	>1000

Source: COSEWIC, 2016; Natural Heritage Information Centre (Element Occurrences for Golden-eye Lichen)

## Quantitative analysis (population viability analysis conducted)

Probability of extinction in the wild is unknown.

## Threats

A threats calculator for the entire Canadian population was prepared for the COSEWIC assessment by Mary Sabine, David Richardson, Chris Lewis, Sam Brinker and Janet Marsh.

Although the threats assessment in the COSEWIC report focused on the much larger Manitoba population, two of the three threats that were identified are applicable to the Prairie/Boreal population in Ontario: 1) climate change that could alter the composition of host trees, and 2) fire suppression which can result in dense shading. Fire suppression may not be a threat to all occurrences in Ontario, particularly those that occur along shorelines.

The COSEWIC assessment ranked all other threats that apply to this population in Ontario as negligible. These include tree clearing for cottage development (particularly in the Lake of the Woods area), commercial forestry and construction of roads for forestry. Although the new locations discovered in 2017 were not included in the COSEWIC threats assessment, the low level of threat likely applies across the range of this population in Ontario.

## Rescue effect and broader biologically relevant geographic range

<b>Rescue effect attribute</b>	<b>Value</b>
Status of outside population(s) most likely to provide immigrants to Ontario	Special Concern in Manitoba, not ranked but present in Minnesota
Is immigration of individuals and/or propagules between Ontario and outside populations known or possible?	Probably Over 15 M individuals from Spruce Woods in MB, also MN along border, and occurs in Voyageurs National Park in Minnesota
Would immigrants be adapted to survive in Ontario?	Yes
Is there sufficient suitable habitat for immigrants in Ontario?	Yes
Are conditions deteriorating in Ontario?	Possibly in some areas
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?	Probably

## Sensitive species

No

## Appendix 2: Broader biologically relevant geographic range

Information regarding rank and decline for Golden-eye Lichen (*Teloschistes chrysophthalmus*)

Adjacent Jurisdictions	Biologically Relevant to Ontario (n/a, yes, no)	Status & Trends	Condition	Notes & Sources
Quebec	n/a	n/a	n/a	(NatureServe, 2017)
Manitoba	yes	S3S4 unknown	Good	(COSEWIC, 2016)
Michigan	no	Not in NatureServe, but occurs.	Poor	Only known from lower peninsula (Fryday & Wetmore, 2002)
Minnesota	yes	Not in NatureServe, but occurs unknownn	Good 25+ occurrences, mostly from southwest	(Consortium of North American Lichen Herbaria, 2018)
Nunavut	n/a	n/a	n/a	(NatureServe, 2017)
New York	n/a	n/a	n/a	(NatureServe, 2017)
Ohio	no	Not in NatureServe, but occurs Trend unknown. .	Poor Only one post-1965 location known from southern Ohio	(Ohio Moss & Lichen Association, 2012)
Pennsylvania	no	SNR	Unknown	(NatureServe, 2017)
Wisconsin	no	S1	Fair? Listed as Special Concern	(Wisconsin Department of Natural Resources, 2016)

### Broader Biologically Relevant Geographic Range in Other Jurisdictions

Populations of Golden-eye Lichen (Prairie/Boreal population) from Manitoba and Minnesota are part of the meta-population that includes northwestern Ontario.

### Global Status and Trends

Golden-eye Lichen (Prairie/Boreal population) appears to be globally secure although the population has likely declined in some areas (Wisconsin).

## Acronyms

COSEWIC: Committee on the Status of Endangered Wildlife in Canada

COSSARO: Committee on the Status of Species at Risk in Ontario

DU: designatable unit

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