

**Ontario Species at Risk Evaluation Report for
Colicroot (*Aletris farinosa*)**

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

Assessed by COSSARO as Endangered

June 2016

Final

Alétris farineux (*Aletris farinosa*)

L'alétris farineux est une plante herbacée vivace appartenant à la famille des lis. Il pousse dans les prairies restantes du Sud-Ouest de l'Ontario. Possédant une rosette basale de couleur vert-jaunâtre et des feuilles en forme de lance, il produit un pédoncule de 40 à 100 cm portant de petites fleurs blanches; la floraison a lieu à la fin juin ou au début juillet. La distribution de l'alétris farineux en Ontario et au Canada se limite à huit (possiblement à sept) sous-populations dans le Sud de l'Ontario. Il est disparu d'au moins sept autres endroits depuis les années 1880. Son habitat se caractérise par un sol sablonneux et humide dans les prés ou de grandes prairies à hautes herbes. Deux nouvelles sous-populations comprenant 4 256 spécimens ont été découvertes à Windsor en 2004, durant les levés pour la construction du Right Honorable Herb Gray Parkway¹. Les plantes dans les sites de restauration n'ont pas été considérées dans l'évaluation du CDSEPO, étant donné l'incertitude relative quant à leur persistance.

La population sauvage de l'alétris farineux est d'au moins 6 800 spécimens². On estime à 47 % la perte de spécimens sauvages au cours des trois dernières générations (de 21 à 30 ans).

L'alétris farineux est une espèce menacée en Ontario vu son aire de distribution restreinte dans le Sud-Ouest de l'Ontario, sa présence dans seulement quelques endroits épars et le déclin de la qualité de son habitat.

Cette publication hautement spécialisée «COSSARO Candidate Species at Risk Evaluation for Colicroot» n'est disponible qu'en anglais conformément au Règlement 671/92, selon lequel il n'est pas obligatoire de la traduire en vertu de la Loi sur les services en français. Pour obtenir des renseignements en français, veuillez communiquer avec le ministère des Richesses naturelles et des Forêts au recovery.planning@ontario.ca.

Executive summary

Colicroot is a perennial herb in the lily family that occurs in prairie remnants in southwestern Ontario. It has a basal rosette of yellowish-green lance-shaped leaves and produces a 40 cm to 100 cm stalk of small white flowers in late June or early July. The distribution of Colicroot in Ontario and Canada is restricted to 8 (and possibly only 7) subpopulations in southern Ontario. It is extirpated from at least 7 additional sites since the 1880s. All of its occurrences are associated with moist sandy soils in open tallgrass prairie and meadow habitats. Two new subpopulations comprised of 4,256 individuals were discovered in Windsor in 2004 during surveys for the construction of the Right Honorable Herb Gray Parkway³. The presence of these plants at restoration sites was not considered in COSSARO's assessment, given uncertainty regarding the long-term persistence of these plants.

The current wild population Colicroot is at least 6,800 individuals⁴. There has been an estimated loss of 47% in the number of wild individuals over the last 3 generations (21 years to 30 years).

Colicroot is Endangered in Ontario because it has a very restricted range in southwestern Ontario, occurs in only a few highly fragmented locations and the quality of the habitat has been declining.

1. Background Information

1.1. Current designations

- GRANK: G5
- NRANK Canada: N2
- COSEWIC: Endangered (November 2015)
- SARA: Threatened (Schedule 1)
- ESA 2007: Threatened (2008)
- SRANK: S2

1.2. Distribution in Ontario

The Ontario and Canadian distribution of Colicroot is restricted to southwestern Ontario. Current confirmed occurrences are the City of Windsor and the adjacent Town of LaSalle, Walpole Island, and near Eagle, in the municipality of West Elgin (Figure 1). It occurs in eight subpopulations with 36 patches (COSEWIC 2015) (Table 1).

NHIC has defined six extant element occurrences for Colicroot (two subpopulations defined by COSEWIC above have been grouped). Six additional occurrences that are ranked as extirpated.

Figure 1. Range of Colicroot in Canada. Source: COSEWIC 2016 (reproduced with permission).

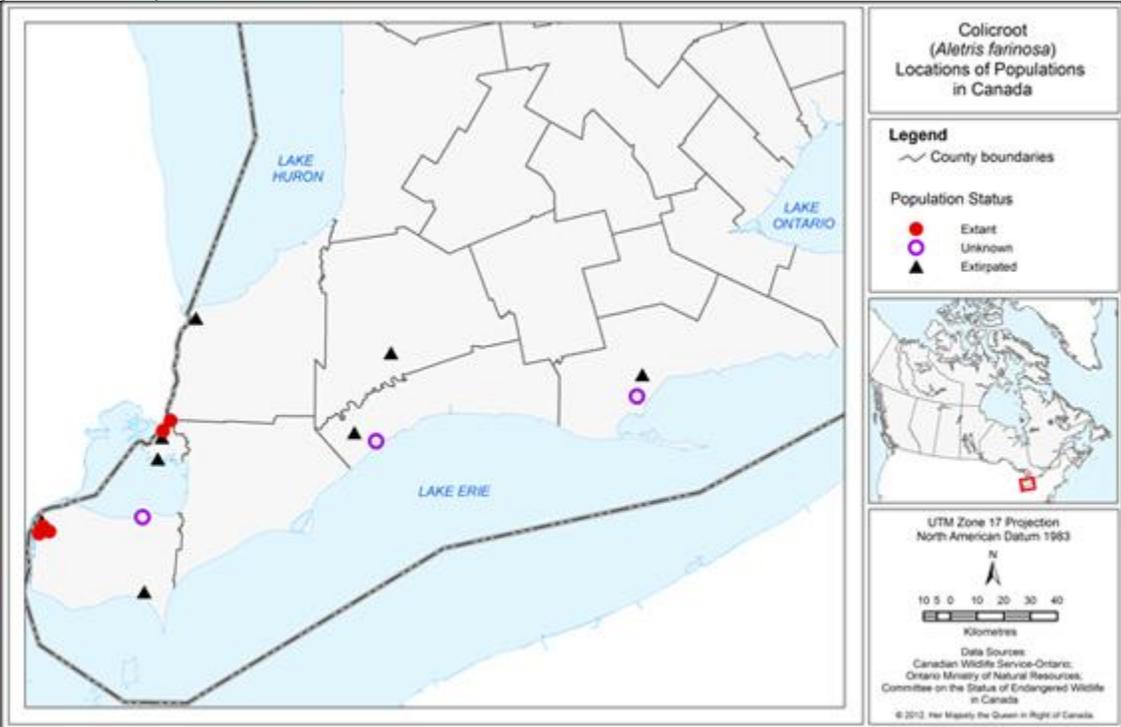


Table 1: Subpopulations, patches and numbers of Colicroot in Ontario

(COSEWIC 2015). In some subpopulations, the number of documented individuals is different in the COSEWIC assessment (COSEWIC 2015) and recovery strategy (Environment Canada 2015).

Subpopulation	Extant patches	Number
Walpole Island A	2	Unknown (potentially up to 100?)
Walpole Island B	2	Unknown (potentially up to 500?)
Windsor Ojibway	21	~3300
Windsor Todd Lane	3	~2700
LaSalle Normandy	4	~104
LaSalle Reaume St.	2	22
West Elgin, Eagle	1	420
Turkey Point	1	inferred extirpated
Total	36	6800+

1.3. Distribution and status outside Ontario

Colicroot is relatively common and widely distributed in the eastern and central U.S. It occurs in 27 states from New York and Wisconsin, south to Florida and eastern Texas. It is generally rare or extirpated in the northeast, and is ranked as secure Virginia, North Carolina and South Carolina. It is unranked in about half of the states where it occurs. The range-wide population appears to be relatively stable (NatureServe 2015). Colicroot is state listed in New York (threatened), and is proposed for listing as state endangered in Pennsylvania. It is unranked in Michigan (the state closest to the Ontario population), and has been recorded from 27 counties (see Appendix 2).

1.4. Ontario conservation responsibility

It is estimated that less than 1% of the historic and current range and population of this species occurs in Ontario.

1.5. Direct threats

The highest ranking threats to Colicroot are lack of disturbance/succession and invasive species, which threaten tallgrass prairie ecosystems. These threats are related and reduce the viability of Colicroot by creating shaded habitat conditions. Threats vary by land ownership, and are less likely to occur on publically owned lands that are managed for open, prairie-conditions (and which may support multiple species at risk). However, succession has occurred at several publicly owned patches, in the absence of adequate management (COSEWIC 2015). Eleven of 35 patches are privately-owned. Deer browse is a low to moderate threat that could impact all populations. Habitat conversion by development is a low threat. Critical habitat has been identified and mapped for Colicroot (Environment Canada 2015).

1.6. Specialized life history or habitat use characteristics

Colicroot grows in open, moist, sandy ground associated with tallgrass prairie habitats

and damp sandy meadows. These habitat types are very rare in Ontario. Some existing subpopulations are in areas that were disturbed including former plowed fields and lawns. It has several pollinating insect species (e.g. bumblebees and hoverflies) and the small seeds are wind-dispersed (COSEWIC 2015).

2. Eligibility for Ontario status assessment

2.1. Eligibility Conditions

2.1.1. Taxonomic distinctness

Yes. Colicroot is a recognized species (Brouillet et. al 2010).

2.1.2. Designatable Units

There is only one designatable unit in Ontario.

2.1.3. Native Status

Yes. Colicroot has been recorded since the mid-1880s in Ontario. Early records include:

- 1886 from sandy thickets near Leamington, Essex County, by T.J. Burgess
- 1891 from Caradoc Township, Middlesex County, by J. Dearness
- 1896 near Sarnia, Lambton County, by C.K. Dodge (COSEWIC 2015)

2.1.4. Occurrence

Extant. Seven subpopulations are known to be extant.

2.2. Eligibility Results

Colicroot (*Aletris farinosa*) is eligible for status assessment in Ontario.

3. Ontario Status Assessment

3.1. Application of Endangered or Threatened Status in Ontario

3.1.1. Criterion A – Decline in Total Number of Mature Individuals

Threatened. A2ac. There has been a decline in the total number of individuals over the last three generations (30 years) of approximately 47% which qualifies as Threatened.

This is based on (a) direct observation, and (c) a decline in the index of area of occupancy, extent of occurrence and quality of habitat. For example, in the LaSalle Woodlot ESA, the number of plants went from approximately 1,000 in 1994 to about 25 in 2014 due to habitat succession.

There is not a projected reduction in the total number of individuals in the future as there are approximately 9,300 additional individuals that are within restoration sites that are being managed and monitored. These individuals include wild plants that were moved (approximately 4,300) and plants propagated *ex-situ* (approximately 5,000). If these restoration efforts are successful, these individuals will be counted as part of the wild population in the future. The recovery strategy for Colicroot notes that: *Once the transplanted populations occurring in suitable habitat have established the restoration sites will be reviewed and additional critical habitat may be identified* (Environment Canada 2015).

3.1.2. Criterion B – Small Distribution Range and Decline or Fluctuation

Endangered. B1ab (i,iii,iv), B2ab (i,iii,iv),

B1. Extent of occurrence estimated to be <5,000 km² (1967 km²).

B2. Index of area of occupancy is estimated to be <500 km² (32 km²)

and,

- a. The population is extremely fragmented. Approximately 93% of mature individuals are scattered in small, disconnected patches in Windsor-LaSalle (the largest populations) (COSEWIC 2015). Most (>50%) of its total area of occupancy is in habitat patches that are (1) smaller than would be required to support a viable population, and (2) separated from other habitat patches by a large distance (IUCN 2014).
- b. There has been a continuing reduction observed in
 - (i) the extent of occurrence (observed loss of 47% in the EOO in the last 30 years);
 - (iii) area, extent and/or quality of habitat (highest ranking threat is habitat succession, documented decline in habitat quality), and;
 - (iv) number of locations (disappeared from 30% of sites since 1986).

3.1.3. Criterion C – Small and Declining Number of Mature Individuals

Does not apply.

Although the current wild population is below the threshold for Threatened, there is no projected decrease in the total number as it is projected that additional individuals and habitat areas that are part of the restoration project for the Right Honorable Herb Gray Parkway will be included in future assessments.

3.1.4. Criterion D – Very Small or Restricted Total Population

Does not apply. There are over 1,000 mature individuals.

3.1.5. Criterion E – Quantitative Analysis

Does not apply. Not done.

3.2. Application of Special Concern in Ontario

Does not apply. Meets the criteria for Endangered.

3.3. Status Category Modifiers

3.3.1. Ontario's conservation responsibility

Not applied. This species is globally secure (G5).

3.3.2. Rescue effect

Not applied. Rescue is very unlikely. It does occur in in Wayne County Michigan across the Detroit River but dispersal of seeds to suitable habitat is not probable.

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

Not applicable.

4. Summary of Ontario status

Colicroot (*Aletris farinosa*) is classified as Endangered in Ontario based on meeting criteria B1ab (i,iii,iv) and B2ab (i,iii,iv).

5. Information sources

Brouillet, L., F. Coursol, S.J. Meades, M. Favreau, M. Anions, P. Bélisle & P. Desmet. 2010+. [VASCAN, the Database of Vascular Plants of Canada](#). Website accessed 2016-04-29.

COSEWIC. 2015. [COSEWIC assessment and status report on the Colicroot *Aletris farinosa* in Canada](#). Committee on the Status of Endangered Wildlife in Canada. Ottawa. xiii + 39 pp.

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A. A. Reznicek, E. G. Voss, & B. S. Walters. 2011. [Michigan Flora Online: Colicroot species account](#). University of Michigan. Website accessed March 24, 2016.

NatureServe. 2016. [NatureServe Explorer](#). Accessed May 5, 2016.

IUCN Standards and Petitions Subcommittee. 2014. [Guidelines for Using the IUCN Red List Categories and Criteria](#). Version 11. Prepared by the Standards and Petitions Subcommittee.

New York State Department of Environmental Conservation. 2014. [New York Nature Explorer website](#).

PA Natural Heritage Program. 2016. [Endangered, Threatened, Special Concern Species & Rare and Significant Ecological Features List as of Jan 28, 2014](#).

Appendix 1: Technical Summary for Ontario

Species: Colicroot (*Aletris farinosa*)

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.	7-15 years (could be longer if seedbank is considered, also some new populations appeared after mowing ceased, e.g. at an old baseball diamond). 10 years used for this report
Is there an observed, inferred, or projected continuing decline in number of mature individuals?	Yes Observed loss of 47% since 1986 (last 30 years)
Estimated percent of continuing decline in total number of mature individuals within 5 years or 2 generations.	Unknown Overall number likely to increase as individuals in restoration area are included in the next assessment
Observed, estimated, inferred, or suspected percent reduction or increase in total number of mature individuals over the last 10 years or 3 generations.	47% reduction in the total number of mature individuals in the last 3 generations (30 years).
Projected or suspected percent reduction or increase in total number of mature individuals over the next 10 years or 3 generations.	Population could more than double when individuals in restoration area are included in the next assessment.
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.	47% reduction in the total number of mature individuals in the last 3 generations (30 years).
Are the causes of the decline a. clearly reversible and b. understood and c. ceased?	a. Yes, with habitat management b. Yes, succession c. No, succession continues in several patches
Are there extreme fluctuations in number of mature individuals?	No, not within existing patches. Patches have appeared in formerly disturbed areas (lawns, fields).

Extent and occupancy information in Ontario

Extent and occupancy attributes	Value
Estimated extent of occurrence. (Request value from MNRF or use http://geocat.kew.org/)	1967 km ² (significantly smaller if Turkey Point is excluded)
Index of area of occupancy (IAO). (Request value from MNRF or use http://geocat.kew.org/)	32 km ²
Is the total population severely fragmented?	a. Yes: evidence that it

Extent and occupancy attributes	Value
(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?)	has disappeared from 30% of sites (mostly small patches) b. Yes: while wind dispersed, the subpopulations are fragmented and even within subpopulations patches are separated by anthropogenic habitats
Number of locations (<i>as defined by COSEWIC</i>).	COSEWIC reports 6-14 based on property ownership (threats)
Number of NHIC Element Occurrences (<i>Request data from MNRF</i>)	8
Is there an observed, inferred, or projected continuing decline in extent of occurrence?	Yes. Inferred loss of subpopulation at Turkey Point. Results in a 47% loss of EOO.
Is there an observed, inferred, or projected continuing decline in index of area of occupancy?	Yes. Observed loss of patches in Windsor, Walpole Island and Turkey Point (inferred). 36% loss of IAO.
Is there an observed, inferred, or projected continuing decline in number of populations?	Yes. Inferred loss of Turkey Point. This decline is ongoing given the overall loss of at least seven additional sites in the last century.
Is there an observed, inferred, or projected continuing decline in number of locations?	Yes. evidence that it has disappeared from 30% of sites (mostly small patches)
Is there an observed, inferred, or projected continuing decline in [area, extent and/or quality] of habitat?	Yes. Declining in many patches and threat of succession is ranked as high. Newly discovered populations removed for road construction (now in restored habits).
Are there extreme fluctuations in number of populations?	No, although new population have been documented in the last 10 years and it does appear in previously disturbed habitats
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)	N of mature individuals

Sub-population (or total population)	N of mature individuals
1. Walpole Island A (2 patches)	Unknown (potentially up to 100?)
2. Walpole Island B (2 patches)	Unknown (potentially up to 500?)
3. Windsor – Ojibway (21 patches)	~3300
4. Windsor – Todd Lane (3 patches)	~2700
5. LaSalle – Normandy St (4 patches)	~104
6. LaSalle – Reaume St (2 patches)	22
7. West Elgin (1 patch)	420
8. Turkey Point (1 patch)	inferred extirpated
TOTAL	6800+

Quantitative analysis (population viability analysis conducted)

Not conducted.

Rescue effect

Rescue effect attribute	Likelihood
Is immigration of individuals and/or propagules between Ontario and outside populations known or possible?	No. The species does occur in Michigan but dispersal (by wind) into suitable habitat is very unlikely.
Would immigrants be adapted to survive in Ontario?	Yes
Is there sufficient suitable habitat for immigrants in Ontario?	Possibly
Is the species of conservation concern in bordering jurisdictions?	In New York. It is unlikely of conservation concern in Michigan (not ranked, but occurs in 24 counties).
Is rescue from outside populations reliant upon continued intensive recovery efforts?	No

Appendix 2: Adjoining Jurisdiction Status Rank and Decline

Information regarding rank and decline for Colicroot

Jurisdiction	Subnational rank	Population trend	Sources
Ontario	S2	Declined by 47%	COSEWIC 2015
Quebec	Not present	n/a	n/a
Manitoba	Not present	n/a	n/a
Michigan	SNR	Reported from 24 counties.	NatureServe 2016 Michigan Flora Online 2011
Minnesota	Not present	n/a	n/a
Nunavut	Not present	n/a	n/a
New York	S2	State Threatened. Extirpated from 2 of 6 counties.	NatureServe 2016 NY Natural Heritage Program 2016
Ohio	SNR	unknown	NatureServe 2016
Pennsylvania	S1	Proposed State status of Endangered	NatureServe 2016 PA Natural Heritage Program 2016
Wisconsin	S4	unknown	NatureServe 2016

Acronyms:

AOO: area of occupancy

COSEWIC: Committee on the Status of Endangered Wildlife in Canada

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

EOO: extend of occurrence

ESA: Endangered Species Act

GRANK: global conservation status assessments

IAO: index of area of occupancy

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

B : Breeding

¹ En plus de ces deux sous-populations, quatre autres ont été relevées sur des terrains privés par le ministère des Transports lors de levés.

² L'évaluation du CDSEPO exclut les spécimens ayant été transplantés.

³ In addition to these two subpopulations, four additional subpopulations were documented on private lands by the Ministry of Transportation during surveys.

⁴ This COSSARO assessment does not include any transplanted individuals.