

**Ontario Species at Risk Evaluation Report for
Deerberry
Airelle à longues étamines
(*Vaccinium stamineum*)**

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

Assessed by COSSARO as Threatened

April 2021

Airelle à longues étamines (*Vaccinium stamineum*)

L'airelle à longues étamines (*Vaccinium stamineum*) est classée dans la catégorie des espèces menacées en Ontario par le CDSEPO.

L'airelle à longues étamines est un arbuste dressé, décadu et étalé appartenant à la famille des plantes éricacées, qui s'apparente également étroitement aux bleuets et aux canneberges. Il dépasse rarement plus d'un mètre de hauteur. Les feuilles de l'airelle à longues étamines sont alternes, ovales et lisses, vert foncé sur le dessus et blanchâtres en dessous. Au début de l'été, elle produit des grappes de fleurs blanches pendantes. Son fruit de couleur bleu verdâtre contient quelques graines et mûrit en août.

L'aire de répartition de l'airelle à longues étamines s'étend vers le sud, de l'État de New York, de l'Ohio et du Missouri jusqu'à la Floride et l'est du Texas. Elle est généralement commune dans toute son aire de répartition. Au Canada, elle est confinée dans deux régions de l'Ontario – celles du Niagara et des Mille-Îles. En Ontario, l'airelle à longues étamines pousse principalement dans des zones boisées dégagées et sèches, sur des sols sableux et bien drainés, au pied de chênes, de faux sapins ou de pins blancs.

En Ontario, les populations d'airelle à longues étamines sont au nombre de cinq, principalement dans la région de Mille-Îles. Plusieurs sous-populations sont maintenant disparues à plusieurs emplacements de la région de Niagara. La plupart des emplacements existants sont situés dans des parcs et des zones protégées. Une seule population a été établie par translocation dans le parc national des Mille-Îles. La menace principale pour cette espèce est la suppression des incendies qui entraîne la fermeture du couvert et l'ombrage et, de plus, elle est tributaire de la gestion continue de la conservation de ces habitats. Son aire de répartition historique dans l'État de New York semble également s'être rétractée, y compris dans la partie des Mille-Îles située sur son territoire.

L'airelle à longues étamines a déjà été évaluée comme une espèce menacée lors de l'entrée en vigueur de la *Loi sur les espèces en voie de disparition* en 2008 et est actuellement désignée comme espèce menacée, en vertu de la *Loi sur les espèces en péril* fédérale. Elle est classée dans la catégorie des espèces menacées en Ontario. Bien que cette espèce soit conforme aux critères de désignation des espèces en voie de disparition, elle est désignée comme espèce menacée, car elle n'est pas exposée au risque de disparition imminente et des efforts de conservation sont déployés dans les zones protégées où elle est présente.

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Executive summary

Deerberry is an upright, spreading, deciduous shrub and is closely related to blueberries and cranberries that rarely reaches more than one metre in height. The leaves are alternate, oval and smooth, and are dark green on top with a whitish colour underneath. In early summer, Deerberry produces clusters of hanging white flowers. The fruit is a greenish-blue berry that contains a few seeds and ripens by August.

Deerberry ranges from New York, Ohio, and Missouri south to Florida and eastern Texas. It is generally common throughout its global range. In Canada it only occurs in two areas in Ontario – the Niagara region and the Thousand Islands. In Ontario Deerberry is found predominately in dry open woodlands on sandy and well-drained soils growing under oaks, Pitch Pine or White Pine.

There are five extant subpopulations of Deerberry in Ontario, mostly in Thousand Islands region. Several sites from the Niagara region are now extirpated. Most of the existing sites are within parks and protected areas. One new subpopulation has been established through translocation in Thousand Islands National Park. The primary threat to this species is fire suppression which leads to canopy closure and shading, and it is dependent on continued conservation management of these habitats. Its ahistorical range in New York also appears to have also retracted, including the New York portion of the Thousand Islands.

Deerberry was already assessed as Threatened when the *Endangered Species Act* took effect in 2008 and is currently listed as Threatened under the federal *Species at Risk Act*. Deerberry is classified as Threatened in Ontario. While Deerberry meets the criteria for Endangered, it is designated Threatened because the species is not at risk of imminent extirpation and conservation efforts in the protected areas where it occurs.

1. Eligibility for Ontario status assessment

1.1. Eligibility conditions

1.1.1. Taxonomic distinctness

Throughout its range, Deerberry shows variability in many characters, and there has been much debate around the number of recognized taxa (Ford, 1995). The Flora of North America recognize one species with no infraspecific taxa (Flora of North America Editorial Committee, 1993+).

1.1.2. Designatable units

The Canadian population of Deerberry comprises a single Designatable Unit within the Great Lakes Plains Ecological Area (COSEWIC, 2020). There is no genetic or morphological evidence, or evidence of differentiation by habitat to support segregating the subpopulations of this taxon into distinct DUs within Canada (COSEWIC, 2020). weak increase in genetic differentiation in subpopulations at the edges of its range are likely a result of isolation (Yakimowski & Eckert, 2008).

1.1.3. Native status

Deerberry has been known from Ontario for over 200 years with early collections from Niagara (1798) and the Thousand Islands (1876) (Ford, 1995).

1.1.4. Occurrence

Deerberry currently occurs in Ontario in the Niagara and Thousand Islands.

1.2. Eligibility results

Deerberry (*Vaccinium stamineum*) is eligible for status assessment in Ontario.

2. Background information

2.1. Current designations

- GRANK: G5 (NatureServe 2021)
- IUCN: Not assessed
- NRANK Canada: N1
- COSEWIC: Threatened (November 2020)
- SARA: Threatened (Schedule 1)
- ESA 2007: Threatened (2008)
- SRANK: S1

2.2. Distribution in Ontario

In Ontario Deerberry only occurs in the Niagara region along the Niagara Gorge and the Thousand Islands east of Kingston.

COSEWIC has identified five locations (Appendix 1). This includes the location on Georgina Island West in Thousand Islands National Park that was established through translocation. Subpopulations are defined by a distance of at least 1 km of unsuitable habitat.

In 2000 there were only four locations of Deerberry and the population had decreased by >60% in the previous 10-20 years as a result of habitat loss (White & Oldham, 2000).

NHIC has identified nine element occurrences for Deerberry. This includes 6 that are now ranked as extirpated or historical from the Niagara area.

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

Deerberry ranges from New York, Ohio, and Missouri south to Florida and eastern Texas. It is generally common or unranked in the states where it occurs (Table 1) and is ranked as globally secure by NatureServe.

The broader biologically relevant geographic range of Deerberry is roughly defined by the Eastern Great Lakes and Hudson Lowlands ecoregion (8.1.) that occurs in Ontario and New York (Wiken et al., 2011). Deerberry was once more common in this region of New York with historical records within all counties along Lake Ontario (Weldy et al., 2021) and are also part of the northern range limit (Yakimowski & Eckert, 2008). Its historical range in New York appears to have retracted including the New York portion of the Thousand Islands. Deerberry is more common in the Allegheny Plateau and Atlantic coastal plain region of the state.

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	n/a	n/a	n/a
Manitoba	n/a	n/a	n/a
Michigan	n/a	n/a	n/a
Minnesota	n/a	n/a	n/a
Nunavut	n/a	n/a	n/a
New York	Yes	S5	Has decreased in northern range (Weldy et al., 2021)
Ohio	No	SNR	36 iNaturalist observations
Pennsylvania	No	SNR	173 iNaturalist observations
Wisconsin	n/a	n/a	n/a
Illinois	No	S1	
Vermont	No	S1	

2.4. Ontario conservation responsibility

Canadian subpopulations represent the northern margins of this species' global range. Less than 1% of the global population occurs in Canada.

2.5. Direct threats

Fire suppression and deer browse are the two greatest threats to the persistence of Deerberry. Fire suppression has occurred in the Niagara and Thousand Islands area for over a century, leading to natural succession and promotion of shade-tolerant species, and resulted in the loss of several sites. As suggested by the plant's common name, deer are known to browse on leaves and fruit. Heavy browsing has caused the failure of at least one introduction attempt at Thousand Islands National Park (Hill Island) and is thought to have contributed to the lack of success at several other sites (COSEWIC, 2020).

These threats (particularly succession) are partially reflected in the ranking of the Element Occurrences (EOs). The three extant EOs are ranked as B (Good estimated viability/ecological integrity), C (Fair estimated viability) and D (Poor estimated viability).

The recent threats assessment determined the threat level depends on conservation management. Overall threats are low if active management continues and high if it ceases.

2.6. Specialized life history or habitat use characteristics

Deerberry is found predominately in dry open woods on sandy and well-drained soils growing under oaks, Pitch Pine or White Pine. The Pitch Pine Heath Barrens where it

occurs in Ontario and New York is imperilled (S1 Ontario, S1S2 New York) (NatureServe, 2021).

Deerberry is a very long-lived shrub with a generation time of 50 years. This could allow it to persist at sites despite low reproductive rates. It primarily spreads colonially through ramets, while sexual reproduction is less common.

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

Does not apply. Although Deerberry has declined in the last three generations (150 years), there is insufficient information to determine the rate of decline (COSEWIC, 2020) and the rate of decline has slowed since the last assessment.

This decline is evident in that 67% of sites (element occurrences) are now extirpated or historical and because in 2000 the population had decreased by >60% over the previous 10-20 years (White & Oldham, 2000). However, the number of locations has recently increased through translocations.

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

Meets Endangered B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v). Both the Extent of Occurrence (EOO) and Index of Area of Occupancy (IAO) are well below the threshold for Endangered. There are five locations in Ontario and, despite the establishment of a new location, continued declines are observed* in EOO, IAO, number of locations, habitat quality, and numbers of mature individuals, particularly at the remaining site in Niagara.

(*COSEWIC includes projected declines, but these are only likely to occur if current recovery actions cease.)

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

Does not apply. Meets the threshold for Threatened based on number of mature individuals, but conservation management in the protected areas where it occurs is beginning to offset declines and could prevent a continuing 10% decline over the next century.

3.1.4. Criterion D – Very small or restricted total population

Does not apply.

3.1.5. Criterion E – Quantitative analysis

Insufficient information.

3.2. Application of Special Concern in Ontario

Does not apply. Meets criteria for Endangered.

3.3. Status category modifiers

3.3.1. Ontario's conservation responsibility

Not applied. Ontario has less than one percent of the global range of Deerberry and the species is not of global conservation concern.

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

Not applied. Rescue from adjacent subpopulations in New York State is considered possible, but unlikely (COSEWIC, 2020). Fruits may be widely dispersed by birds and large mammals, but the nearest reported site in northern New York is approximately 5 km from the closest Ontario subpopulation on Wellesley Island. This population is small (Bickerton pers comm).

The Canadian population of Deerberry comprises a single Designatable Unit within the Great Lakes Plains Ecological Area (COSEWIC, 2020). The broader biologically relevant geographic range of Deerberry is roughly defined by the Eastern Great Lakes and Hudson Lowlands ecoregion (8.1.) that occurs in Ontario and New York (Wiken et al., 2011). These northern populations appear to be weakly genetically isolated (Yakimowski & Eckert, 2008). Deerberry and the condition of its habitat has declined throughout its historical northern range, and the same threats that impact it in Ontario also occur in the Eastern Great Lakes Ecoregion of New York. The status of this ecoregion¹ has been assessed as Critical/Endangered due to habitat loss with less than 5% remaining intact (Ricketts et al., 1999).

3.4. Other status categories

3.4.1. Data deficient

Not applicable.

¹ Described as Eastern Great Lakes lowland forests ecoregion. Boundaries do not exactly match the Eastern Great Lakes and Hudson Lowlands ecoregion.

3.4.2. Extinct or extirpated

Not applicable.

3.4.3. Not at risk

Not applicable.

4. Summary of Ontario status

Deerberry (*Vaccinium stamineum*) is classified as Threatened in Ontario based on meeting criterion B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v).

While Deerberry meets the criteria for Endangered, it is designated Threatened because the species is not at risk of imminent extirpation and conservation efforts in the protected areas where it occurs.

The category of Threatened is consistent with the status of this species in Ontario. Status category adjustments based on occurrences in protected areas and level of risk have been done for other species at risk in Ontario including Hill's Thistle (*Cirsium hillii*) (meets Endangered, assessed as Threatened) and Lakeside Daisy (*Tetraneuris herbacea*) (meets Endangered, assessed as Threatened) (Government of Canada, 2020).

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

5. Information sources

COSEWIC. 2020. *COSEWIC assessment and status report on the Deerberry Vaccinium stamineum in Canada (in press)*. Committee on the Status of Endangered Wildlife in Canada: Ottawa. p. xi + 37.

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Government of Canada. (2020). Species at risk public registry, species search.

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[da - Vaccinium spp - Gaylussacia baccata Woodland](#)

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- Weldy, T, Werier, D, and Nelson, A. (2021). New York Flora Atlas. Available from <http://newyork.plantatlas.usf.edu/>
- White, D, and Oldham, M. 2000. Update COSEWIC status report on Deerberry (*Vaccinium stamineum*). *Ottawa, Canada: Environment Canada*.
- Wiken, E, Nava, FJ, and Griffith, G. 2011. *North American Terrestrial Ecoregions—Level III*. Commission for Environmental Cooperation: Montreal. p. 149.
- Yakimowski, SB, and Eckert, CG. 2008. Populations do not become less genetically diverse or more differentiated towards the northern limit of the geographical range in clonal *Vaccinium stamineum* (Ericaceae). *New Phytologist*, **180**(2), 534-544.

Appendix 1: Technical summary for Ontario

Species: Deerberry (*Vaccinium stamineum*)

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.	50 years
Is there an observed, inferred, or projected continuing decline in number of mature individuals?	Yes based on observed extirpation of 6-7 subpopulations. The small Niagara subpopulation is likely declining, but the TINP subpopulations appear currently stable.
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. Yes 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). <i>If value in COSEWIC status report is not applicable, then use geocat.kew.org. State source of estimate.</i>	231 km ² (COSEWIC, 2020)
Index of area of occupancy (IAO). <i>If value in COSEWIC status report is not applicable, then use geocat.kew.org. State source of estimate.</i>	24 km ² (COSEWIC, 2020)

Extent and occupancy attributes	Value
<p>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?</p>	<p>a. No b. No</p>
<p>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></p>	<p>5</p>
<p>Number of NHIC Element Occurrences <i>Request data from MNRF.</i></p>	<p>9 (6 are ranked as extirpated or historical)</p>
<p>Is there an observed, inferred, or projected continuing decline in extent of occurrence?</p>	<p>Yes Based on loss of Element Occurrences.</p>
<p>Is there an observed, inferred, or projected continuing decline in index of area of occupancy?</p>	<p>Yes The IAO of all known natural subpopulations, not including introduced extant site = 156 km² (85% decline). These declines are largely historical and incorporate the addition of a new subpopulation resulting from recovery efforts. (COSEWIC, 2020)</p>
<p>Is there an observed, inferred, or projected continuing decline in number of sub-populations or EOs?</p>	<p>Yes (observed and projected*) *dependent on conservation management</p>
<p>Is there an observed, inferred, or projected continuing decline in number of locations?</p>	<p>Yes (observed and projected*) *dependent on conservation management</p>
<p>Is there an observed, inferred, or projected continuing decline in [area, extent and/or quality] of habitat?</p>	<p>Yes (observed and projected*) Observations suggest that habitat quality is declining due to shading (resulting from fire suppression), and overabundance of native and non-native species. *dependent on conservation management</p>
<p>Are there extreme fluctuations in number of populations?</p>	<p>No</p>

Extent and occupancy attributes	Value
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 (stems)
Whirlpool Gorge	6
Grenadier Island (West), TINP	1335
Endymion Island, TINP	1051
Deathdealer Island	736
Georgina Island West, TINP (cultivated origin)	651
	3779 (note 3743 in COSEWIC report)

Quantitative analysis (population viability analysis conducted)

Probability of extinction in the wild is unknown.

Threats

Based on threats calculator (COSEWIC, 2020)

Fire and Fire Suppression: High-Low

Problematic Native Species – White-tailed Deer: Medium-Low

Invasive Non-native Species: Low

Rescue effect

Rescue effect attribute	Value
Does the broader biologically relevant geographic range for this species extend beyond Ontario?	Yes (New York portion of the Thousand Islands)
Status of outside population(s) most likely to provide immigrants to Ontario	S5 in New York
Is immigration of individuals and/or propagules between Ontario and outside populations known or possible?	Possibly
Would immigrants be adapted to survive in Ontario?	Probably
Is there sufficient suitable habitat for immigrants in Ontario?	Probably

Rescue effect attribute	Value
Does the broader biologically relevant geographic range for this species extend beyond Ontario?	Yes (New York portion of the Thousand Islands)
Are conditions deteriorating in Ontario?	Yes (fire suppression, deer browse)
Is the species of conservation concern in bordering jurisdictions?	No
Is the Ontario population considered to be a sink?	No
Is rescue from outside populations likely?	No Considered unlikely due to low frequency of Deerberry in the areas immediately bordering regions, and decreasing habitat suitability due to invasive species and fire suppression.

Sensitive species

No

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