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Cherry Birch
(Betula lenta) in Ontario

Ontario Recovery Strategy Series

Recovery strategy prepared under the *Endangered Species Act, 2007*

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Ministry of Natural Resources

Ontario

About the Ontario Recovery Strategy Series

This series presents the collection of recovery strategies that are prepared or adopted as advice to the Province of Ontario on the recommended approach to recover species at risk. The Province ensures the preparation of recovery strategies to meet its commitments to recover species at risk under the Endangered Species Act, 2007 (ESA, 2007) and the Accord for the Protection of Species at Risk in Canada.

What is recovery?

Recovery of species at risk is the process by which the decline of an endangered, threatened, or extirpated species is arrested or reversed, and threats are removed or reduced to improve the likelihood of a species' persistence in the wild.

What is a recovery strategy?

Under the ESA, 2007, a recovery strategy provides the best available scientific knowledge on what is required to achieve recovery of a species. A recovery strategy outlines the habitat needs and the threats to the survival and recovery of the species. It also makes recommendations on the objectives for protection and recovery, the approaches to achieve those objectives, and the area that should be considered in the development of a habitat regulation. Sections 11 to 15 of the ESA, 2007 outline the required content and timelines for developing recovery strategies published in this series.

Recovery strategies are required to be prepared for endangered and threatened species within one or two years respectively of the species being added to the Species at Risk in Ontario list. There is a transition period of five years (until June 30, 2013) to develop recovery strategies for those species listed as endangered or threatened in the schedules of the ESA, 2007. Recovery strategies are required to be prepared for extirpated species only if reintroduction is considered feasible.

What's next?

Nine months after the completion of a recovery strategy a government response statement will be published which summarizes the actions that the Government of Ontario intends to take in response to the strategy. The implementation of recovery strategies depends on the continued cooperation and actions of government agencies, individuals, communities, land users, and conservationists.

For more information

To learn more about species at risk recovery in Ontario, please visit the Ministry of Natural Resources Species at Risk webpage at: **www.ontario.ca/speciesatrisk**

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Cette publication hautement spécialisée Recovery strategies prepared under the *Endangered Species Act, 2007*, *n'est disponible qu'en Anglais en vertu du Règlement 411/97 qui en exempte l'application de la Loi sur les services en français. Pour obtenir de l'aide en français, veuillez communiquer avec Cathy Darevic au ministère des Richesses naturelles au 705-755-5580.*

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DECLARATION

The recovery strategy for the Cherry Birch has been prepared in accordance with the requirements of the *Endangered Species Act* (ESA). This recovery strategy has been prepared as advice to the Government of Ontario, other responsible jurisdictions and the many different constituencies that may be involved in recovering the species.

The recovery strategy does not necessarily represent the views of all of the individuals who provided advice or contributed to its preparation, or the official positions of the organizations with which the individuals are associated.

The goals, objectives and recovery approaches identified in the strategy are based on the best available knowledge and are subject to revision as new information becomes available. Implementation of this strategy is subject to appropriations, priorities and budgetary constraints of the participating jurisdictions and organizations.

Success in the recovery of this species depends on the commitment and cooperation of many different constituencies that will be involved in implementing the directions set out in this strategy.

RESPONSIBLE JURISDICTIONS

Ontario Ministry of Natural Resources
Environment Canada - Canadian Wildlife Service, Ontario

EXECUTIVE SUMMARY

Cherry Birch is a medium-sized, deciduous tree, usually growing on moist, well-drained soils. There appears to be only one wild population in Canada, located in the Niagara Region of Ontario, west of St. Catharines. Despite several focused searches in natural habitats along the Lake Ontario shoreline and Niagara River valley, no additional Cherry Birch specimens have been found in this region. The nearest other population is located approximately 70 km east in New York State.

Cherry Birch is widespread in the eastern United States. Its range extends from the states of Maine, New Hampshire and Vermont, south through the Appalachian Mountains to northern Alabama and Georgia, with disjunct occurrences in Mississippi and western Kentucky.

In Ontario, Cherry Birch is thought to have always been a minor component of forests at its historical and extant locations; nonetheless, its population has declined by 72%, from 50 trees observed in 1967 to 14 trees in 2005. Presently, there are only two sites, in proximity to each other, together harbouring probably not more than 18 individuals, nearly half of them being seedlings planted on a residential lawn. At the location where young trees grow within a natural forest habitat, the individuals appear healthy and produce seeds, but the level of reproductive success is unknown.

Habitat loss and degradation, including shoreline erosion, are believed to be the greatest threat to the species' survival. The apparent inability of Cherry Birch to establish at new sites may be caused by genetic depression and loss of fitness, caused by inbreeding and long isolation from the main distribution range.

The recovery goal is to ensure continued persistence of Cherry Birch at known sites in Ontario with no further decline in population size in the short-term and an increase in population size in the long-term. The protection and recovery objectives are:

- maintain the extant population of mature trees with the number of individuals stable or increasing;
- monitor planted Cherry Birch saplings and seedlings, and investigate possibilities of transfer to natural habitat;
- identify, protect and restore potential suitable habitats and reintroduce populations where possible, particularly at historical sites; and
- gain an understanding of habitat requirements, genetics, life history and population trends.

The only major recovery action carried out recently has been the planting of several dozen seedlings, grown from seeds collected on-site within a residential lawn and adjacent forest.

The proposed approaches to recover Cherry Birch, in addition to stewardship, include monitoring the population of mature trees, monitoring planted seedlings, exploring the feasibility of transplanting the seedlings to nearby natural habitats, growing additional

seedling stock at nursery facilities and initiating rigorous research of Cherry Birch genetics, population biology and habitat requirements.

It appears that the species may not require large habitat patches for its preservation however the minimum habitat size requirements are unknown at present. As a conservative approach, it is recommended that habitat patches of the specific forest type where naturally established Cherry Birch already grows as a tree or sapling, be prescribed as habitat in a habitat regulation.

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1.1 Species Assessment and Classification

COMMON NAME: Cherry Birch
SCIENTIFIC NAME: *Betula lenta*
SARO List Classification: Endangered
SARO List History: Endangered (2008)
COSEWIC Assessment History: Endangered (2006)
SARA Schedule 1: Endangered (2007)
CONSERVATION STATUS RANKINGS: GRANK: G5 NRANK: N1 SRANK: S1

The glossary provides definitions for technical terms, including the abbreviations above.

1.2 Species Description and Biology

Species Description

Cherry Birch is a medium-sized tree that reaches up to 25 m in height and 95 cm in diameter (COSEWIC 2006). The leaves are simple, alternate, with toothed edges. The bark is initially smooth, dark cherry red to almost black in colour, with conspicuous horizontal lenticels. It becomes ashy-brown with age and breaks up into large plates, which do not curl at the edges as is characteristic of other birches (Farrar 1995, Fernald 1950). Cherry Birch is similar in appearance to Yellow Birch (*Betula alleghaniensis*), which is quite common in the forests of the Niagara Region and often confused with Cherry Birch.

Species Biology

Cherry Birch is a long-lived tree, reaching the age of 200 years or more. As with most members of this family, it is monoecious with male and female flowers found on the same tree in separate catkins. Flowering occurs in early spring before the leaves expand. Fruit has been known to develop on isolated trees indicating self-compatibility. The seeds develop over the course of the summer and are released in late fall to winter. The wind-dispersed seeds have small wings and do not require cold stratification for development, but are reliant on light for germination (OMNR 2000; Burns and Honkala 1990). Seedlings develop best in light shade conditions; in natural stands, they take advantage of small canopy openings and where crown density is moderate (Burns and Honkala 1990).

Like other hardwoods, Cheery Birch can be browsed by large herbivores. However, herbivory does not seem to affect the mature trees (COSEWIC 2006).

1.3 Distribution, Abundance and Population Trends

Cherry Birch is relatively widespread in the eastern United States. Its distribution extends from southern Maine, New Hampshire, Vermont and New York to eastern Ohio and south through the Appalachian Mountains to northern Alabama and Georgia, over a wide range of altitudes from the New England coast to 1370 m in the southern Appalachian Mountains (Burns and Honkala 1990). Disjunct populations are documented in Mississippi and western Kentucky. There are reports from Quebec; however, these are generally thought to be erroneous (COSEWIC 2006; Marie-Victorin 1935).

The only confirmed wild population of Cherry Birch in Canada is found west of St. Catharines, at the mouth of Fifteen and Sixteen Mile creeks near the Lake Ontario shoreline (Figure 1). This population presently consists of individuals growing at two adjacent sites. The closest other population is about 70 km east in New York State. In 1967 the Canadian population consisted of about 50 trees. By 2005 only 14 trees were confirmed between the two sites, six of which were fruiting (COSEWIC 2006).

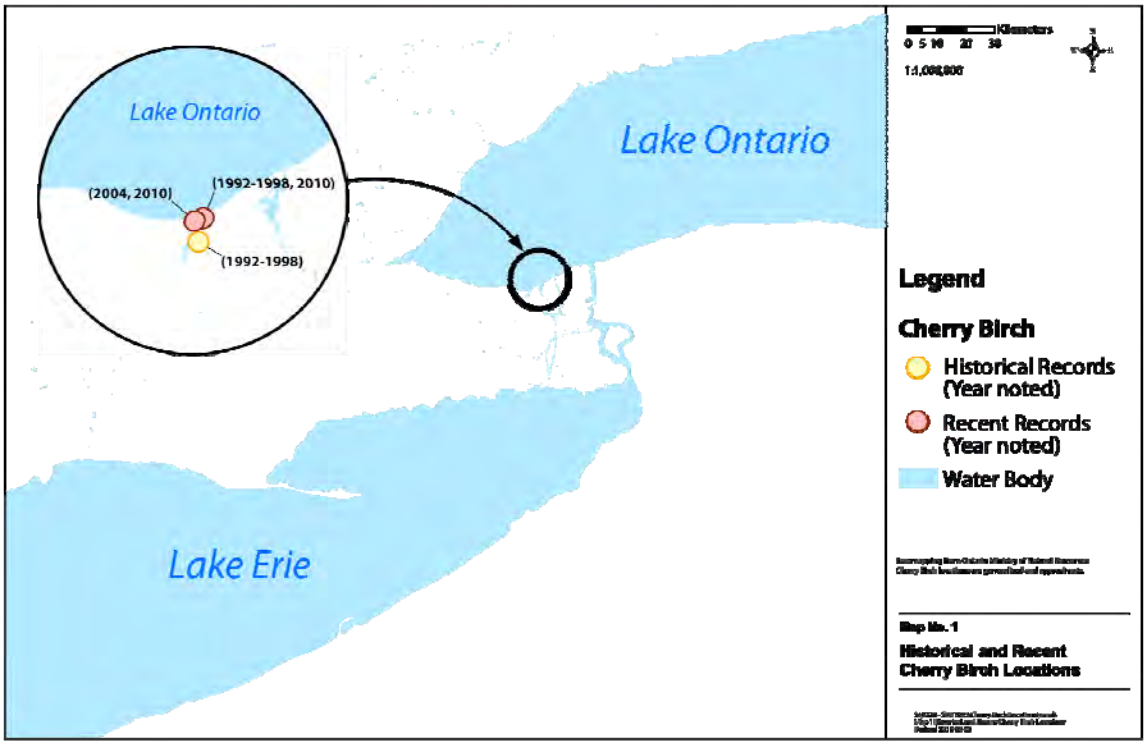

Figure 1. Historical and current distribution of Cherry Birch in Ontario (after COSEWIC 2006 surveys for this report)

A site visit in 2010 by Zoladeski and Hayes to both properties confirmed the presence of only nine young trees at the first location. At the second location, some 400 m away, no trees remained as they all had succumbed to shoreline erosion. One sapling was found at that location within a deciduous woodlot, but that specimen had been apparently planted there as a seedling in approximately 1998 (landowner, pers. comm. 2010) using seeds collected from the fruiting trees present on site at that time. Also planted at that location in 2008, were about 70 Cherry Birch seedlings propagated from seeds collected from the native individuals. The site visit revealed that only about eight seedlings were still alive. As of 2010 there appears to be a total of 18 individuals of Cherry Birch growing at the two sites.

1.4 Habitat Needs

Cherry Birch is believed to prefer moist, well-drained soils; however, the species is also found on coarse-textured and rocky, shallow soils. The New York population is found on stony clay loam, organic rich clay loam and sandy soils, and these soils are generally neutral to acidic (COSEWIC 2008). In Ontario, the location where the nine trees were found in 2010 is a north-facing slope on clay-loam soils which are generally alkaline, being associated with the presence of limestone bedrock. At the second location until recently, mature trees also grew in semi-open narrow wooded strips at the top of a cliff along Lake Ontario.

In Ontario, the forest where Cherry Birch was observed in 2010 is composed of Red Oak (*Quercus rubra*), Sugar Maple (*Acer saccharum*), Black Cherry (*Prunus serotina*) and Eastern Hop-hornbeam (*Ostrya virginiana*). In contrast, the western New York population co-occurs with Sugar and Red Maple (*Acer rubrum*), American Beech (*Fagus grandifolia*), Eastern Hemlock (*Tsuga canadensis*) and Black Cherry, with occasional associates being Tulip Tree (*Liriodendron tulipifera*), Yellow Birch, Paper Birch (*Betula papyrifera*) and Chestnut Oak (*Quercus prinus*) (COSEWIC 2006).

In New York seedlings were observed establishing in openings of the forest canopy in areas of fine gravel but not in the duff-covered portions of the forest floor. Some of the trees were also noted to have stilt roots indicating that they may have originated on a decayed stump or a nurse log.

The geographic extent of Cherry Birch in Ontario is extremely limited. Despite numerous searches no other populations have been found in the Niagara Region. Several otherwise high quality deciduous forest habitats, such as Niagara Glen Nature Reserve and Navy Island do not apparently harbour Cherry Birch trees.

1.5 Threats to Survival and Recovery

Habitat loss and degradation are the greatest threats to the survival of Cherry Birch in Ontario. Historical land clearing for agricultural development likely resulted in the direct

loss of Cherry Birch individuals and their habitat. Current residential development is widespread in the area surrounding the remaining population. Only the steep slopes associated with Fifteen Mile Creek and the associated valley floors still remain under natural forest cover.

In addition to human-caused or induced losses, natural events such as intense shoreline erosion along Lake Ontario endanger the Cherry Birch extant population. Cliff erosion from storms in 2004 and 2005 resulted in the loss of all mature trees at the second location. The nine remaining trees at the first location, at least partially, remain there because the site is sheltered and away from wave action.

There is evidence that Cherry Birch has intermediate tolerance to drought (Burns and Honkala 1990), which may have been a contributing factor affecting the Southern Ontario populations. Winter events, primarily ice and glaze storms, which cause limb damage and allow wood decay organisms to enter, can cause direct reduction of crown volume. However, Cherry Birch is probably not very susceptible to outright winter killing (Burns and Honkala 1990).

An important group of biotic factors that can impact the Cherry Birch trees are fungal pathogens, such as white trunk rot (*Phellinus igniarius*), yellow cap fungus (*Pholiota limonella*) and Nectria canker (*Nectria galligena*), the latter being the most serious threat. As well, insects feeding on Cheery Birch leaves include birch tubemaker (*Acrobasis betulella*), birch skeletonizer (*Bucculatrix canadensisella*), oriental moth (*Cnidocampa flavescens*), gypsy moth (*Lymantria dispar*) and dusky birch sawfly (*Croesus latitarsus*) (Burns and Honkala 1990).

Given the low number and isolation of extant individuals, genetic depression may also pose a potential threat. All of the seedlings planted in 1998 and 2008 at the second location originated from mature trees that used to grow there (landowner, pers. comm. 2010). However, the seedlings appear to have undergone a high rate of herbivory from rabbits and mice. Of the 70 planted on the lawn, only eight have survived. This area is also subject to mechanical mowing, trampling and vehicle storage but it is not clear to what extent these activities may have inadvertently affected the survival of the seedlings. Likely due to herbivory, most if not all of the seedlings planted in the adjacent woodlot in 2008 perished. The individual planted in 1998 in the woodlot - now a three metre tall sapling - appears to be thriving.

1.6 Knowledge Gaps

Basic facts about habitat requirements and the biology of Cherry Birch are known (COSEWIC 2006). Also the threats to the historical and present existence of the species, especially those concerning land use practices, habitat degradation and loss, have been identified and are generally understood. Still, potentially critical information in particular with relation to the Ontario population, is unavailable.

Very small populations of plants occurring within limited geographic localities often suffer the effects of isolation. The following could be identified as knowledge gaps in the understanding of Cherry Birch vigour and continued existence both at the known sites and potentially within the Niagara Region:

- genetics, in particular signs of regression and loss of plasticity due to potential inbreeding;
- seed production and germination rates;
- recruitment and seedling survivorship in the natural habitat;
- rooting habit;
- habitat requirements of the naturally recruited progeny, e.g. soil type, moisture and drainage, topography, canopy type and closure, understorey species and light levels; and
- minimum habitat size requirements for self-sustaining populations.

1.7 Recovery Actions Completed or Underway

Cherry Birch is afforded species protection under the *Endangered Species Act, 2007* (ESA). General habitat protection will come into effect for the species by June 30, 2013 unless a habitat regulation is in place first. The two extant sites are located on private property, and the landowners are aware of the species presence and appear to be supportive of its conservation.

The following recovery actions have been completed.

- Surveys in the Niagara Region undertaken in 1984, 1992, and 2004-2005 by Ambrose and Thompson, resulting in the discovery of a new site in 2005 (COSEWIC 2006).
- Survey of Niagara Glen Nature Reserve in 2006 and 2007 by M.J. Oldham, but not specifically targeting Cherry Birch (Ritchie, pers. comm. 2010).
- Survey of Navy Island in 2006 and 2007 by M.J. Oldham, but not specifically targeting Cherry Birch (R. Ritchie pers. comm. 2010).
- Plantings of Cherry Birch in Niagara Glen in 1998, but not documented.
- Planting of 70 Cherry Birch seedlings in habitat adjacent to extant populations by the Niagara Restoration Council in 2008 (Burant, pers. comm. 2010).
- Unconfirmed plantings of seedlings in Malcolmson Eco-Park in St. Catharines (landowner, pers. comm. 2010).
- Scoped survey of both extant sites in 2010 by Zoladeski and Hayes, resulting in the confirmation of the site originally found in 2005 (COSEWIC 2006) and the corroboration of the loss of six mature individuals at the second site. The survey further revealed the survival of approximately eight seedlings from the 2008 plantings by the Niagara Restoration Council and the presence of one healthy sapling planted in 1998 by the landowners (both sourced from seeds taken from native individuals on–site).

2.0 RECOVERY

2.1 Recovery Goal

The recovery goal is to ensure continued persistence of Cherry Birch at known sites in Ontario with no further decline in population size in the short-term and an increase in population size in the long-term.

2.2 Protection and Recovery Objectives

Table 1. Protection and recovery objectives

No.	Protection or Recovery Objective
1	Maintain the extant population of mature trees with the number of individuals stable or increasing.
2	Monitor planted Cherry Birch saplings and seedlings and investigate possibilities of transfer to natural habitat.
3	Identify, protect and restore potential suitable habitats and reintroduce populations where possible particularly at historical sites.
4	Gain an understanding of habitat requirements, genetics, life history, and population trends.

2.3 Approaches to Recovery

Table 2 Approaches to recovery of Cherry Birch in Ontario

Relative Priority	Relative Timeframe	Recovery Theme	Approach to Recovery	Threats or Knowledge Gaps Addressed
1. Maintain the extant population of mature trees with the number of individuals stable or increasing.				
Critical	Ongoing	Stewardship	**1.1** Continue to work with private landowners of both extant and historic sites to promote stewardship and conservation of Cherry Birch.	• All threats
Necessary	Short-term	Communications	**1.2** Collaborate with the Niagara Restoration Council and other partners to promote continued coordinated stewardship and outreach/education efforts related to Cherry Birch.	• All threats
2. Monitor planted Cherry Birch saplings and seedlings and investigate possibilities of transfer to natural habitat.				
Critical	Ongoing	Monitoring and Assessment	**2.1** Assess the survival rate, health and status of the saplings and seedlings on an annual basis.	• Herbivory • Lawn mowing • Trampling • Overrun by vehicles
Necessary	Short-term	Monitoring and Assessment	**2.2** Investigate feasibility of transplanting the eight surviving individuals from the lawn into adjacent forested habitat to reduce threat from mechanical mowing, vehicles, trampling.	• Herbivory • Lawn mowing • Trampling • Overrun by vehicles
Necessary	Long-term	Monitoring and Assessment	**2.3** Secure independent sources of progeny for planting in local natural habitat.	• Herbivory • Lawn mowing • Trampling • Overrun by vehicles

Relative Priority	Relative Timeframe	Recovery Theme	Approach to Recovery	Threats or Knowledge Gaps Addressed
3. Identify, protect and restore potential suitable habitats and reintroduce populations where possible, particularly at historic sites.				
Necessary	Long-term	Monitoring and Assessment	**3.1** Undertake inventories of additional suitable habitat for protection in the region including historic sites in conjunction with targeted outreach to landowners to confirm presence of any other individuals.	Soil erosion Preferred habitat
Necessary	Long-term	Research	**3.2** Survey Canadian herbaria for historical records to identify and verify potentially existing additional sites outside Ontario.	Preferred habitat
Necessary	Long-term	Monitoring and Assessment	**3.3** Initiate introduction program at identified sites	Preferred habitat
4. Gain an understanding of habitat requirements, genetics, life history and population trends.				
Necessary	Long-term	Monitoring and Assessment	**4.1** Monitor habitat characteristics at both extant sites.	Soil erosion Herbivory
Necessary	Long-term	Research	**4.2** Determine population size and age distribution, in particular new recruitment at extant sites.	Herbivory Critical population level
Necessary	Long-term	Research	**4.3** Collect tissue samples for genetic research, investigate reproductive success and habitat characteristics.	Genetic depression Critical population level Preferred habitat
Necessary	Long-term	Research	**4.4** Identify a government or academic research unit to carry out life history and population studies.	Genetic depression Critical population level Preferred habitat

Narrative to Support Approaches to Recovery

Approach 1.1: The saplings planted on a landowner's lawn are at the present time the only living offspring of parent trees at that location. Although the landowner is very enthusiastic about the species, assistance to protect the seedlings from herbivory (e.g., maintaining the guards) and mechanical damage (better identification of individuals using stakes, flags, etc.) should be offered to the landowner.

Approach 2.2 and 2.3: Within two or three years, when the seedlings are larger and stronger, they should be transplanted into the adjacent woods while providing the same level of protection (guards) from herbivory. In the meantime, to secure another and independent source of progeny, seeds collected from local trees should be germinated by an approved nursery to be subsequently planted in natural habitat (deciduous forest in ravine) in the vicinity of the lawn.

Approach 4.3: If inbreeding is identified as a limiting factor, consideration should be given to diversifying the genetic makeup by using material from the nearby New York State populations.

2.4 Performance Measures

The primary performance measures of the recovery approaches should be doubling of population size and sustained natural reproduction of the Cherry Birch in natural habitats. Secondary performance measures should be the successful propagation of the species and transplanting into natural habitats.

2.5 Area for Consideration in Developing a Habitat Regulation

Under the ESA, a recovery strategy must include a recommendation to the Minister of Natural Resources on the area that should be considered in developing a habitat regulation. A habitat regulation is a legal instrument that prescribes an area that will be protected as the habitat of the species. The recommendation provided below by the authors will be one of many sources considered by the Minister when developing the habitat regulation for this species.

It appears that Cherry Birch, both at its extant and historic sites, does not require large habitat patches for survival. In fact, at one of the sites mature trees have persisted within a strip of vegetation at the edge of lakeshore bluff (landowner, pers. comm. 2010). The extant population of mature trees is located on a narrow wooded stable slope. However the minimum habitat size below which Cherry Birch likely would not survive is unknown. As a conservative approach it is recommended that habitat patches of the specific forest type where naturally established Cherry Birch already grow as a tree or sapling, be prescribed as habitat in a habitat regulation. Temporary habitats where the species is purposely cultivated for propagation should not be

protected. On the other hand, habitat patches of the specific forest type where native Cherry Birch has been planted should also be considered for regulation.

GLOSSARY

Cold stratification: the process of subjecting seeds to both cold and moist conditions to allow for germination.

Committee on the Status of Endangered Wildlife in Canada (COSEWIC): The national committee responsible for assessing and classifying species at risk in Canada.

Committee on the Status of Species at Risk in Ontario (COSSARO): The committee established under section 3 of the *Endangered Species Act* that is responsible for assessing and classifying species at risk in Ontario.

Conservation status rank: A rank assigned to a species or ecological community that primarily conveys the degree of rarity of the species or community at the global (G), national (N) or subnational (S) level. These ranks, termed G-rank, N-rank and S-rank are not legal designations. The conservation status of a species or ecosystem is designated by a number from 1 to 5, preceded by the letter G, N or S reflecting the appropriate geographic scale of the assessment. The numbers mean the following:

1 = critically imperilled
2 = imperilled
3 = vulnerable
4 = apparently secure
5 = secure

Lenticels: spongy spots or slits in the bark of twigs and branches of woody plants that serve as pores allowing exchange of gases between the air and plant tissue.

Monoecious: related to both male and female reproductive units (e.g. flowers) present on the same plant.

Endangered Species Act (ESA): The provincial legislation that provides protection to species at risk in Ontario.

Species at Risk Act (SARA): The federal legislation that provides protection to species at risk in Canada. This act establishes Schedule 1 as the legal list of wildlife species at risk to which the SARA provisions apply. Schedules 2 and 3 contain lists of species that at the time the act came into force needed to be reassessed. After species on Schedule 2 and 3 are reassessed and found to be at risk, they undergo the SARA listing process to be included in Schedule 1.

Species at Risk in Ontario (SARO) List: The regulation made under section 7 of the *Endangered Species Act* that provides the official status classification of species at risk in Ontario. This list was first published in 2004 as a policy and became a regulation in 2008.

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