45 Cindy Lane
Township of Adjala-Tosorontio
Natural Heritage Evaluation

P/N 2023-180
November 2023
October 2024 Update

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Table of Contents

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1. INTRODUCTION

This report presents the results of a natural heritage assessment conducted for a parcel of land described as 45 Cindy Lane, in the Township of Adjala-Tosorontio.

The parcel is approximately 22 ha in size, however the proposed development area is limited to an area approximately 3 ha in size along the Cindy Lane frontage. The property is situated to the north of Cindy Lane east of Concession Road 3. The proposed development areas is currently vacant, while the balance of the parcel has been developed as a golf course (Silverbrooke Golf Course).

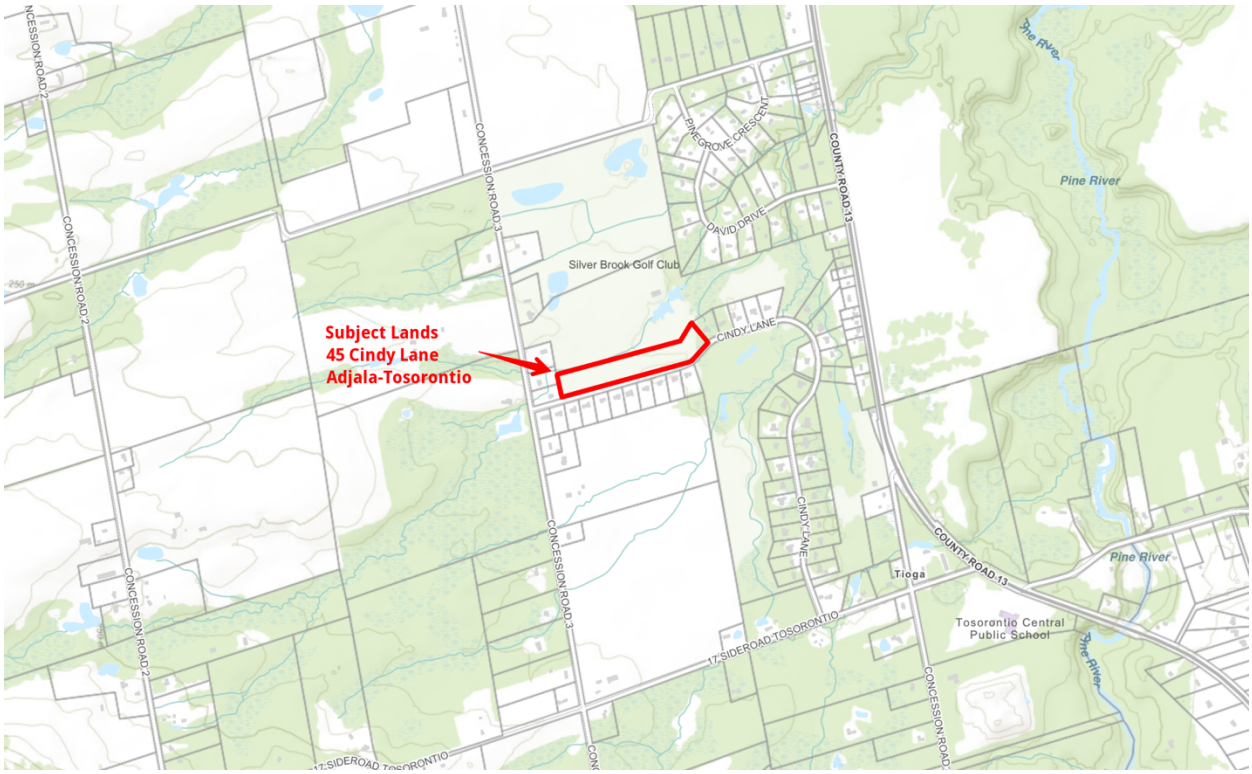


Figure 1 Location

The property is situated adjacent to an estate residential subdivision with surrounding land uses consisting of large estate residential lot development to the north-east, east, south and south-eats. Land uses to the west consist of large rural lots on the east side of Concession Road 3 and large rural largely forested lots to the west.

The subject lands have been cleared for an extended period of time, originally for agricultural purposes. The lands have been maintained in a non-forested condition as residential development and golf course

development occurred over the last two decades.

Figure 2 Aerial Photo 1978 (Source: Simcoe County GIS)

Figure 3 Aerial Photo 2008 (Source: Simcoe County GIS)

Figure 4 Aerial Photo 2023 (Source: Simcoe County GIS)

The landowner (2834556 Ontario Inc) proposes to develop the frontage along Cindy Lane as 8 estate residential lots similar to those on the south side of the road and extending easterly and south-easterly along Cindy Lane.

The number and location of the lots has been set out in a proposed draft plan of subdivision prepared by Powell Planning and Associates. As shown in that plan, a proposed walking trail is shown to the rear of the proposed lots in response to comments from community members received in an open house to provide public information concerning the proposal.

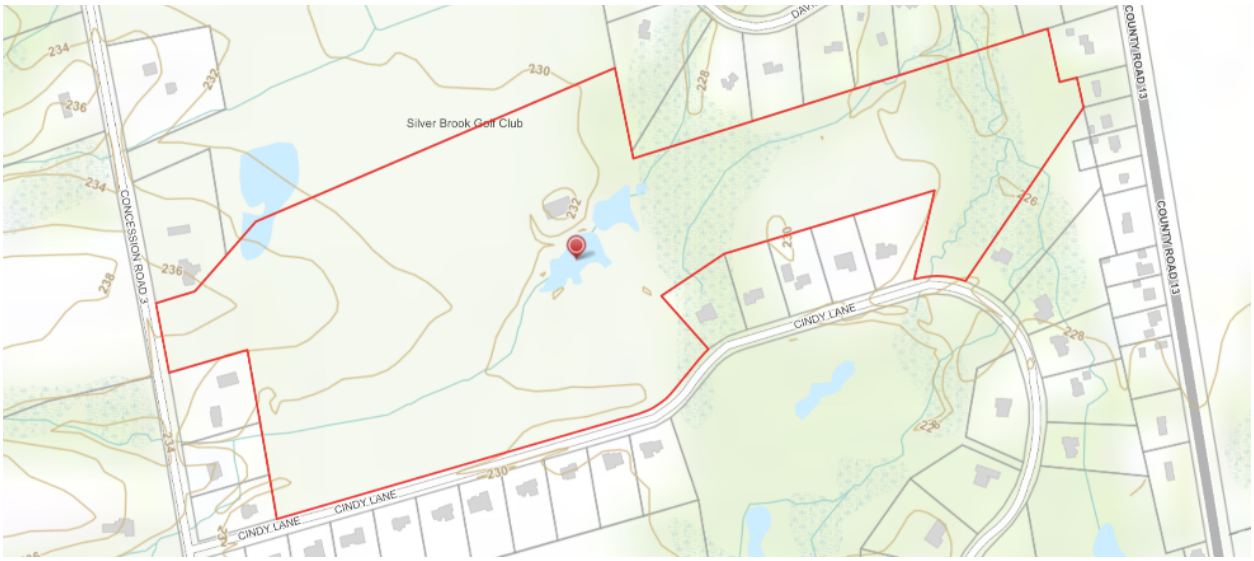
Krystawyn Consulting's role in the proposal involved carrying out a natural heritage and ecological impact assessment on the lands proposed to be development and the adjacent lands (within 120m of the development area).

Figure 5 Proposed Lotting

2. DESCRIPTION OF SITE

The building envelope is a large vacant area of land situated apart from the golf course which occupies the balance of the property. The majority of the building envelope is a cultural meadow with sparse tree and shrub cover. A watercourse and swale establish the northerly limit of the building envelope. The watercourse and swale have an associated small riparian wetland feature.

The property exhibits a relatively flat topography sloping slightly toward the east, with the watercourse and swale occupying a shallow constructed agricultural drainage profile. Soils consist of Tioga loamy sand with a shallow Muck soil within the immediate riparian areas.



The following ELC units were identified on the site:

Dry – Moist Old Field Meadow Type (CUM1-1)

This community is dominated by forb species. Species include Early Goldenrod (*Solidago juncea*), Canada Goldenrod (*Solidago canadensis*), Cow Vetch (*Vicia cracca*), Wild Carrot (*Daucus carota*), Common Ragweed (*Ambrosia artemisiifolia*), Chicory (*Cichorium intybus*), Common Mullen (Verbascum 5hapsus ssp. 5hapsus), Common Dandelion (*Taraxacum offinciale*), Grass Sp (*Poaceae* Sp.), Field Strawberry (*Fragaria vesca*). Scattered immature tree species, all under 10cm DBH are also found within the ecosite, these species include Eastern White Pine (*Pinus strobus*), Trembling Aspen (*Populus tremuloides*), Scots Pine (*Pinus sylvestris*), Jack Pine (*Pinus banksiana*), Balsam Poplar (*Populus balsamifera*) and Red Maple (*Acer rubrum*).

This unit consists of former agricultural lands formerly regularly mowed, but more recently left to natural regenerate. It, resultingly, supports a large variety of successional and non-native species including invasives. Scattered tree growth occurs from natural seed dispersal from adjacent tree cover.

Fresh – Moist Poplar Deciduous Forest Type (FOD8-1)

This community is young with most trees being around 10cm DBH. There is also a small watercourse/ditch feature within this ecosite. This community is dominated by Balsam Poplar (Populus balsamifera) and Trembling Aspen (*Populus tremuloides*). Associate species include White Birch (*Betula papyrifera*), Red Maple (*Acer rubrum*), Eastern White Pine (*Pinus strobus*), Crack Willow (*Salix euxina*) and Eastern White Cedar (*Thuja occidentalis*). Shrub and ground cover varied from wetland to upland species due to the watercourse feature. Species include Willow Sp. (*Salix* Sp), Red Osier Dogwood (*Cornus stolonifera*), Sensitive Fern (*Onoclea sensibilis*), Red Raspberry (*Rubus ideaus*), Highbush Cranberry (*Viburnum opulus ssp. Trilobum*), Canary Grass (*Phalaris canariensis*) and Bracken Fern (*Pteridium aquilinum*) among many others.

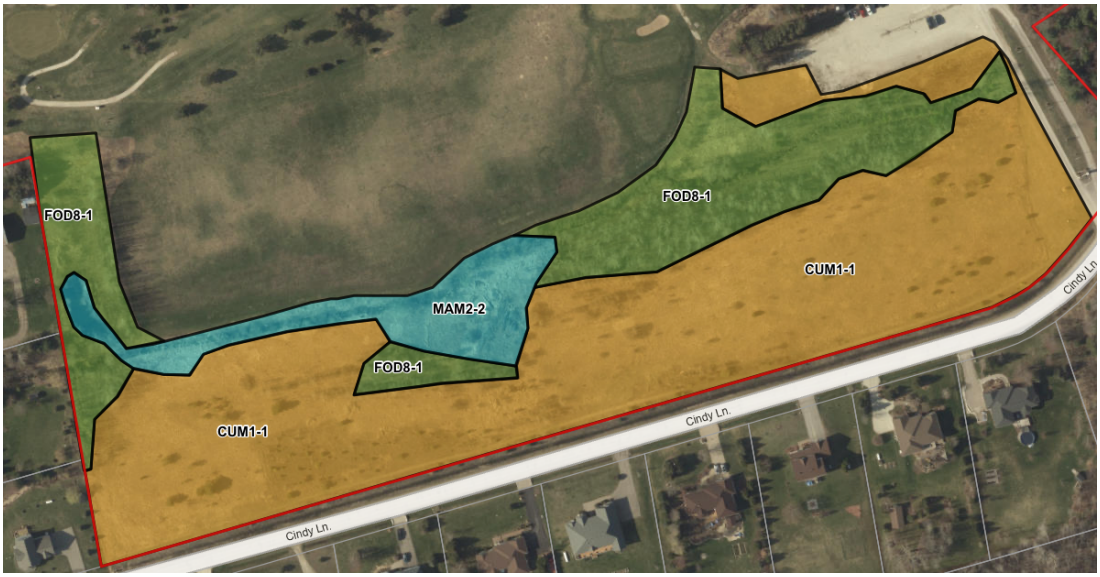
This unit occupies an area of poor drainage associated with a watercourse and a shallow swale. The watercourse feature flows easterly and then north-easterly to a constructed pond. The swale occupies

the northerly extent of the building envelope. This unit was also formerly cleared and drained for agricultural purposes. The watercourse and swale had been altered to facilitate agricultural uses. With cessation of agricultural practices, natural regeneration occurred. Although native species predominate in this unit, non-native species and invasives are present.

Reed-Canary Grass Mineral Meadow Marsh Type (MAM2-2)

This community is dominated by Canary Grass (*Phalaris canariensis*). This community is directly related to the small watercourse running through this feature. Associate species include Red Osier Dogwood (*Cornus stolonifera*), Willow Sp (*Salix*), Crack Willow (*Salix euxina*), Balsam Poplar (*Populus balsamifera*), Spotted Joe-pye Weed (*Eutrochium maculatum*), Sensitive Fern (*Onoclea sensibilis*), Speckled Alder (*Alnus incana*), Narrow-leaved Cattail (*Typha angustifolia*) and Jewelweed (*Impatiens capensis*) among others.

This unit occupies an area of poor drainage associated with a watercourse. This unit was also formerly cleared and drained for agricultural purposes. The watercourse had been altered to facilitate agricultural uses. With cessation of agricultural practices, natural regeneration occurred in the form of a meadow marsh. Although native species predominate in this unit, non-native species and invasives are present.



3. STUDY REQUIREMENTS

This study is intended to address the environmental review requirements at a level appropriate to the proposed development of large estate residential lots within the identified building envelope area.

It is intended to address with the potential impacts of the construction of the proposed development and, if required, how these can be mitigated to comply with Provincial, County and Township natural heritage policies so as to ensure that any negative impact to natural heritage features and functions can be mitigated.

The study is intended specifically to address municipal and provincial natural heritage policy in

accordance with requirements established under the Planning Act, and, where and as applicable, the: Endangered Species Act (Ontario), the Fish and Wildlife Conservation Act (Ontario), the Migratory Birds Act (Canada) and the Fisheries Act (Canada). This study is not an Environmental Site Assessment (Environmental Protection Act) nor a Natural Hazards Assessment (Conservation Authorities Act) each as relevant to the natural heritage policies.

Policy and Requirements

The lands are governed by the Official Plans of the County of Simcoe and the Township of Adjala-Tosorontio.

The County Official Plan maps the proposed development area as Agricultural although the subject lands have been developed as a golf course for an extended period of time and are designated to permit the golf course and residential development in the Township Official Plan. Proposed mapping of the County natural heritage system for the County of Simcoe Official Plan review intends to remove the lands from the draft natural heritage designation.

The lands on which development is to occur are designated Rural Residential (Special Provisions 4.5.5.1) in the Township Official Plan. The permitted uses include the golf course and associated residential development.

The development envelope is situated in the Township Open Space Recreation zone (OSR-2) in which the following uses are permitted: a golf course; a public or private park; a stormwater management facility; conservation uses; and accessory buildings and uses. The floodplain associated with the riparian features is identified as being within the Nottawasaga Valley Conservation Authority (NVCA) regulated area.

The requirement for an environmental impact study, or natural heritage assessment, arises from the fact that the property is situated within the minimum influence area of unevaluated wetlands and a tributary of the Pine River.

Compliance with the natural heritage protection policies of the Provincial and municipal documents applicable to the lands requires a determination of whether or not any of the following exist on the site or adjacent lands: significant wetlands; significant portions of the habitat of endangered or threatened species; permanent and intermittent streams and fish habitat; significant woodlands; significant valley lands; significant wildlife habitat; and significant areas of natural and scientific interest.

In accordance with the Provincial Policy Statement (2024), development and site alteration are not permitted in significant wetlands or in significant portions of the habitat of endangered and threatened species.

Under the Provincial Policy Statement, development and site alteration are permitted adjacent to natural heritage features where it has been demonstrated that there will be no negative impacts on natural features or ecological functions for which the area is identified. This is also the case for the County of Simcoe Official Plan. Therefore, where such features are located on the site or adjacent lands, further study is required to determine the potential impacts as well as outline mitigation measures to ensure that no loss of significant features or functions occurs.

The PPS 2024 indicates that the diversity of natural features in an area, the natural connections between them, ecological function of the area, and the biodiversity of the area should be maintained or restored, and improved, where possible.

Therefore, although the Provincial policies establish a requirement to protect natural features and functions, it is not intended that development of the nature proposed be prohibited. Development may occur under an approved environmental impact study.

The assessment approach involves determining, through an investigation of existing information data bases and the observation and analysis of site conditions, whether or not significant, or key, natural heritage features or functions occur on the development area or adjacent lands; whether or not the proposed development has detrimentally impacted those features or functions; and, what measures are required, if any, to avoid impact to significant features and functions.

In order to determine the potential for various key natural heritage features of the development area and adjacent lands existing sources of information (such as official plan and natural heritage resource mapping), aerial photography, and existing data base information were utilized. Numerous site visit were conducted in the spring, summer and fall of 2023 and in the summer of 2024.

4. DESKTOP REVIEW NATURAL HERITAGE FINDINGS

Simcoe County interactive mapping indicates the presence of unevaluated wetlands and watercourses on the subject lands. The watercourse features are shown at the northerly limit of the proposed development area and unevaluated wetlands are shown on adjacent lands. Mapping also illustrates the proposed adjustment to the draft natural heritage system mapping.

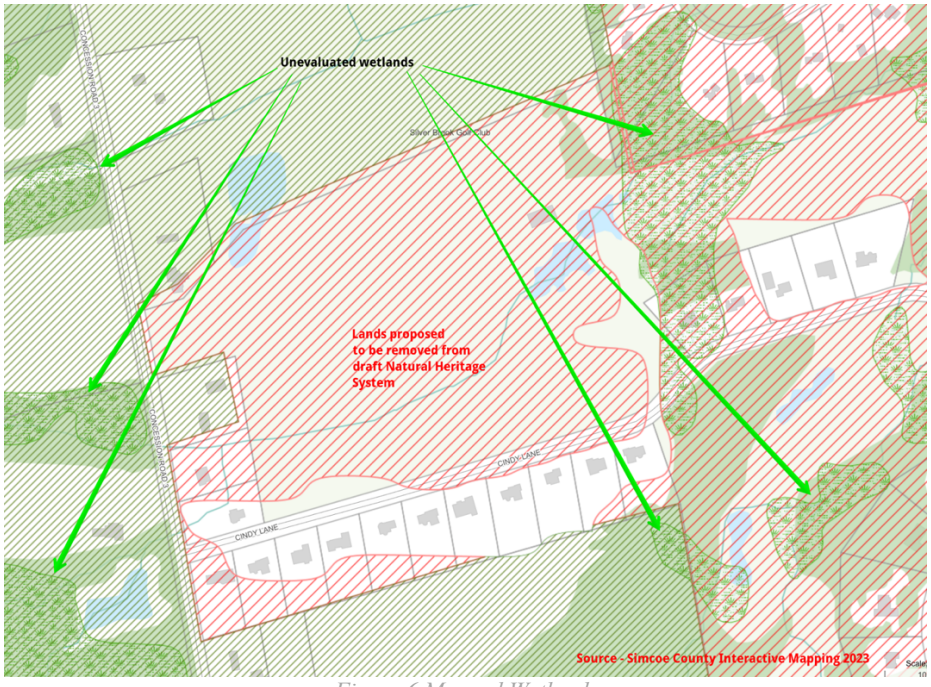


Figure 6 Mapped Wetlands

This information corresponds with Natural Heritage Information Centre mapping of the subject lands.

The Natural Heritage Information Centre has one natural heritage data reporting square covering the entire property. Square (17NJ8198) documents three Species at Risk: Eastern Meadowlark (*Sturnella magna*) (threatended status); Golden Winged Warbler (*Vermivora chrysoptera*) (special concern status); and Common Five-lined Skink (*Plestiodon fasciatus*) (endangered status for Carolinian population and special concern status for southern Shield population).

A Species at Risk (SAR) desk-top assessment was conducted and is set out in Appendix A. The risk assessment concluded that the subject lands were either situated outside the current observed range of species at risk or that no suitable habitat occurred on site. Site investigations, reported on in the next section of this report, also confirmed an absence of species at risk observations other than feeding Bank Swallows.

A review of eBird data indicated only a single observation of SAR species in the vicinity of the proposal. Eastern Meadowlark (*Sturnella magna*) non-research grade observations were reported on a residential lot to the east of the proposed development area and on the edge of a large agricultural parcel to the west across Concession Road 3. The residential observation is in habitat not typically utilized for nesting or feeding. The agricultural observation is in a large agricultural and rural parcel well separated from the proposed development area which may provide suitable nesting habitat for this species. The proposed development area is separated from this parcel by Concession Road 3 and large lot residential development on the east side of the concession road.

No species at risk were noted in iNaturalist observations in the vicinity of the proposal.

5. FIELD WORK OBSERVATIONS

Field work was conducted for the purposes of conducting amphibian surveys, ecological land classification, breeding bird surveys, stick nest and snag surveys, and spring and summer plant surveys.

All field data is set out in Appendix B.

Amphibian surveys confirmed the presence of American Toad (*Anaxyrus americanus*) and Spring Peeper (*Hyla crucifer*). The level of spring calls did not establish significant wildlife breeding habitat for these species. Both species are considered very common and demonstrably secure under present conditions in the Province.

Breeding bird surveys confirmed the presence of 31 species on the subject lands. Other than the previously mentioned Bank Swallow observation (feeding observation), all species are typical of the habitat of the site and surrounding lands and are considered common and widespread and either apparently or demonstrably secure in the Province. Introduced species were also observed. No species of conservation significance were observed to be nesting or utilizing nesting habitat on the subject lands.

No endangered or threatened species were observed on the subject lands, other than the previously mentioned feeding Bank Swallows.

A total of two reptile species were observed. All species are typical of the habitat of the site and surrounding lands and are considered common and widespread and either apparently or demonstrably secure in the Province.

Evidence or observations of six mammal species were observed. All species are typical of the habitat of

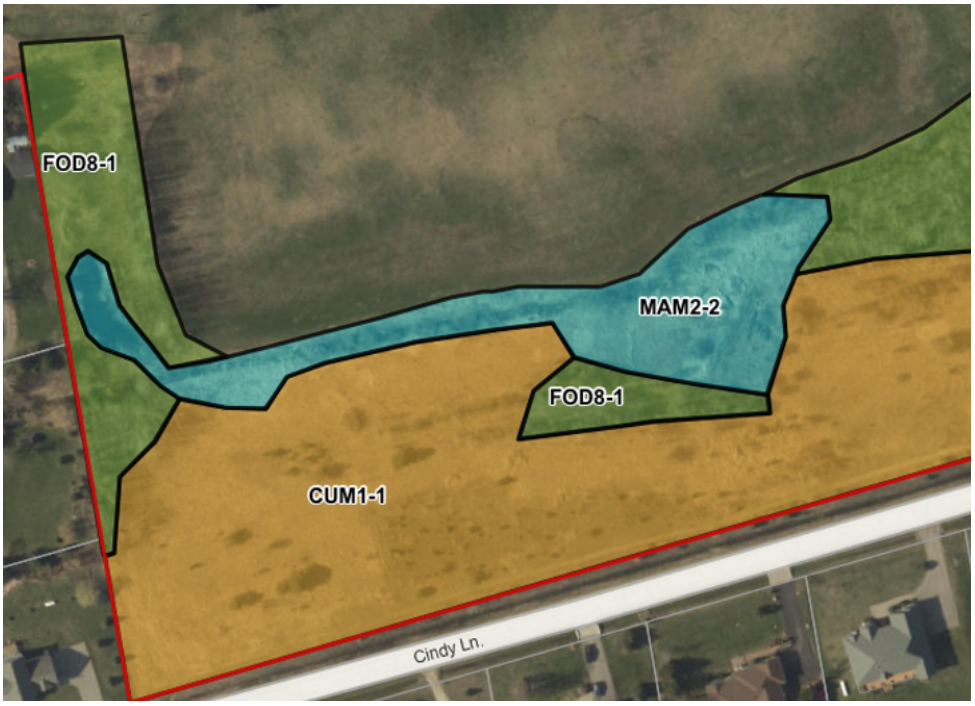
the site and surrounding lands and are considered common and widespread and demonstrably secure in the Province.

No stick nest or snags were observed.

6. SIGNIFICANT WETLANDS

The presence/absence of wetland features was determined through a review of available digital mapping resources; habitat analysis; as well as examinations of topographic mapping and field investigation.

Unevaluated wetlands are shown to be situated on land surrounding the property to west and east. Mapping did not indicate the presence of wetlands on the proposed development site, however, field work indicated the presence of small amounts of riparian wetland habitat associated with the watercourse and swale. This is identified as the MAM2-2 ELC unit which is situated along the northern perimeter of the proposed development area in the western portion of the site.



Development is therefore situated within the minimum area of influence associated with the unevaluated wetland. There are no provincially significant wetlands within or adjacent to the proposed development area.

As the area adjacent to the wetland is already subject to disturbances associated with the gold course and residential development, the introduction of a low-density residential use in proximity to the feature would not be expected to result in any significant disturbance.

The Provincial Policy Statement does not establish set buffers from wetland features. In this instance, the wetland is a small heavily disturbed feature created by past agricultural drainage practices and does not

provide significant wildlife habitat. A 15m vegetated buffer should be sufficient to maintain the functions of this wetland and should be either permanently demarcated on the lots with fencing or be left on the remnant parcel to be created by land division. The vegetated buffer should be left to naturally regenerate.

The wetland and associated buffer should be staked in the field prior to development to establish limits of grading and works.

As development will be situated in the vicinity of the wetland area and require grading works, silt fencing should be installed along the entire perimeter of this feature adjacent to the development area prior to any site disturbance. Silt fencing should be inspected and maintained during the construction period and should be in place until a stable surface cover is re-established.

A pedestrian trail is proposed to be situated within the wetland buffer. The trail is not intended to cross or enter the wetland and is intended to be utilized solely for passive enjoyment. Such development is generally compatible with the intended buffer feature and the following mitigative measures are recommended to ensure that there are no negative impacts to the wetland:

- Minimize the disturbance area to no greater than 3m width;
- Plant barrier vegetation along trail edges to help keep trail users on trails and limit disturbance in off-trail areas and, where possible, establish low growing plants within 1m of the trail to maintain sightlines and access;
- Avoid trail construction that results in small pools of water within and alongside the trail as these can act as “ecological traps”;
- Keep native soil in situ where possible;
- Maintain existing drainage patterns;
- Maximize permeability in trail surfaces by using porous surfacing materials (e.g., organics, mulch); and,
- Minimize ground compaction and rutting during trail construction and maintenance by working in dry conditions, limiting ground contact, and using low-impact machinery (e.g., tracked equipment; flotation tires), wherever possible.

The proposed development is relatively minor in nature and is consistent with other rural residential development situated in proximity to the wetland to the west of the subject lands.

No direct or indirect impacts are expected to occur to the unevaluated wetland as long as sedimentation impacts are avoided by the use of silt fencing as recommended and a 15m vegetated buffer is maintained.

7. HABITAT OF THREATENED AND ENDANGERED SPECIES

The presence/absence of habitat of threatened and endangered species was determined through examination of digital Ministry of Natural Resources and Forests reports and records; a review of habitat potential; and field investigation.

The Ministry of Natural Resources and Forests NHIC mapping has a single square which applies to the subject property. The information from this square indicates a record of Eastern Meadowlark (*Sturnella magna*) which is a threatened species.

Eastern Meadowlark (*Sturnella magna*) occupy certain large agricultural fields and long grass meadows. These species require long grasses to provide nesting habitat as well as feeding areas. The subject property has no habitat for this species. The proposed development will have no impact on this species.

Due to a prevalence of both Black Ash (*Fraxinus nigra*) and Butternut (*Juglans cinerea*) in the Township, surveys were conducted on the property which resulted in no observations of either of these species within or adjacent to the building envelope assessment area.

There are no trees of sufficient size or density to provide habitat for Species at Risk bats.

A review of eBird Data for endangered and threatened avian species observations within 200m of subject lands was conducted and no species were noted other than Meadowlark which has been previously addressed in this report.

A review of iNaturalist observation of species within 200m of subject lands was conducted and no SAR species were reported.

No observations of threatened or endangered species, or habitat suitable for such species, occurred during the site visit.

The construction of a low density residential lots and associated accessory uses and services in the potential building envelope, a previously disturbed and cleared area, will not impact threatened or endangered species or their habitat.

8. FISH HABITAT, INTERMITTENT AND PERMANENT WATERCOURSES

The presence/absence of fish habitat and intermittent and permanent watercourses was determined through examination of Ministry of Natural Resources and Forests mapping; Official Plan mapping; habitat analysis; and, field investigation.

Mapping indicates the at Tributary of the Pine River flows from east to west across the northern perimeter of the proposed development area.

During the site visit it was apparent that the watercourse was diverted from the northerly limit into the golf course and a golf course pond feature in the easterly portion of the property and also continues as a small area swale which was observed along the northern portion of the proposed development area east of where the watercourse is diverted.

During field visits on standing pockets of water were observed in the watercourse/swale. It is anticipated that more significant flows would occur during run-off events. No fish species were observed in these features.

The building envelope assessment area is situated adjacent to the watercourse/swale. The wetland is coincident with a large portion of the watercourse. Again, given site conditions, the nature of the watercourse, existing levels of disturbance, a 15m vegetated buffer from the edge of wetland and watercourse should be sufficient to maintain the functions of these features. We note that a hazard land assessment (prepared by others) may require a specific setback for structures and grading alterations, however, for natural heritage purposes a 15m vegetated buffer is sufficient.

As previously noted, development will be situated adjacent to the watercourse, and silt fencing should be installed at the perimeter of the construction areas prior to any site disturbance. Silt fencing should be inspected and maintained during the construction period and should be in place until a stable surface cover is re-established.

The proposed development is relatively minor in nature and is consistent with other rural residential development situated in proximity to the riparian features to the west and north-east of the subject lands.

No direct or indirect impacts are expected to occur the watercourses as long as sedimentation impacts are avoided by the use of silt fencing as recommended and a 15m vegetated buffer is maintained.

Figure 7 Approximate Buffer Location (see details in Draft Plan)

9. SIGNIFICANT WOODLANDS

The presence/absence of significant woodlands was determined through examination of mapping and field investigation.

There are no significant woodlands identified on the subject property or within 120 metres.

There are no significant woodlands on the subject lands or on adjacent lands and there is no potential for direct or indirect impacts on significant woodlands.

10. SIGNIFICANT VALLEYLANDS

The presence/absence of significant valleylands was determined through examination of mapping and field investigation.

The proposed development area is not located adjacent to or within significant valleylands.

11. SIGNIFICANT WILDLIFE HABITAT

The presence/absence of significant wildlife habitat features was determined through examination of

mapping, habitat and vegetation analysis, and field investigation.

A summary analysis of significant wildlife habitat potential is set out in Appendix C to this report.

Potential turtle wintering and nesting habitat is associated with the golf course pond features situated to the north of the proposed development area. The proposed development area is sufficiently separated from these features by watercourse and wetland features along the northern perimeter of the development area and the 15m vegetated buffers recommended for those features.

Although amphibians were observed within the wetland and riparian areas, call levels were insufficient to establish these areas as significant wildlife habitat. However, this habitat will be protected by the recommended non-disturbance and 15m buffers proposed for these features.

The NHIC mapping square covering the subject property identified two species of Special Concern: Golden Winged Warbler (*Vermivora chrysoptera*) and Common Five-lined Skink (*Plestiodon fasciatus*).

Golden Winged Warbler (*Vermivora chrysoptera*) are currently listed as Special Concern within the Province. This species prefers early successional habitats with dense understories with heavy shrub cover. This species can also be found within wetland thickets or bogs. Although there is a very small portion of the property that is successional habitat, no Golden Winged Warblers were observed during any site investigation and the extent of habitat is anticipated to be a limiting factor.

Common Five-lined Skink (Plestiodon fasciatus) are currently listed as Special Concern within the Province. This species occupies forest clearing and edge habitats primarily with exposed bedrock. This species is currently extirpated from this part of the Province. Additionally, the property does not provide habitat for this species.

There are no significant wildlife habitat features in the potential development area or on adjacent lands other than the identified potential for turtle wintering and nesting habitat situated to the north of, and well separated from, any potential disturbance area.

The proposed development will not detrimentally impact significant wildlife habitat.

12. SAND BARRENS, SAVANNAHS AND TALL GRASS PRAIRIES

The presence/absence of sand barrens, savannahs and tall grass prairies was determined through examination of mapping, habitat and vegetation analysis, and field investigation.

There are no sand barrens, savannahs or tall grass prairies on or adjacent to the development site and there is no potential to impact such features.

13. KETTLE LAKES

The presence/absence of kettle lakes was determined through examination of mapping, and field investigation.

There are no kettle lakes on or adjacent to the development site and there is no potential to impact kettle lakes.

14. SEEPAGE AREAS AND SPRINGS

The presence/absence of spring areas and seepage areas was determined through examination of mapping, and field investigation.

There is no evidence of seepage or springs within or adjacent to the disturbance areas and there is no potential for the proposed development to impact seepage areas or springs.

15. SIGNIFICANT AREAS OF NATURAL AND SCIENTIFIC INTEREST

The presence/absence of Areas of Natural and Scientific Interest (ANSI) was determined through a review of Ministry of Natural Resources, and County of Simcoe and Township information.

The lot is not situated within the minimum area of influences of any Areas of Natural and Scientific Interest. There is no potential for the proposed development to impact the ANSI.

16. NATURAL DIVERSITY AND CONNECTIONS

Construction in the proposed previously cleared building envelope will have had no negative impact on natural diversity and connections of the area. The existing disturbed and cleared area does not provide diversity or corridor functions. Development is sufficiently separated from the riparian corridor by the recommended 15m buffers. The maintenance of this corridor will allow for continuation of limited connectivity functions represented by this corridor which is already impacted by existing residential and recreational development.

17. MIGRATORY BIRDS ACT AND FISH AND WILDLIFE CONSERVATION ACT

All migratory bird nests are protected by the Migratory Birds Act when they contain a live bird or viable egg. The nests of 377 migratory bird species can be removed when they are no longer active, that is when they do not contain a live bird or viable egg. For most nests, once the chicks have fledged have left the nest on their own, and it is no longer occupied by a migratory bird or eggs, they no longer continue to have conservation value, and most species will build a new nest each year.

There are some migratory birds who either re-use their own nests from one year to the next, or whose nests are commonly re-used by other species of migratory birds. The nests of 18 species listed in Schedule 1 of the Migratory Birds Act are protected year-round. Of these 18 species, the following occur in Ontario Great Egret, Great Blue Heron, Cattle Egret, Green Heron, Snowy Egret, Black-crowned Night Heron and Pileated Woodpecker.

Birds protected by the Fish and Wildlife Conservation Act are: pelicans, cormorants, vultures, ospreys, kites, eagles, hawks, caracaras, falcons, partridges, pheasants, grouse, ptarmigan, turkey, quail, owls, kingfishers, jays, nutcrackers, magpies and ravens. Specially protected birds include American White Pelican, Belted Kingfisher, Gray Jay, Blue Jay, Common Raven, Rusty Blackbird, Brewer‘s Blackbird and Yellow-headed Black bird.

While no stick nests, owl nesting cavities or Schedule 1 nests were observed in or adjacent to the proposed disturbance area during site investigations associated with the preparation of this assessment,

nesting may occur prior to the proposed activities.

To ensure compliance and avoid damaging nest of avian species the following recommendations apply to both the proposed filling activity as well as any subsequent development:

- no tree clearing between April 1st and August 31, unless the proposed clearing area has been reviewed by a qualified ecologist who determines no active nests are present;
- no clearing of any trees containing Schedule 1 nests at any time of year, unless the nest has been abandoned, the appropriate waiting period has elapsed and the nest is declared abandoned in accordance with regulatory requirements under the Migratory Birds Act;
- no clearing of any trees containing stick nests or owl nesting cavities at any time of year, unless the proposed clearing area has been reviewed by a qualified ecologist who determines no active or viable long-term nests of species of concern are present.

18. CONCLUSION

The lands on which the residential use is proposed has already significantly influenced by past clearing. The associated natural heritage values are correspondingly reduced from a “natural” environment.

The proposed development area, utilizing recommended buffers, is adequately separated from the unevaluated wetland and significant wildlife habitat features associated with small already heavily disturbed riparian system. No significant tree removal is proposed. All development is to be situated outside the floodplain and associated riparian areas. The maintenance of appropriate natural vegetation buffers and utilization of silt fencing during the construction period has been recommended to avoid any potential for indirect impacts. Tree removal should also occur in such a manner as to not impact nesting birds. Recommendations have also be provided to guide proposed trail development in the recommended buffer so as to avoid ecological impacts.

On this basis, the planning approvals for residential large lot development, and associated accessory uses and services is appropriate and is consistent with the requirements of the Provincial Policy Statement and conforms to the Official Plans of the County of Simcoe and the Township of Adjala-Tosorontio regarding matters of natural heritage protection.

Michael Wynia, MCIP, RPP
Environmental Planner

Note: Photo/mapping credits: Aerial photos and mapping base obtained from the County of Simcoe (Geographic Information Systems, 2023).

APPENDIX A – SPECIES AT RISK ASSESSMENT

SCIENTIFIC NAME	COMMON NAME	STATUS	SYNONYMS	S RANK	S RANK REASONS (NHIC DATA)	HABITAT DESCRIPTION (NHIC INFORMATION UNLESS NOTED ADDITIONAL INFORMATION)	POTENTIAL	OBSERVED/COMMENTS
Acipenser fulvescens pop. 3	Lake Sturgeon (Great Lakes - Upper St. Lawrence River population)	END		S2		The Lake Sturgeon lives almost exclusively in freshwater lakes and rivers with soft bottoms of mud, sand or gravel. They are usually found at depths of five to 20 metres. They spawn in relatively shallow, fast-flowing water (usually below waterfalls, rapids, or dams) with gravel and boulders at the bottom. However, they will spawn in deeper water where habitat is available. They also are known to spawn on open shoals in large rivers with strong currents. n North America, Lake Sturgeon can be found from Alberta to the St. Lawrence drainage of Quebec and from the southern Hudson Bay to the lower Mississippi. In Ontario, the Lake Sturgeon is found in the rivers of the Hudson Bay basin, the Great Lakes basin and their major connecting waterways,	Y	No habitat

						including the St. Lawrence River. There are three distinct populations in Ontario: Great Lakes - Upper St. Lawrence, Saskatchewan - Nelson River, and Southern Hudson Bay - James Bay.		
Agalinis gattingeri	Gattinger's False Foxglove	E N D	*Gerardia gattingeri*	S2 S3	Most Ontario populations are on alvars on the Bruce Peninsula and Manitoulin Island. Otherwise known only from prairies on Walpole Island First Nation and a 1952 record from Glen Morris (Brant County). According to the Ontario recovery strategy (Jones 2015) there are 26 extant Ontario occurrences, most of which are on Manitoulin Island. The species is in serious decline on Walpole Island. Abundance fluctuates from year to year. First collected in Ontario by Charles K. Dodge (GH) in 1904 from Squirrel Island, Lambton County.	Gattinger's Agalinis grows in dry prairie, dry open woodlands, dry roadsides, glades, bluffs and alvars. In Ontario, this species is found in dry tallgrass prairies in Lambton County and on alvars in Bruce County and Manitoulin Island Region. Alvar is a dry, open habitat with very thin soil over a rocky or limestone base. Gattinger's Agalinis grows in low, sparse vegetation, in shallow soil or nearly bare ground, between tussocks of grass. Gattinger's Agalinis grows in dry prairie, dry open woodlands, dry roadsides, glades, bluffs and alvars. In Ontario, this species is found in dry tallgrass prairies in Lambton County and on alvars in Bruce County and Manitoulin Island Region. Alvar is a dry, open habitat with very thin soil over a rocky or limestone base. Gattinger's Agalinis grows in low, sparse vegetation, in	N	NA

						shallow soil or nearly bare ground, between tussocks of grass.		
Agalinis skinneriana	Skinner's agalinis	E N D	*Gerardia skinneriana, Tomanthera skinneriana*	S1	A pale-flowered species of prairie remnants restricted in the province to Walpole Island First Nation and the Ojibway Prairie area of Windsor, Essex County. Of global conservation concern (G3G4) and first collected in Ontario by Charles K. Dodge (GH) in 1904 from Squirrel Island, Lambton County. See Argus et al. (1982-1987), Brodowicz (1990), Canne-Hilliker (1988), COSEWIC (2000f, 2010), Dieringer (1999), Kercher and Sytsma (2000).	Skinner's agalinis only grows in tallgrass prairie habitats in Ontario, an extremely rare ecosystem in the province. It probably has a range of host species, but the only confirmed connection is to the prairie grass, Little bluestem (Schizachyrium scoparium). Skinner's agalinis is rare throughout its range in central North America which extends from extreme southwestern Ontario, west to Indiana, Minnesota and Kansas. In Canada, it is found only in southwestern Ontario – on two islands in the St. Clair River delta, at Lake St. Clair, and also in a small prairie near Windsor.	N	NA
Aletris farinosa	White Colicroot	E N D		S2	Prairies, open sandy woods and edges in southwestern Ontario. Has disappeared from several historically documented sites. First collected in Ontario in 1901 by John Macoun at Sandwich, Essex County (CAN). Placed in the Stemonaceae by FNA (2002) and included in Liliaceae by other authors. See Argus et al. (1982-1987), Killingbeck et al. (1998), Soper (1962), Stewart (1979), Sutherland (1987).	In Ontario, Colicroot grows in open, sunny, and moist habitats with sandy or mucky soil, such as prairies and old abandoned fields. It has also been found along roadsides and forest edges. It does not tolerate shade or competition from other plants and appears to do well in areas that are kept open by fire, drought, grazing and other disturbances.	N	NA

						In Canada, Colicroot is found only in southwestern Ontario.		
Allogona profunda	Broad-banded Forestsnail	E N D	*Polygyra profunda*	S1 S2	Known historically from 16 locations at which it has been documented extant at only 10 in a recent (2013) survey of more than 60 known historical occurrences and prospective sites in southern Ontario. Documented extant (empty shells) at eight sites, but at only two were lives specimens found. 	Broad-banded Forestsnails are found mainly in forest and woodland on sandy soil in Ontario, but shells have also been seen in wooded alvars and shrubby vegetation on sandy soil near deciduous forests. The snails are active during the day and night, but retire to shelter during the mid-morning to late afternoon. Broad-banded Forestsnails hibernate by burying 5 to 10 cm under the soil or under leaf litter on the forest floor. They require damp habitat for feeding, accessibility, and reproduction. The Broad-banded Forestsnail now occurs only at Point Pelee National Park and on Pelee Island; although in the past it was found at other mainland locations and islands in Lake Erie. It is also found in the United States.	N	NA
Ambystoma hybrid pop. 1	Unisexual Ambystoma (Jefferson Salamander dependent population)	E N D	*Ambystoma JJJL, Ambystoma hybrid pop. 1, Ambystoma platineum, Ambystoma pop. 1, Ambystoma x platineum*	S2	The presence of polyploid Ambystoma salamanders where the Jefferson genome dominates indicates the presence of pure Jefferson Salamander (Ambystoma jeffersonianum) at the same site. Jefferson dominated polyploids are known from fewer than 20 sites in the province and are vulnerable to habitat loss and fragmentation. Element occurrence records will only be entered for Jefferson dominated polyploids at sites where	Unisexual Ambystoma salamanders live in leaf litter, under logs and in underground cavities in deciduous and mixed forests, typically within close proximity to breeding habitats. Adults breeds in vernal pools (temporary woodland ponds) or fish-free permanent wetlands. They lay their eggs in clumps attached to	Y	No habitat.

					pure Jefferson Salamanders have not also been documented.	underwater vegetation in shallow water. The eggs hatch into aquatic larvae after about one month, and the larvae transform into juveniles by the end of summer. The juveniles leave the pond and head into the surrounding forest. Unisexual Ambystoma salamanders spend the winter underground where they can get below the frost line and avoid freezing temperatures, such as in mammal burrows, rock crevices or other underground cavities. Although these salamanders spend much of the year underground or under cover, they can often be observed in early spring when they travel to breeding sites. In Canada, the Unisexual Ambystoma (Jefferson Salamander dependent population) salamanders are restricted to southern Ontario, mainly along the Niagara Escarpment. The Unisexual Ambystoma (Jefferson Salamander dependent population) also occurs across parts of the northeastern U.S.		
Ambystoma jeffersonianum	Jefferson Salamander	END		S2	Currently ranked as S2. Although there are more than 20 occurrences in Ontario, good abundance information is lacking for many of them. Therefore, an S2 rank is warranted because the species may be vulnerable to population declines or extirpation.	Adults live in moist, loose soil, under logs or in leaf litter. Your best chance of spotting a Jefferson salamander is in early spring when they travel to woodland ponds to breed. They lay their eggs in	Y	No habitat

						clumps attached to underwater vegetation. By midsummer, the larvae lose their gills and leave the pond and head into the surrounding forest. Once in the forest, Jefferson salamanders spend much of their time underground in rodent burrows, and under rocks and stumps. They feed primarily on insects and worms. The Jefferson salamander lives in deciduous forests. Its range extends across parts of the northeastern U.S. In Canada, it is found only in southern Ontario, mainly along the Niagara Escarpment.		
Ambystoma pop. 4	Unisexual Ambystoma (Small-mouthed Salamander dependent population)	E N D	*Ambystoma hybrid pop. 1, Ambystoma platineum, Ambystoma pop. 4, Ambystoma x platineum*	S1	Very rare; restricted in Ontario to Pelee Island where it is dependent on the rare Small-mouthed Salamander (Ambystoma texanum) as a sperm donor.	Unisexual Ambystoma salamanders live in leaf litter, under logs and in underground cavities in deciduous and mixed forests, typically within close proximity to breeding habitats. Adults breeds in vernal pools (temporary woodland ponds) or fish-free permanent wetlands. They lay their eggs in clumps attached to underwater vegetation in shallow water. The eggs hatch into aquatic larvae after about one month, and the larvae transform into juveniles by the end of summer. The juveniles leave the pond and head into the surrounding forest. Unisexual Ambystoma salamanders spend the	N	NA

						winter underground where they can get below the frost line and avoid freezing temperatures, such as in mammal burrows, rock crevices or other underground cavities. Although these salamanders spend much of the year underground or under cover, they can often be observed in early spring when they travel to breeding sites. The Unisexual Ambystoma (Small-mouthed Salamander dependent population) have a very restricted global distribution and are only found on Pelee Island in Ontario, Canada as well as in Ohio, Michigan and Indiana in the U.S.		
Ambystoma texanum	Small-mouthed Salamander	E N D		S1	The Smallmouth Salamander is extremely rare in Ontario with only one occurrence; all confirmed Canadian records are from Pelee Island. Most breeding populations are near Fish Point on the southern tip of Pelee Island (Bogart and Licht 1991, p. 3), restricting the range even further. If the remaining habitat for the species was destroyed, altered through draining seasonally flooded areas, or developed for recreational purposes, Smallmouth Salamander populations would be threatened further.	The Small-mouthed salamander prefers moist habitats, such as tall grass prairies, dense deciduous forests and agricultural lands that provide suitable breeding ponds. They require soft soil for digging burrows and ponds without fish for breeding. Eggs are laid on leaf litter and debris at the bottom of the pond. It is important that the ponds do not support fish because these predators would eat the young salamanders. Adults spend most of the non-breeding season	N	NA

						hidden in burrows dug by themselves or by other animals, underneath decomposing tree trunks, rocks or fallen leaves. n Canada, the Small-mouthed salamander is found only on Pelee Island in extreme southwestern Ontario. This species was considered locally abundant in 1991, but by 2000 the range of this salamander decreased substantially, when two out of only five known breeding ponds dried up. There are currently no population estimates for the Small-mouthed Salamander on Pelee Island.		
Ammannia robusta	Scarlet Ammannia	E N D	*Ammannia coccinea*	S1	Moist muddy or sandy open areas particularly shorelines. Sometimes in disturbed situations such as artificial ponds and edges of moist agricultural fields. First collected in Ontario in 1974 by Wilfred Botham at Hillman Marsh, Essex County (CAN; Campbell and Reznicek 1977), and since then found at a few additional sites both on Pelee Island and the Essex County mainland. Roberts and Stuckey (1992) suggested that the northward expansion of the range of Ammannia robusta into the western Lake Erie area may have been facilitated by the Ohio Canal System. See also Argus et al. (1982-1987), Baskin et al. (2002), Baumbrough et al. (2003a), Graham (1985).	In Ontario, Scarlet ammannia is found on mudflats, sand beaches, and the edges of wetlands and ponds that are seasonally flooded. Fluctuating water levels are important to its survival. It does well in habitat that is generally submerged early in the year and when water levels recede later in the summer the plants emerge. Scarlet ammannia ranges from south central British Columbia southward to Central America, and eastward through the United States to Ohio and southwestern Ontario in the north, and Tennessee in the south.	N	NA

						It is not found on the eastern coast of North America, with the exception of New Jersey where it is considered non-native.		
Ammocrypta pellucida	Eastern Sand Darter	END	*Ammocrypta pellucida pop. 1, Ammocrypta pellucidum, Etheostoma pellucida, Etheostoma pellucidum*	S2		The Eastern Sand Darter prefers shallow habitats in lakes, streams, and rivers with clean, sandy bottoms. It often buries itself completely in the sand. It feeds on aquatic insects, but due to its small mouth is limited in the size of prey it can eat. In Ontario, the Eastern Sand Darter is found in Lake St. Clair, Lake Erie, West Lake, Big Creek and in the Grand, Sydenham, Thames and Detroit rivers. The species may have disappeared from several other rivers in southwestern Ontario. In 2008 it was rediscovered in Big Creek after an absence of more than 50 years.	N	NA
Anaxyrus fowleri	Fowler's Toad	END	*Bufo fowleri, Bufo woodhousii fowleri*	S2	Fowler's Toad is currently ranked as S2 because of its very restricted range, low-moderate abundance, and fewer than 20 extant EOs. Most Ontario populations are small, and populations are largely fragmented (except at a few larger sites such as Long Point and Rondeau). Nationally, Green (1998) notes that a status of "Threatened" is now warranted because of the cyles of rise and decline observed from his research (1988-1997) and the small	In Ontario, Fowler's Toads inhabit open beaches, dunes, sandy shorelines, rocky pools, creek and stream mouths, backshore wetlands, and marshes along the northern shore of Lake Erie. Fowler's Toad is found throughout much of eastern North America, from the Gulf Coast north to the Great Lakes. In Canada,	N	NA

					number of source populations in the province.	Fowler's Toad is restricted to only three localities: Rondeau, Long Point and Niagara.		
Anguilla rostrata	American Eel	E N D		S1 S2		Over the course of its life, the American Eel can be found in both salt and fresh water. In fact, some scientists consider the American Eel to have the broadest diversity of habitats of any fish species in the world. The American Eel starts life in the Sargasso Sea in the North Atlantic Ocean and migrates along the east coast of North America. In Canada, it is found in fresh water and salt water areas that are accessible from the Atlantic Ocean. This area extends from Niagara Falls in the Great Lakes up to the mid-Labrador coast. In Ontario, American Eels can be found as far inland as Algonquin Park. Once the eels mature (10-25 years) they return to the Sargasso Sea to spawn.	Y	No habitat
Anguispira kochi	Banded Tigersnail	E N D		S1 S2		In Canada, the Eastern Banded Tigersnail inhabits moist old hardwood or mixed-wood forests. In Ontario, it has been found in Chinquapin Oak-Nodding Onion treed alvar, dry-fresh Hackberry deciduous forest, dry-fresh Sugar Maple-White Ash	N	NA

						deciduous forest, and dry Black Oak woodland. These habitats are described as having either limestone bedrock with vegetative cover or sandy soil with a leaf litter layer. The Eastern Banded Tigersnail currently occurs on two islands in Lake Erie: Pelee Island and Middle Island. It was also historically found on Middle Sister Island, East Sister Island and North Harbour Island but now appears to be extirpated from these locations. It is unknown if this species still exists on Hen Island.		
Apalone spinifera	Spiny Softshell	END	*Amyda ferox spinifera, Trionyx ferox spinifera, Trionyx spiniferus*	S2	There are about twenty occurrences in Ontario but a few of these occurrences cover large areas (e.g., Long Point, Thames and Sydenham rivers) and have many individuals; some are based on single sight reports. The majority of extant populations is restricted to Southwestern Ontario but there are recent reports of individuals in Prince Edward County, and along the St. Lawrence and Ottawa rivers in Eastern Ontario (which could be wandering individuals or misidentifications). The species is susceptible to land use changes (e.g., shoreline development and stabilization projects) and recreational use. This is of concern given the bulk of the softshell population is in the most populated area of Ontario where development and recreational pressures are the greatest. Habitat has been lost or fragmented, resulting in reduced availability of suitable basking,	Spiny softshells are highly aquatic turtles that rarely travel far from water. They are found primarily in rivers and lakes but also in creeks and even ditches and ponds near rivers. Key habitat requirements are open sand or gravel nesting areas, shallow muddy or sandy areas to bury in, deep pools for hibernation, areas for basking, and suitable habitat for crayfish and other food species. These habitat features may be distributed over an extensive area, as long as the intervening habitat doesn't prevent the turtles from traveling between them.	N	NA

					nesting and overwintering habitat and poorer quality habitat for the species. There is a lack of population data prior to 1990s, but presumed declines in numbers are based on loss of habitat and fragmentation of its former range in the province.	In Canada, the Spiny softshell is found only in Quebec and southwestern Ontario in the Lake St. Clair, Lake Erie and western Lake Ontario watersheds. The majority of Spiny softshells in Ontario are found in the Thames and Sydenham rivers and at two sites in Lake Erie. The size of the home range of this turtle depends on availability of habitat features such as nesting and hibernation sites. Some turtles travel up to 30 kilometres in a year from one part of their home range to another.		
Aquila chrysaetos	Golden Eagle	END		S1B, S4N	A very rare breeding species with an estimated 10-20 pairs in extreme northern Ontario. Appears to have declined in numbers and range from historical levels although recent evidence suggests that this species is increasing in numbers. Extremely sensitive to human disturbance during the breeding season. Very uncommon but increasing in migration (mostly fall) throughout the province and very uncommon but increasing in winter in southern Ontario.	Golden Eagles nest in remote, undisturbed areas, usually building their nests on ledges on a steep cliff or riverbank, but they will also use large trees if needed. Most hunting is done near open areas such as large bogs or tundra. During migration they could be encountered anywhere, but are most frequently seen migrating west along the shores of Lake Ontario and Erie in November. Small numbers also winter in the southern half of Ontario, most often near large deer wintering areas where carcasses might be found. In Canada, Golden Eagles are most common in the	N	NA

						western mountains and prairies but are also fairly widespread in Labrador and Quebec's Ungava peninsula. In Ontario, breeding Golden Eagles are presently known only from the Hudson Bay Lowland, although there is some evidence suggesting they once nested much further south. Currently there are believed to be 10 to 20 pairs in the province.		
Aristida basiramea	Forked Threeawn Grass	E N D		S2	First confirmed in Ontario in Simcoe County in 1975 by A.A. Reznicek (Catling et al. 1977). An earlier record from Norfolk County (reported as A. intermedia by Cruise 1969) is probably the result of a labelling error (Argus et al. 1982-1987), and an early specimen from Hamilton by George Lawson in 1862 (CAN 220976) may also be mislabelled. Recently discovered by Judith Jones at several additional sites in Simcoe County. A population found along a roadside in Rainy River District in 2001 is probably non-native. See Allen (2003), Brisson (2004), COSEWIC (2002d), Jones (2007), Shinners (1940).	Forked Three-awned Grass grows on open, bare ground or in sparsely-covered grassy areas, often in bare spots between patches of other species of grasses. The maintenance of this type of habitat requires periodic disturbances, such as fire or drought, to prevent other plants from dominating the area. However, some forms of disturbance facilitate the establishment of invasive plant species that can outcompete Forked Three-awned Grass. Forked Three-awned Grass is found primarily in the Midwestern United States, west from Colorado, south to Texas, east to Maine, and north to central Minnesota, northern	N	NA

						Wisconsin and northern Michigan. In Canada, Forked Three-awned Grass is found only in southwestern Quebec and southern Ontario, with one likely introduced population found in the Rainy River area of northwestern Ontario.		
Asclepias quadrifolia	Four-leaved milkweed	E N D		S1	Dry, calcareous woods. Recently (2006) discovered in Canada at two sites in Prince Edward County by Sean Blaney and David Bree (Oldham 2007). First collected in Ontario in 1888 by Mathilde M. Schlegel (MICH) from "Foster's Flats, Ont." (Niagara Region). Collected in 1892 by John Macoun at Bay of Quinte, Hastings County (QK) and reported from Adolphustown and the vicinity of Napanee (Macoun 1883-1890). Also known from several other old specimen records from the Niagara Peninsula area of Ontario where it has not been seen since 1956 despite considerable fieldwork in the region (Oldham 2010). See Cabin et al. (1991), Pleasants and Chaplin (1983), Wilbur (1976), Woodson (1954).	Four-leaved Milkweed typically occurs on dry to somewhat moist, shallow or rocky soils over limestone, or sometimes sandstone, bedrock within mature deciduous woodlands and sometimes in forests, thickets or meadows. In Ontario, it is found in two types of habitat: (1) dry woodlands dominated by Tallgrass prairie herbs, Bur Oak and Shagbark Hickory, and (2) a woodland alvar dominated by Red Cedar and pasture grasses, which was probably created by human activities. Four-leaved Milkweed is at the northern limit of its range in Ontario and New England. There are only two known populations remaining in Ontario, both in Prince Edward County. Historically, populations have also been recorded from the neighbouring Lennox and Addington	N	NA

						County, as well as from the Niagara River gorge.		
Aureolaria virginica	Downy Yellow False Foxglove	E N D	*Gerardia virginica*	S1	A very local and declining species of dry open woods and savannas in southwestern Ontario. First collected in Ontario in 1901 by John Macoun at Queenston Heights, Niagara Region (CAN). The species has been recently verified at five Ontario locations, with three-quarters of the estimated 400 to 600 plants at a single site. McLeod (1990) notes loss of suitable forested habitat, habitat specificity (e.g., dependent on White Oak and dry-mesic habitats), and forest fragmentation as serious threats affecting the species. See Argus et al. (1982-1987), King (1989), Soper (1952).	Fern-leaved Yellow False Foxglove is found in open savanna and woodland habitats along with Black Oak (Quercus velutina), its preferred host tree. The full range of Fern-leaved Yellow False Foxglove beyond southern Ontario covers most of the Eastern United States extending from Minnesota to Maine in the north and from Louisiana to Florida in the south. Fern-leaved Yellow False Foxglove is largely restricted to the Carolinian ecoregion. There are six subpopulations remaining in Ontario which are found in: Hamilton Halton Lambton Norfolk Niagara Two additional populations may persist in Brant County and Walpole Island First Nation. About 19 subpopulations have been extirpated including ones in Essex, Waterloo and the city of Toronto.	N	NA
Betula lenta	Cherry Birch	E N D		S1	First collected in Ontario in 1952 by Bert Miller at Port Dalhousie, Niagara Region (HAM, TRT), and still present in this area. Formerly occurred in the Niagara Glen based on a 1953 specimen in the Niagara Parks Commission herbarium (verified by M.J. Oldham in 2007),	In Ontario, the Cherry Birch is found on moist, well-drained clay loam soil over limestone bedrock with White Oak, Red Oak, Eastern Hemlock, Sugar Maple and other deciduous trees.	N	NA

					though recent searches of the area have not rediscovered the species (Oldham 2007, 2010). Cherry Birch is threatened by residential development, shoreline erosion, lack of regeneration, and has a very restricted range and small population in deciduous woods in the Niagara Peninsula area. See COSEWIC (2006c), Fox and Soper (1954), Higginbotham et al. (1989), Sharik and Barnes (1971, 1976, 1979), Sharik and Ford (1984).	The single population of Cherry Birch in Canada is isolated at two sites on the Niagara peninsula in southern Ontario. A survey of the two sites in 2010, found only 17 trees out of the 50 trees that were originally identified in 1967.		
Bombus affinis	Rusty-patched Bumble Bee	E N D	*Bombus (Bombus) affinis*	S1	Ontario is a large jurisdiction with a land area of approximately 1,076,395 km2. The province includes three ecozones (Mixedwood Plains, Boreal Shield, and Hudson Plains). The largest ecozone represented in this province is the Boreal Shield. Threats to bees and bee communities in the northern part of the province (i.e., Boreal Shield and Hudson Plains) are largely unknown, but probably minimal. Threats are probably severe in the southern areas of the province, and particularly intense much of the Mixedwood Plains. The bee fauna is poorly studied in most areas of the north, mainly due to inaccessibility, excluding urban areas and transport corridors connecting these urban areas. The ecozones within the north remain largely unmodified, aside from the longer-term effects of climate change. Given the natural history information available, we assume that the bee fauna is largely unchanged in the north. The Mixedwood Plains are particularly important for bees, and are relatively well known, having been studied several times since the 1960's. However, a long history of	This species, like other bumble bees, can be found in open habitat such as mixed farmland, urban settings, savannah, open woods and sand dunes. The most recent sightings have been in oak savannah, which contains both woodland and grassland flora and fauna. The Rusty-patched bumble bee was once widespread and common in eastern North America, found from southern Ontario south to Georgia and west to the Dakotas. The species has suffered rapid, severe decline throughout its entire range since the 1970s with only a handful of specimens collected in recent years in Ontario. The only sightings of this bee in Canada since 2002 have been at The Pinery Provincial Park on Lake Huron.	Y	NA – no recent observations

					agriculture in the ecozone (with much of the land converted to agriculture) has probably had a significant negative impact on bees. This region also has the highest number of introduced bee species in the country. In Canada known from southern ON, QC and NB (one specimen; a queen collected in1949 from Fredericton). Found in three eastern ecozones (Boreal Shield, Mixedwood Plains and Atlantic Maritime).Primitively eusocial bee. Generalist forager, species forms colonies that grow in abundance throughout the season. Floral resources are needed throughout the season. Food plants include Helianthus (Sunflowers), Asters, Solidago (Goldenrods), Lonicera (Honeysuckles), Vaccinium, Prunus, Aesculus			
Bombus bohemicus	Gypsy Cuckoo Bumble Bee	E N D	*Bombus (Psithyrus) ashtoni, Bombus (Psithyrus) bohemicus, Bombus ashtoni, Psithyrus ashtoni*	S1 S2	Ontario is a large jurisdiction with a land area of approximately 1,076,395 km2. The province includes three ecozones (Mixedwood Plains, Boreal Shield, and Hudson Plains). The largest ecozone represented in this province is the Boreal Shield. Threats to bees and bee communities in the northern part of the province (i.e., Boreal Shield and Hudson Plains) are largely unknown, but probably minimal. Threats are probably severe in the southern areas of the province, and particularly intense much of the Mixedwood Plains. The bee fauna is poorly studied in most areas of the north, mainly due to inaccessibility, excluding urban areas and transport corridors connecting these urban areas. The ecozones within the north remain largely unmodified, aside from the longer-term effects of climate	The Gypsy Cuckoo Bumble Bee is a holarctic species known to occur around the globe in Europe, Asia and North America. In Canada, the Gypsy Cuckoo Bumble Bee has been recorded in every province and territory except Nunavut and occurs in diverse habitats such as open meadows, agricultural and urban areas, boreal forest and woodlands. This bumble bee is thought to eat the pollen and nectar of a wide variety of plants. Gypsy Cuckoo Bumble Bees are a parasitic species which follows the life cycle pattern and therefore, in part, the	Y	NA – no recent observations

					change. Given the natural history information available, we assume that the bee fauna is largely unchanged in the north. The Mixedwood Plains are particularly important for bees, and are relatively well known, having been studied several times since the 1960's. However, a long history of agriculture in the ecozone (with much of the land converted to agriculture) has probably had a significant negative impact on bees. This region also has the highest number of introduced bee species in the country. In Canada known from YT, NT, BC, AB, SK, MB, ON, QC, NB, NS, PE and NL. Cuckoo bumble bee. Host bees are Bombus affinis, Bombus terricola, Bombus cryptarum (?) and Bombus occidentalis. Recorded from most ecozones, although historically most common in eastern ecozones and the most recent records are from 2008. Some of the host species appear to have declined. Plath (1934) lists the eastern species (MB, ON, QC, NS, NF, NB, PE) as Bombus affinis and Bombus terricola (declining) as hosts. In the west in BC, AB, SK, YT, NT the host species are unknown but likely Bombus cryptarum, Bombus terricola (declining) and Bombus occidentalis (declining).	habitat of its hosts which are other bumble bees (e.g., the Rusty-patched and Yellow-banded Bumble Bees). In Ontario, the Gypsy Cuckoo Bumble Bee was historically found throughout most of the province; however in recent years it is known only to occur in Pinery Provincial Park. Despite recent search effort, few Gypsy Cuckoo Bumble Bees have been observed in the last 20 years in Ontario. Due to its decline across Canada, it is now only known to occur in three provinces based on evidence from recent survey efforts.		
Bombus suckleyi	Suckley's Cuckoo Bumble Bee	E N D	*Bombus (Psithyrus) suckleyi, Psithyrus suckleyi*	S H	Has not been recorded in Ontario since 1971.	Suckley's Cuckoo Bumble Bee occupies diverse habitats that include: lowland or montane meadows, or prairies farms and croplands urban areas boreal forest In early spring, the bumble bee species that are the	Y	NA – no recent observations

						hosts of Suckley's Cuckoo Bumble Bee usually establish nests in abandoned underground rodent burrows or other dry, natural hollows. Because Suckley's Cuckoo Bumble Bee is a nest parasite, these hosts' residences are part of its habitat. Suckley's Cuckoo Bumble Bee is primarily a western Nearctic species, found from southeastern Alaska to northern California, and east to Manitoba and Colorado. This species has been recorded in every Canadian province and territory except for Nunavut. While this species has been recorded on the east coast, it primarily occurs on the west coast, and becomes rarer east of the 100th meridian. Historically, Suckley's Cuckoo Bumble Bee distribution has been sparse and mostly limited to sporadic records in southern Ontario. There are three records of this species in northwestern Ontario near the borders with Manitoba and Minnesota, and one record south of James Bay close to the Quebec border. There have been extensive bumble bee surveys in southern Ontario that have not yielded any observations of Suckley's		

						Cuckoo Bumble Bee since 1971. Central and northern Ontario have not been adequately surveyed for bumble bees to determine whether Suckley's Cuckoo Bumble Bee still occurs there.		
Brychius hungerfordi	Hungerford's Crawling Water Beetle	END		S1	Hungerford's Crawling Water Beetle is a globally rare species and is endemic to the Great Lakes region. It is only known from five streams in Michigan and three streams in Ontario. It is a specialist of small to medium-sized streams characterized by a moderate to fast flow, good stream aeration, cool temperatures (15°C to 25°C), inorganic substrate, and alkaline water conditions. Populations are often, but not always, found immediately downstream from culverts, beaver dams, and human-made dams. The presence of the alga Dichotomosiphon may be a critical component of the habitat because the beetle larvae appear to be very dependent upon it as a food source. Some areas within two watersheds (Saugeen and Grey-Sauble) containing Hungerford's Crawling Water Beetle are relatively pristine while others are very degraded. Poor agricultural practices, wetland degradation, impoundment and other watercourse alterations, and urban development are current threats in these watersheds. There is some evidence that the habitat at the site on the North Saugeen River has been impacted in such a way that may have led to a decline or loss of the Hungerford's Crawling Water Beetle population at that site.	This beetle is found in small to medium-sized streams with cool, high quality, fast-flowing water, often immediately downstream from beaver dams, culverts and man-made barriers. As larvae, they may require a specific kind of algae (Dichotomosiphon) to eat. In Ontario, this beetle's range is restricted to three rivers in Bruce County. It has also been found in five rivers in northern Michigan. These are the only places in the world where this beetle is found.	N	NA

Buchnera americana	American Bluehearts	END		S1	Currently restricted in Canada to moist interdunal sandy meadows at the south end of Lake Huron in Lambton County. Dodge (1914) reported it as "Occasional in poor ground on the delta islands of St. Clair River. Abundant in sandy ground at Port Franks."; there have been no subsequent records from the St. Clair River delta islands (Walpole Island First Nation). First collected in Ontario in 1905 by Charles K. Dodge at Port Franks, Lambton County (MICH). Buchnera americana has declined significantly in the past century and is now of conservation concern in most states east of the Mississippi and in Ontario (FNA Vol. 17, 2019).	In Ontario, Bluehearts is found in wet meadow communities between sand dunes along shorelines where it is associated with plants characteristic of tallgrass prairies. This habitat is considered rare in Ontario. In Canada, Bluehearts is limited to three locations along a 10-kilometre stretch of the Lake Huron shoreline within the area between Kettle Point and Pinery Provincial Park.	N	NA
Calidris canutus pop. 4	Red Knot rufa subspecies - Southeastern USA / Gulf of Mexico / Caribbean wintering population	END		S1M		Red Knot rufa subspecies breed within the central Canadian Arctic before travelling thousands of kilometres south to overwinter. The Northeastern South America designatable unit of Red Knot rufa subspecies overwinters primarily in coastal areas of Brazil, with a small proportion in small groups in French Guiana and Suriname. The Southeast USA / Gulf of Mexico / Caribbean designatable unit of Red Knot rufa subspecies overwinters in coastal areas of Florida, Louisiana, the Texas/Mexico border region, and islands in the Caribbean Sea.	N	NA

						The Tierra del Fuego / Patagonia designatable unit of Red Knot rufa subspecies overwinters in coastal areas of Patagonia, including areas on the northern coastline of Tierra del Feugo, and further north in the San Jorge Gulf. During migration, the subspecies prefer open beaches, mudflats, and coastal lagoons, where they feast on molluscs, crustaceans, and other invertebrates. The Red Knot rufa subspecies only occurs in Ontario during migration, where it may feed and rest on beaches. The coastal mudflats along the southwest coast of Hudson Bay and James Bay in northern Ontario are very important staging sites (where birds stop to refuel) during both spring and fall migration. They are also regularly seen in small numbers during the fall in southern Ontario, usually along Great Lakes beaches and mudflats. Occasionally, large flocks have been seen in spring at select eastern Ontario beaches, such as Presqu'ile Provincial Park and Amherst Island, when birds flying non-stop from		

						Delaware Bay to James Bay are forced to land because of bad weather.		
Calidris canutus rufa	Red Knot rufa subspecies - Tierra del Fuego / Patagonia wintering population	E N D		S1 M		Red Knot Rufa subspecies breed within the central Canadian Arctic before travelling thousands of kilometres south to overwinter. The Northeastern South America designatable unit of Red Knot rufa subspecies overwinters primarily in coastal areas of Brazil, with a small proportion in small groups in French Guiana and Suriname. The Southeast USA / Gulf of Mexico / Caribbean designatable unit of Red Knot rufa subspecies overwinters in coastal areas of Florida, Louisiana, the Texas/Mexico border region, and islands in the Caribbean Sea. The Tierra del Fuego / Patagonia designatable unit of Red Knot rufa subspecies overwinters in coastal areas of Patagonia, including areas on the northern coastline of Tierra del Feugo, and further north in the San Jorge Gulf. During migration, the subspecies prefer open beaches, mudflats, and coastal lagoons, where they feast on molluscs, crustaceans, and other invertebrates.	N	NA

						The Red Knot rufa subspecies only occurs in Ontario during migration, where it may feed and rest on beaches. The coastal mudflats along the southwest coast of Hudson Bay and James Bay in northern Ontario are very important staging sites (where birds stop to refuel) during both spring and fall migration. They are also regularly seen in small numbers during the fall in southern Ontario, usually along Great Lakes beaches and mudflats. Occasionally, large flocks have been seen in spring at select eastern Ontario beaches, such as Presqu'ile Provincial Park and Amherst Island, when birds flying non-stop from Delaware Bay to James Bay are forced to land because of bad weather.		
Carex juniperorum	Juniper Sedge	E N D		S1	A recently described species known only from Ontario, Ohio, Kentucky (Catling et al. 1993), and Virginia. First collected in Ontario in 1989 by Paul M. Catling and Vivian R. Catling growing in alvar woodland at the Salmon River Alvar in Hastings County, Ontario (Catling et al. 1993). Subsequently found in 2005 in open Red Oak woods on clay soil in Haldimand County by Michael J. Oldham and Wasyl D. Bakowsky (# 31205 at DAO, MICH, NHIC, OAC). Similar to Carex	The Juniper Sedge grows mainly on alvars located in relatively open woodland, often dominated by red cedar but also deciduous trees. At one site in Ontario, the species occurs in oak savannah. Drought and fire have a big role to play in keeping alvars and savannah in an open or semi-open condition.	N	NA

					backii and C. jamesii. See Ford and Naczi (2001), Ford et al. (1998a, 1998b), Naczi and Ford (2001), Oldham (1998), Star and Ford (2001), Star et al. (1999).	Without such disturbances, this habitat would likely become overgrown by shrubs and trees that would shade-out the rare vegetation below. The Juniper Sedge is only found in southeastern Ontario and the southern Ohio-northern Kentucky region and is considered globally rare. In Canada, there are three sub-populations in Hastings County in the Salmon River Alvar. One sub-population has been extirpated. Each sub-population contains 600 to 5000 shoots, some of which may actually be extensions of the same parent plant spreading by underground roots. A small population was also recently discovered near Selkirk in Haldimand County. There are fewer than 20 known populations for this Juniper Sedge globally.		
Carex lupuliformis	False Hop Sedge	E N D		S1	First collected in Ontario by W. Herriot in 1902 near Galt, Waterloo Region (CAN; Reznicek and Ball 1974), and rediscovered in the province by Tony Reznicek in 1985 near Amherstburg, Essex County (Oldham and Crins 1988). Subsequently found at several additional southwestern Ontario sites (Oldham et al. 1993, Consiglio and Oldham 2020). Very similar to the much more common Carex	In Canada, this plant most often grows in riverine swamps and marshes, and around temporary forest ponds. It prefers open areas and areas under forest canopy openings, with lots of sunlight. False Hop Sedge ranges from Florida and Texas north to Quebec and	N	NA

					lupulina and examination of mature fruits is needed to separate the two.	Ontario. In Ontario, seven occurrences are known to persist. In Quebec, there are three persisting populations and three populations that are being restored where False Hop Sedge is believed to have been extirpated. The largest populations occur in southern Ontario.		
Castanea dentata	American Chestnut	E N D		S1 S2	Although there are many recently verified populations, very few are producing viable seeds. The range is restricted to southwestern Ontario where it occurs in deciduous forests. First collected in Ontario in 1885 by W. Yates at Burford, Brant County (WSF).Trees are being lost through cutting and suburban expansion. Few trees lack Chestnut Blight cankers, and healthy trees are extremely rare, although suckers and stump sprouts are locally common in the Carolinian Zone of Ontario. See Anagnostakis (1982), Anagnostakis and Hillman (1992), Argus et al. (1982-1987), Brewer (1982, 1995), COSEWIC (2004a), Fox (1949a, 1959), Fox and Soper (1953), Fulbright et al. (1983), Griffin (1992), Larson and Waldron (1994), Paillet (1982), Russell (1987), Soper (1962), Sutherland (1987), Tindall et al. (2004).	The American Chestnut prefers dryer upland deciduous forests with sandy, acidic to neutral soils. In Ontario, it is only found in the Carolinian Zone between Lake Erie and Lake Huron. The species grows alongside Red Oak, Black Cherry, Sugar Maple, American Beech and other deciduous tree species. The American Chestnut has almost disappeared from eastern North America due to an epidemic caused by a fungal disease called the chestnut blight (Cryphonectria parasitica). In Canada, the American Chestnut is restricted primarily to southwestern Ontario. Based on information available in 2004, it was estimated that there are 120 to 150 mature trees	N	NA

						and 1,000 or more small, young trees in the province.		
Centronyx henslowii	Henslow's Sparrow	END	*Ammodramus henslowii*	S1B	Formerly an uncommon and local breeder of southern Ontario, now may not even breed every year. Very rare but annual in migration.	The Henslow's Sparrow breeds in the northeastern and east-central United States, and reaches its northeastern limit in Ontario. It has also been found in abandoned farm fields, pastures, and wet meadows. It tends to avoid fields that have been grazed or are crowded with trees and shrubs. It prefers extensive, dense, tall grasslands where it can more easily conceal its small ground nest. In Ontario, the Henslow's Sparrow lives in open fields with tall grasses, flowering plants, and a few scattered shrubs. It was once fairly common in scattered areas of suitable habitat south of the Canadian Shield. However, steep declines since the 1960s have all but wiped this bird out as a breeding species in Ontario. A few are still seen each spring at migration hotspots such as Point Pelee National Park, and a few may breed at selected locations.	Y	Not observed on site. No records of observation on site.

Charadrius melodus	Piping Plover	E N D	*Charadrius melodus circumcinctus*	S1 B	Formerly much more widespread along the shoreline of the lower Great Lakes and from the 1980s to 2000s almost extirpated from the province. Present recently as a breeder on Lake of the Woods (Rainy River Dist.) and 3-4 sites on each of Lake Huron and Lake Ontario. very rare away from breeding sites in southern Ontario in migration.	Piping Plovers nest exclusively on dry sandy or gravelly beaches just above the reach of high water and waves. When not migrating, this bird spends virtually all of its time between the water's edge and the back of the beach. It pecks the sand and searches small pools of water for food - mostly insects and small crustaceans. In North America, the Piping Plover primarily breeds along the Atlantic coast, the western Great Lakes and along wetlands, rivers and lakes in the northern Great Plains. In Ontario, although never common, they breed along the shores of the Great Lakes, and at Lake of the Woods in northwestern Ontario.	Y	No habitat
Cicindela patruela	Northern Barrens Tiger Beetle	E N D		S1	A single colony has been reported in Canada.	The Northern barrens tiger beetle occurs in natural or other openings in sandy oak-pine woodlands and savannah. It prefers areas with sparse understorey vegetation over coarse-grained sand deposits. As such, it is dependent on periodic disturbances (e.g., fire) for the maintenance of its open habitat. Canadian	N	NA

						populations of the Northern barrens tiger beetle have been found in mature vegetated dunes and along trails. The Northern barrens tiger beetle is a globally restricted, rare species found in only 30 sites in its north-central and eastern North America range, which extends as far north as southern Ontario. Although this tiger beetle has historically been recorded at three locations in Canada (two in Ontario and one in Quebec), it is currently only known to occur at a single site along the southeast shore of Lake Huron.		
Clemmys guttata	Spotted Turtle	END	*Testudo guttata*	S2	Widespread in southern Ontario but very local and absent from many wetlands. Because of habitat loss and fragmentation, collection for the pet trade, and certain life history traits (low reproduction, susceptibility of nests to predation, etc.) populations are thought to be declining. Some populations occur in protected areas, but these populations are susceptible to a variety of threats also (e.g. road mortality, nest predation, illegal collection).	The Spotted turtle is semi-aquatic and prefers ponds, marshes, bogs and even ditches with slow-moving, unpolluted water and an abundant supply of aquatic vegetation. They are found in different types of wetlands throughout the province, depending on the types of habitats that are available. Females dig their nests in sunny locations where there is not a lot of woody vegetation. This species usually hibernates in wetlands or seasonally wet areas associated with structures including overhanging	Y	No habitat

						banks, hummocks, tree roots, or aquatic animal burrows. In Canada, the Spotted turtle is found primarily in Ontario along the north shore of Lake Erie, in the Georgian Bay area and in scattered locations throughout southern and eastern Ontario. Over the last 30 to 40 years, Spotted turtles have declined significantly and are no longer found at several sites in southern Ontario. It is difficult to estimate the Ontario population size, but recent data suggests there are approximately 2000 individual Spotted turtles spread throughout several small, scattered populations. Of the handful of known populations, only a few are large enough to ensure long-term survival.		
Clinostomus elongatus	Redside Dace	E N D		S1	Now only about 30 extant EOs, many of which are under decline and face threat of extinction.	The Redside dace is found in pools and slow-moving areas of small streams and headwaters with a gravel bottom. They are generally found in areas with overhanging grasses and shrubs, and can leap up to 10 cm out of the water to catch insects. During spawning, they can be found in shallow parts of streams, which are also popular spawning areas for other minnow species.	N	NA

						Redside dace are found in patches around the Great Lakes Basin, west to Minnesota, south to Kentucky and West Virginia, and east to New York State. In Canada, Redside dace are found in a few tributaries of Lake Huron, in streams flowing into western Lake Ontario, the Holland River (which flows into Lake Simcoe), and Irvine Creek of the Grand River system (which flows into Lake Erie).		
Coccinella novemnotata	Nine-spotted Lady Beetle	E N D		S1	Once widespread and relatively common (Gordon 1985) it has apparently disappeared from ON with no records in over 25 years.	The Nine-spotted Lady Beetle is able to live in a wide variety of areas including agricultural areas, suburban gardens, parks, coniferous forests, deciduous forests, prairie grasslands, meadows, riparian areas, and isolated natural areas. Nine-spotted Lady Beetle was once found throughout southern Ontario and as far north as the eastern shores of Lake Superior. Since the mid-1990s, there have been no records of this species in Ontario. Given the lack of recent records the species may be extirpated, however, it is also possible that individuals or small populations have been overlooked in parts of its range.	Y	NA – no recent observations

Coccinella transversoguttata	Transverse Lady Beetle	END		S1	Once widespread and relatively common (Gordon 1985) it has apparently disappeared from ON with no records in the past 30 years.	The Transverse Lady Beetle is a habitat generalist, meaning it is able to live in a wide range of habitats, including agricultural areas, suburban gardens, parks, coniferous forests, deciduous forests, prairie grasslands, meadows and riparian areas. Their distribution is mainly driven by seasonal changes in prey availability (aphids and other small insects) across a variety of vegetation types. The Transverse Lady Beetle is a wide-ranging species that has been recorded throughout Canada and the United States, but is now either absent or below detection levels in many of its former habitats. In Ontario, all records are considered to be historical. There have been no new records of the Transverse Lady Beetle since 1990, despite greater search effort in recent years to find individuals in parts of its previous range.	Y	NA – no recent observations
Colinus virginianus	Northern Bobwhite	END		S1?	Formerly an uncommon breeding resident of southwestern Ontario, the species has been confined to Walpole Island for the last couple of decades and may now be extirpated.	Northern bobwhites live in savannahs, grasslands, around abandoned farm fields, along brushy fencerows and other similar sites. Grasslands that are occasionally burned are particularly important because the fires help keep	N	NA

						the habitat from becoming too forested. In such places, bobwhites can find most of their needs such as food, nesting cover, and places to hide and rest throughout the year. In severe winter conditions bobwhites sometimes need to move into small forest areas to find snow-free areas for foraging. Bobwhites lay up to 16 eggs in a shallow natural depression that they line with plant material and conceal with grasses and vines. The Northern bobwhite is near its northern range limit in southern Ontario. This bird benefited greatly when the original forests were cleared and it expanded its range significantly in Ontario. At its peak over a century ago, its range in Ontario extended north to Georgian Bay and east to Kingston. This range has steadily retracted and now includes only the southwest corner of the province, mostly on Walpole Island, and possibly a few scattered locations nearby.		

						Isolated sightings away from this area are usually a result of introductions or birds escaping from captivity.		
Coluber constrictor foxii	Blue Racer	END	*Coluber constrictor flaviventris*	S1	Currently restricted in Ontario to Pelee Island, where populations are vulnerable to a number of threats including loss of habitat due cottage/housing development, habitat modification due to agriculture and hedgerow removal, human caused mortality especially due to road kills but also due to direct persecution. In addition, several natural factors contribute to Blue Racer mortality including succession caused habitat loss and over-winter mortality due to freezing and flooding. Formerly occurred elsewhere in southwestern Ontario. 	The Blue Racer prefers open habitat with abundant cover such as prairie, savanna, alvar and open woodlands. It also lives in pastures and abandoned farm fields where it can find a plentiful bounty of rodents, its primary food source. Females lay their eggs in rotting logs or compost piles that serve as incubators until the eggs hatch. In winter, the Blue Racer hibernates below the frost line in rock crevices. n Ontario, the Blue Racer is currently found only on Pelee Island in western Lake Erie. The population appears to have declined since 1995, when there were about 205 adult Blue Racers on Pelee Island. Ontario's Blue Racers range over a wide area - the average is 111 hectares for females and 201 hectares for males.	N	NA
Coregonus reighardi	Shortnose Cisco	END		SH		The Shortnose Cisco is found only in the Great Lakes of North America. It was last seen in Lake Ontario in 1964 and in Lake Huron in 1985.	Y	No habitat

						In Ontario, the Shortnose Cisco lives in the deep, cold water of the Great Lakes, usually at depths between 22 to 110 metres. It has been found at depths reaching 144 metres! This species eats mostly freshwater shrimp.		
Cornus florida	Eastern Flowering Dogwood	E N D	*Benthamidia florida*	S2 ?	Formerly a widespread species of sandy deciduous woods in the Carolinian Zone now much reduced and declining due to habitat loss and dogwood anthracnose, a probably introduced fungal disease. Although not considered provincially rare by Argus et al. (1982-1987) the threat and widespread decline due to dogwood anthracnose, coupled with extensive habitat loss in southwestern Ontario, has resulted in tracking by NHIC and legal listing as Endangered in Ontario and Canada. Ontario distribution mapped by Fox and Soper (1952). See Carr and Banas (2000), COSEWIC (2007a), Jenkins and White (2002).	Eastern Flowering Dogwood grows under taller trees in mid-age to mature deciduous or mixed forests. It most commonly grows on floodplains, slopes, bluffs and in ravines, and is also sometimes found along roadsides and fencerows. Eastern Flowering Dogwood is a fairly common species in the core of its range in the middle and southern United States. In Canada, it can only be found in southern Ontario in the Carolinian Zone (the small area of Ontario southwest of Toronto to Sarnia down to the shores of Lake Erie).	N	NA
Cypripedium candidum	Small White Lady's-slipper	E N D		S1	Very rare and local in southern Ontario prairies and fens. First collected in Ontario in 1903 at Port Elgin, Bruce County (CAN). Has declined in Ontario and elsewhere in its range and is now only known from two extant populations in the province. Not seen recently at several other historically documented Ontario sites (Argus et al. 1982-1987, Whiting and Catling 1986). Hybridizes with Cypripedium parviflorum at both	In Ontario, Small White Lady's-slipper grows in moist prairies, savannahs, and rich calcareous (limestone) wetlands, known as fens. This plant does best in full sunlight conditions. The range of the Small White Lady's-slipper extends from southern Ontario and New York	N	NA

					Ontario sites. See Bowles (1983), Catling and Knerer (1980), COSSARO (2016), Curtis (1946, 1954), Environment Canada (2006b), Falb and Leopold (1993), From (2007), Imrie et al. (2005), Saunders (1926).	state, west to southern Manitoba and Saskatchewan, and south through the United States midwest to Missouri and Kentucky. In Canada, it is limited to isolated populations in southern Ontario and southern Manitoba. The Small White Lady's-slipper has disappeared from Saskatchewan and from the Bruce, Kent, Norfolk and Welland counties of Ontario; some plants are still found in Lambton and Hastings counties in Ontario. There are seven populations of Small White Lady's-slipper remaining in Ontario with a total of about 14,600 plants.		
Desmognathus fuscus	Northern Dusky Salamander	E N D	*Desmognathus fuscus pop. 1*	S1	There is only one known extant population of this species in the province in a highly developed area of the Niagara region in southern Ontario. The species is susceptible to habitat alterations resulting from urbanization (Orser and Shure 1972) and would probably be adversely impacted with any impairment of ground or surface water quality.	Northern dusky salamander adults are mainly found on land, but are always close to small groundwater fed streams, seeps (areas where water in the ground oozes to the surface to form a pool) and springs, where they live under rocks, logs or leaf litter within or near water. The Northern dusky salamander is widely distributed in eastern North America, including Quebec and New Brunswick. In Ontario, it is restricted to a small area of the Niagara Peninsula.	N	NA

Desmognathus ochrophaeus	Allegheny Mountain Dusky Salamander	E N D	*Desmognathus ochrophaeus pop. 1*	S1	Only known from a single site in Ontario where it is susceptible to habitat alterations resulting from urbanization and would probably be adversely impacted with any impairment of ground or surface water quality.	Allegheny Mountain Dusky Salamanders are found most often in or near forested small streams, springs, or seeps (areas where water in the ground oozes to the surface to form a pool). They typically nest in underground cavities close to seeps, or in shallow depressions in moist soil beneath logs, stones, moss, leaf litter or stumps. They are usually absent from larger streams where predatory fish occur. Other predators include watersnakes and birds. The Allegheny Mountain Dusky Salamander is widely distributed in eastern North America. In Ontario, it occurs along two streams within the Niagara Gorge.	N	NA
Eleocharis equisetoides	Horsetail Spikerush	E N D		S1	A large, emergent spikerush known in Canada only from a single pond on Long Point, Norfolk County, where first collected by Monroe Landon in 1953 (DAO, HAM, OAC). See Argus et al. (1982-1987), Environment Canada (2006).	Throughout its range, the Horsetail Spike-rush grows in shallow water along the edges of ponds.	N	NA
Eleocharis geniculata	Bent Spikerush	E N D	*Eleocharis caribaea*	S1	A species of moist, sandy, open ground, usually on shorelines. First collected in Ontario at Rondeau in 1934 by Roy Cain (Taylor 1935) and not seen there since. Subsequently discovered at Long Point, Norfolk County (Reznicek and Catling 1989), and one site in Chatham-Kent (M.J. Oldham and A.W. Cusick 19557 at MICH, DAO, WAT, TRTE, NHIC, WIS, in	In Ontario, this species is found on wet, sandy to muddy soil in open flats along the shore of Lake Erie. It occurs occasionally along the edges of wet meadows and seasonal ponds further inland.	N	NA

					1996). Invasive Phragmites is resulting in declining habitat quality at both recent sites and the Chatham-Kent site may be extirpated.	Bent Spike-rush is primarily a tropical species. In North America, it occurs in the Gulf of Mexico region, with geographically separate populations in British Columbia and the Great Lakes basin. In Ontario, it occurs along the shore of Lake Erie, and at one inland site.		
Empidonax virescens	Acadian Flycatcher	END		S1B	A rare breeder of the Carolinian region, primarily in Norfolk and Elgin Counties. Total population likely under 200 individuals. Rare in migration away from breeding sites.	It is typically found in mature, shady forests with ravines, or in forested swamps with lots of maple and beech trees. The nest is placed near the tip of a lower limb on a tree, and is loosely woven, with strands of plant material hanging down. In Canada, the Acadian Flycatcher nests only in southwestern Ontario, mostly in large forests and forested ravines near the shore of Lake Erie. In Ontario, the Acadian Flycatcher primarily lives in the warmer climate of southern Ontario's Carolinian forests. It needs large, undisturbed forests, often more than 40 hectares in size. It has also been known to nest at a few sites in the Greater Toronto Area but this is unusual. The Acadian Flycatcher population in Ontario is very small, with 25 to 75	N	NA

						breeding pairs recorded in 2010.		
Epioblasma rangiana	Northern Riffleshell	E N D	*Dysnomia sulcata delicata, Dysnomia torulosa rangiana, Epioblasma biloba, Epioblasma sulcata delicata, Epioblasma torulosa rangiana*	S1	Restricted range, very few EO's, low abundance. Threatened by pollution, natural erosion and devel. pressures. Although there is evidence of recent recruitment in the Sydenham River, the population is at very low levels.	In Ontario, the Northern Riffleshell is found in riffle areas within rivers or streams with rocky, sand, or gravel bottoms. Like all freshwater mussels, this species feeds on algae and bacteria that it filters out of the water. Mussel larvae are parasitic and must attach to a fish host, where they consume nutrients from the fish body until they transform into juvenile mussels and drop off. In North America, the Northern Riffleshell's range has decreased by 95 per cent. The presence of fish hosts is one of the key features for an area to support a healthy mussel population. The Northern Riffleshell is believed to have several potential fish hosts in Ontario: Blackside Darter, Fantail Darter, Iowa Darter, Johnny Darter, Rainbow Darter, Logperch, Brown Trout and Mottled Sculpin. In Ontario, it is now only found in the Sydenham River and Ausable River in southwestern Ontario. Populations in Lake Erie, Lake St. Clair and the	N	NA

						Detroit River have disappeared.		
Epioblasma triquetra	Snuffbox	E N D	*Dysnomia triquetra, Plagiola triquetra, Unio cuneatus, Unio formosus, Unio triangularis*	S1		The Snuffbox is typically found in small to medium-sized rivers in shallow riffle areas. They prefer clean, clear, swift-flowing water and firm rocky, gravel or sand river bottoms. Mussel larvae are parasitic and must attach to a fish host, where they consume nutrients from the fish body until they transform into juvenile mussels and drop off. In Ontario, the main fish host for Snuffbox is the Logperch but other host fish may include various darter species, Largemouth Bass, Mottled Sculpin and Brook Stickleback. Like all freshwater mussels, the Snuffbox feeds on algae and bacteria that it filters out of the water. n Canada, the Snuffbox is now only found in the East Sydenham River and the Ausable River in southwest Ontario. The total population size is very small. Historically, the species was also found in Lake Erie, Lake St. Clair, and the Thames, Detroit, Grand, and Niagara rivers.	N	NA

Erimyzon sucetta	Lake Chubsucker	E N D		S2		Lake Chubsucker occurs in the eastern United States from Virginia to Florida and west to Texas. The northern extent of the species' distribution includes the Great Lakes Basin. In Canada, the species has only been found in the southern Great Lakes. In Ontario, Lake Chubsucker has been documented in: Lake Huron Lake St. Clair Lake Erie a tributary of the Niagara River The Lake Chubsucker lives in marshes and lakes with clear, still, warmer water and plenty of aquatic plants. This habitat is found in: bays channels ponds coastal wetlands During the breeding season, from April to early June in Ontario, adults move into marshes where eggs are laid among vegetation in shallower water.	Y	No habitat
Erynnis martialis	Mottled Duskywing	E N D	*Erynnis martialis pop. 1, Gesta martialis, Nisoniades martialis*	S2	A rare and very local species in Ontario, known from less than 20 locations. Most of the known locations are not protected and are habitats which are rare, local or threatened in Ontario such as sand dune communities and limestone alvars. Trends not known.	While many butterflies thrive in lush meadows, the mottled duskywing tends to live in dry habitats with sparse vegetation. These include open barrens, sandy patches among woodlands, and alvars.	N	NA

						(Alvars are areas of limestone with shallow soil and sparse vegetation of grasses, shrubs, and wildflowers.) In Ontario, the mottled duskywing will only deposit their eggs on two closely-related plants: New Jersey tea and prairie redroot. Larvae build silk leaf-nests and spend the winter as mature larvae, emerging as adults between mid-May and late June. In southwestern Ontario, a second brood matures in early July and takes flight between mid-July and late August. Scattered populations of this butterfly occur throughout southern Ontario. They have recently been documented in the Burlington and Oakville areas, and in Marmora (east of Peterborough). Some documented sites are within protected areas, including provincial parks and land set aside for conservation.		
Frasera caroliniensis	American Columbo	E N D	*Swertia caroliniensis*	S2	Rare, very local, and likely declining in open woods on sandy and clay soils in the Carolinian Zone. Mapped from seven Ontario sites by Argus et al. (1982-1987), only one of which is based on a post-1964 collection. First collected in Ontario in 1877 by J. Macoun at Queenston Heights, Niagara Region (CAN). See COSEWIC	American Columbo grows primarily in open deciduous forests, and to a lesser extent along open forest edges and dense shrub thickets in Ontario. It is most commonly found in dry upland woods, but in parts of its range it has	N	NA

					(2006a), Gillett (1963), Horn (1997), McIntosh and Catling (1979), Threadgill & Baskin (1978), Threadgill et al. (1979, 1981a, 1981b, 1981c).	been found in grasslands, moist woods and swampy habitats. American Columbo is widely distributed in eastern North America, ranging from southern Ontario west to Illinois and south to eastern Oklahoma, northern Mississippi,and western South Carolina. In Canada, American Columbo is only found in the Carolinian forest region of southern Ontario. There have been 22 populations recorded in Ontario. Based on field surveys in 2004 and 2005, 13 populations are currently believed to exist.		
Fraxinus nigra	Black Ash	E N D		S4	Widespread in southern and central Ontario in wet (at least seasonally flooded) acidic substrates, but declining due to Emerald Ash Borer. Ash trees are being decimated in southern Ontario by Emerald Ash Borer, which is now has populations throughout most of southern Ontario south of the Precambrian Shield as well as in Sault Ste. Marie and is likely to continue to expand its range and kill Fraxinus species. Fraxinus nigra is perhaps less likely to be adversely affected than other Ontario ash species since it ranges further north, well beyond the current range of Emerald Ash Borer. This species has been assessed as Critically Endangered globally by the IUCN Red List (Barstow et al. 2018) and Threatened in Canada by COSEWIC.	Black Ash is predominantly a wetland species found in swamps, floodplains and fens. Black Ash occurs from western Newfoundland to southeastern Manitoba and North Dakota, ranging southward to Iowa, Illinois, Virginia and Delaware. Black Ash's range extends farther north than any other ash and approximately 51% of the species' global range is within Canada. Black Ash occurs throughout most of Ontario, except the Far North, ranging from southern Ontario east to the Quebec border, west to the	Y	None observed

						Manitoba border and north to approximately 51° latitude. Approximately 25% of the global range of Black Ash occurs in Ontario.		
Fuscopannaria leucosticta	White-rimmed Shingle Lichen	E N D		S2	A corticolous cyanolichen restricted in Ontario to humid, old-growth cedar swamps and forests where it reaches its northeastern limit. Ontario distribution ranges from the Emo area in the Rainy River District east to Lake Nipigon. Population trends in Ontario not well documented, but the species has declined in the northeastern U.S. due to acid rain and air pollution.	The White-rimmed Shingle Lichen lives almost exclusively on the bark of trees in wet forests, usually occurring on the highest surface of tree trunks that lean away from the vertical position and tends to avoid growing on the southwestern side of tree trunks. This lichen tends to prefer habitat ranging from open swamps with persistent standing water year-round, to dense riparian corridors or transitional habitats near peatlands. White-rimmed Shingle Lichen occurs primarily in eastern Canada, the southeastern United States, and in Europe and the Asia-Pacific region. It is most commonly found on Red Maple in Nova Scotia, and on Eastern White Cedar in New Brunswick and Ontario. The Ontario subpopulation consists of a small cluster of sites from Thunder Bay west to the Quetico region in Rainy River District. It was also found in Lake Superior Provincial Park in 1993.	N	NA

Gentiana alba	White Prairie Gentian	E N D	*Gentiana flavida*	S1	In Ontario this species grows in prairie and oak savanna habitat. Currently known in Canada only from Walpole Island (Lambton County), though historically recorded from Amherstburg, Essex County (P.W. Maclagan in 1840 at BM) and Healey Falls, Northumberland County (J. Macoun in 1891, MTMG). See Argus et al. (1982-1987), COSEWIC (2001), Heikens (2002), Pringle (1965).	In Ontario, the White prairie gentian grows in open and sunny oak-hickory savannah, a rare type of habitat with grassland prairie growing between scattered mature trees. The habitat requires a regular fire regime (the pattern that fire follows in a particular ecosystem) to prevent encroachment by trees and shrubs. In Canada, the White prairie gentian is currently found only in southwestern Ontario on lands of the Walpole Island First Nation. In 2000, fewer than 50 of these plants were found on Walpole Island. White prairie gentian was originally discovered at the turn of the 20th century in Northumberland County, east of Toronto and in Essex County, but these populations no longer exist.	N	NA
Glyptemys insculpta	Wood Turtle	E N D	*Clemmys insculpta*	S2	Although more than 20 Ontario occurrences, some of these may represent escaped or released captives or misidentifications. Status of most Ontario populations unknown, with only a few populations in Ontario having been studied in detail. Populations in Ontario are thought to be declining. The species has been given Species At Risk status nationally and provincially because of: a) a discontinuous distribution of small numbers restricted to a specific habitat (clear, sand and gravel-bottomed streams); b) a long life	The Wood Turtle prefers clear rivers, streams or creeks with a slight current and sandy or gravelly bottom. It spends more time on land and the shores of watercourses than other native Ontario turtles. Wooded areas are essential habitat for the Wood Turtle, but they are found in other habitats, such as wet meadows,	N	NA

					span which increases the susceptibility of the species to serious decline if adult mortality increases; and c) threats from collecting for the pet trade (Litzgus and Brooks 1996). Also this species' tendency to congregate in certain areas for hibernation and nesting increases its susceptibility to collection for the pet trade (Litzgus and Brooks 1996). There is rangewide conservation concern for the species.	swamps and fields. Wood Turtles overwinter on stream bottoms. In Ontario, Wood Turtles have been found in three separate regions of the province. Studies are underway to determine more accurately the size and extent of these populations and threats they're facing. The Wood Turtle is found in isolated patches from Nova Scotia and New Brunswick south to Virginia, and west through southern Quebec and Ontario to Minnesota and northeastern Iowa.		
Hemileuca sp. 1	Bogbean Buckmoth	E N D	*Hemileuca iroquois, Hemileuca menyanthevora, Hemileuca sp. 1*	S1 ?	Known only from two locations despite extensive searches of apparently suitable habitat.	The Bogbean Buckmoth is restricted to open, chalky, low shrub fens containing large amounts of bogbean, an emergent wetland flowering plant. In Canada, the Bogbean Buckmoth is restricted to two isolated sites in southeastern Ontario. This moth also occurs in northeastern New York State in wetlands near Lake Ontario.	N	NA
Icteria virens	Yellow-breasted Chat	E N D	*Icteria virens virens*	S1 B	Formerly more widespread throughout the Carolinian Zone where it was rare to uncommon; in recent years the only reliable breeding locations have been on Pelee Island with occasional males detected elsewhere within its former range. Fairly rare migrant.	The Yellow-breasted chat lives in thickets and scrub, especially locations where clearings have become overgrown. These birds spend their winters in coastal marshes. This bird eats insects gathered from the foliage of	N	NA

						low, dense shrubs, or from the ground. The Yellow-breasted chat is found in much of the United States. In Canada, it lives in southern British Columbia, the Prairies, and southwestern Ontario, where it is concentrated in Point Pelee National Park and Pelee Island in Lake Erie. This bird winters along the Gulf of Mexico.		
Inflectarius inflectus	Shagreen Snail	E N D	*Mesodon inflectus, Polygyra inflecta*	S1		Shagreen occurs in moist forest habitats where it can be found in leaf litter, on logs and exposed rocks. The global distribution of Shagreen extends from southern Ontario, Michigan and New York south to Texas and Florida. Shagreen is part of the unique fauna of the Carolinian Forest. In Ontario, the species has a small range. It is currently only known to occur on two Lake Erie islands, Pelee Island and Middle Island.	N	NA
Isoetes engelmannii	Engelmann's Quillwort	E N D		S1	Two populations are known in the province, restricted to small sites on rivers draining into southeastern Georgian Bay. First collected in Ontario by Paul Catling, Steve Varga, and Jim Norris in 1988 in the Severn River, Simcoe County (Britton et al. 1991). The hybrid with Isoetes echinospora (I. x eatonii) occurs commonly at both known Ontario sites. See Brunton (1998), Engelmanns Quillwort Recovery Team (2006).	In Canada, Engelmann's Quillwort occurs at just two locations, both in Ontario. It was first found in the province in the 1970s. It is an uncommon species throughout much of its main range in the eastern United States. This range extends from New York State, south to	Y	No habitat

						northern Florida and west to Tennessee. Ontario populations are not genetically distinct from those found in the northern United States.		
Isotria medeoloides	Small Whorled Pogonia	E N D		S1	First discovered in Ontario in 1977 by William Stewart (1977, 1978, 1983) at Calton Swamp, Elgin County, where last seen in 1998. Found at a site in Norfolk County (10 or 11 plants) in 2014. Rare throughout its range in rich deciduous woods. See Argus et al. (1982-1987), Case and Schwab (1971), COSEWIC (2000c), McConnell (2007), Mehrhoff (1983, 1989).	In Ontario, Small whorled pogonia is found in moist, mixed forests with acidic soils and a rich layer of decaying leaves. It prefers openings in the forest where it can get lots of sunlight and where there are usually very few shrubs or other plants growing on the forest floor. In Canada, Small whorled pogonia is found only in the Calton Swamp area of Elgin County in southwest Ontario.	N	NA
Isotria verticillata	Large Whorled Pogonia	E N D		S H	First found in Ontario in 1879 near Komoka by W.E. Saunders (Whiting and Catling 1986) and discovered at a few additional southwestern Ontario sites in Norfolk, Middlesex, and Oxford Counties since then (Anderson and Britton 1986). There are no known observations for more than 20 years at any of the historically documented Ontario sites. See Argus et al. (1982-1987), Klinkenberg (1986), Mehrhoff (1983), Soper (1962).	In Ontario, Large Whorled Pogonia has been found in deciduous or mixed forests with sandy soil and a thick layer of leaf litter. A relatively open forest canopy is required so that enough light can reach the plant. Large Whorled Pogonia ranges from New England and Michigan south to Texas and Georgia. In Canada, there are three records in southwestern Ontario. The last recorded sighting of Large Whorled Pogonia in Ontario was in 1996,	N	NA

						when a single plant was found.		
Juglans cinerea	Butternut	END		S2?	Widespread but declining forest tree in southern Ontario occurring primarily south of the Precambrian Shield on calcareous soils (Fox and Soper 1953). Sometimes planted north of its native range. Populations of this species are being devastated throughout its natural range by a fungal disease known as Butternut Canker. Butternut canker (Sirococcus clavigignenti-juglandacearum) is a fungus that produces stem cankers that girdle and kill adult trees. In some areas up to 77% tree mortality has occurred. Butternut is widespread and relatively common in southern Ontario (more than 100 occurrences). Butternut canker was first detected in this province in 1991. In eastern Ontario 90% of trees surveyed were found to be infected with the canker. Overall, the long-term outlook for Butternut is bleak. It is declining quite rapidly and there are few populations not affected by disease. Despite the fact that there may be numerically more than 100 populations, there are almost certainly far fewer than 100 robust and healthy populations which will persist for the long term. The abundance and condition are both in rapid decline due to Butternut Canker disease, with no known remedy. Even with the canker evident and widespread, there are a large number of occurrences persisting though decline and loss of most or all of them is likely. Some reports from more northern areas of the province involve planted individuals or those spreading from cultivation (e.g.	In Ontario, Butternut usually grows alone or in small groups in deciduous forests. It prefers moist, well-drained soil and is often found along streams. It is also found on well-drained gravel sites and rarely on dry rocky soil. This species does not do well in the shade, and often grows in sunny openings and near forest edges. Butternut can be found throughout central and eastern North America. In Canada, Butternut occurs in Ontario, Quebec and New Brunswick. In Ontario, this species is found throughout the southwest, north to the Bruce Peninsula, and south of the Canadian Shield.	Y	None observed on site

					Morton and Venn 2000). Hybrids with Japanese Walnut (Juglans ailantifolia) are apparently common in southern Ontario (McLaughlin and Hayden 2012). See Catling and Small (2001), COSEWIC (2003b), Furnier et al. (1998), Katovich and Ostry (1998), Michler et al. (2005), Ross-Davis et al. (2008), Schultz (2003c).			
Lanius ludovicianus	Loggerhead Shrike	E N D	*Lanius ludovicianus migrans, Lanius ludovicianus pop. 1*	S1 B	A very rare breeding species with currently fewer than 50 individuals primarily split between Carden and Napanee plains; a few scattered individuals in any given year elsewhere along southern edge of the Canadian Shield from Manitoulin Island to Renfrew and Ottawa. Formerly much more common and widespread throughout southern Ontario. Very rare migrant away from breeding sites. Historical winter records may be misidentifications.	In Ontario, the Loggerhead shrike prefers pasture or other grasslands with scattered low trees and shrubs. It lives in fields or alvars (areas of exposed bedrock) with short grass, which makes it easier to spot prey. It builds its nest in small trees or shrubs and hunts by waiting patiently in tree branches until it swoops down and attacks its unsuspecting prey – usually large insects, such as grasshoppers. Loggerhead shrikes also require spiny, multi-branched shrubs where they can impale prey before eating it. Barbed wired fencing can also be used for this. The Loggerhead shrike currently breeds in central and western North America. Until the 1970s, the Loggerhead shrike could be found at many locations	Y	None observed on site – no appropriate habitat

						throughout southern Ontario and other parts of northeastern North America, but it has declined dramatically. Although the occasional bird is still found within the broader former range, most remaining Loggerhead shrikes are now found in two core grassland habitats - the Carden Plain north of Lindsay, and the Napanee Limestone Plain. Every fall these birds migrate to the southern United States for the winter.		
Lepisosteus oculatus	Spotted Gar	E N D		S1	Very few individuals; Although a reproducing population is believed to be present, confirmation is lacking; Range is very restricted, with less than 10 EO's. Not S1 because population not isolated, no apparent threats at present.	In Ontario, the Spotted Gar lives in calm, clear pools and bays with plenty of aquatic plants. It is usually found in lakes with soft mud bottoms. During the spring breeding season, the adults move to shallow water with lots of aquatic plants, where they mate and lay eggs. The eggs are slightly sticky and attach to aquatic plants. The Spotted Gar feeds on small fishes. In Canada, the Spotted Gar is found in a few wetlands along the north shore of Lake Erie and in East Lake off of eastern Lake Ontario. There are historic single records of this species from the Bay of Quinte and from Lake St. Clair at the mouth of the Thames River, but no recent sightings in these areas.	N	NA

Lepomis gulosus	Warmouth	E N D	*Chaenobryttus gulosus*	S1		The warmouth, a warm-water species, prefers silt-free marshes, ponds and lakes with abundant aquatic plants and mucky bottoms. Males gather in loose colonies in spring and early summer and build nest depressions for the females to lay eggs. The males then guard their nest and eggs fiercely. Spawning occurs at one to two years of age, and females lay 800 to 34,000 eggs depending on their size. They can live up to eight to nine years. The warmouth is found in the eastern United States, from the lower Great Lakes south to Florida, and west to Kansas. In Canada, the species has been reported in Lake Erie at Rondeau Bay, Long Point Bay and Point Pelee.	N	NA
Lespedeza virginica	Slender Bush-clover	E N D		S1	Only one small extant population in the Windsor, Essex County (and an extirpated population near Leamington). At risk from vegetation succession and may require active management. A species of prairies, open oak woods, thickets. First collected in Ontario in 1892 by J. Macoun at Leamington, Essex County (CAN, DAO). See Argus et al. (1982-1987), Clewell (1966), COSEWIC (2000d), Pratt (1986), Soper (1962).	In Ontario, Slender bush-clover grows on dry, sandy soil in tallgrass prairies. This plant does not do well in the shade and can be harmed by other plants that compete for light and space. The open and sunny prairie habitat it prefers, depends on natural disturbances, such as fire and drought, which naturally remove many unwanted trees and shrubs. In Ontario, Slender bush-clover is found only in	N	NA

						Essex County, the most southwesterly county in the province. A total of approximately 180 plants were counted at the two locations in 1997.		
Magnolia acuminata	Cucumber Tree	E N D		S2	Rich deciduous woods; confined in Ontario to the Norfolk County and Niagara Region in the Carolinian Zone (Argus et al. 1982-1987). First collected in Ontario in 1897 by W.C. McCalla near St. Catherines, Niagara Region (CAN). Sometimes planted north of its native range. See Ambrose and Aboud (1983), Ambrose and Kevan (1990), Ambrose and Kirk (2007), Budd (2015), COSEWIC (2000), Fox and Soper (1952), Sutherland (1987), Yaki (1970).	In Ontario, Cucumber Trees are found in upland moist deciduous or mixed forest habitats, where they grow in rich, well-drained soils, often in headwater areas or on rises within low swampy areas. The Cucumber Tree ranges from southeastern New York to northern Georgia, with outlying populations occurring from Florida to southern Ontario. In Ontario, the Cucumber Tree only occurs in Niagara Region and Norfolk County. Field surveys were conducted in these municipalities during the periods 1998-2001 and 2008-2009. As a result 18 populations of Cucumber Tree have been identified in Ontario with approximately 170 to 190 mature trees, plus additional saplings.	N	NA
Melanerpes erythrocephalus	Red-headed Woodpecker	E N D		S3	A very uncommon, declining species of southern Ontario with very small numbers in the Rainy River area. Some birds remain at breeding sites year-round while others do not. Formerly common and widespread in southern Ontario. Some recent evidence of a slight recovery in numbers,	The Red-headed Woodpecker lives in open woodland and woodland edges and is often found in parks, golf courses and cemeteries. These areas typically have many dead trees, which the bird uses for nesting and perching.	Y	Non observed – no habitat in development area

					particularly along the southern edge of the Canadian Shield.	This woodpecker regularly winters in the United States, moving to locations where it can find sufficient acorns and beechnuts to eat. A few of these birds will stay the winter in woodlands in southern Ontario if there are adequate supplies of nuts. The Red-headed Woodpecker is found across southern Ontario, where it is widespread but rare. Outside Ontario, it lives in Alberta, Saskatchewan, Manitoba and Quebec, and is relatively common in the United States.		
Mesodon zaletus	Toothed Globe	END	*Polygyra zaletus*	S1?		Toothed Globe lives in cool, mature to old growth deciduous forests. Toothed Globe is distributed in eastern North America from Ontario, south to Texas. Adjacent regions with reported populations include New York, Michigan, Ohio and Pennsylvania. While there are no recent reports of Toothed Globe in Ontario, it is believed to be present at two sites in Essex County and one site in Middlesex County. It is expected that suitable habitat is still present in southern Ontario and the species may occur in unsearched sites.	N	NA
Morus rubra	Red Mulberry	END		S2	Rich woods, sometimes on floodplains, and confined to the Carolinian Zone of southwestern	In Ontario, Red Mulberry grows in moist, forested habitats and on both sandy	N	NA

					Ontario (Argus et al. 1982-1987). Sometimes planted north of its natural range and an occasional escape from cultivation as at Ottawa (Brunton 1985). First collected in Ontario in 1877 by J. Macoun at Queenston Heights, Niagara Region (CAN). Hybridization with the introduced Morus alba is occurring at most Ontario M. rubra locations; also threatened by habitat loss and several diseases. See Burgess and Husband (2004, 2006), Burgess et al. (2008), Fox and Soper (1953), Soper (1956).	and limestone-based loamy soils. It is often found in areas where the forest canopy is quite open and allows lots of sunlight to reach the forest floor, but it will tolerate some shade. Red Mulberry occurs in eastern North American forests. In Canada, it is only found in the Carolinian Zone (the small area of Ontario southwest of Toronto to Sarnia down to the shores of Lake Erie) near rivers, the shores of Lake Erie, and the slopes of the Niagara Escarpment.		
Myotis leibii	Eastern Small-footed Myotis	E N D	*Myotis subulatus, Myotis subulatus leibii*	S2 S3	Only in the order of 12 known EOs. Threatened by disturbance of hibernacula. A poorly understood species with very little known about its life history.	In the spring and summer, eastern small-footed bats will roost in a variety of habitats, including in or under rocks, in rock outcrops, in buildings, under bridges, or in caves, mines, or hollow trees. These bats often change their roosting locations every day. At night, they hunt for insects to eat, including beetles, mosquitos, moths, and flies. In the winter, these bats hibernate, most often in caves and abandoned mines. They seem to choose colder and drier sites than similar bats and will return to the same spot each year.	Y	No habitat

						The eastern small-footed bat has been found from south of Georgian Bay to Lake Erie and east to the Pembroke area. There are also records from the Bruce Peninsula, the Espanola area, and Lake Superior Provincial Park. Most documented sightings are of bats in their winter hibernation sites.		
Myotis lucifugus	Little Brown Myotis	E N D		S3	A common and widespread species in Ontario. Threats and trends not well known but apparently stable with few known threats.	Bats are nocturnal. During the day they roost in trees and buildings. They often select attics, abandoned buildings and barns for summer colonies where they can raise their young. Bats can squeeze through very tiny spaces (as small as six millimetres across) and this is how they access many roosting areas. Little brown bats hibernate from October or November to March or April, most often in caves or abandoned mines that are humid and remain above freezing. The little brown bat is widespread in southern Ontario and found as far north as Moose Factory and Favourable Lake. Outside Ontario, this bat is found across Canada (except in Nunavut) and most of the United States.	Y	No habitat
Myotis septentrionalis	Northern Myotis	E N D	*Myotis keenii septentrionalis*	S3	Approximately 50 occurrences of this species, for which little is known about its natural history.	Northern long-eared bats are associated with boreal forests, choosing to roost	Y	No habitat

					Threats include disturbances at hibernacula and forestry practices which eliminate trees used as maternity sites. Trends not well known.	under loose bark and in the cavities of trees. These bats hibernate from October or November to March or April, most often in caves or abandoned mines. The northern long-eared bat is found throughout forested areas in southern Ontario, to the north shore of Lake Superior and occasionally as far north as Moosonee, and west to Lake Nipigon. This bat is found in all Canadian provinces as well as the Yukon and Northwest Territories.		
Noturus stigmosus	Northern Madtom	END		S1		The Northern madtom usually lives in large creeks and rivers with a moderate to swift current, and a sand, gravel, or mud bottom. However, in Ontario, this fish has also been captured in the deeper waters of Lake St. Clair and the Detroit River. It prefers clean, unpolluted water but can tolerate slightly muddy water. Adults eat aquatic insects, crustaceans, and smaller fish. During the summer breeding season, Northern madtoms normally build nests under large flat rocks and logs.	N	NA

						In Canada, the Northern madtom is only found in Ontario in the St. Clair River, Lake St. Clair, the Detroit River, and the Thames River. It has not been seen in the Sydenham River since 1975.		
Obovaria olivaria	Hickorynut	END		S1?		Hickorynuts live on the sandy beds in large, wide, deep rivers – usually more than two or three metres deep – with a moderate to strong current. Mussels filter water to find food, such as bacteria and algae. Mussel larvae must attach to a fish, called a host, where they consume nutrients from the fish body until they transform into juvenile mussels and then drop off. In Canada, the fish host of the Hickorynut is the Lake Sturgeon. Presence of the fish host is one of the key features determining whether a body of water can support a healthy Hickorynut population. The Hickorynut is found within the Great Lakes – St. Lawrence basin and the Mississippi River basin. In Canada, the Hickorynut is found in sporadic	N	NA

						locations within the Great Lakes and St. Lawrence basin, from Lake Huron to Quebec City. In Ontario, it is found in the Mississagi River and the Ottawa River.		
Obovaria subrotunda	Round Hickorynut	E N D	*Lampsilis orbiculata, Obovaria leibii, Obovaria retusa lens*	S1		In Ontario, the Round hickorynut is mainly found in rivers with clay, sand, or gravel bottoms. It also lives in shallow areas of lakes with firm sand. It prefers moderately fast moving water. Like all mussels, this species filters water to find food, such as bacteria and algae. Mussel larvae are parasitic and must attach to a fish host, where they consume nutrients from the fish body until they transform into juvenile mussels and drop off. The fish hosts of the Round hickorynut in Canada have not been confirmed but may include the Greenside darter and the Eastern sand darter, which is also a species at risk. The presence of fish hosts is one of the key features for an area to support a healthy mussel population. The Round hickorynut has been lost from 90 per cent	N	NA

						of its former range in Canada. It is now found only in the Sydenham River and the St. Clair River delta in Lake St. Clair in southwest Ontario. Populations have been lost from the rest of Lake St. Clair, the Thames River, the Detroit River, Lake Erie and the Grand and Niagara River drainages.		
Ophiogomphus howei	Pygmy Snaketail	END	*Ophionuroides howei*	S1		Pygmy Snaketail larvae are found in large, fast flowing rivers having substrates of sand and gravel. However, searches for larval skins at many apparently suitable waters have been unsuccessful, suggesting that the habitat may be more narrowly defined. Adult Pygmy Snaketails live in the forest canopy adjacent to the river where they lived as larvae. There is just one record of a Pygmy Snaketail from Ontario, based on a larval skin collected in northwestern Ontario (Namakan River) in 2007. Despite ongoing searches, no additional Ontario specimens have been found. The species occurs in two separate regions – one in	N	NA

						Wisconsin, Minnesota, and northwestern Ontario, and a more extensive eastern population ranging along the Appalachian Mountains from Tennessee to New Brunswick.		
Opuntia cespitosa	Eastern Prickly-pear Cactus	END	*Opuntia compressa, Opuntia humifusa*	S1	Two extant native populations occur in southwestern Ontario, one quite large, the other small and threatened. Several historical occurrences are also known (Reznicek 1982, Stewart and Oldham 1996). First collected in Ontario in 1882 by T.J.W. Burgess at Point Pelee, Essex County (CAN, MTMG, TRT). Opuntia cespitosa (long known in Ontario as O. humifusa) is a conspicuous plant with fairly narrow habitat requirements, therefore it is unlikely that many (if any) additional native populations will be found in Ontario. Extant Ontario populations occur in dry, open or semi-shaded sandy ground near Lake Erie. This species and related Opuntia species are often cultivated and several Ontario populations have been found in sites where they were likely planted or transplanted, e.g. three inland sites in Chatham-Kent County, Long Point (Norfolk County), and Niagara Region. See Abella and Jaeger (2004), Argus et al. (1982-1987), COSEWIC (2000g), Drezner (2017a, 2017b), Hanks and Fairbrothers (1969a, 1969b), Klinkenberg and Klinkenberg (1984), Wallace and Fairbrothers (1987).	The Eastern Prickly-pear Cactus grows in dry sandy areas that are relatively open and sunny. It cannot grow in complete shade. It is found on sandy openings on dry, sometimes forested, hillsides and in sand dunes near beaches. In Canada, the Eastern Prickly-pear Cactus is found only in southern Ontario. There are two known locations, which are on sand spits along the shore of Lake Erie. Based on historical reports, this cactus may once have been marginally more widespread in areas near Lake Erie and Lake St. Clair.	N	NA
Panax quinquefolius	American Ginseng	END	*Panax quinquefolium*	S2	Although there may be more than 80 extant populations in Ontario, many are quite small, and the population is threatened by human exploitation. Current status of many Ontario populations is unknown and	In Ontario, American Ginseng typically grows in rich, moist, but well-drained, and relatively mature, deciduous woods dominated by Sugar Maple	Y	No habitat

					a number of populations presumed extant have not been seen for 20 years or more; some of these populations may be extirpated. The species is threatened because of the harvest of roots for commercial and personal use. Most Ontario populations are considered non-viable based on population size (COSEWIC 2000). Occurs over a wide area of southern Ontario (Argus et al. 1982-1987) and there are undoubtedly additional undiscovered and unreported populations. First collected in Ontario in 1862 by J. K. McMorine at Ramsay, Lanark County (QK). Cultivated as a crop in southern Ontario with annual production estimated at 675,000 kg (Bai et al. 1997). Native populations are found in rich, moist deciduous woods, particularly on calcareous rocky shaded slopes. Declining due to habitat loss and harvesting for its root which is highly prized for its supposed medicinal properties. In some areas dried roots command prices in excess of $1000 U.S. per kilogram (Weakley 2020). See Anderson et al. (1993), Baranov (1966), Carpenter and Cottam (1982), Case et al. (2007), Charron and Gagnon (1991), Grubbs and Case (2004), Furedi and McGraw (2004), Hu (1976), Hu et al. (1980), Lewis (1984, 1988), Lewis and Zenger (1982), Lindsay and Cruise (1975), Nantel et al. (1996), Nault and White (1998), Nault et al. (1998), Proctor (1987), Robbins et al. (2000), Small et al. (1994), White (1987).	(Acer saccharum), White Ash (Fraxinus americana) and American Basswood (Tilia americana). It usually grows in deep, nutrient rich soil over limestone or marble bedrock. The main threats to American Ginseng in Ontario are small population sizes with low reproductive potential, harvesting for commercial purposes, and habitat loss and degradation associated with clearing, logging and grazing. Small population sizes make American Ginseng especially susceptible to human-caused or natural disturbances of its habitat.		
Pantherophis gloydi pop. 2	Eastern Foxsnake (Carolinian population)	END	*Elaphe gloydi pop. 2, Pantherophis gloydi pop. 2*	S2	Population 2 (Carolinian population) listed as END in Ontario in 2009. Formerly the full species was listed as THR in Ontario. This harmless,	Eastern Foxsnakes in the Carolinian population are usually found in old fields, marshes, along hedgerows,	Y	No habitat

					large (140 cm long), non-venomous snake has a small global range, being primarily confined to shorelines of lakes Erie, St. Clair and Huron. Seventy percent of the global range for this species is found in Ontario. The Eastern Foxsnake is found in two distinct regions of Ontario, one along the eastern Georgian Bay coast and islands, and the other in the Carolinian region in southwestern Ontario. Snakes in these two regions are widely separated, exhibit significant genetic differences and occupy different ecological regions. Therefore, they are assessed as two distinct populations. <u>Carolinian Population</u>: Snakes in this population occupy old fields, prairie remnants, marshes, hedgerows and dune-shorelines in the Essex, Chatham-Kent, Lambton, Haldimand and Norfolk regions. The population has undergone a marked contraction of its area of occupancy in the past 20 years. The snakes face several immediate threats including loss of its wetland habitats, and mortality from a dense road network, from farm machinery in this intensively agricultural region, and from direct human persecution. Some poaching for the pet trade may occur. Expansion of the human population and increasing degradation of habitat in this area is intensifying these threats and this population is classified as Endangered based on ongoing decline in area of occupancy and increasing population fragmentation. (COSSARO classifications from March 24-25 and May 27-29, 2009 assessments	drainage canals and shorelines. Females lay their eggs in rotting logs, manure or compost piles, which naturally incubate the eggs until they hatch. Individuals from the Georgian Bay population are usually found within 150 metres of the shore in rocky habitats spotted with trees and shrubs. During the winter, Eastern Foxsnakes hibernate in groups in deep cracks in the bedrock and in some man-made structures. The Eastern Foxsnake is only found in Ontario, Michigan and Ohio. Ontario contains 70 per cent of their range in two distinct populations: the Carolinian population in southwestern Ontario and the eastern Georgian Bay population.		

					reported to the Minister on June 11, 2009).			
Pantherophis spiloides pop. 2	Gray Ratsnake (Carolinian population)	E N D	*Elaphe obsoleta, Elaphe spiloides pop. 2*	S1	Habitat loss and direct human persecution have eliminated this species from much of the Carolinian Zone portion of its Ontario range. It is now restricted to only a few areas where it remains at high risk. Being a large snake in an area of intensive human use of the landscape, it is particularly threatened by habitat loss, road mortality, and human persecution (both direct mortality and collection for the pet trade). 	The two populations of Gray Ratsnake in Ontario can be found in different types of habitat. The Frontenac Axis population requires a variety of habitat types including deciduous forests, wetlands, lakes, rocky outcrops and agricultural fields. The Carolinian population is found in a mix of agricultural land and deciduous forest, preferring habitat where forest meets more open environments. Adults are strongly attached to their home ranges and often return to the same nesting and hibernation sites. They often lay eggs in logs or compost piles that serve as incubators. Sometimes several females will use the same site to deposit eggs. Gray Ratsnakes are widely distributed throughout the eastern and central United States, extending as far north as southern Ontario. There are two widely separated populations in Ontario: the Carolinian in southwestern Ontario and the Frontenac Axis in southeastern Ontario.	N	NA
Patera pennsylvanica	Proud Globelet	E N D	*Mesodon pennsylvanicus,*	S1	Species is restricted to one area of the Ojibway Prairie, Windsor, found nowhere else in Ontario or Canada;	In North America, the Proud Globelet is typically found in wooded hillsides	N	NA

			Polygyra pennsylvanica		never found alive in Canada, although fresh shells were found in the 1990s.	or in ravines. In Ontario the species has been located in a sandy oak forest and a nearby former light industrial area. Proud Globelet is found from southwestern Ontario south to Iowa and Missouri and east to Pennsylvania. Freshly dead shells of Proud Globelets were found in Windsor, Ontario in 1992 and 1996. In 2013, empty and weathered shells were found in the same location as in 1992 and 1996. The search found fourteen empty shells that were estimated to be 5 to 15 years old.		
Percina shumardi pop. 3	River Darter (Great Lakes - Upper St. Lawrence populations)	END		S1		In Ontario, the River Darter lives in medium to large rivers and lakes with moderately fast current. Unlike many other darter species, the River Darter is tolerant of turbid conditions. It is typically found on gravel and cobble substrates in relatively deep water habitats. The River Darter is known to undertake seasonal migrations, moving upstream in the spring to spawn, and downstream in the fall. It eats a variety of food items including aquatic snails, fish eggs, and insect larvae. The River Darter is one of the most broadly distributed darter species and is found from the Gulf of Mexico north to the Nelson River,	N	NA

						near Hudson Bay. However, it is generally not very abundant throughout its range. In Canada, the River Darter lives in Saskatchewan, Manitoba, and Ontario. In Ontario, it is found in several rivers and lakes of the Northwest as well as in a limited number of locations around the Great Lakes. The Great Lakes-Upper St. Lawrence populations are only known from three locations; Lake St. Clair, and the Thames and Sydenham Rivers.		
Perimyotis subflavus	Tricolored Bat	E N D	*Pipistrellus subflavus*	S3 ?	A rare species in Ontario at the northernmost part of its distribution. Less than 20 occurrences verified within the last 20 years. Threats may include disturbances of the hibernacula although they appear to be less easily aroused than other species of bats. Population size and trends poorly known.	During the summer, the Tri-colored Bat is found in a variety of forested habitats. It forms day roosts and maternity colonies in older forest and occasionally in barns or other structures. They forage over water and along streams in the forest. Tri-colored Bats eat flying insects and spiders gleaned from webs. At the end of the summer they travel to a location where they swarm; it is generally near the cave or underground location where they will overwinter. They overwinter in caves where they typically roost by themselves rather than part of a group. This bat is found in southern Ontario and as far north as Espanola near Sudbury. Because it is very rare, it has a scattered	Y	No habitat

						distribution. It is also found from eastern North America down to Central America.		
Physconia subpallida	Pale-bellied Frost Lichen	E N D		S3	This lichen is an eastern North American endemic that, in Canada, is restricted to mature hardwoods with Ostrya virginiana and Fraxinus pennsylvanica / F. americana particularly, notable for bark with a high pH and moisture holding capacity. The lichen appears to have suffered a dramatic population decline throughout its range since the early 1900s. The major threat to the lichen is air pollution and timber harvest.	Throughout its range, Pale-bellied frost lichen grows on the bark of hardwood trees such as White ash, Black walnut, and American elm. It can also be found growing on fence posts and boulders. In Ontario, Pale-bellied frost lichen grows on Hop Hornbeam (also known as Ironwood) trunks at a height of 0.5 to 2 metres in wooded areas. Pale-bellied frost lichen only occurs in eastern North America. In Canada, it is limited to southern Ontario where it is currently known from locations in Frontenac, Haliburton, Hastings, Peterborough, Lanark and Renfrew counties.	N	NA
Plantago cordata	Heart-leaved Plantain	E N D		S1	Known from two extant populations and four presumed extirpated populations in southwestern Ontario. First collected in Ontario in 1873 by Maclagan at Amherstburg, Essex County (MTMG). Occurs in moist woods, stream banks, wooded swamps. See Allen and Oldham (1985), Argus et al. (1982-1987), Bassett (1973), Bowles and Apfelbaum (1989), Harper (1944), Mymudes and Les (1993), Oldham (1992), Parfitt (2002), Stromberg and Stearns (1989), Tessene (1969).	A semi-aquatic plant, Heart-leaved Plantain is found in relatively undisturbed wet woods, often along the rocky or gravelly limestone beds of shallow, slow-moving clear streams. Moisture is generally always present above or just below the soil surface. The most common trees in Ontario woodlots associated with this plant are Sugar Maple (Acer saccharum), Silver Maple	N	NA

						(Acer saccharinum), Red Maple (Acer rubrum), Blue-beech (Carpinus caroliniana), Shagbark Hickory (Carya ovata), White Ash (Fraxinus americana), Black Ash (F. pennsylvanica) and Basswood (Tilia americana). Heart-leaved Plantain occurs across eastern North America, ranging from eastern Iowa to western New York, south to northern Florida. However, its distribution is very patchy across this range. In Canada, Heart-leaved Plantain grows in just two locations in southwestern Ontario.		
Platanthera leucophaea	Eastern Prairie Fringed Orchid	END	*Habenaria leucophaea*	S2	A globally rare and declining orchid of prairies, fens, calcareous shorelines, and moist old fields with scattered shrubs in southern Ontario. First collected in Ontario in 1873 by J. Macoun in Hastings County (MTMG; no specific location on specimen label). See Argus et al. (1982-1987), Bowles (1983), Bowles et al. (1992, 2002, 2005), Bowles et al. (1992), Brown (1985), COSEWIC (2003), Reddoch (1977), Sheviak and Bowles (1986), Wallace (2003), Zettler et al. (2001).	The Eastern Prairie Fringed-orchid grows in wetlands, fens, swamps and tallgrass prairie. It has been found in ditches and railroad rights of way. The species ranges from Ontario to Illinois, Wisconsin, Ohio, Kansas and further west to Nebraska. In Ontario, there are about 20 small populations in prairie habitat or fens in Simcoe, Essex and Lambton counties, and the municipality of Chatham-Kent. It's also found in tamarack swamps in the Bruce	Y	No habitat

						Peninsula and Ottawa area.		
Plestiodon fasciatus pop. 1	Common Five-lined Skink (Carolinian population)	END	*Eumeces fasciatus pop. 1*	S2	Five-lined Skinks in Ontario's Carolinian Zone appear to have declined and remain vulnerable to habitat loss and fragmentation, and collection. There are fewer than 20 extant populations known in the Carolinian Zone. Several populations are in protected areas (e.g. Point Pelee NP, Rondeau PP, Pinery PP).	Common Five-lined Skink enjoys basking on sunny rocks and logs to maintain a preferred body temperature between 28 and 36°C. During the winter, they hibernate in crevices among rocks or buried in the soil. In North America, Common Five-lined Skink occurs throughout hardwood forests from the Atlantic seaboard to Texas and Minnesota, and from southern Ontario to the Gulf of Mexico. In Canada, the species is limited to two distinct areas: one is along the southern margin of the Canadian Shield, and the other is in the Carolinian Zone in southwestern Ontario. There are two populations of Common Five-lined Skink in Ontario, occupying different types of habitat. The Southern Shield population can be found underneath rocks on open bedrock in forests. The Carolinian population can be found under woody debris in clearings with sand dunes, open forested areas, and wetlands. The Southern Shield population of Common Five-lined Skink is found on	N	NA

						the southern margin of the Canadian Shield, from Georgian Bay to Leeds and Grenville counties. The Carolinian population is comprised of several distinct subpopulations distributed near the shores of: Lake Erie Lake St. Clair Lake Huron		
Pleurobema sintoxia	Round Pigtoe	END	*Pleurobema coccineum, Quadrula paupercula*	S1		The Round pigtoe is usually found in rivers of various sizes with deep water and sandy, rocky, or mud bottoms. Like all freshwater mussels, this species feeds on algae and bacteria that it filters out of the water. Mussel larvae are parasitic and must attach to a fish host, where they consume nutrients from the fish body until they transform into juvenile mussels and drop off. Known fish hosts of the Round Pigtoe include: Bluegill, Spotfin shiner, Bluntnose minnow, and Northern redbelly dace. The presence of fish hosts is one of the key features for an area to support a healthy mussel population. In Canada, Round pigtoe are found only in southwestern Ontario, mainly in the St. Clair River	N	NA

						delta and the Sydenham River but small populations still exist in the Grand and Thames rivers and in shallow areas near the shorelines of Lake Erie and Lake St. Clair.		
Polygala incarnata	Pink Milkwort	END		S1	A rare species of prairies known from three extant populations in Ontario, two of which are on Walpole Island First Nation, the other in the Ojibway Prairie area of Windsor, Essex County. First collected in Ontario in 1894 by Charles K. Dodge on Walpole Island, Lambton County (MICH). An extimated 400 plants were known in the province in 1997 (Brownell 1997). Potentially threatened by conversion of prairie to agriculture on Walpole and Squirrel Islands. Active management may be necessary to maintain the species. No specimen has been located to substantiate a very old literature record from near Niagara Falls (Macoun 1883-1890). See Argus et al. (1982-1987), Gillett (1968).	Pink milkwort grows in moderately moist to dry, sandy, prairie habitats, where it is often found growing with Little Bluestem grass (Schizachyrium scoparium). Periodic fire is important to maintain open prairie conditions. This plant's North American range extends from Long Island, New York, west to Iowa and south to Florida and Texas. It is most abundant in the Carolinas, Oklahoma and Nebraska. In Canada, Pink milkwort is found only in southwestern Ontario on Walpole Island First Nation and around Windsor.	N	NA
Potamogeton x ogdenii	Ogden's Pondweed	END	*Potamogeton ogdenii*	SNA	Only three Ontario records are known all from the southeastern part of the province (COSEWIC 2007). First collected in Ontario in 1873 by John Macoun in Hastings County (no more precise locality provided on specimen). A globally imperiled (G1G2) pondweed known outside Ontario only from about 20 localities in the northeastern United States (Kaplan et al. 2013). Potamogeton x ogdenii has not been relocated at historic Ontario sites, despite searches. See Hellquist and Hilton	In Ontario, Ogden's pondweed is found in clear, slow-moving streams, beaver ponds and lakes. It often grows with other species of narrow-leaved pondweeds, which can make identification of this rare plant even more difficult. In Canada, Ogden's pondweed is found only in southeastern Ontario. It was recorded at Murphys	N	NA

					(1983), Hellquist and Mertinooke-Jongkind (2003).	Point Provincial Park and Davis Lock on the Rideau Canal between 1970 and 1990. A historical sighting of the species was recorded in Hastings County in 1873. It has been recommended that additional surveys are needed to determine whether this species exists at any other sites in Ontario. Outside of Canada, Ogden's pondweed has been identified in Connecticut, New York, Vermont and Massachusetts.		
Prays atomocella	Hop-tree Ermine Moth	END	*Yponomeuta atomocella*	S1	he Hoptree Borer is dependent on its sole larval host plant, Common Hoptree, which occurs on shorelines of Lake Erie. Hoptree Borer has been documented only in the largest subpopulations of Common Hoptree, and has not been found in the smaller, more isolated Common Hoptree subpopulations along Lake Erie northeast of Point Pelee.	The distribution of Hoptree Borer is extremely restricted in Ontario. It is thought to occur in only two locations: Point Pelee National Park and on Pelee Island. The locations where Hoptree Borer is currently known to be found are within protected areas.	N	NA
Protonotaria citrea	Prothonotary Warbler	END		S1B	A very rare breeding species restricted to a small handful (less than ten) sites in the Carolinian Zone. Current population has remained relatively stable since the 1990s at around 25-50 individuals. Historically was apparently more abundant but was never thought to be common in Ontario.	The Prothonotary warbler nests in small, shallow holes, found low in the trunks of dead or dying trees standing in or near flooded woodlands or swamps. They will also readily use properly placed artificial nest boxes. Silver maple, ash, and yellow birch are common trees in these habitats.	N	NA

						The Prothonotary is the only warbler in eastern North America that nests in tree cavities, where it typically lays four to six eggs on a cushion of moss, leaves and plant fibres. In Canada, the Prothonotary warbler is only known to nest in southwestern Ontario, primarily along the north shore of Lake Erie. Over half of the small and declining population is found in Rondeau Provincial Park. In Ontario, the Prothonotary warbler is found in the warmer climate of the Carolinian deciduous forests. In 2005, it was estimated that there were only between 28-34 individuals in Ontario.		
Ptychobranchus fasciolaris	Kidneyshell	END	*Unio phaseolus*	S1		The Kidneyshell is typically found in small to medium sized rivers. It prefers shallow, clear, swift-moving water with gravel and sand. It also used to occur on gravel shoals in the Great Lakes. All mussels filter water to find food, such as bacteria and algae. Mussel larvae are parasitic and must attach to a fish host, where they consume	N	NA

						nutrients from the fish body until they transform into juvenile mussels that drop off of the fish. The Kidneyshell has three known fish hosts in Canada: Blackside Darter, Fantail Darter, and Johnny Darter. The presence of fish hosts is one of the key features for an area to support a healthy mussel population. In Canada, the Kidneyshell is currently found in four areas in southwestern Ontario. There are reproducing populations in the East Sydenham River and in the Ausable River. Small populations are also found in St. Clair River delta in Lake St. Clair and a tributary of the Thames River. The species no longer occurs in Lake Erie or the Detroit, Thames, Grand, Welland or Niagara rivers.		
Puma concolor	Cougar	E N D	*Felis concolor, Puma concolor couguar, Puma concolor pop. 1*	S U	Sightings of cougars are reported annually in Ontario. On average, 10-15 reports received annually from the area north of Lake Nipissing (south of 50 N) and from the Quebec border west. Most reports involve sightings of single individuals. A total of 191 sightings has been documented in the period 1980 to 1997, with 121 of those made between 1990 and 1997 (N.	The Cougar lives in large, undisturbed forests or other natural areas where there is little human activity. The forest must support plenty of white-tailed deer, which is an important food source for the Cougar.	Y	No habitat, density of settlement, no observations

					Dawson in Scott 1998). However, because reports may involve sightings of the same individual, it is not known how many occurrences actually exist, but the total number of occurrences may be in the range of 6-100. Reports for southern Ontario, south of Lake Nipissing, but particularly south of the limit of the Precambrian Shield, are generally believed to involve escaped or released pets. In northern Ontario, particularly north and west of Lake Nipigon, reported sightings may involve animals either from a remnant native stock or naturalized captives or both. However, no evidence with which to determine either the taxonomic disposition or the 'wild' status of these animals has to date been forthcoming.	The species has a very wide range, encompassing large areas of North, Central and South America. In Ontario, Cougars are most likely believed to live in northern Ontario because of the remoteness of the habitat. However, there have been many reports from the southern part of the province. Cougars found in Ontario may be escaped or released pets, animals dispersing from western North America, native animals or a combination of those factors. The population size is unknown.		
Pycnanthemum incanum	Hoary Mountain-mint	E N D		S1	Dry oak woods and openings. Only known in the province from one area near the eastern end of Lake Ontario (Argus et al. 1982-1987). First collected in Ontario in 1873 by J. Macoun at Hamilton (MTMG). See Crins (1985, 1989b), Grant and Epling (1943).	In Ontario, Hoary Mountain-mint mostly occurs in dry, oak woodland habitat, on steep, warmer-than-normal slopes. The species does best in open areas with ample sunlight, in habitats that depend on disturbance such as fire to maintain these conditions.	N	NA
Pyrrhia aurantiago	False-foxglove Sun Moth	E N D	*Rhodoecia aurantiago, Xanthia aurantiago*	S1		False-foxglove Sun Moth inhabits oak-dominated savannas and open woodlands. Globally, False-foxglove Sun Moth ranges from southern Maine west through southern Ontario and southern Wisconsin and south to eastern Texas and central Florida.	N	NA

						In Ontario, the species ranges in southwestern Ontario from eastern Lake Erie, west to Lake Huron and south to Windsor. Its habitats include dry sandy or loamy soils near the Great Lakes. There are four known subpopulations of the moth in Ontario, located in the Pinery area, the Ojibway Prairie Complex at Windsor, London and Delhi, although the London and Delhi subpopulations are considered extirpated. The populations in Ontario comprise the full Canadian distribution of the species, so where they are found mark the northern edge of the species' global range.		
Rallus elegans	King Rail	END		S1B	A rare breeding species with a restricted range in southern Ontario. Estimated to be 60-100 individuals. Threatened by habitat loss and deterioration of habitat quality. Listed by federally and provincially as "endangered".	King Rails are found in densely vegetated freshwater marshes with open shallow water that merges with shrubby areas. They are sometimes found in smaller isolated marshes but most seem to prefer larger, coastal wetlands. Its nest is a dinner-plate sized platform made of plant material, placed just above the water in shrubs or clumps of other marsh plants. King Rails reach their northern limit in southern Ontario, where they are quite rare.	N	NA

						Recent province-wide surveys suggest there are only about 30 pairs left, the majority of which are in the large wetlands bordering Lake St. Clair. Most of the remainder are found in several key coastal marshes along Lakes Erie and Ontario.		
Regina septemvittata	Queensnake	E N D	*Natrix septemvittata*	S2	Queen Snake is very rare in the province with <20 occurrences. It is restricted to relatively small sections of a few rivers and wetlands in southwestern Ontario. In addition, the habitat of this species is highly specialized and it is rarely found more than 3 m from water. Wood (1949) noted the following three conditions necessary to support a large population of Queen Snakes: permanent area of water, flowing or still, with a temperature at or above 18.3C throughout most of the active season; abundant cover, such as flat rocks submerged and/or on the bank; and an abundance of crayfish.	The Queensnake is an aquatic species that is seldom found more than a few metres from the water. It prefers rivers, streams and lakes with clear water, rocky or gravel bottoms, lots of places to hide, and an abundance of crayfish. Queensnakes will often hibernate in groups with other snakes, amphibians and even crayfish. Suitable hibernation sites (called hibernacula) include abutments of old bridges and crevices in bedrock. In Ontario, the Queensnake is found only in the southwest in Middlesex, Brant, Huron and Essex counties, and on the Bruce Peninsula. There are fewer than 25 sites where it is known to occur in these areas. The extremely specialized habitat requirements of the Queensnake restrict this species to particular areas, with large gaps of unfavourable habitat in between populations. The snake's home range is	N	NA

						quite small, making Queensnakes less likely to move into new areas or areas where it was historically found.		
Ripariosida hermaphrodita	Virginia Mallow	END	*Sida hermaphrodita*	S1	Two sites are known in the province in Niagara and Haldimand Counties of the Carolinian Zone. First collected in Ontario in 1951 by Bert Miller at Taquanyah Conservation Area, Haldimand County (TRT). Difficult to determine if the species is native, since at both sites it occurs in disturbed situations, however, habitat is consistent with other presumed native occurrences elsewhere (A.W. Cusick pers. comm. 1994), and the species is not commonly cultivated in Ontario. Moist open sites, often on floodplains; sometimes in disturbed sites. Considered introduced in Michigan (Reznicek et al. 2011). See Kujawski et al. (1997), Spooner et al. (1985), Sutherland (1987), Thomas (1979), Weakley et al. (2017).	Virginia mallow grows in riparian habitats that are flooded in most years. It benefits from this moist environment and is usually found in sunny or partly shaded areas with sandy soils. Loose sandy or rocky soils of scoured riversides and floodplains, and disturbed areas along roadsides and railroad banks are its preferred habitats. Virginia mallow is found from the Appalachian Mountains to the Mississippi and Atlantic watersheds. In Ontario, it is found in only two sites, in Haldimand County, and the Niagara Region.	N	NA
Rotala ramosior	Lowland Toothcup	END		S1	First found in Ontario in 1984 by Donald A. Sutherland, Gary M. Allen, and Michael J. Oldham in a moist sandy field near Turkey Point, Norfolk County (M.J. Oldham 4619 at CAN, DAO, MICH, NHIC); a population which has subsequently been destroyed. More recently (1994) discovered at Puzzle Lake and Sheffield Long Lake in Lennox and Addington County, southeastern Ontario, in rock crevices along open granitic shorelines near the waterline of periodically fluctuating lakes (Brownell et al. 1996). See Argus et al. (1982-1987), Baskin et al. (2002), Sutherland (1987).	In Ontario, Lowland Toothcup grows along lake and river shorelines on thin sandy, muddy or gravely soils on Precambrian bedrock. This shoreline habitat is often submerged in the spring and early summer and emerges when the waters recede. Toothcup ranges throughout most of the United States, with the exception of some of the	N	NA

						midwestern states, into Mexico and South America. In Canada, Toothcup is found in south-central British Columbia and southeastern Ontario. Two lakes in Lennox and Addington County, Ontario supported about 6000 Lowland Toothcup plants in 2004, however, the numbers vary greatly from year to year depending on water levels. The species had also occurred at a site in southwestern Ontario but is no longer found at that site.		
Setophaga kirtlandii	Kirtland's Warbler	END	*Dendroica kirtlandii, Setophaga kirtlandii (= Dendroica kirtlandii)*	S1B	A very rare breeding species basically restricted to two breeding locations along the southern edge of the Canadian Shield with a total population of about 50 adults at most. Some breeding evidence (mostly unpaired males) has been documented along southern Georgian Bay. With numbers increasing in the core of the range (Michigan) and habitat creation/restoration work underway the Ontario population seems likely to continue increasing. Very rare transient in primarily spring mgration to southwestern Ontario.	Kirtland's Warblers have very specific habitat requirements, typically nesting in well-drained sandy soils covered in large forests of young jack pine, a habitat often created by fire. They lay their nests on the ground, hidden away under low living branches of young jack pines with a thick cover of understory plants, such as grasses, sweet-fern and blueberry. Mature pines that no longer have branches near the ground do not provide sufficient cover. Kirtland's Warblers primarily breed in central Michigan and migrate to the Bahamas for winter.	Y	No habitat

						A few are seen annually at Point Pelee National Park and other migration hotspots in southwestern Ontario, and they have long been suspected of occasional nesting in Ontario, in pockets of suitable habitat. To date, breeding evidence has been acquired at only two sites, the most recent being in 2007 at Canadian Forces Base Petawawa.		
Simpsonaias ambigua	Salamander Mussel	END	*Simpsoniconcha ambigua*	S1	One record for ON in the Sydenham River	The Salamander mussel prefers waterbodies with a soft bottom and a swift current and is often found burrowed in sand or silt under large rocks in shallow areas, on gravel bars, or in mud. It is found in streams that support the Mudpuppy, an aquatic salamander. Salamander mussel larvae are parasitic and use the mudpuppy as a host, where they consume nutrients from the salamander's body until they transform into juvenile mussels and drop off. Adult mussels feed by filtering algae and bacteria from the water. In Ontario, the Salamander mussel occurs only in the East Sydenham River and at one location in the Thames River.	N	NA

						The species has disappeared from the Detroit River due to Zebra mussel impacts, but it may remain in the small area of the St. Clair River delta in Lake St. Clair.		
Sistrurus catenatus pop. 2	Massasauga (Carolinian population)	E N D		S1	The population is reduced to two highly isolated and restricted areas surrounded by intense threats from neighbouring development and subject to illegal exploitation. The sub-populations are small and subject to genetic and demographic stochasticity that endangers future growth. Habitat quality also continues to decline (COSEWIC, 2012).	Massasaugas live in different types of habitats throughout Ontario, including tall grass prairie, bogs, marshes, shorelines, forests and alvars. Within all of these habitats, Massasaugas require open areas to warm themselves in the sun. Pregnant females are most often found in open, dry habitats such as rock barrens or forest clearings where they can more easily maintain the body temperature required for the development of their offspring. Non-pregnant females and males forage and mate in lowland habitats such as grasslands, wetlands, bogs and the shorelines of lakes and rivers. Massasaugas hibernate underground in crevices in bedrock, sphagnum swamps, tree root cavities and animal burrows where they can get below the frost line but stay above the water table. In Canada, the Massasauga is found only in Ontario, primarily along the eastern side of Georgian Bay and on the Bruce Peninsula. Two small populations are also found	N	NA

						in the Wainfleet Bog on the northeast shore of Lake Erie and near Windsor. The Massasauga was once more widespread in southwestern Ontario, especially along the shores of the Great Lakes.		
Solidago gillmanii	Gillman's Goldenrod	E N D	*Solidago gillmanii, Solidago simplex ssp. randii, Solidago simplex var. gillmanii, Solidago spathulata var. gillmanii*	S1	A Great Lakes endemic restricted to Lake Michigan and Lake Huron dunes and sandy shores. In Ontario currently known from only two sites on Great Duck Island, south of Manitoulin Island. The species was collected at Dean's Bay, Manitoulin Island, in 1976, but it has not been found there since, despite searches. Morton and Venn (1984) mention it but do not map it from Cockburn Island, presumably in error, since it is not mentioned or mapped from Cockburn Island by Ringius and Semple (1987), Semple et al. (1999), or Weatherbee (2016). This apparent error was later corrected by Morton and Venn (2000) who do not mention or map Solidago gillmanii from Cockburn Island.	In Canada, the Massasauga is found only in Ontario, primarily along the eastern side of Georgian Bay and on the Bruce Peninsula. Two small populations are also found in the Wainfleet Bog on the northeast shore of Lake Erie and near Windsor. The Massasauga was once more widespread in southwestern Ontario, especially along the shores of the Great Lakes. In Ontario, Gillman's Goldenrod is only known to occur in two locations on Great Duck Island in northern Lake Huron, south of Manitoulin Island.	N	NA
Solidago rigidiuscula	Stiff-leaved Showy Goldenrod	E N D	*Solidago rigidiuscula, Solidago speciosa pop. 1, Solidago speciosa ssp. speciosa var. rigidiuscula, Solidago speciosa var. rigidiuscula*	S1	Currently known in Canada only from prairie remnants on Walpole Island where rare and local (Semple et al. 1999). Known historically from Squirrel Island, where first collected in Ontario in 1918 by N. Tripp (DAO, OAC). A previous report from Port Franks, Lambton County (Zhang et al. 1999), was based on a misidentifed specimen (F. Cook at UWO), as was a report (Zhang et al. 1999; based on a Wellwood specimen at WLU) from east of Stratford, Perth County (J.C. Semple pers. comm. July 2017). Solidago rigidiuscula was formerly included in S.	Stiff-leaved Showy Goldenrod is widespread in the eastern United States, ranging from New Hampshire west to Wyoming, and south to New Mexico and the Gulf states. In Canada, this species is restricted to southwestern and northwestern Ontario. These habitats are kept in an open condition by frequent fires.	N	NA

					speciosa and a population in northwestern Ontario formerly refered to S. speciosa is now considered to belong to S. pallida (Semple et al. 2012, 2017).	Stiff-leaved Showy Goldenrod is widespread in the eastern United States, ranging from New Hampshire west to Wyoming, and south to New Mexico and the Gulf states. In Canada, this species is restricted to southwestern and northwestern Ontario. In southwestern Ontario, there are two populations on Walpole Island First Nation in Lambton County, which contained approximately 800 plants in 2008.		
Somatochlora hineana	Hine's Emerald	E N D		S1	There is only a single Element Occurrence of Hine's Emerald in the province, located in the Minesing Wetlands, Simcoe County.	Hine's Emerald lives in groundwater-fed wetlands with grassy vegetation. Larvae use crayfish burrows during periods of low water and during the winter. In Ontario, Hine's Emerald has been documented in and around Minesing wetland in Simcoe County (west of Barrie). It is also found in Wisconsin, Michigan, Illinois and Missouri.	Y	No habitat
Stylophorum diphyllum	Wood-poppy	E N D		S1	Rich woods and wooded river banks in southwestern Ontario. First collected in Ontario in 1887 by R. Elliott at Plover Mills, Middlesex County (CAN, DAO, MTMG) and then in 1889 by J. Dearness along the Thames River near London (CAN, DAO). Not seen again in the London area until found in 1987 by Dave Stephenson in Meadowlily Woods on the Thames River	In Ontario, Wood-poppy is found in rich mixed deciduous woodlands, forested ravines and slopes, and along wooded streams. It is possible that Wood-poppy is still found in these areas because they were unsuitable for agriculture,	N	NA

					(Stephenson 1987, Oldham 1992). Recently discovered at a couple of additional southwestern Ontario sites. Occasionally planted in gardens and escaping to ravines, e.g. in the Toronto area. Similar to the introduced Chelidonium majus. See Argus et al. (1982-1987), Baskin and Baskin (1984), Bowles (2000, 2007), Bowles and Oldham (1993), COSEWIC (2007d), Soper (1962).	rather than being reflective of its true habitat requirements. Wood-poppy grows in full shade, although the cultivated variety does well in partial sun. Associated dominant trees include: Sugar Maple, White Ash, American Beech, Black Cherry, and Hackberry. In Canada, there are only three known populations of Wood-poppy found in southwestern Ontario, all in the county of Middlesex.		
Stylurus amnicola	Riverine Clubtail	E N D	*Gomphus amnicola, Stylurus amnicola pop. 2*	S2		This dragonfly is found in and near streams and rivers with sandy, muddy, or gravely beds. Larvae often burrow in the river bottom and prey on small animals such as other insects. After emerging, adults tend to move from riverbanks to the forest canopy to feed. Adults hang vertically off leaves as they await prey flying by. Current records of the riverine clubtail in Ontario are from Big Creek and Big Otter Creek, two streams that empty into Lake Erie near Long Point. The species is elusive, and may yet be found elsewhere in Ontario, since it inhabits neighbouring regions of Minnesota, Michigan, and southwestern Québec.	N	NA

Stylurus laurae	Laura's Clubtail	E N D	*Gomphus laurae*	S1		Laura's Clubtail larvae need shallow, sandy or sandy-muddy bottomed creeks with forested shorelines. They are sensitive to water quality degradation and are only found in unpolluted waters. During their adult life stage, they require forest cover beside the creek. Adults use riffle areas in the stream for foraging and require vegetation along the creek to perch between flights. In Ontario, Laura's Clubtail is only known to occur in two sites in Ontario; along Big Creek and Big Otter Creek in the Tillsonburg and Long Point area near Lake Erie. This dragonfly may also occur undetected in nearby areas with similar habitats. Laura's Clubtail is considered rare in bordering states but is relatively widespread in the southeastern United States.	N	NA
Taxidea taxus jacksoni	American Badger (Southwestern Ontario population)	E N D		S1	Basically restricted to the Norfolk Sand Plain, where the population is relatively small. Home range sizes cover vast areas.	In Ontario, badgers are found in a variety of habitats, such as tall grass prairie, sand barrens and farmland. These habitats provide badgers with small prey,	N	NA

						including groundhogs, rabbits and small rodents. Since badgers are primarily nocturnal and quite wary of people, not many people are fortunate enough to spot one in the wild. The American Badger ranges from California and Texas to the Great Lakes region. In Canada, the badger is found in southern British Columbia, all the prairie provinces and Ontario. In Ontario, the Southwestern population of American Badger is found in the southwestern part of the province, primarily close to Lake Erie in the Norfolk and Middlesex area. The Northwestern population of American Badger is found in northwestern Ontario in the Thunder Bay and Rainy River Districts. Badgers can travel sizeable distances and occupy large home ranges of many square kilometres. There are thought to be fewer than 200 in Ontario.		
Taxidea taxus taxus	American Badger (Northwestern population)	E N D		S1	Restricted in Ontario to a small range in the Rainy River area, with an unknown but small total population.	In Ontario, badgers are found in a variety of habitats, such as tall grass prairie, sand barrens and farmland. These habitats provide badgers with small prey, including groundhogs, rabbits and small rodents. Since badgers are primarily	N	NA

						nocturnal and quite wary of people, not many people are fortunate enough to spot one in the wild. The American Badger ranges from California and Texas to the Great Lakes region. In Canada, the badger is found in southern British Columbia, all the prairie provinces and Ontario. In Ontario, the Southwestern population of American Badger is found in the southwestern part of the province, primarily close to Lake Erie in the Norfolk and Middlesex area. The Northwestern population of American Badger is found in northwestern Ontario in the Thunder Bay and Rainy River Districts. Badgers can travel sizeable distances and occupy large home ranges of many square kilometres. There are thought to be fewer than 200 in Ontario.		
Teloschistes chrysophthalmus pop. 2	Golden-eye Lichen (Great Lakes population 2)	END		S1	The Great Lakes population is confined to coastal areas of the lower Great Lakes and currently known only from a single occurrene in Prince Edward County on Lake Ontario. Trend data is limited, but suggests that Great Lakes subpopulation, which is typcially corticolous on the bark of deciduous trees, was likely always rare and restricted. The number of mature individuals has declined due to a combination of threats which include air pollution, human	The Golden-eye Lichen lives in well-lit, humid environments with nutrient rich substrate. In Canada, it is found on branches and twigs of tree species including White Spruce, Trembling Aspen, Jack Pine, Balsam Fir, Bur Oak and Red Oak. It prefers open habitat near shorelines and coastal areas and sites with	N	NA

					disturbance, invasive species and severe weather.	calcareous soils or base-rich bedrock. There are two populations of Golden-eye Lichen in Ontario: the Great Lakes population and the Prairie/Boreal population. The Great Lakes population of Golden-eye Lichen is now restricted to a single individual at Sandbanks Provincial Park on Lake Ontario. The large Prairie/Boreal population occurs from the Manitoba border to Rainy Lake in northwestern Ontario.		
Tephrosia virginiana	Virginia Goat's-rue	E N D		S1	Restricted in Ontario to dry, open, sandy woods on the Norfolk Sand Plain (Argus et al. 1982-1987). First collected in Ontario in 1885 by A. Yates at Normandale, Norfolk County (CAN, TRT). See Soper (1962), Sutherland (1987).	Virginia goat's-rue grows in open, sunny areas with sandy soil, such as prairies, open oak and pine forests on sandy ridges, and sand dunes. It has also been found in more disturbed habitats, such as roadsides and abandoned fields. In Ontario, Virginia goat's-rue is limited to acidic sand deposits in remnant Black oak savanna and open Black oak woodland. Virginia goat's-rue range extends from New Hampshire west to Nebraska and Texas, and south to Florida. Populations at the northern limits of the range, in southern Ontario, New Hampshire, New York, Michigan and Wisconsin, are widely separated.	N	NA

						In Canada, the Virginia goat's-rue is found only in southwestern Ontario where it is believed to be restricted to two sites on the Norfolk Sand Plain near Turkey Point on Lake Erie's north shore. It is thought to be extirpated from at least four other sites in this area. Two invasive plant species, periwinkle (Vinca minor) and Oriental bittersweet (Celastrus orbiculata), are known to occur with Virginia goat's-rue at one location.		
Thamnophis butleri	Butler's Gartersnake	E N D		S2	This species warrants an S2 rank because there are fewer than 20 known extant occurrences in the province, it has fairly narrow habitat preferences, and is susceptibile to continued habitat loss or alteration (e.g. drainage of wetlands, conversion of old fields to urban or industrial development) and habitat fragmentation. The species does occur in some protected areas, although many of these are isolated parcels of land in highly urbanized areas (e.g. prairie remnants within the City of Windsor). The distribution, status and biology of this species in Ontario are all poorly known.	he Butler's Gartersnake prefers open, moist habitats, such as dense grasslands and old fields, with small wetlands where it can feed on leeches and earthworms. Burrows made by small mammals and even crayfish are sometimes used as hibernation sites, called hibernacula. This species is also commonly found in rock piles or old stonewalls. he only place in the world where Butler's Gartersnake is found is in the lower Great Lakes region. In Ontario, this snake is concentrated in two areas, within 10 kilometres of the Detroit River, Lake St. Clair, the St. Clair River, and Lake Huron from Amherst Point to Errol, in Essex and Lambton counties Luther	N	NA

						Marsh, Dufferin and Wellington counties. Population sizes can vary. Estimates done at several sites in Ontario in 1997 ranged between 50 and 900 snakes. At some sites it is considered to be locally common.		
Trichophorum planifolium	Few-flowered club-rush	E N D	*Scirpus verecundus*	S1	A small and inconspicuous sedge of dry, open, wooded slopes in southern Ontario (Argus et al. 1982-1987). First collected in Ontario in 1955 by Alexander Tamsalu at the Royal Botanical Gardens, Hamilton (HAM). Currently only known in Canada from the Royal Botanical Gardens and historically from the Rouge River Valley in eastern Toronto. See Crins (1985, 1989), Fernald (1948).	This species is usually found on steep slopes of oak forests. In Ontario, it grows at just two sites, at the Royal Botanical Gardens near Hamilton and Rouge Park in Toronto. The species is found in the eastern United States and is relatively common in the Appalachians and the Atlantic coastal plain. It ranges from Virginia and Missouri north to New York, Pennsylvania and Ohio.	N	NA
Trillium flexipes	Drooping Trillium	E N D	*Trillium gleasonii*	S1	A showy Trillium species currently known from only two small areas in southwestern Ontario, in Elgin and Middlesex Counties (Oldham 1992, Stewart and Oldham 1995). It has not been found at five additional sites where it was documented historically. First collected in Ontario in 1848 near Amherstburg, Essex County (E; no collector on specimen label). This riparian species is at on-going risk of habitat degradation from the invasion of exotic plants. Trillium flexipes can be confused with other southern Ontario trilliums (e.g. T. erectum, T. cernuum) and might be overlooked	Drooping Trillium grows on damp sandy soil in mature, deciduous forests that are usually close to a river or stream. It is found in Carolinian forests with Maple, White Ash, Basswood, Hackberry, White Elm, and Blue Ash trees. It shares the forest floor with other native plants including Ostrich Fern, Wild Ginger and Jack-in-the-pulpit.	N	NA

					elsewhere. See Case and Burrows (1962), McLeod (1995).	In Canada, Drooping Trillium only grows in southwestern Ontario in the warmer climate of the Carolinian forest. There were once six known locations in the province, but today there are only two. A total of 1465 flower stems were reported in 2007. Both populations along the Sydenham River in Middlesex County and along the Thames River in Elgin County are believed to be reproducing successfully.		
Triphora trianthophoros	Nodding Pogonia	END	*Triphora trianthophora, Triphora trianthophoros*	S1	A globally rare to uncommon orchid (G3G4) first found in Ontario in 1950 by C.H. Zavitz near Leamington, Essex County (Zavitz and Gaiser 1956), a site where it is probably now extirpated. Subsequently found at a second southwestern Ontario site in Chatham-Kent County (Whiting 1968, Whiting and Catling 1986). A small orchid of rich hardwood forests. According to Pace and Freudenstein (2018) this species is threatened by logging, invasive earthworms, and changing rainfall patterns. See Argus et al. (1982-1987), Keenan (1984, 1992), Ramstetter (2001), Soper (1962), Van Arsdale (1982), Williams (1994, 1998), Zika (1983).	In Ontario, Nodding pogonia is found in rich, moist deciduous forests with a well-developed tree canopy and a deep layer of leaf litter. Nodding pogonia ranges from New England to Ontario, and south to Texas and Florida. In Canada, Nodding pogonia is found only in southwestern Ontario, and only at two sites. At one of those sites, it has not been seen in more than 20 years.	N	NA
Truncilla donaciformis	Fawnsfoot	END		S1		The Fawnsfoot inhabits medium and large rivers with moderate to slow flowing water. It usually inhabits shallow waters (one to five metres	N	NA

						deep) with gravel, sand or muddy bottoms. Fawnsfoot is only found in North America, where it primarily occurs in the Great Lakes and Mississippi drainages. In Canada, this species is limited to tributaries of the Great Lakes. In most areas where Fawnsfoot occurs, it has a patchy distribution and is limited to the lower portions of large rivers.		
Tyto alba	Barn Owl	E N D	*Tyto alba pop. 2*	S1	Extremely rare permanent resident of southwestern Ontario. Formerly slightly more common but has never been abundant. May not even breed every year. Most recent records are from late fall suggesting dispersal, possibly from outside of Ontario.	The Barn Owl is found on all continents except Antarctica. In Canada, the species breeds only in extreme southern Ontario and British Columbia. The Barn Owl is extirpated (no longer found) in Michigan and has declined in other parts of the northeastern and midwestern parts of the United States. The Barn Owl cannot tolerate severe winter temperatures, and southern Ontario is the northern limit of its range. Breeding sites in Ontario seem to be restricted to areas with the moderating effects of the Great Lakes (within 50 kilometres of the lakes). In southern Ontario, this adaptable owl nests and roosts in barns and abandoned buildings.	N	NA

						It may also use natural cavities in trees or holes in cliff faces, as it did before the arrival of Europeans in North America. It lives year round at its nest site and hunts for rodents over orchards, and grasslands such as farmlands, fallow fields and meadows. Today, there are fewer than five pairs of Barn Owls in Ontario.		
Villosa fabalis	Rayed Bean	E N D	*Paetulunio fabalis, Unio capillus, Unio donacopsis, Unio lapillus*	S1		The Rayed bean is typically found buried in sand or gravel in shallow, clear headwaters and riffle areas of small tributaries. It is often found buried among the roots of aquatic plants. The Rayed bean filters water to find food, such as bacteria and algae. Mussel larvae are parasitic and must attach to a fish host, where they consume nutrients from the fish body until they transform into juvenile mussels and drop off. Canada, the Rayed bean is found only in southern Ontario, in the East Sydenham River and a small section of the North Thames River.	N	NA

						The species has been lost from Lake Erie and the Detroit River. In Ontario, the fish hosts of the Rayed bean include: the Brook Stickleback, Largemouth Bass, Greenside Darter, Johnny Darter, Rainbow Darter, Logperch, and Mottled Sculpin. The presence of fish hosts is one of the key features for an area to support a healthy mussel population.		
Viola pedata	Bird's-foot Violet	E N D	*Viola pedata var. linearioba*	S1	Dry, sandy oak woods and savannas in southwestern Ontario. First collected in Ontario in 1880 by R. T. Anderson at Paris, Brant County (TRT). Currently known from Brant and Norfolk Counties and historically recorded from Waterloo, Niagara and Lambton Counties (Scoggan 1978-1979, Argus et al. 1982-1987). See COSEWIC (2002), Hutchison and Kavanagh (1994), Russell (1956), Sutherland (1987), Thompson (2006).	n Ontario, Bird's-foot Violet is found only in black oak savanna, a very rare vegetation type having widely spaced open-grown trees with an understorey of tallgrass prairie herbs. Natural disturbances caused by drought or fire are important for removing trees and shrubs that would otherwise shade out the tiny Bird's-foot Violet. In Canada, Bird's-foot Violet is found only in southern Ontario at a handful of sites. In 2001, the population was estimated to be fewer than 7,000 plants at only five locations.	N	NA
Webbhelix multilineata	Striped Whitelip	E N D	*Polygyra multilineata, Triodopsis multilineata*	S2 S3		The Striped Whitelip snail inhabits wet, lowland forest at the margins of periodically flooded areas (like marshlands or swamps), or in continuously wet areas.	N	NA

						This species inhabits areas with plenty of leaves and woody materials, such as logs and bark. The damp woods that the Striped Whitelip inhabits are typically dominated by the following trees: oak hickory maple The Striped Whitelip is distributed across eastern North American from Indiana to Kansas. Ontario represents the northern limit of the species' range. he current range of the Striped Whitelip in Ontario includes sites from two counties (Essex and Lambton), where live specimens or shells have recently been found. The species is known to be extant (presently located) in: Fish Point Provincial Nature Reserve and Stone Road Alvar on Pelee Island on the mainland in Bickford Oak Woods Conservation Reserve, Walpole Island Point Pelee National Park The known number of occupied sites have recently been reduced from 12 to seven. This is because it has not been seen alive during the last 20 years at several of the sites where it had been previously known to occur,		

						despite repeated and recent searches.		
Woodsia obtusa	Blunt-lobed Woodsia	END	*Physematium obtusum*	S1	A rare and local southern species occurring on south-facing calcareous rocky slopes in the Frontenac Axis region of southeastern Ontario (Argus et al. 1982-1987). Reported new to Ontario by Britton (1977) based on a 1975 collection by Don Britton and M. Coulthart in Frontenac Provincial Park north of Kingston (OAC). However Woodsia obtusa had been previously collected by Jack M. Gillett et al. in 1973 at Westport Mountain, Leeds and Grenville United Counties (CAN, OAC). A vague earlier report by Metcalfe (1963) is unverified (see Britton 1977). See also COSEWIC (2006), Lafontaine (1973), Wild and Gagnon (2005).	In Canada, Blunt-lobed Woodsia is found growing on steep chalky rock faces or escarpments on the Precambrian shield. In Ontario, this species grows only in south-facing locations where the microclimate is warmer. Due to relatively shallow soil over bedrock, the trees around the ferns are typically small to moderate in size and widely scattered. Associated tree species are deciduous, including Sugar Maples, Oaks, White Ash and Ironwood. Blunt-lobed Woodsia is a relatively common species in the eastern United States. However, in Canada, there are only eight known populations, four in eastern Ontario and four in western Quebec. In Ontario, Blunt-lobed Woodsia is concentrated at sites along the Frontenac Axis, all within approximately 20 kilometres of each other.	N	NA
Acipenser fulvescens pop. 12	Lake Sturgeon (Northwestern Ontario population)	THR	*Acipenser fulvescens pop. 1*	S2		The Lake Sturgeon lives almost exclusively in freshwater lakes and rivers with soft bottoms of mud, sand or gravel. They are usually found at depths of five to 20 metres.	N	NA

						They spawn in relatively shallow, fast-flowing water (usually below waterfalls, rapids, or dams) with gravel and boulders at the bottom. However, they will spawn in deeper water where habitat is available. They also are known to spawn on open shoals in large rivers with strong currents. In North America, Lake Sturgeon can be found from Alberta to the St. Lawrence drainage of Quebec and from the southern Hudson Bay to the lower Mississippi. In Ontario, the Lake Sturgeon is found in the rivers of the Hudson Bay basin, the Great Lakes basin and their major connecting waterways, including the St. Lawrence River. There are three distinct populations in Ontario: Great Lakes - Upper St. Lawrence, Saskatchewan - Nelson River, and Southern Hudson Bay - James Bay.		
Antrostomus vociferus	Eastern Whip-poor-will	THR	*Caprimulgus vociferus*	S4B	Uncommon breeding species mostly south of the boreal forest. Has experienced steep declines, especially in southern Ontario. Still locally common on the Frontenac Arch and along the southern edge of the Canadian Shield. Uncommon migrant throughout southern Ontario.	The Eastern Whip-poor-will is usually found in areas with a mix of open and forested areas, such as savannahs, open woodlands or openings in more mature, deciduous, coniferous and mixed forests.	Y	No observations, site does not provide habitat

						It forages in these open areas and uses forested areas for roosting (resting and sleeping) and nesting. It lays its eggs directly on the forest floor, where its colouring means it will easily remain undetected by visual predators. The Eastern Whip-poor-will's breeding range includes two widely separate areas. It breeds throughout much of eastern North America, reaching as far north as southern Canada and also from the southwest United States to Honduras. In Canada, the Whip-poor-will can be found from east-central Saskatchewan to central Nova Scotia and in Ontario they breed as far north as the shore of Lake Superior. Although Eastern Whip-poor-wills were once widespread throughout the central Great Lakes region of Ontario, their distribution in this area is now fragmented. The Whip-poor-will migrates to Mexico and Central America, where it stays throughout the cold Canadian winter.		
Asio flammeus	Short-eared Owl	THR		S4 ?B ,S 2S 3N	Uncommon to rare and declining breeding species; small numbers breed scattered throughout most of the province but most individuals in Ontario are in the Hudson Bay	The Short-eared Owl lives in open areas such as grasslands, marshes and tundra where it nests on the ground and hunts for	N	NA

					Lowlands. Exact population difficult to ascertain due to strong year-to-year fluctuations in location due to changing prey availability. Uncommon migrant throughout the province and uncommon but very local at a small number of wintering sites in southern Ontario.	small mammals, especially voles. The Short-eared Owl has a world-wide distribution, and in North America its range extends from the tundra south to northern Mexico. The species is considered to be highly nomadic, moving in response to the abundance of small mammal prey. In Ontario, the species is widely distributed. The majority of Ontario observations during the breeding season occur in the James Bay and Hudson Bay Lowlands. The species has become an increasingly rare and irregular breeder in southern Ontario, primarily associated with remnant habitat near: Kingston the lower Ottawa River the Niagara Peninsula Sault Ste. Marie Most northern populations are migratory, moving southward in the winter to the Carolinian zone and the Kingston region. Of particular importance are: Long Point Haldimand County Amherst Island Wolfe Island		
Atlanticus davisi	Davis's Shieldback	T H R		S1	Known in Ontario only from two sites [one historical] in Norfolk Co. May be locally common, but rarely collected due to its cryptic	Davis's Shieldbacks live in oak woodland, oak savannah and sand barren sites with well-drained dry,	N	NA

					coloration and habits. Males can be located by their loud stridulations. Strongly associated with sand plains [e.g. Norfolk Sand Plain] and may occur in additonal localities, but likely very rare; Paiero and Marshall 2006. Properly A. davisi, cf. Paiero and Marshall 2014.	sandy soils. They are most often found: near forest edges in woodland openings in openings along forest access roads or trails Katydids like the Davis's Shieldback tend to inhabit the leaf litter and above-ground shrubbery in their habitats. Davis's Shieldback has been recorded in southwestern Ontario, from Michigan to Vermont, and south to North Carolina and Arkansas. Davis's Shieldback has only been found in Norfolk County in southwestern Ontario, in the habitats of the Norfolk Sand Plain.		
Aureolaria flava	Smooth Yellow False Foxglove	T H R	*Gerardia flava*	S2 ?	A declining species of dry open woods and savannas known from fewer than ten extant sites in southwestern Ontario. See Soper (1952).	Smooth Yellow False Foxglove is found in dry, open to semi-open upland oak forests typically with White Oak present, on well-drained soils. The full range of Smooth Yellow False Foxglove beyond southern Ontario covers most of the Eastern United States extending from Wisconsin to Maine in the north and from Texas to Florida in the south. There are seven remaining subpopulations in southern Ontario which are potentially viable located in: Essex County	N	NA

						Norfolk Walpole Island First Nation Hamilton Waterloo Halton An eighth subpopulation may persist in Middlesex County. About 18 subpopulations are believed to be extirpated including ones from Brant County, Haldimand County, the Region of Niagara and the City of Toronto.		
Aureolaria pedicularia	Fern-leaved Yellow False Foxglove	T H R	*Gerardia pedicularia*	S2 ?	A declining species of dry open woods and savannas in southwestern Ontario known from fewer than ten extant populations. First collected in Ontario by A. Cosens (TRT) in 1900 at Grand Bend, Huron County. See Argus et al. (1982-1987), Soper (1952), Werth and Riopel (1979).	Fern-leaved Yellow False Foxglove is found in open savanna and woodland habitats along with Black Oak (Quercus velutina), its preferred host tree. The full range of Fern-leaved Yellow False Foxglove beyond southern Ontario covers most of the Eastern United States extending from Minnesota to Maine in the north and from Louisiana to Florida in the south. Fern-leaved Yellow False Foxglove is largely restricted to the Carolinian ecoregion. There are six subpopulations remaining in Ontario which are found in: Hamilton Halton Lambton Norfolk Niagara Two additional populations may persist in Brant County and Walpole Island First Nation. About 19	N	NA

						subpopulations have been extirpated including ones in Essex, Waterloo and the city of Toronto.		
Bartonia paniculata	Branched Bartonia	THR		S2	An inconspicuous plant of Sphagnum peatlands in the southeastern Georgian Bay area. First found in Ontario in 1973 by Emerson Whiting in Muskoka District (Reznicek and Whiting 1976) and since then found at a few additional sites. Plants in the Great Lakes region are disjunct by over 500 km from the main range of the species further to the east. See Argus et al. (1982-1987), Brinker (2006), COSEWIC (2003a), Gillett (1959, 1963), Henson (1985), Mathews et al. (2009), White (1992).	Branched Bartonia grows in sphagnum bog or fen wetlands dominated by sedges or low shrubs. It is usually found in areas with Tamarack and Black Spruce trees. Branched Bartonia is found in the United States from New England south to Florida and Texas, and west to Wisconsin. In Canada, this plant has been found only at ten sites in south-central Ontario, in Muskoka and Parry Sound districts.	N	NA
Bryoandersonia illecebra	Spoon-leaved Moss	THR	*Cirriphyllum boscii*	S2	Roughly 15 populations known (Jennifer Doubt, pers. comm. Nov. 2012).	Spoon-leaved moss grows in a range of habitat types but most Canadian populations are located on soil in low-lying areas that are seasonally flooded under trees or shrub thickets. It is often found in close proximity to a species of moss called narrow-leaved wetland plume moss, which is associated with swamps, marshes, and wet meadows. Spoon-leaved moss is found only in eastern North America, from southern Ontario south to Texas and Florida. In Canada, it is restricted to a few sites in southern Ontario – Elgin, Essex and Welland	N	NA

						counties, and the Niagara Region.		
Camassia scilloides	Wild Hyacinth Eastern Camas	T H R		S1	First collected in Ontario in 1882 by J. Macoun on White Island in the Detroit River, Essex County (CAN; Campbell and Reznicek 1977). Currently restricted to moist deciduous woods and thickets on the Erie Islands and known from fewer than ten recently verified locations. Campbell and Reznicek (1977) considered Camassia scilloides vulnerable to picking and grazing. The species has declined on some of the smaller islands in Lake Erie due to a dramatic increase in the number of nesting Double-crested Cormorants resulting in changes to vegetation and soil chemistry. See Argus et al. (1982-1987), Campbell and Reznicek (1977), COSEWIC (2002i), Gould (1942).	Wild hyacinth grows best in light to moderate shade. In Ontario, Wild hyacinth prefers openings in woodlands, shrubby areas and forest edges. This species requires rich soil. In Canada, Wild hyacinth is found only in southwest Ontario. Based on surveys in 1998 and 2001 it is believed to exist at only six sites scattered over a few islands in west Lake Erie, including Pelee Island, with most of these populations consisting of 2,000 to 5,000 plants.	N	NA
Canis sp. cf. lycaon	Eastern Wolf	T H R	*Canis lupus lycaon, Canis sp. cf. lycaon*	S2	Relatively small range, and small population size. Multiple threats, including continued hybridization with Eastern Coyote, and, to a lesser extent, Gray Wolf.	The Eastern Wolf is not restricted to any specific habitat type but typically occurs in deciduous and mixed forest landscapes. It is found to be most prevalent in areas with abundant prey, such as Beaver, White-tailed Deer and Moose along with low levels of human-caused mortality. Den sites are typically found in conifer dominated forests close to a permanent water source. Suitable soil to construct a den, such as sand, is necessary for excavation. Ontario's Eastern Wolf population is estimated to be fewer than 500 mature individuals. A core concentration of Eastern	N	NA

						Wolf can be found in Algonquin Provincial Park and surrounding townships. Eastern Wolf is also found in other areas of central Ontario, including in and around Killarney Provincial Park, Kawartha Highlands Signature Site, and Queen Elizabeth II Wildlands. Populations of Eastern Wolf outside of Algonquin Park are small and relatively isolated.		
Celtis tenuifolia	Dwarf Hackberry	T H R	*Celtis pumila*	S2	Dry, open sandy woods and dunes; and alvar woodland in southwestern Ontario. Most common in the province in the Grand Bend area (Lambton County) on forested dunes. Also disjunct at a few calcareous rocky woodland sites in southeastern Ontario (see Brownell et al. 1994). First collected in Ontario in 1907 by Charles K. Dodge at Port Franks, Lambton County (MICH). See Argus et al. (1982-1987), COSEWIC (2003c), Dunster (1992). Soper and Heimburger (1982), Wagner (1974).	Dwarf Hackberry grows in several different habitats. These include dry, sandy areas near lakeshores, inland dunes, ridge tops and limestone alvars. Several plant communities in which Dwarf Hackberry occurs are considered rare to extremely rare, such as shrub and treed sand dunes, oak savannas, and red cedar-treed alvars. Dwarf Hackberry is a sun-loving tree that does best in areas where it will not be shaded-out by other trees and vegetation. The species reaches the northern limits of its distribution in southern Ontario, over 1,000 kilometres north of the geographical centre of its range in the United States. In Canada, there are six known locations in southern Ontario: Port Franks area, Point Pelee,	N	NA

						Pelee Island, Point Anne, and two sites near Belleville. The Canadian population is estimated to be more than 14,000 plants.		
Chaetura pelagica	Chimney Swift	THR		S3B	An uncommon and declining breeding species of southern Ontario. Fairly common migrant throughout southern Ontario.	Before European settlement Chimney Swifts mainly nested on cave walls and in hollow trees or tree cavities in old growth forests. Today, they are more likely to be found in and around urban settlements where they nest and roost (rest or sleep) in chimneys and other manmade structures. They also tend to stay close to water as this is where the flying insects they eat congregate. The Chimney Swift breeds in eastern North America, possibly as far north as southern Newfoundland. In Ontario, it is most widely distributed in the Carolinian zone in the south and southwest of the province, but has been detected throughout most of the province south of the 49th parallel. It winters in northwestern South America.	Y	No habitat
Chimaphila maculata	Spotted Wintergreen	THR		S2	Dry, sandy woods in southern Ontario. First collected in Ontario in 1874 by J. Macoun from 'shore of Lake Erie' (DAO). Seven presumed extant populations known as of 2015, some of which are relatively large. Known from as far north as the Georgian Bay area at Wasaga	n Ontario, Spotted Wintergreen occurs in dry oak-pine woodland habitats with sandy soils Typically, dominant tree species include White Pine, Red Oak, Black Oak, and	N	NA

					Beach and in Muskoka District though not seen recently at either site. See Argus et al. (1982-1987), COSEWIC (2000a), Hodgdon and Eastman (1973), Kirk (1987), Soper and Heimburger (1982), Standley et al. (1988), Sutherland (1987), White (1998).	American Beech. The species does best in semi-open habitats. Spotted Wintergreen ranges from New England and Michigan south to Georgia. It also occurs in Mexico and Central America. In Canada, it is only found in a few locations in southern Ontario in Norfolk County and the Niagara Region. It is believed to have been been extirpated from Simcoe Kent, Middlesex and York Counties, Hamilton-Wentworth Region and the District of Muskoka. There is a record for Spotted Wintergreen in Quebec but it is believed to have been introduced and now no longer persists.		
Cirsium pitcheri	Pitcher's Thistle	T H R		S2	A Great Lakes sand dune endemic of Lake Huron and one site on Lake Superior with several populations extirpated and others threatened by recreational use of dunes (ATVs, trampling and cottage development) and by predation from White-tailed Deer and plume moth larvae. Fewer than 20 extant localities known in Ontario. First collected in Ontario in 1866 by John Bell at Cockburn Island in Lake Huron, Manitoulin District (CAN). See Argus et al. (1982-1987), Balogh and Scholtens (2001), Bell et al. (2002), Bowles et al. (1993), Chen (1997), Chen and Maun (1998, 1999), D'Ulisse (1995), D'Ulisse and Maun (1996),	The Pitcher's Thistle grows in windblown sandy habitats, especially on coastal sand dune ridges, among grasses and other plants. It requires a moderate amount of sand movement, and open, bare areas among the vegetation. The global population of the Pitcher's Thistle is limited to the Great Lakes basin of Canada and the United States.	N	NA

					Guire and Voss (1963), Hamze and Jolls (2000), Keddy and Keddy (1984), Loveless and Hamrick (1988), Marshall (2017), Maun (1997), Maun et al. (1996), McEachern et al. (1994), Moore and Frankton (1974), Nantel et al. (2018), Phillips and Maun (1996), Promaine (1999), Rowland and Maun (2001), Stanforth et al. (1997).	In Canada, the Pitcher's Thistle is found only in Ontario where it is believed to be restricted to 30 sites: three on the Lake Huron shoreline south of the Bruce Peninsula, two on the Lake Superior shoreline and the remainder in the Manitoulin region.		
Cirsium pumilum var. hillii	Hill's Thistle	THR	*Cirsium hillii, Cirsium pumilum ssp. hillii, Cirsium pumilum var. hillii*	S3	Sand dunes, sandy woods, alvar pavement and alvar woodland primarily on the Bruce Peninsula and Manitoulin Island. First collected in Ontario in 1874 by J. Macoun from the Fishing Islands in Lake Huron, Bruce County (CAN). A large portion of the range of this globally rare thistle is in the Great Lakes region (Argus et al. 1982-1987). Freeland et al. (2010) studied the conservation genetics of Hill's Thistle in Ontario. See Anonymous (2003a), COSEWIC (2004c), Moore and Frankton (1966, 1974).	In Ontario, Hill's Thistle is found in open alvar grasslands, surrounded by forests of Jack Pine, White Spruce, and Eastern White Cedar. Alvars are flat areas of limestone bedrock with very shallow soil and vegetation consisting of scattered trees, shrubs and grasses. This sun-loving thistle is also found in prairie and sand dunes. These are all rare habitats in Ontario, characterized by open and sunny conditions. Hill's Thistle is only found near the Great Lakes of North America. In Canada, following an assessment in 2004, Hill's Thistle is believed to persist at 64 sites in southern Ontario. It is mainly found on Manitoulin Island, and on the west side of the Bruce Peninsula. Note: also found in Simcoe County – Wasaga Beach area.	Y	No habitat

Coregonus clupeaformis pop. 4	Lake Whitefish - Opeongo Lake small-bodied population	T H R		S U		Lake Whitefish typically prefers the deep sections of large lakes, acting mainly as a bottom feeder, eating crustaceans, snails, insects and other small aquatic organisms. Lake Whitefish will move into rivers and streams to feed in the early spring and in the fall and early winter will move to shoals of large lakes and rivers. In some lakes, Lake Whitefish have co-evolved as species pairs with two distinct populations of larger and smaller-bodied individuals. These two populations are distinct in appearance and occupy different habitats but are not considered to be different species. The small-bodied population often occupies surface waters, while the large-bodied population are often found near the bottom of the lake. Lake Whitefish is broadly distributed throughout Canada and Alaska, south into New England, the Great Lakes basin and central Minnesota. The Opeongo Lake populations of Lake Whitefish are found exclusively in Opeongo Lake, which is located in Algonquin Provincial Park.	N	N

Coregonus clupeaformis pop. 5	Lake Whitefish - Opeongo Lake large-bodied population	T H R		S U		Lake Whitefish typically prefers the deep sections of large lakes, acting mainly as a bottom feeder, eating crustaceans, snails, insects and other small aquatic organisms. Lake Whitefish will move into rivers and streams to feed in the early spring and in the fall and early winter will move to shoals of large lakes and rivers. In some lakes, Lake Whitefish have co-evolved as species pairs with two distinct populations of larger and smaller-bodied individuals. These two populations are distinct in appearance and occupy different habitats but are not considered to be different species. The small-bodied population often occupies surface waters, while the large-bodied population are often found near the bottom of the lake. Lake Whitefish is broadly distributed throughout Canada and Alaska, south into New England, the Great Lakes basin and central Minnesota. The Opeongo Lake populations of Lake Whitefish are found exclusively in Opeongo Lake, which is located in Algonquin Provincial Park.	N	N

Coregonus zenithicus	Shortjaw Cisco	THR	*Coregonus alpenae*	S2		The Shortjaw Cisco spends most of the year in deep water, usually between 55 to 180 metres in depth. During the breeding season, which can be spring or fall depending on the lake, it migrates to shallower water (10 to 60 metres) to mate and lay eggs. It feeds on tiny aquatic animals, called zooplankton, but also eats aquatic insects, crustaceans, and freshwater shrimp. The Shortjaw Cisco lives in the Great Lakes, and a few large lakes in Ontario, Manitoba, Saskatchewan, Alberta and North West Territories. In Ontario, it is found in Lake Superior, Lake Nipigon and in some smaller inland lakes. It is considered extirpated from lakes Michigan, Erie and Huron.	Y	No habitat
Cyclonaias tuberculata	Purple Wartyback	THR		S2		Purple Wartyback can be found in small to large rivers with different types of substrates, including: cobble gravel mixed gravel sand The rivers they occur in typically have moderate to swift currents. The adults burrow into the substrate and are usually found in areas with water depths ranging from 0.6 meters to six meters. The adults are typically found at the	N	NA

						surface of the substrate during the summer months but burrow deeper during the winter, while the juveniles spend their first few years completely buried. Larvae are free-swimming and parasitize fish, meaning the species requires a host fish to complete part of its lifecycle. Historically, the Purple Wartyback was widespread throughout eastern North America, being found in 20 American states and one Canadian province. The historical distribution ranged from southwestern Ontario south to Mississippi, east to North Carolina, and west to Oklahoma. It is thought to be extirpated from Pennsylvania and South Dakota. In Ontario, the Purple Wartyback is found within the Great Lakes – Upper St. Lawrence National Freshwater Biogeographic Zone. This species has been observed in southwestern Ontario in the Ausable, Sydenham and Thames Rivers.		
Cyperus subsquarrosus	Small-flowered Lipocarpha	THR	*Cyperus subsquarrosus, Hemicarpha micrantha, Lipocarpha micrantha, Scirpus micranthus*	S2?	First documented in 1892 and 1901 from the shore of the Detroit River south of Amherstburg by John Macoun and rediscovered at nearby Big Creek on Lake Erie in 1984 by Michael Oldham (CAN, GH, TRT; Oldham and Crins 1988). Not seen in southern Ontario in more than 25	The Small-flowered Lipocarpha grows on sandy beaches that are seasonally flooded and are protected from high waves or strong currents.	N	NA

					years but more recently discovered at about ten sites on Rainy Lake and Lake of the Woods in northwestern Ontario. Most visible during low water years. See Argus et al. (1982-1987), Baumbrough (2003b), COSEWIC (2002f), Friedland (1941), Oldham (1996c).	It is most abundant in open, sunny areas with little vegetation. This sensitive plant does not tolerate even slight changes to its habitat, pollution, or competition from other plants. In Canada, based on surveys done in 2000 and 2001, the Small-flowered Lipocarpha is thought to occur only in southern British Columbia and northwestern Ontario. In Ontario, it is found in the Lake of the Woods and Rainy Lake areas. In 1987, Small-flowered Lipocarpha was reported in Essex Country in southwestern Ontario, but shoreline habitat destruction may have since resulted in loss of this population.		
Dolichonyx oryzivorus	Bobolink	T H R		S4 B	Fairly common but declining breeding species found over most of the province. Most of breeding range is patchy with breeding birds in northern Ontario primarily restricted to the Rainy River, Thunder Bay, and New Liskeard areas. In southern Ontario it has a nearly continuous range except for the Algonquin dome where it is mostly absent, however, it is much more abundant along the southern edge of the Canadian Shield than elsewhere in the south. Common migrant throughout the province.	Historically, Bobolinks lived in North American tallgrass prairie and other open meadows. With the clearing of native prairies, Bobolinks moved to living in hayfields. Bobolinks often build their small nests on the ground in dense grasses. Both parents usually tend to their young, sometimes with a third Bobolink helping. The Bobolink breeds across North America. In Ontario, it is widely	Y	Not observed on site – insufficient habitat – disturbance levels too high

						distributed throughout most of the province south of the boreal forest, although it may be found in the north where suitable habitat exists.		
Emydoidea blandingii	Blanding's Turtle	T H R	*Emydoidea blandingii pop. 2, Emys blandingii*	S3	Widespread in southern and central Ontario. However populations often appear to be rather small and declines have undoubtedly occurred in southwestern Ontario due to habitat loss. Increasingly threatened by road mortality, invasive species, illegal collection, and habitat loss and decline.	Blanding's Turtles live in shallow water, usually in large wetlands and shallow lakes with lots of water plants. It is not unusual, though, to find them hundreds of metres from the nearest water body, especially while they are searching for a mate or traveling to a nesting site. Blanding's Turtles hibernate in the mud at the bottom of permanent water bodies from late October until the end of April. The Blanding's Turtle is found in and around the Great Lakes Basin, with isolated populations elsewhere in the United States and Canada. In Canada, the Blanding's Turtle is separated into the Great Lakes-St. Lawrence population and the Nova Scotia population. Blanding's Turtles can be found throughout southern, central and eastern Ontario.	Y	No habitat
Enemion biternatum	Eastern False Rue-anemone	T H R	*Isopyrum biternatum*	S2	Floodplain woods and rich wooded slopes in the Carolinian Zone. First collected in Ontario in 1891 by J. Dearness at Mud Creek, Parkhill,	Eastern False Rue-anemone grows in deciduous forests and thickets with rich, moist	N	NA

					Middlesex County (DAO, OAC). See Argus et al. (1982-1987), Austen (1991), Boufford and Massey (1976), COSEWIC (2005a), Soper (1962).	soil, often in valleys, floodplains and ravine bottoms. This species is frequently found close to watercourses within mature forests with lots of maple and beech trees. It prefers partial sun or somewhat shady conditions. In Canada, based on information available in 2003, Eastern False Rue-anemone is believed to occupy only six places in southwestern Ontario, all in the Carolinian region. Some sites support tens of thousands of plants but they are often densely clustered into a small area.		
Eurybia divaricata	White Wood Aster	THR	*Aster divaricatus*	S3	Mesic to dry deciduous woods in southwestern Ontario where threatened by habitat loss and invasive species. First collected in Ontario in 1893 by R. Cameron at Niagara Falls (CAN). Recently found at a number of new sites in Niagara Regional Municipality (O'Hara 2018), bringing the number of extant Ontario populations from 15 in 2002 (COSEWIC 2002) to 44 in 2018 (Environment and Climate Change Canada 2018). Formerly known from the Hamilton, Toronto, and Kingston areas, though no recent records from any of these locations. See also Argus et al. (1982-1987), Bernard and Boivin (1982), Semple et al. (2002).	White wood aster grows in open, dry deciduous forests that are dominated by Sugar maple and American beech trees. It is often found mixed in with other asters. The plant does best in well-drained soils and it may prefer a low level of disturbance, as it has been found to grow along trails. It does well in partial to full shade. White wood aster ranges from New England south to Georgia and Alabama. In Canada, it is restricted to a relatively small number of sites in the Niagara region	N	NA

						and a few woodlots in southwestern Quebec.		
Exoglossum maxillingua	Cutlip Minnow	T H R		S2		In Ontario, the Cutlip Minnow lives in warmer rivers and creeks with clear, slow-moving water, and a rocky or gravel bottom. The males dig nests in the gravel where the females lay their eggs. Nests are often found under banks, logs, or around large rocks. The adult feeds on the river bottom and eats aquatic insects. In Canada, the Cutlip Minnow is found in Ontario and Quebec. Since the 1930s, this species has been recorded at 12 sites in southeast Ontario. However, the most recent surveys have found the Cutlip Minnow at only a few sites in the province.	N	NA
Fraxinus quadrangulata	Blue Ash	T H R		S2 ?	Floodplains, sandy woods and alvar woodland in southwestern Ontario (Argus et al. 1982-1987, Fox and Soper 1953). First collected in Ontario in 1882 by J. Macoun and T.J.W. Burgess at Point Pelee, Essex County. Threatened by the introduced Emerald Ash Borer (e.g. Anulewicz et al. 2008). Ash trees have been decimated in southwestern Ontario by Emerald Ash Borer and populations of Blue Ash are declining, however this species has a higher survival rate than other native ash species following Emerald Ash Borer invasion (Tanis and McCullough 2012). This species has been assessed as Critically Endangered globally by the IUCN Red List	In Ontario, Blue Ash grows in deciduous floodplain forests, and along sandy beaches and on limestone outcrops associated with Lake Erie. The range of Blue Ash extends from southwestern Ontario south to Oklahoma and Georgia. In Canada, it occurs only in southwestern Ontario, at the northern limits of its range, where about 56 occurrences are known.	N	NA

					(Barstow et al. 2018), Threatened in Canada by COSEWIC, and Threatened in Ontario by COSSARO.			
Gulo gulo	Wolverine	T H R	*Gulo gulo luscus, Gulo gulo pop. 1*	S2 S3	Rare but relatively widespread species now primarily restricted in the province to the area north of 51N. Distribution greatly reduced from the documented historical range. Current population trends unclear, but some evidence of regional fluctuations. Recent survey results suggest a larger population, but long-term population viability remains uncertain.	Wolverines usually live alone and roam across large territories that vary from 500 to 1500 square kilometres or more. Females build dens under snow-covered boulders, fallen logs, and occasionally in snow drifts. Researchers are still learning about the ecology and habitat needs of the Wolverine in Ontario. Historically, Wolverines were found throughout most of Ontario. Today, they are primarily found in the northwest boreal forest and coastal tundra; however, recent studies show some re-colonization of their historical northeastern range.	N	NA
Gymnocladus dioicus	Kentucky Coffee-tree	T H R	*Gymnocladus dioica*	S2	Rich woods and marsh edges in the Carolinian Zone; open Hackberry woods on shallow soil over limestone on the Erie Islands. First collected in Ontario in 1892 by J. Macoun on Pelee Island, Essex County. Most Ontario populations are single-sex clones. Sometimes planted and the native status of populations or individual trees along roadsides, fencerows, and in yards can be difficult to determine. See Ambrose (1984), Ambrose and Kevan (1990), Argus et al. (1982-1987), Fox and Soper (1953), Limbird et al. (1980), Sutherland (1987).	Kentucky Coffee-tree is found in a variety of habitats, but grows best on moist, rich soil. Consequently, it is often found in floodplains, though it will tolerate shallow rocky or sandy soils. It is shade-intolerant, and therefore grows along the edges of woodlots or relies on canopy openings in forests and woodlots. The Kentucky Coffee-tree is rare throughout its range, which extends from the southern Great Lakes	N	NA

						region east to New York in scattered localities, south to Oklahoma and Arkansas, and west to Kansas and Nebraska. In Canada, it is only found in southwest Ontario where it was documented at 20 locations in 2000. Native subpopulations of Kentucky Coffee-tree are restricted to southwestern Ontario, particularly: the County of Essex the County of Lambton the County of Middlesex the Municipality of Chatham-Kent The extent of native subpopulations in Ontario represents approximately 3% of the global range of Kentucky Coffee-tree. Extirpated subpopulations previously occurred in: the County of Oxford the County of Norfolk the County of Elgin In addition to the native subpopulations that occur in southwest Ontario, Kentucky Coffee-tree has been introduced throughout southern Ontario. Planted individuals have been reported throughout the Mixedwood Plains Ecozone (Ecoregions 6E and 7E), as far north and east as Ottawa.		

Haploa reversa	Reversed Haploa Moth	T H R	*Callimorpha reversa*	S1		Reversed Haploa Moth is associated with: oak savanna oak woodland dune habitats Moth larvae in the Haploa genus are polyphagous, meaning they are able to feed on plants of many species. Moths in the Haploa genus are commonly associated with Eupatorium plant species, as well as plants in the sunflower (Asteraceae) and borage (Boraginaceae) families. Reversed Haploa Moth larvae have been observed feeding on Hairy Puccoon (Lithospermum caroliniense) in Canada. The full range of Reversed Haploa Moth extends across North America from southeast Minnesota to Texas and western Arizona, east to North Carolina and north into southwestern Ontario. Reversed Haploa Moth is known from four extant (currently existing) subpopulations in southwestern Ontario, restricted to the Carolinian ecoregion. It can be found in: Lambton County Walsingham, Norfolk County The Coves in London Ojibway Prairie, Essex County	N	NA

Heterodon platirhinos	Eastern Hog-nosed Snake	T H R	*Heterodon contortrix*	S3	Although Eastern Hog-nosed Snakes are widespread in southern Ontario, the species appears to have declined, particularly in southwestern Ontario. There are very few sites where the species is common and many occurrences are based on single sight records. Populations in the Georgian Bay area and along the southern edge of the Precambrian Shield appear to be smaller than those in southwestern Ontario. The susceptibility of the Hognose Snake to human persecution (often heightened by its elaborate defensive behaviours), the lack of abundance data on most, if not all, populations in the province, and the noticeable decline in range/number of extant occurrences in Ontario suggests that a rank of S3 is warranted.	The Eastern Hog-nosed Snake specializes in hunting and eating toads, and usually only occurs where toads can be found. Eastern Hog-nosed Snakes prefer sandy, well-drained habitats such as beaches and dry forests where they can lay their eggs and hibernate. They use their up-turned snout to dig burrows below the frost line in the sand where eggs are deposited. The Eastern Hog-nosed Snake is only found in eastern North America, with less than 10% of its range occurring in Canada. It is found in 34 states in the United States and in Ontario, Canada. The Canadian population is limited to Ontario where it can be found in two areas: the Carolinian Region and Great Lakes-St. Lawrence Region.	Y	No habitat, none observed
Ixobrychus exilis	Least Bittern	T H R		S4 B	A very uncommon but local breeding species, primarily of southern Ontario.	In Ontario, the Least bittern is found in a variety of wetland habitats, but strongly prefers cattail marshes with a mix of open pools and channels. This bird builds its nest above the marsh water in stands of dense vegetation, hidden among the cattails. The nests are almost always built near open water, which is needed for foraging. This species eats	Y	No habitat

						mostly frogs, small fish, and aquatic insects. In Ontario, the Least bittern is mostly found south of the Canadian Shield, especially in the central and eastern part of the province. Small numbers also breed occasionally in northwest Ontario. This species has disappeared from much of its former range, especially in southwestern Ontario, where wetland loss has been most severe. In winter, Least bitterns migrate to the southern United States, Mexico and Central America.		
Justicia americana	American Water-willow	T H R		S2	A wetland species with a very limited range in southern Ontario, primarily along the north shore of Lake Erie, but also in southeastern Ontario. First collected in Ontario in 1879 by T.J.W. Burgess at Niagara Falls (DAO, TRT). Its shoreline habitat is threatened by development, erosion, and succession. Some populations observed in the 1980's could not be relocated in the 1990's despite searches by several botanists. Discovered in 2008 on the Canadian side of the St. Lawrence River by Shaun Thompson, where it was previously only known from the U.S. (New York state) side (Argus et al. 1982-1987). Seven extant Ontario occurrences listed in Parks Canada Agency (2011) with one additional record reported since. See Fritz and Feminella (2003), Hill (1981), Howell (1975), Koryak and Reilly	The range of the American Water-willow is limited to east central North America from Georgia and Texas north to New York, Michigan, southern Ontario and Quebec. The American Water-willow grows along the shores and in the waters of: streams rivers lakes ditches occasionally wetlands It can grow on wet soil and in up to 1.2 metres of water but appears to require periodic flooding and wave action to reduce competition from other aquatic plants.	N	NA

					(1984), Lewis (1980), Penfound (1940).	The underlying subsoil on which it grows is usually gravel, sand or organic matter. In Ontario, the number of locations where the species could be found ranges from six to 10. The majority of subpopulations in Ontario are along the Lake Erie shoreline. Subpopulations are also found along the Welland River and St. Lawrence River and a subpopulation may occur at Sharbot Lake, although it is unclear whether that subpopulation still exists.		
Lampsilis fasciola	Wavy-rayed Lampmussel	T H R		S2		The Wavy-rayed lampmussel is usually found in small to medium rivers with clear water. It lives in shallow riffle areas with clean gravel or sand bottoms. Like all mussels, this species filters water to find food, such as bacteria and algae. Mussel larvae are parasitic and must attach to a fish host, where they consume nutrients from the fish body until they transform into juvenile mussels and drop off. The Wavy-rayed lampmussel's fish hosts are the Largemouth bass and Smallmouth bass. The presence of fish hosts is one of the key features for an area to support a healthy mussel population. In Canada, the Wavy-rayed lampmussel is found only in Ontario in the Grand, upper	N	NA

						Thames, Maitland, Ausable and St. Clair rivers, and the Lake St. Clair delta. It has disappeared from Lake Erie, the Detroit River and most of Lake St. Clair, and may also be gone from the Sydenham River.		
Liatris spicata	Dense Blazing-star	T H R		S2	Native populations are restricted to the tall-grass prairies and oak savanna remnants of southwestern Ontario. First collected in Ontario in 1884 by J. Macoun at Point Edward, Lambton County (CAN). Fewer than 20 extant native populations, most of which are threatened by development. More than 10 extirpated populations indicating a significant decline. Occasionally occurs along roadsides or railways and sometimes planted in "prairie restorations" away from its native range. Populations in the western Lake Ontario region (e.g. Toronto area, Niagara Region) and Kingston area are probably non-native (Argus et al. 1982-1987, Catling and McKay 1974, Roberts et al. 1977, Oldham 2010a, 2017). See Allen (1988, 2001), Cruise (1964), Gaiser (1946), Medve (1985, 1987).	In Ontario, Dense Blazing Star grows in moist prairies, grassland savannahs, wet areas between sand dunes, and abandoned fields. This plant does not do well in the shade and is usually found in areas that are kept open and sunny by fire, floods, drought, or grazing. Dense Blazing Star is found only in North America. In Canada, it occurs naturally only in southwest Ontario, mainly in the area between Lake St. Clair, Lake Huron and Lake Erie. There are believed to be 11 to 13 populations in the province with six populations known to have been lost.	N	NA
Limosa haemastica	Hudsonian Godwit	T H R		S3 B, S4 M	An uncommon breeder but restricted to the small strip of tundra along Hudson Bay. Fairly common in fall migration along James Bay, where globally-significant numbers (a significant portion of the global population) stages. Rare in spring and fall migration elsewhere in Ontario.	Hudsonian Godwit has one of the longest migrations of any North American shorebird. It travels approximately 32,000 km round trip annually between its breeding areas in the north and wintering grounds in South America. This bird uses a wide variety of habitats during migration, such as freshwater marshes, saline lakes, flooded fields,	N	NA

						shallow ponds, coastal wetlands and mudflats. It overwinters in the southernmost regions of South America. There are only three known breeding areas for this species: the Hudson Bay Lowlands of Ontario and Manitoba the Mackenzie Delta in the Northwest Territories southwestern Alaska. In Ontario, Hudsonian Godwit only breeds along the coast of James Bay. It breeds in wetland habitats such as sedge meadows and muskeg. It has been detected during the breeding season in large fens 40 to 50 km inland from the coast and occasionally as much as 100 km inland.		
Liparis liliifolia	Purple Twayblade	T H R	*Liparis lilifolia*	S2 S3	A rare and local orchid known from scattered southern Ontario sites. First reported in Ontario by Andrews (1961) from a site near Komoka, Middlesex County, where found by Mrs. J. C. Higgins. Grows in open woods, but also colonizes previously open and disturbed habitats during early and mid-successional stages of reforestation and apparently increasing in the northern part of its range (Case 1987, Sheviak 1974, Whiting and Catling 1986). See Allen (1989), Argus et al. (1982-1987), Mattrick (2004).	In Ontario, Purple twayblade is found in a variety of habitats including open oak woodland and savannah, mixed deciduous forest, shrub thicket, shrub alvar, deciduous swamp, and even conifer plantations. It will grow in partial shade, but does not like dense shade and depends on natural disturbances, such as storms and fire, to keep its habitat relatively open and sunny. In Canada, Purple twayblade is found primarily in southwest	Y	No habitat, not observed

						Ontario. Two additional populations are known from farther east, one in the Regional Municipality of York and the second in Frontenac County near Kingston. Based on field surveys undertaken from 2007 to 2009, the Canadian population of Purple Twayblade is estimated at 200 to 500 plants in any given year within up to 19 distinct populations. Note: also found east of Port Severn area (N. Simcoe, S. Muskoka)		
Macrhybopsis storeriana	Silver Chub	T H R	*Hybopsis storeriana, Hybopsis storerianus, Macrhybopsis storeriana pop. 1*	S2	Very restricted range in Ontario (& all of Canada). Low abundance as indicated be catch-per-unit-efforts by OMNR. On the COSEWIC list as rare in Canada, and the only demes are in Ontario & Manitoba (marginal in both). Abundant in early 60's, uncommon in late 60's therefore unstable population.	In Canada, Purple twayblade is found primarily in southwest Ontario. Two additional populations are known from farther east, one in the Regional Municipality of York and the second in Frontenac County near Kingston. Based on field surveys undertaken from 2007 to 2009, the Canadian population of Purple Twayblade is estimated at 200 to 500 plants in any given year within up to 19 distinct populations. The distribution of the Silver chub includes the Mississippi drainage area from the Great Lakes south to the Gulf coast, east to the foothills of the Appalachians and as far	N	NA

						west as the Great Plains. In Ontario, it is found in Lake Erie and Lake St. Clair. It is also found in Manitoba in the Red River and lower Assiniboine River.		
Moxostoma duquesnei	Black Redhorse	THR		S2	Few EO's, very restricted range; small and declining pop., geographically isolated from U.S. pops. (ie. limited gene pool).	In Ontario, the Black Redhorse lives in pools and riffle areas of medium-sized rivers and streams that are usually less than two metres deep. These rivers usually have few aquatic plants, a moderate to fast current, and a sandy or gravel bottom. In the spring, it migrates to breeding habitat where eggs are laid on gravel in fast water. The winter is spent in deeper pools. Adults feed on crustaceans and aquatic insects, while the young fish feed on plankton. In Canada, the Black Redhorse is found only in southwestern Ontario at a few locations in the Bayfield River, Maitland River, Ausable River, Grand River, Thames River, and Spencer Creek watersheds.	N	NA
Notropis anogenus	Pugnose Shiner	THR	*Miniellus anogenus*	S2	Very restricted range. Small population sizes & these are all geographically isolated. Rarely seen or collected. Significant numbers in the past therefore threatened or endangered? On COSEWIC list as rare in Canada.	The Pugnose Shiner is found in lakes and calm areas of rivers and creeks having clear water and bottoms of sand, mud or organic matter. It prefers water bodies with plenty of aquatic vegetation, particularly stonewort (Chara sp.).	N	NA

						Aquatic plants provide hiding places, food, and breeding habitat. The Pugnose Shiner eats aquatic plants, green algae, plankton and some aquatic insects. In North America, the Pugnose Shiner is found in several tributaries of the upper Mississippi River, in the upper Red River drainage and in the Great Lakes drainage. In Canada, the Pugnose Shiner is found only at a few sites in southern Ontario, including the Teeswater River, the old Ausable Channel, the Trent River and a few coastal wetlands in Lake St. Clair (and some tributaries), Lake Erie, lower Lake Huron, Lake Ontario and the St. Lawrence River. The population sizes at these sites are unknown.		
Notropis photogenis	Silver Shiner	T H R				Silver shiners prefer moderate to large size streams with swift currents that are free of weeds and have clean gravel or boulder bottoms. They live in schools and feed on crustaceans and adult flies that fall in the water or fly just above the surface. In June or July, they spawn by scattering their eggs over gravel riffles.	N	NA

						The Silver shiner range includes east-central North America throughout the Ohio and Tennessee River drainage basins. In Ontario, it is found in the Thames and Grand Rivers, and in Bronte Creek and Sixteen Mile Creek, which flow into Lake Ontario.		
Obliquaria reflexa	Threehorn Wartyback	T H R		S1		This mussel is found in large rivers with moderate current and stable gravel, sand and mud bottoms. It burrows in the riverbed to filter-feed. Like most mussels, threehorn wartyback females expel their larvae in the gills of host fish, where they live as parasites before forming into free-living mussels. Likely host fish are the common shiner and longnose dace. In Ontario, this mussel is found only in the Sydenham, Thames and Grand rivers in southwestern Ontario. Historically, it was also found in Lake St. Clair, the Detroit River and western Lake Erie.	N	NA
Opsopoeodus emiliae	Pugnose Minnow	T H R	*Notropis emiliae*	S2		The Pugnose Minnow prefers coastal wetlands, and slow-moving rivers and streams with clear, warm water, little or no current, and abundant vegetation. The Pugnose Minnow lives in central North America in	N	NA

						the rivers and streams of the Mississippi River basin. Its range extends from South Carolina and Florida west to Texas and north to Wisconsin. In Canada, it is at the northern limit of its range and is only found in extreme southwestern Ontario with small populations in Lake St. Clair and the Detroit River.		
Pantherophis gloydi pop. 1	Eastern Foxsnake (Georgian Bay population)	THR	*Elaphe gloydi pop. 1, Pantherophis gloydi pop. 1*	S3	Population 1 (Georgian Bay population) listed as THR in Ontario in 2009. Formerly the full species was listed as THR. This harmless, large (140 cm long), non-venomous snake has a small global range, being primarily confined to shorelines of lakes Erie, St. Clair and Huron. Seventy percent of the global range for this species is found in Ontario. The Eastern Foxsnake is found in two distinct regions of Ontario, one along the eastern Georgian Bay coast and islands, and the other in the Carolinian region in southwestern Ontario. Snakes in these two regions are widely separated, exhibit significant genetic differences and occupy different ecological regions. Therefore, they are assessed as two distinct populations. <u>Georgian Bay Population</u>: This population (referred to as the Great Lakes/St. Lawrence Population by COSEWIC) occupies the shoreline of Georgian Bay, swimming among the islands and rarely straying more than 100m inland. These snakes predominantly use open habitats, coastal rock barrens and moist meadows along shorelines. The population's area of occupancy has	Eastern Foxsnakes in the Carolinian population are usually found in old fields, marshes, along hedgerows, drainage canals and shorelines. Females lay their eggs in rotting logs, manure or compost piles, which naturally incubate the eggs until they hatch. Individuals from the Georgian Bay population are usually found within 150 metres of the shore in rocky habitats spotted with trees and shrubs. During the winter, Eastern Foxsnakes hibernate in groups in deep cracks in the bedrock and in some man-made structures. The Eastern Foxsnake is only found in Ontario, Michigan and Ohio. Ontario contains 70 per cent of their range in two distinct populations: the Carolinian population in southwestern Ontario and the eastern Georgian Bay population.	Y	Out of observed range

					declined ~ 33% in the past 20 years, mostly near Honey Harbour and Port Severn. Immediate threats include loss of its shoreline habitat to recreational development, mortality from increasing road and boat traffic, persecution, and loss of hibernation sites to development. The population is classified as Threatened because although it is declining in abundance and area of occupancy, it may be still relatively secure in the less populated portions of Georgian Bay. (COSSARO classifications from March 24-25 and May 27-29, 2009 assessments reported to the Minister on June 11, 2009).			
Pantherophis spiloides pop. 1	Gray Ratsnake (Frontenac Axis population)	T H R	*Elaphe obsoleta, Elaphe spiloides pop. 1*	S3	Populations of Gray Ratsnakes in the Frontenac Axis region are vulnerable to habitat loss and fragmentation. This area subjected to increased vehicular traffic resulting in high road mortality to snakes. Communal hibernation behaviour makes the species more vulnerable to a variety of human threats including collecting and direct mortality. There are between 20 and 80 extant occurrences in the Frontenac Axis region of Ontario. 	The two populations of Gray Ratsnake in Ontario can be found in different types of habitat. The Frontenac Axis population requires a variety of habitat types including deciduous forests, wetlands, lakes, rocky outcrops and agricultural fields. The Carolinian population is found in a mix of agricultural land and deciduous forest, preferring habitat where forest meets more open environments. Adults are strongly attached to their home ranges and often return to the same nesting and hibernation sites. They often lay eggs in logs or compost piles that serve as incubators. Sometimes several females will use the same site to deposit eggs.	N	NA

						Gray Ratsnakes are widely distributed throughout the eastern and central United States, extending as far north as southern Ontario. There are two widely separated populations in Ontario: the Carolinian in southwestern Ontario and the Frontenac Axis in southeastern Ontario.		
Parkesia motacilla	Louisiana Waterthrush	THR	*Seiurus motacilla*	S2B	An uncommon to rare, local breeding species found throughout the Carolinian zone, north along the Niagara Escarpment, east along the Oak Ridge Moraine and then scattered further east along the southern edge of the Canadian Shield to Kingston.	The Louisiana waterthrush is usually found in steep, forested ravines with fast-flowing streams. Although it prefers running water, especially clear, coldwater streams, it also less frequently inhabits heavily wooded, deciduous swamps having large pools of open water. It nests among the roots of fallen trees, in niches of stream banks, and in or under mossy logs. The Louisiana waterthrush summer range extends from the lower Great Lakes south to Georgia and west to Kansas. Its winter range, though poorly known, includes much of Mexico, the Caribbean, Central America, and extreme northwestern South America. In Canada, the Louisiana waterthrush breeds only in southern Ontario, along the Niagara Escarpment, in woodlands along Lake Erie and scattered locations	Y	No habitat

						elsewhere. It probably nests sporadically in southwestern Quebec, but breeding there has never been confirmed. The Canadian breeding population is estimated to be between 105 and 195 pairs, which represents less than one per cent of the total continental population. Although the species has declined locally in some parts of its breeding range, due to habitat loss and degradation, overall population levels have been relatively stable in both Canada and much of the United States over the past 20 years.		
Pelecanus erythrorhynchos	American White Pelican	THR		S3B, S4M	A rare breeder in Ontario with about 15,000 individuals, primiarly in Lake of the Woods with smaller colonies on Lake Nipigon and near Thunder Bay. Small colony recently established in sw Lake Erie. Very uncommon in migration, primarily in NW Ontario with smaller numbers elsewhere on the Great Lakes, but also seen regularly on James Bay from breeding birds off Akimiski Island, Nunavut.	American White Pelicans nest in groups on remote islands that are barren or sparsely treed located in lakes, reservoirs, or on large rivers. Remote islands offer eggs and chicks some protection from predators. Pelicans nest in slight depressions in the ground with sticks and vegetation piled up around them. Their diet is mainly fish. American White Pelicans are found across the north-central and western United States. In Canada, they are found from the interior of British Columbia, east to northwestern Ontario.	N	NA

						These birds migrate south to the Gulf Coast states and Mexico. Ontario has about 10 per cent of the world's population of American White Pelicans.		
Phanogomphus quadricolor	Rapids Clubtail	T H R	*Gomphus quadricolor*	S2		The Rapids Clubtail is typically found in clear, cool medium-to-large rivers with gravel shallows and muddy pools. Larvae occupy quiet muddy pools. Adult males perch on exposed rocks and other projections in the rapids. Males are quite territorial and make short flights over the water, repeatedly returning to the same perch. Adult females typically inhabit forests along riverbanks, and only visit shallows and pools when they are ready to mate and lay eggs. The Rapids Clubtail is a globally rare to uncommon species found throughout eastern North America. Within this range the species and its habitat are locally distributed and there are large areas where the species does not occur. Most populations of the Rapids Clubtail are located in the U.S. Midwest, but their range extends from northern Alabama and Georgia to southern Ontario, and from Maine to eastern Minnesota.	N	NA

						In Ontario, the Rapids Clubtail has only been found in seven rivers in southern and eastern Ontario: the Thames, Humber, Credit and Mississippi. Ausable River Thames River Nith River Grand River Humber River Credit River Mississippi River		
Philomycus flexuolaris	Winding Mantleslug Carolina Mantleslug	T H R	*Philomycus carolinianus flexuolaris*	S3	Species relatively widespread north into southern Canadian Shield areas; slugs are a little under-surveyed in ON; probably still lots of habitat, especially in north of its distribution	Carolina Mantleslug is a terrestrial air-breathing slug that prefers undisturbed wet and riparian areas of older-growth forests, with large amounts of well-decayed wood. This slug is often found underneath loose bark on downed trees after rains and can often be spotted in forests containing large amounts of pine or aspen trees. Carolina Mantleslug can be found across eastern North America, from Minnesota to Maine and south to Texas and Florida. Its northern range limit is Michigan, southern Ontario and Vermont. Within Ontario, the species occurs in southwestern Ontario at the following locations: Pelee Island in Lake Erie	N	NA

						Grape Fern Woods in Lambton County Wheatley Provincial Park, Rondeau Provincial Park and Sinclair's Bush in Chatham-Kent County		
Rangifer tarandus pop. 14	Caribou (Boreal population)	T H R	*Rangifer tarandus, Rangifer tarandus caribou*	S4		Caribou habitat in the boreal forest is constantly changing. Much of the forest is naturally in an unsuitable condition for caribou at any one time, but caribou need and use the entire landscape over time as habitat changes. Disturbances from fires, blowdown, and insects can quickly change the amount and distribution of habitat. There is also great ecological variation in caribou habitat across the province ranging from upland fire-dependent forests in the northwest to extensive lowland forests in the northeast where fire is much less frequent. At the broad landscape scale, caribou require large, undisturbed areas of old or mature conifer upland forest and lowlands dominated by jack pine and/or black spruce. These areas allow caribou to effectively separate themselves from higher densities of moose, white-tailed deer, grey wolves and black bears which tend to be associated with younger mixed or deciduous forest. At smaller scales, caribou seasonally select specific habitat	N	NA

						features and areas that support successful reproduction and calf rearing, provide summer and/or winter forage, and/or facilitate movement between discrete areas of use. The boreal population of caribou was formerly found throughout most of northern Ontario. Its range has now receded and the species is generally found north of Sioux Lookout, Geraldton and Cochrane with a few isolated populations further south along the shoreline and islands of Lake Superior. It is estimated that there are roughly 5,000 boreal population caribou in Ontario. In the rest of Canada, boreal population caribou are found throughout the boreal forest from Newfoundland and Labrador to the Northwest Territories.		
Riparia riparia	Bank Swallow	T H R		S4 B	A common and widespread but declining breeding species throughout Ontario wherever suitable foraging and nesting sites occur.	Bank swallows nest in burrows in natural and human-made settings where there are vertical faces in silt and sand deposits. Many nests are on banks of rivers and lakes, but they are also found in active sand and gravel pits or former ones where the banks remain suitable. The birds breed in colonies ranging from	Y	No breeding habitat on site, observed in feeding habitat on-site and adjacent golf course. Golf course will continue to provide feeding habitat.

						several to a few thousand pairs. The bank swallow migrates south for the winter, primarily to South America. The bank swallow is found all across southern Ontario, with sparser populations scattered across northern Ontario. The largest populations are found along the Lake Erie and Lake Ontario shorelines, and the Saugeen River (which flows into Lake Huron). Although still widespread in Ontario, the bank swallow has declined in numbers and locations where it is found in the province.		
Setophaga cerulea	Cerulean Warbler	T H R	*Dendroica cerulea*	S2 B	An uncommon and declining breeding species of southern Ontario. The vast majority of breeding birds are now restricted to the Frontenac arch with only small, scattered numbers elsewhere in southern Ontario. Total population now estimated at less than 1000 adults. Rare migrant in southern Ontario away from breeding locations.	Cerulean Warblers spend their summers (breeding seasons) in mature, deciduous forests with large, tall trees and an open under storey. In late summer, they begin their long migration to wintering grounds in the Andes Mountains in South America. The Cerulean Warbler's breeding range extends from extreme southwestern Quebec and southern Ontario west to Minnesota and Nebraska and south to Texas and other Gulf states across to North Carolina.	Y	No habitat

						In southern Ontario, populations appear to be separated into two distinct bands: one from southern Lake Huron to western Lake Ontario, and further north, the other from the Bruce Peninsula and Georgian Bay area to the Ottawa River.		
Sistrurus catenatus pop. 1	Massasauga (Great Lakes / St. Lawrence population)	T H R		S3	The number of adults may be fewer than 10,000 and is declining because of continued degradation and loss of habitat, increasing mortality on roads and ongoing persecution of this venomous species (COSEWIC 2012).	Massasaugas live in different types of habitats throughout Ontario, including tall grass prairie, bogs, marshes, shorelines, forests and alvars. Within all of these habitats, Massasaugas require open areas to warm themselves in the sun. Pregnant females are most often found in open, dry habitats such as rock barrens or forest clearings where they can more easily maintain the body temperature required for the development of their offspring. Non-pregnant females and males forage and mate in lowland habitats such as grasslands, wetlands, bogs and the shorelines of lakes and rivers. Massasaugas hibernate underground in crevices in bedrock, sphagnum swamps, tree root cavities and animal burrows where they can get below the frost line but stay above the water table. In Canada, the Massasauga is found only in Ontario, primarily along the eastern side of	Y	Not in observed range

						Georgian Bay and on the Bruce Peninsula. Two small populations are also found in the Wainfleet Bog on the northeast shore of Lake Erie and near Windsor. The Massasauga was once more widespread in southwestern Ontario, especially along the shores of the Great Lakes.		
Smilax rotundifolia	Round-leaved Greenbrier	T H R		S2	Rare and local in woods, woodland edges, and thickets. A southern species of the Carolinian Zone known from Essex, Norfolk, and Niagara. Mapped by Argus et al. (1982-1987) only from two old records from Essex County and considered probably extirpated in the province. Subsequently found at a few sites in Essex (Oldham 1983), Haldimand-Norfolk (TRTE), and Niagara (Oldham 2010). First collected in Ontario in 1882 by J. Macoun from Point Pelee, Essex County (CAN; though specimen may not have come from within the boundaries of Point Pelee National Park, since not seen there subsequently). Specimens supporting records mapped from Chathan-Kent and Middlesex Counties by Soper and Heimburger (1982) were not located by Argus et al. (1982-1987) nor have there been subsequent records from these counties. Most Ontario populations are unisexual and do not reproduce sexually (Kevan et al. 1991).	In Ontario, Round-leaved Greenbrier is found mainly in the warmer climate of the Carolinian Forest. It prefers open moist to wet woodlands, often growing on sandy soil. The species is found across much of eastern North America from southwestern Nova Scotia to northern Florida, eastern Texas and north to eastern Michigan and southwestern Ontario. As of 2007, thirteen populations were known in Ontario.	N	NA
Solidago houghtonii	Houghton's Goldenrod	T H R	*Oligoneuron houghtonii*	S2 ?	Sand dunes and moist alvars near Lake Huron on the Bruce Peninsula and Manitoulin Island (Argus et al. 1982-1987). First collected in Ontario in 1935 by P. V. Krotkov at Cabot Head, Bruce County (TRT). Weatherbee (2016) considers the	In Ontario, Houghton's Goldenrod grows primarily on open alvars, which are barren-looking landscapes of exposed bedrock with very little soil.	N	NA

					introduced Gypsophila scorzonerifolia to be a threat to some S. houghtonii populations on Cockburn Island. See COSEWIC (2005), Guire and Voss (1963), Morton (1979), Semple et al. (1999).	This rare habitat is kept relatively open and sunny by natural disturbances, such as drought and fire, which prevent shade-producing shrubs and trees from taking over. Houghton's Goldenrod is also found in the relatively low wetland areas between sand dunes associated with Great Lakes shorelines. Houghton's Goldenrod is only found near the Great Lakes of North America. In Ontario, it is found at Cabot Head at the tip of the Bruce Peninsula and at several sites in the Manitoulin Island area. Based on surveys done in 2003, the Ontario population is estimated to include 27,000 mature plants.		
Solidago pallida	Pale Showy Goldenrod	THR	*Solidago pallida, Solidago speciosa pop. 2, Solidago speciosa ssp. pallida, Solidago speciosa var. pallida*	S1	Known in Ontario from a single site on a dry, rocky slope above the Winnipeg River near Kenora in northwestern Ontario, where first collected in 2005 (M.J. Oldham, W.D. Bakowsky, et al. #32123 at MICH, NHIC, WAT; Semple et al. 2012). This is the most northeastern known population of the species, disjunct from the main range, and the only known Canadian population (Semple et al. 2017).	In northwestern Ontario, Pale Showy Goldenrod grows in prairie grassland on south-facing slopes, on shallow soils over bedrock, bordered by jack pine and white pine. Here, the habitat remains in an open condition due to the shallowness of the soil, which is not deep enough for trees and shrubs to become established. Currently, there is a single population of Pale Showy Goldenrod in northwestern	N	NA

						Ontario. This single population contains approximately 1000 plants.		
Sturnella magna	Eastern Meadowlark	THR		S4B, S3N	A fairly common but declining breeder, primarily of southern Ontario but with scattered breeding birds throughout the southern two-thirds of the province. Breeding densities highest along the southern edge of the Canadian Shield.	Eastern Meadowlarks breed primarily in moderately tall grasslands, such as pastures and hayfields, but are also found in alfalfa fields, weedy borders of croplands, roadsides, orchards, airports, shrubby overgrown fields, or other open areas. Small trees, shrubs or fence posts are used as elevated song perches. In Ontario, the Eastern Meadowlark is primarily found south of the Canadian Shield but it also inhabits the Lake Nipissing, Timiskaming and Lake of the Woods areas.	Y	Not observed on site – insufficient habitat – disturbance levels too high
Symphyotrichum praealtum	Willow-leaved Aster	THR	*Aster praealtus*	S2	Known from few Ontario populations, mostly on private land in southwestern Ontario. Occurs in prairie and savanna remants, roadsides, and old fields and easily confused Symphyotrichum lanceolatum (S5). First collected in Ontario in 1976 by Wilfred Botham at Cedar Creek, Essex County (DAO). Recently (2015) rediscovered in Perth County by Graham Buck (pers. comm.) where originally reported by Chmielewski and Semple (1984). See Argus et al. (1982-1987), COSEWIC (2003).	In Ontario, the Willowleaf aster is found in openings of oak savannahs, a very rare type of vegetation community containing many tallgrass prairie herbs and oak trees. It has also been found along railways, roadsides and in abandoned farm fields. In Canada, the Willowleaf aster is believed to exist at about 12 locations in southwest Ontario, in Lambton, Essex and Middlesex Counties and the Municipality of Chatham-Kent. Additional	N	NA

						populations may no longer exist. The largest populations are in the greater Ojibway Prairie Complex of Windsor and on Walpole Island. The population size is unknown. The Willowleaf aster is common in the Midwestern United States.		
Symphyotrichum sericeum	Western Silvery Aster	T H R	*Aster sericeus, Virgulus sericeus*	S1	A distinctive species which is rare and local in Bur Oak prairie remnants and open rocky sites in the Lake of the Woods area of northwestern Ontario. Despite recent surveys in both areas, it has not been relocated at Ingolf or Rainy Lake, where historically collected. First collected in Ontario in 1827 by Richardson at Rainy Lake, Rainy River District (CAN). Although Argus et al. (1982-1987) suggested the species might be introduced in Ontario, three recently discovered populations are in undisturbed natural habitat on islands in Lake of the Woods remote from roads, railways, or other sources of introduction. See Semple and Brouillet (1980), Semple et al. (2002).	The Western Silvery Aster grows in open bur oak savannahs on shallow soils over bedrock. It is found with other prairie species. The range of the Western Silvery Aster in central North America extends from Texas to Michigan and Manitoba. In Ontario, the Western Silvery Aster grows in just three areas: on the south shore of Lake of the Woods and on two islands within the lake.	N	NA
Toxolasma parvum	Lilliput	T H R	*Carunculina parva, Toxolasma parvus*	S1		Unlike many at-risk mussels, lilliput are found in a variety of soft river bottoms, such as mud, sand, and silt. Lilliputs burrow in these soft materials to filter-feed. This mussel is very sensitive to changes in water quality. Like most mussels, lilliput females expel their larvae in the gills of host fish, where they live as	N	NA

						parasites before forming into free-living mussels. Likely hosts are Johnny darter, white crappie, bluegill and green sunfish. This mussel is found in a small number of rivers flowing into Lake St. Clair, Lake Erie and Lake Ontario, as well as two wetlands near the western end of Lake Ontario. Since 1997, the lilliput has been documented in the Sydenham River, the lower Thames River (Baptiste Creek), Ruscom River, Belle River, Grand River, Welland River, 20 Mile Creek (Jordan Harbour) and Hamilton Harbour (Sunfish Pond).		
Trimerotropis huroniana	Lake Huron Grasshopper	T H R		S2	Recently (2014) discovered at 12 sites in Ontario in Lake Huron and eastern Lake Superior.	The Lake Huron Grasshopper lives exclusively in open dune habitat along the shores of Lake Huron, Lake Michigan and Lake Superior. Its preferred habitat is the foredune, the low ridge of open bare sand covered with scattered grasses and located closest to the lake. This grasshopper is known to occur at eight locations in Ontario. One is located on Pancake Bay on southern Lake Superior, one on Great Duck Island, Lake Huron and the rest are found on Manitoulin Island along the shores of Lake Huron. The species was once found farther	Y	No habitat

						south in Ontario with historic records from Wasaga and Sauble beaches as well as Giant's Tomb Island.		
Tringa flavipes	Lesser Yellowlegs	T H R		S3 S4 B, S5 M	A fairly common breeding species throughout most of its Ontario range, which encompasses the northern one-third of the province. Has experienced fairly substantial long and short-term declines. Common throughout the province in spring and fall migration.	Lesser Yellowlegs is a migratory shorebird. This species breeds in areas across Alaska and northern Canada, stretching from the Yukon to western Labrador. It breeds mainly in boreal wetlands and typically nests on dry ground near wetland areas like peatlands and marshes, which are used for foraging. The species typically forages by walking in shallow water, gathering its prey from the surface of the water or from the mud. It spends the winters throughout the southern United States and much of Central and South America. During the winter and its migration between its summer and winter ranges, the species frequents: coastal salt marshes estuaries and ponds lakes freshwater wetlands anthropogenic wetlands, such as flooded rice fields and sewage lagoons Lesser Yellowlegs' breeding range is limited to Alaska and northern Canada, including northern Ontario. Lesser Yellowlegs breed primarily within the:	N	NA

						Taiga Shield and Hudson Plains Bird Conservation Region of Ontario northern Boreal Softwood Shield It can be found throughout central and southern Ontario during its migration between winter and summer habitats.		
Urocyon cinereoargenteus	Gray Fox	THR		S1	A poorly understood species in Ontario. Not uncommon 350+ years ago but absent from c. 1650 until the 1940's. Since then, only a few scattered records throughout southern Ontario and in the Rainy River District with little evidence of breeding. Current threats and trends poorly known.	In Ontario, the Grey Fox lives in deciduous forests and marshes. Grey Fox dens are usually found in dense shrubs close to a water source but they will also use rocky areas, hollow trees, and underground burrows dug by other animals. This species will live in many types of habitat provided there is sufficient shelter and prey availability. The range of the Grey Fox extends across much of the United States, where it is relatively common. In Canada, it is found only in Ontario and Manitoba. In Ontario, its historic range is across the southernmost portions of the province. In recent years, this range has been reduced to west of Lake Superior in the Rainy River District and on Pelee Island in west Lake Erie. There have been occasional sightings and reports of the Grey Fox close to the U.S. border in the Niagara, Thousand Islands and Windsor areas.	N	NA

Ursus maritimus	Polar Bear	T H R		S3	A species at the southern edge of their range, only found along the Hudson Bay and James Bay shoreline as far south as Akimiski Island. Approximately 1000 individuals and probably at least 100 occurrences. Population appears to be increasing since 1963.	The Ontario population of Polar Bears can be found on the sea ice of Hudson Bay and James Bay from late fall until early summer. During the winter, Polar Bears roam widely over the sea ice and hunt Ringed and Bearded Seals. When ice in Hudson Bay and James Bay melts, the bears are forced onto land for several months. During this time, they are dependent on fat reserves they stored over the winter. During fall, pregnant females dig maternity dens in the sides of palsas (raised peat mounds), gravel ridges and river banks.	N	NA
Vaccinium stamineum	Deerberry	T H R		S1	Very rare and local in dry woods with shallow sandy or rocky soil near the Niagara River and St. Lawrence River (Argus et al. 1982-1987). First collected in Ontario in 1891 by J. Dearness at Niagara-on-the-lake, Niagara Region (DAO). See Cane et al. (1985), Cody (1982), Crowder (1982), Ford (1984, 1995), Hill (2002), Kreher et al. (2000), Soper & Heimburger (1982), Yaki (1984), Yakimowski and Eckert (2007).	Deerberry ranges from New York State, Ohio and Missouri south to Florida and eastern Texas. In Canada, it only occurs in two areas in Ontario in habitats where the climate is moderated by its proximity to large bodies of water: the Niagara region along the Niagara Gorge the Thousand Islands east of Kingston Within Ontario, Deerberry is found predominately in dry open woods on sandy and well-drained soils growing under oaks, Pitch Pine or White Pine. There are five extant populations of Deerberry in	N	NA

						Ontario, most of them in the Thousand Islands region.		
Valeriana edulis ssp. ciliata	Hairy Valerian	THR	*Valeriana ciliata, Valeriana edulis ssp. ciliata, Valeriana edulis var. ciliata*	S1	Only subspecies in Ontario; see Valeriana edulis.	Hairy Valerian is typically found on wet and moderately wet prairies and fens, but it can also occur on drier sites such as hillsides and bluffs with groundwater flow. It occurs in full sun or light shade and is sometimes associated with calcium-rich sites. Hairy Valerian can be found in the Great Lakes Region and occurs in a narrow band from Wisconsin and Iowa in the west, through Michigan and Indiana into Ohio. This plant is known to persist in three subpopulations in southwestern Ontario located in Brant and Huron counties. The viability of one of these subpopulations is questionable as only one plant has been observed recently at that location. About five subpopulations are believed to be extirpated including some in Middlesex and Waterloo.	N	NA

APPENDIX B FIELD INVESTIGATION RESULTS

Field Investigation Dates and Conditions

Site Visit	Date	Start Time	Cloud Cover	Wind (Beaufort Scale)	Temperature
Bird Survey 1	June 10, 2023	6:15am	50%	0	15
Bird Survey 2	July 5, 2023	7:00am	10%	2	22
Amphibian Survey 1	May 15, 2023	8:45 pm	10%	2	15
Amphibian Survey 2	May 29,2023	9:30 pm	10%	1	18
Amphibian Survey 3	June 19,2023	10.00 pm	5%	0	18
Ecological Land Classification	October 27, 2023	3:00pm	10%	1-2	14

Amphibian Observations

SCIENTIFIC NAME	COMMON NAME	*SYNONYMS*	SAR	S RANK	G RANK	N RANK	S RANK REASONS
Anaxyrus americanus	American Toad	*Bufo americanus*	N	S5	G5	N5	Abundant, widespread, no evidence of major recent declines, appears relatively tolerant of human activities.
Pseudacris crucifer	Spring Peeper	*Hyla crucifer*	N	S5	G5	N5	Locally common and widespread throughout most of Ontario. No evidence of widespread decline in relatively undisturbed areas, but has

							undoubtedly declined in parts of southern Ontario due to habitat loss.

Amphibian Survey Results

Station #	Date	Time	Temperature	Cloud Cover	Wind (Beaufort Scale)	Species	Call Level
1	15/05/23	8:45 pm	15	10%	2	Spring Peeper	1
	29/05/23	9:30 pm	18	10%	2	Spring Peeper	3
	19/06/23	10:00 pm	18	5%	1	Spring Peeper American Toad	2 3
2	15/05/23	9:00 pm	17	10%	2	Spring Peeper	0
	29/05/23	9:46 pm	17	10%	2	Spring Peeper	2
	19/06/23	10:20 pm	18	5%	1	Spring Peeper American Toad	1 3

Incidental Reptile Survey Results

SCIENTIFIC NAME	COMMON NAME	*SYNONYMS*	SAR	S RANK	G RANK	N RANK	S RANK REASONS
Lampropeltis triangulum	Eastern Milksnake		N	S4	G5	N3	Widespread in southern Ontario with over 100 occurrences. Seems to be able to exist in agricultural areas, at least those with some natural or semi-natural habitat retained. Trends and threats poorly known. Probably declining due to habitat loss and fragmentation and human persecution.
Thamnophis sirtalis sirtalis	Eastern Gartersnake		N	S5	G5T5	N5	Widespread and common in Ontario.

Breeding Bird Observations

SCIENTIFIC NAME	COMMON NAME	SYNONYMS	SAR	S RANK	G RANK	N_RANK	S RANK REASONS
Agelaius phoeniceus	Red-winged Blackbird		N	S5	G5	N5B,N5N	An abundant breeding species in southern Ontario, becoming uncommon to rare into the boreal forest. Common migrant and fairly common in southwestern Ontario in

							winter, becoming increasingly rare further north.
Bombycilla cedrorum	Cedar Waxwing		N	S5	G5	N5B,N5N	A common migrant and breeding species throughout the province. Common winter resident in southern Ontario.
Cardinalis cardinalis	Northern Cardinal		N	S5	G5	N5	A common year-round resident in southern Ontario, primarily south of the Canadian Shield. Increasing and spreading north.
Colaptes auratus	Northern Flicker		N	S5	G5	N5B,N5N	A common breeder throughout the province; fairly common in southern Ontario in winter but absent or rare elsewhere.
Corvus brachyrhynchos	American Crow		N	S5	G5	N5B,N5N	A common to abundant breeding species throughout the province. Very common migrant throughout the province. Winter resident in southern Ontario where very large aggregations may occurr.
Cyanocitta cristata	Blue Jay		N	S5	G5	N5	A common breeding and year-round resident throughout Ontario but absent from the Hudson Bay lowlands. Irrupts irregularly south in rsponse to mast crops.
Dryobates pubescens	Downy Woodpecker	*Picoides pubescens*	N	S5	G5	N5	A common permanent resident over most of the province with the exception of most of the Hudson Bay lowlands.

Dumetella carolinensis	Gray Catbird		N	S5B,S3N	G5	N5B,N3N	A common breeder and migrant from the southern boreal south, most common in southern Ontario. Rare in winter in southern Ontario.
Empidonax minimus	Least Flycatcher		N	S5B	G5	N5B	A common and widespread breeding species throughout Ontario, although less common in extreme northern Ontario and absent from the north Hudson Bay lowands. Common migrant throughout the province.
Geothlypis trichas	Common Yellowthroat		N	S5B,S3N	G5	N5B,N3N	A common to abundant breeder and migrant the province. Rare to uncommon in extreme southern Ontairo in winter.
Haemorhous mexicanus	House Finch	*Carpodacus mexicanus*	N	SNA	G5	N5	Exotic. Native to southwestern United States but accidentally introduced to the east in 1940s and spread. First recorded in Ontario in 1970, breeding by late 1970s, and fairly widespread by early 1980s. Numbers appear to have peaked in the early to mid 1990s and leveled off since then. Now a common breeding species primarily of southern Ontario south of the Canadian Shield.
Junco hyemalis	Dark-eyed Junco		N	S5	G5	N5B,N5N	A fairly common to common breeding species from the southern

							edge of the Canadian Shield north. Rare to uncommon breeder south of the shield. Common in migration throughout the province and common in winter in southern Ontario but rare further north.
Melospiza georgiana	Swamp Sparrow		N	S5B,S4N	G5	N5B,N4N	A common to abundant breeder and migrant throughout the province. Uncommon to common in winter in southern Ontario.
Molothrus ater	Brown-headed Cowbird		N	S5	G5	N5B,N5N	An common breeding species in southern Ontario. Common migrant and fairly common in southwestern Ontario in winter, becoming increasingly rare further north.
Passerina cyanea	Indigo Bunting		N	S5B	G5	N5B	A common migrant and breeder from the southern boreal south.
Poecile atricapillus	Black-capped Chickadee	*Parus atricapillus, Poecile atricapilla*	N	S5	G5	N5	A common permanent resident throughout Ontario, but absent from the northern Hudson Bay lowlands.
Quiscalus quiscula	Common Grackle		N	S5	G5	N5B,N5N	A common to abundant breeding species throughout the province but absent from the northern Hudson Bay lowlands. Common migrant throughout the province and fairly common to uncommon in winter in southern Ontario.

Riparia riparia	Bank Swallow		Y	S4B	G5	N4N5B, N5M	A common and widespread but declining breeding species throughout Ontario wherever suitable foraging and nesting sites occur.
Setophaga magnolia	Magnolia Warbler	*Dendroica magnolia*	N	S5B	G5	N5B	A common breeder from the Hudson Bay lowlands south of the Canadian Shield, becoming increasingly uncommon south of the shield and rare in southwestern Ontario but may be increasing and expanding in the southwest. Common migrant throughout the province.
Setophaga pensylvanica	Chestnut-sided Warbler	*Dendroica pensylvanica*	N	S5B	G5	N5B	A common breeding species throughout the province although less common and patchily-distributed in extreme southwestern Ontario and in the Hudson Bay lowlands. Common migrant throughout the province.
Setophaga petechia	Yellow Warbler	*Dendroica petechia*	N	S5B	G5	N5B	A common breeding species and migrant throughout the province, most abundant south of the Canadian Shield and on the Hudson Bay lowlands.
Sialia sialis	Eastern Bluebird		N	S5B,S4N	G5	N5B,N4N	A fairly common breeding species throughout most of the province but absent from the Hudson Bay

							lowlands. Common migrant throughout the province; uncommon and increasing in southern Ontario in winter.
Spinus tristis	American Goldfinch	*Carduelis tristis*	N	S5	G5	N5B,N5N	A common breeding species in the south, less common towards the north boreal forest. Common migrant within its breeding range and irregular in winter at northern half of range but common in winter in the south.
Spizella passerina	Chipping Sparrow		N	S5B,S3N	G5	N5B	A very common breeding and migrant species throughout the province. Rare in winter in southern Ontairo.
Sturnus vulgaris	European Starling		N	SNA	G5	NNA	Exotic. Widespread and common breeding species throughout the province around human habitation (cities, towns, rural farmland). Signficant seasonal movement, especially of northern birds.
Troglodytes aedon	House Wren		N	S5B	G5	N5B	A common to very common breeding species and migrant of southern Ontario and the Rainy River area; fairly rare further north. Occasional in winter in southern Ontario.
Turdus migratorius	American Robin		N	S5	G5	N5B,N5N	A very common breeder and migrant throughout the province.

							Common winter resident in southern Ontario, becoming progressively more rare as one moves north onto the Canadian Shield.
Tyrannus tyrannus	Eastern Kingbird		N	S4B	G5	N5B	A common to abundant breeding species throughout most of southern Ontario, becoming uncommon in forested areas of its range. Has experienced long and short-term declines.
Vireo olivaceus	Red-eyed Vireo		N	S5B	G5	N5B,N5N	A common to abundant breeder throughout the province. Very common migrant.
Zenaida macroura	Mourning Dove		N	S5	G5	N5B,N5N	A common breeding species resident year-round throughout most of its Ontario range, although more sparsely distributed at the northern edge of its range which it retracts from in the winter.
Zonotrichia albicollis	White-throated Sparrow		N	S5	G5	N5B,N5N	A common to abundant, and widespread breeding species throughout the province with the exception of extreme southwestern Ontario. Very common migrant, common to uncommon in southern Ontario in winter, rare elsewhere.

Incidental Mammal Survey Results

SCIENTIFIC NAME	COMMON NAME	*SYNONYMS*	SAR	S RANK	G RANK	N RANK	S RANK REASONS
Canis latrans	Coyote		N	S5	G5	N5	A common and widespread species. More common in the open forests and agricultural areas of southern Ontario than in the north. Threats not well known, but judging from their history a species which can withstand heavy human persecution.
Vulpes vulpes	Red Fox		N	S5	G5	N5	A common and widespread species throughout the province.
Mephitis mephitis	Striped Skunk		N	S5	G5	N5	A common and widespread species that has benefitted from land clearing for agriculture and has also adapted to live in urban areas.
Sylvilagus floridanus	Eastern Cottontail		N	S5	G5	N5	A common and widespread species in southern Ontario. Threats and trends are poorly known.
Microtus pennsylvanicus	Meadow Vole		N	S5	G5	N5	A common and widespread species. Threats and trends poorly known.
Sciurus carolinensis	Eastern Gray Squirrel		N	S5	G5	N5	A common and widespread species with no apparent threats.

Plant Survey List

	Scientific Name	Common Name	CC	CW	G-Rank	N-Rank	S-Rank	SAR
1	*Acer negundo*	Manitoba Maple	0	0	G5	N5	S5	N
2	*Acer rubrum*	Red Maple	4	0	G5	N5	S5	N
3	*Acer saccharinum*	Silver Maple	5	-3	G5	N5	S5	N
4	*Achillea millefolium*	Common Yarrow	n/a	3	G5	NNR	SNA	N
5	*Alnus incana*	Speckled Alder	6	-3	G5T5	N5	S5	N
6	*Ambrosia artemisiifolia*	Common Ragweed	0	3	G5	N5	S5	N
7	*Anemonastrum canadense*	Canada Anemone	3	-3	G5	N5	S5	N
8	*Arctium minus*	Common Burdock	n/a	3	GNR	NNA	SNA	N
9	*Asclepias syriaca*	Common Milkweed	0	5	G5	N5	S5	N
10	*Asparagus officinalis*	Garden Asparagus	n/a	3	G5?	NNA	SNA	N
11	*Betula papyrifera*	Paper Birch	2	3	G5	N5	S5	N
12	*Carex intumescens*	Bladder Sedge	6	-3	G5	N5	S5	N
13	*Cichorium intybus*	Wild Chicory	n/a	5	GNR	NNA	SNA	N
14	*Cirsium vulgare*	Bull Thistle	n/a	3	GNR	NNA	SNA	N
15	*Cornus alternifolia*	Alternate-leaved Dogwood	6	3	G5	N5	S5	N
16	*Cornus sericea*	Red-osier Dogwood	2	-3	G5	N5	S5	N
17	*Daucus carota*	Wild Carrot	n/a	5	GNR	NNA	SNA	N
18	*Echium vulgare*	Common Viper's Bugloss	n/a	5	GNR	NNA	SNA	N
19	*Equisetum arvense*	Field Horsetail	0	0	G5	N5	S5	N

20	*Erigeron annuus*	Annual Fleabane	0	3	G5	N5	S5	N
21	*Eutrochium maculatum*	Spotted Joe Pye Weed	3	-5	G5T5	N5	S5	N
22	*Fagus grandifolia*	American Beech	6	3	G5	N5	S4	N
23	*Fragaria vesca*	American Woodland Strawberry	4	3	G5T5	N5	S5	N
24	*Fraxinus americana*	White Ash	4	3	G4	N5	S4	N
25	*Fraxinus pennsylvanica*	Red Ash	3	-3	G4	N5	S4	N
26	*Hypericum perforatum*	Common St. John's-wort	n/a	5	GNR	NNA	SNA	N
27	*Impatiens capensis*	Spotted Jewelweed	4	-3	G5	N5	S5	N
28	*Leucanthemum vulgare*	Oxeye Daisy	n/a	5	GNR	NNA	SNA	N
29	*Malus pumila*	Common Apple	n/a	5	G5	NNA	SNA	N
30	*Matricaria discoidea*	Pineappleweed	n/a	3	G5	N5	SNA	N
31	*Melilotus albus*	White Sweet-clover	n/a	3	GNR	NNA	SNA	N
32	*Parthenocissus quinquefolia*	Virginia Creeper	6	3	G5	N4?	S4?	N
33	*Phalaris canariensis*	Annual Canarygrass	n/a	3	GNR	NNA	SNA	N
34	*Phleum pratense*	Common Timothy	n/a	3	GNR	NNA	SNA	N
35	*Picea glauca*	White Spruce	6	3	G5	N5	S5	N
36	*Pilosella aurantiaca*	Orange Hawkweed	n/a	5	GNR	NNA	SNA	N
37	*Pinus banksiana*	Jack Pine	5	3	G5	N5	S5	N
38	*Pinus strobus*	Eastern White Pine	4	3	G5	N5	S5	N
39	*Pinus sylvestris*	Scots Pine	n/a	3	GNR	NNA	SNA	N
40	*Plantago major*	Common Plantain	n/a	3	G5	NNR	SNA	N
41	*Populus balsamifera*	Balsam Poplar	4	-3	G5	NNR	S5	N
42	*Populus grandidentata*	Large-toothed Aspen	5	5	G5	N5	S5	N
43	*Populus tremuloides*	Trembling Aspen	2	0	G5	N5	S5	N
44	*Potentilla simplex*	Old-field Cinquefoil	3	3	G5	N5	S5	N
45	*Prunella vulgaris*	Lance-leaved Self-heal	0	0	G5T5	N5	S5	N
46	*Prunus pensylvanica*	Pin Cherry	3	3	G5	N5	S5	N

47	*Prunus serotina*	Black Cherry	3	3	G5	N5	S5	N
48	*Prunus virginiana*	Chokecherry	2	3	G5	N5	S5	N
49	*Pteridium aquilinum*	Bracken Fern	2	3	G5	N5	S5	N
50	*Quercus rubra*	Northern Red Oak	6	3	G5	N5	S5	N
51	*Ranunculus acris*	Common Buttercup	n/a	0	G5	NNA	SNA	N
52	*Rhamnus cathartica*	European Buckthorn	n/a	0	GNR	NNA	SNA	N
53	*Robinia pseudoacacia*	Black Locust	n/a	3	G5	NNA	SNA	N
54	*Rubus allegheniensis*	Allegheny Blackberry	2	3	G5TNR	N5	SU	N
55	*Rubus idaeus*	North American Red Raspberry	2	3	G5T5	N5	S5	N
56	*Rudbeckia hirta*	Black-eyed Susan	0	3	G5T5	N5	S5	N
57	*Rudbeckia hirta*	Black-eyed Susan	0	3	G5T5	N5	S5	N
58	*Salix discolor*	Pussy Willow	3	-3	G5	N5	S5	N
59	*Salix euxina*	Crack Willow	n/a	0	GNR	NNA	SNA	N
60	*Silene latifolia*	White Campion	n/a	5	GNR	NNA	SNA	N
61	*Silene vulgaris*	Bladder Campion	n/a	5	GNR	NNA	SNA	N
62	*Solanum dulcamara*	Bittersweet Nightshade	n/a	0	GNR	NNA	SNA	N
63	*Solidago juncea*	Early Goldenrod	3	5	G5	N5	S5	N
64	*Symphyotrichum lateriflorum var. lateriflorum*	Calico Aster	3	0	G5T5	N5	S5	N
65	*Symphyotrichum novae-angliae*	New England Aster	2	-3	G5	N5	S5	N
66	*Syringa vulgaris*	Common Lilac	n/a	5	GNR	NNA	SNA	N
67	*Taraxacum officinale*	Common Dandelion	n/a	3	G5	N5	SNA	N
68	*Thuja occidentalis*	Eastern White Cedar	4	-3	G5	N5	S5	N
69	*Tilia americana*	Basswood	4	3	G5	N5	S5	N
70	*Trifolium pratense*	Red Clover	n/a	3	GNR	NNA	SNA	N
71	*Trifolium pratense*	Red Clover	n/a	3	GNR	NNA	SNA	N
72	*Trifolium repens*	White Clover	n/a	3	GNR	NNA	SNA	N

73	*Trifolium repens*	White Clover	n/a	3	GNR	NNA	SNA	N
74	*Tussilago farfara*	Coltsfoot	n/a	3	GNR	NNA	SNA	N
75	*Typha angustifolia*	Narrow-leaved Cattail	n/a	-5	G5	N5	SNA	N
76	*Typha latifolia*	Broad-leaved Cattail	1	-5	G5	N5	S5	N
77	*Ulmus americana*	White Elm	3	-3	G4	N5	S5	N
78	*Verbascum thapsus*	Common Mullein	n/a	5	GNR	NNA	SNA	N
79	*Viburnum opulus var. americanum*	Highbush Cranberry	5	-3	G5T5	N5	S5	N
80	*Vicia cracca*	Tufted Vetch	n/a	5	GNR	NNA	SNA	N
81	*Vicia cracca*	Tufted Vetch	n/a	5	GNR	NNA	SNA	N
82	*Vitis riparia*	Riverbank Grape	0	0	G5	N5	S5	N

APPENDIX C SIGNIFICANT WILDLIFE HABITAT ANALYSIS

Significant Wildlife Habitat Criteria Schedules For Ecoregion 6E – SITE ANALYSIS

1.1 Seasonal Concentration Areas of Animals

Seasonal concentration areas are areas where wildlife species occur annually in aggregations at certain times of the year. Such areas are sometimes highly concentrated with members of a given species, or several species, within relatively small areas. In spring and autumn, migratory wildlife species will concentrate where they can rest and feed. Other wildlife species require habitats where they can survive winter. Examples of seasonal concentration areas include deer wintering areas, breeding bird colonies and hibernation sites for reptiles, amphibians and some mammals.

Wildlife Habitat	Wildlife Species	ELC Ecosite Codes	Habitat Criteria	Defining Criteria	Site Confirmation/ Comments
Waterfowl Stopover and Staging Areas (Terrestrial) Rationale: Habitat important to migrating waterfowl.	American Black Duck Wood Duck Green-winged Teal Blue-winged Teal Mallard Northern Pintail Northern Shoveler American Wigeon Gadwall	CUM1 CUT1 Plus evidence of annual spring flooding from melt water or run-off within these Ecosites.	Fields with sheet water during Spring (mid-March to May). Fields flooding during spring melt and run-off provide important invertebrate foraging habitat for migrating waterfowl.	Studies carried out and verified presence of an annual concentration of any listed species, evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”	Not applicable

			Agricultural fields with waste grains are commonly used by waterfowl, these are not considered SWH unless they have spring sheet water available.	Any mixed species aggregations of 100 or more individuals required. The flooded field ecosite habitat plus a 100-300m radius area, dependant on local site conditions and adjacent land use is the significant wildlife habitat. Annual use of habitat is documented from information sources or field studies (annual use can be based on studies or determined by past surveys with species numbers and dates).	
Waterfowl Stopover and Staging Areas (Aquatic) Rationale: Important for local and migrant waterfowl populations during the spring or fall migration or both periods combined. Sites identified are usually only one of a few in the eco-district.	Canada Goose Cackling Goose Snow Goose American Black Duck Northern Pintail Northern Shoveler American Wigeon Gadwall Green-winged Teal Blue-winged Teal Hooded Merganser Common Merganser Lesser Scaup Greater Scaup Long-tailed Duck Surf Scoter White-winged Scoter Black Scoter Ring-necked duck Common Goldeneye Bufflehead Redhead Ruddy Duck Red-breasted Merganser Brant Canvasback	MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 SWD1 SWD2 SWD3 SWD4 SWD5 SWD6 SWD7	Ponds, marshes, lakes, bays, coastal inlets, and watercourses used during migration. Sewage treatment ponds and storm water ponds do not qualify as a SWH, however a reservoir managed as a large wetland or pond/lake does qualify. These habitats have an abundant food supply (mostly aquatic invertebrates and vegetation in shallow water).	Studies carried out and verified presence of: Aggregations of 100 or more of listed species for 7 days, results in > 700 waterfowl use days. Areas with annual staging of ruddy ducks, canvasbacks, and redheads are SWH The combined area of the ELC ecosites and a 100m radius area is the SWH Wetland area and shorelines associated with sites identified within the SWHTG Appendix K are significant wildlife habitat. Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects” Annual Use of Habitat is Documented from Information Sources or Field Studies (Annual can be based on completed studies or determined from past surveys with species	Not applicable

				numbers and dates recorded).	
Shorebird Migratory Stopover Area Rationale: High quality shorebird stopover habitat is extremely rare and typically has a long history of use.	Greater Yellowlegs Lesser Yellowlegs Marbled Godwit Hudsonian Godwit Black-bellied Plover American Golden-Plover Semipalmated Plover Solitary Sandpiper Spotted Sandpiper Semipalmated Sandpiper Pectoral Sandpiper White-rumped Sandpiper Baird's Sandpiper Least Sandpiper Purple Sandpiper Stilt Sandpiper Short-billed Dowitcher Red-necked Phalarope Whimbrel Ruddy Turnstone Sanderling Dunlin	BBO1 BBO2 BBS1 BBS2 BBT1 BBT2 SDO1 SDS2 SDT1 MAM1 MAM2 MAM3 MAM4 MAM5	Shorelines of lakes, rivers and wetlands, including beach areas, bars and seasonally flooded, muddy and un-vegetated shoreline habitats. Great Lakes coastal shorelines, including groynes and other forms of armour rock lakeshores, are extremely important for migratory shorebirds in May to mid-June and early July to October. Sewage treatment ponds and storm water ponds do not qualify as a SWH.	Studies confirming: Presence of 3 or more of listed species and > 1000 shorebird use days during spring or fall migration period. (shorebird use days are the accumulated number of shorebirds counted per day over the course of the fall or spring migration period) Whimbrel stop briefly (<24hrs) during spring migration, any site with >100 Whimbrel used for 3 years or more is significant. The area of significant shorebird habitat includes the mapped ELC shoreline ecosites plus a 100m radius area cxlviii Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"	Not applicable
Raptor Wintering Area Rationale: Sites used by multiple species, a high number of individuals and used annually are most significant	Rough-legged Hawk Red-tailed Hawk Northern Harrier American Kestrel Snowy Owl Special Concern: Short-eared Owl Bald Eagle	Hawks/Owls: Combination of ELC Community Series; need to have present one Community Series from each land class; Forest: FOD, FOM, FOC. Upland: CUM; CUT; CUS; CUW. Bald Eagle: Forest community Series: FOD, FOM, FOC, SWD, SWM or SWC on shoreline areas adjacent to large rivers or adjacent to	The habitat provides a combination of fields and woodlands that provide roosting, foraging and resting habitats for wintering raptors. Raptor wintering sites (hawk/owl) need to be > 20 ha with a combination of forest and upland. Least disturbed sites, idle/fallow or lightly grazed field/meadow (>15ha) with adjacent woodlands Field area of the habitat is to be wind swept with limited snow depth or accumulation.	Studies confirm the use of these habitats by: One or more Short-eared Owls or; One or more Bald Eagles or; At least 10 individuals and two of the listed hawk/owl species To be significant a site must be used regularly (3 in 5 years) for a minimum of 20 days by the above number of birds. The habitat area for an Eagle winter site is the shoreline forest ecosites directly adjacent to the prime hunting area	Not applicable

		lakes with open water (hunting area).	Eagle sites have open water, large trees and snags available for roosting	Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"	
Bat Hibernacula Rationale; Bat hibernacula are rare habitats in all Ontario landscapes.	Big Brown Bat Tri-coloured Bat	Bat Hibernacula may be found in these ecosites: CCR1 CCR2 CCA1 CCA2 (Note: buildings are not considered to be SWH)	Hibernacula may be found in caves, mine shafts, underground foundations and Karsts. Active mine sites should not be considered as SWH The locations of bat hibernacula are relatively poorly known.	All sites with confirmed hibernating bats are SWH. The habitat area includes a 200m radius around the entrance of the hibernaculum. Studies are to be conducted during the peak swarming period (Aug. – Sept.). Surveys should be conducted following methods outlined in the "Bats and Bat Habitats: Guidelines for Wind Power Projects"	Not applicable
Bat Maternity Colonies Rationale: Known locations of forested bat maternity colonies are extremely rare in all Ontario landscapes.	Big Brown Bat Silver-haired Bat	Maternity colonies considered SWH are found in forested Ecosites. All ELC Ecosites in ELC Community Series: FOD FOM SWD SWM	Maternity colonies can be found in tree cavities, vegetation and often in buildings (buildings are not considered to be SWH). Maternity roosts are not found in caves and mines in Ontario. Maternity colonies located in Mature deciduous or mixed forest stands with >10/ha large diameter (>25cm dbh) wildlife trees Female Bats prefer wildlife tree (snags) in early stages of decay, class 1-3 or class 1 or 2 . Silver-haired Bats prefer older mixed or deciduous forest and form maternity colonies in tree cavities and small hollows. Older forest areas with at least 21 snags/ha are preferred	Maternity Colonies with confirmed use by; >10 Big Brown Bats >5 Adult Female Silver-haired Bats The area of the habitat includes the entire woodland or a forest stand ELC Ecosite or an Ecoelement containing the maternity colonies. Evaluation methods for maternity colonies should be conducted following methods outlined in the "Bats and Bat Habitats: Guidelines for Wind Power Projects".	Not applicable
Bat Migratory Stopover Areas	Hoary Bat, Eastern Red Bat, Silver-haired Bat	No specific ELC types.			Not applicable.

Turtle Wintering Areas Rationale: Generally, sites are the only known sites in the area. Sites with the highest number of individuals are most significant.	Midland Painted Turtle Special Concern: Northern Map Turtle Snapping Turtle	Snapping and Midland Painted Turtles; ELC Community Classes; SW, MA, OA and SA, ELC Community Series; FEO and BOO Northern Map Turtle; Open Water areas such as deeper rivers or streams and lakes with current can also be used as over-wintering habitat.	For most turtles, wintering areas are in the same general area as their core habitat. Water has to be deep enough not to freeze and have soft mud substrates. Over-wintering sites are permanent water bodies, large wetlands, and bogs or fens with adequate Dissolved Oxygen Man-made ponds such as sewage lagoons or storm water ponds should not be considered SWH.	Presence of 5 over-wintering Midland Painted Turtles is significant. One or more Northern Map Turtle or Snapping Turtle over- wintering within a wetland is significant. The mapped ELC ecosite area with the over wintering turtles is the SWH. If the hibernation site is within a stream or river, the deep-water pool where the turtles are over wintering is the SWH. Over wintering areas may be identified by searching for congregations (Basking Areas) of turtles on warm, sunny days during the fall (Sept. – Oct.) or spring (Mar. – May). Congregation of turtles is more common where wintering areas are limited and therefore significant.	Potential on adjacent lands on golf course on which ponds are situated. Sufficient buffer exists.
Reptile Hibernaculum Rationale; Generally sites are the only known sites in the area. Sites with the highest number of individuals are most significant.	Snakes: Eastern Gartersnake Northern Watersnake Northern Red-bellied Snake Northern Brownsnake Smooth Green Snake Northern Ring-necked Snake Special Concern: Milksnake Eastern Ribbonsnake Lizard: Special Concern (Southern Shield population): Five-lined Skink	For all snakes, habitat may be found in any ecosite other than very wet ones. Talus, Rock Barren, Crevice, Cave, and Alvar sites may be directly related to these habitats. Observations or congregations of snakes on sunny warm days in the spring or fall is a good indicator. For Five-lined Skink, ELC Community Series of FOD and FOM and Ecosites: FOC1 FOC3	For snakes, hibernation takes place in sites located below frost lines in burrows, rock crevices and other natural or naturalized locations. The existence of features that go below frost line; such as rock piles or slopes, old stone fences, and abandoned crumbling foundations assist in identifying candidate SWH. Areas of broken and fissured rock are particularly valuable since they provide access to subterranean sites below the frost line. Wetlands can also be important over-wintering habitat in conifer or shrub	Studies confirming: Presence of snake hibernacula used by a minimum of five individuals of a snake sp. or; individuals of two or more snake spp. Congregations of a minimum of five individuals of a snake sp. or; individuals of two or more snake spp. near potential hibernacula (eg. foundation or rocky slope) on sunny warm days in Spring (Apr/May) and Fall (Sept/Oct) Note: If there are Special Concern Species present, then site is SWH	Not applicable

			swamps and swales, poor fens, or depressions in bedrock terrain with sparse trees or shrubs with sphagnum moss or sedge hummock ground cover. Five-lined skink prefer mixed forests with rock outcrop openings providing cover rock overlaying granite bedrock with fissures.	Note: Sites for hibernation possess specific habitat parameters (e.g. temperature, humidity, etc.) and consequently are used annually, often by many of the same individuals of a local population (i.e. strong hibernation site fidelity). Other critical life processes (e.g. mating) often take place in close proximity to hibernacula. The feature in which the hibernacula is located plus a 30 m radius area is the SWH.	
Colonially - Nesting Bird Breeding Habitat (Bank and Cliff) Rationale: Historical use and number of nests in a colony make this habitat significant. An identified colony can be very important to local populations. All swallow population are declining in Ontario.	Cliff Swallow Northern Rough-winged Swallow (this species is not colonial but can be found in Cliff Swallow colonies)	Eroding banks, sandy hills, borrow pits, steep slopes, and sand piles. Cliff faces, bridge abutments, silos, barns. Habitat found in the following ecosites: CUM1 CUT1 CUS1 BLO1 BLS1 BLT1 CLO1 CLS1 CLT1	Any site or areas with exposed soil banks, undisturbed or naturally eroding that is not a licensed/permitted aggregate area. Does not include man-made structures (bridges or buildings) or recently (2 years) disturbed soil areas, such as berms, embankments, soil or aggregate stockpiles. Does not include a licensed/permitted Mineral Aggregate Operation.	Studies confirming: Presence of 1 or more nesting sites with 8 or more cliff swallow pairs and/or rough- winged swallow pairs during the breeding season. A colony identified as SWH will include a 50m radius habitat area from the peripheral nests Field surveys to observe and count swallow nests are to be completed during the breeding season. Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”	Not applicable
Colonially - Nesting Bird Breeding Habitat (Tree/Shrubs) Rationale: Large colonies are important to local bird population, typically sites are only known colony in area and are used annually.	Great Blue Heron Black-crowned Night-Heron Great Egret Green Heron	SWM2 SWM3 SWM5 SWM6 SWD1 SWD2 SWD3 SWD4 SWD5 SWD6 SWD7 FET1	Nests in live or dead standing trees in wetlands, lakes, islands, and peninsulas. Shrubs and occasionally emergent vegetation may also be used. Most nests in trees are 11 to 15 m from ground, near the top of the tree.	Studies confirming: Presence of 5 or more active nests of Great Blue Heron or other listed species. The habitat extends from the edge of the colony and a minimum 300m radius or extent of the Forest Ecosite containing the colony or any island	Not applicable

				<15.0ha with a colony is the SWH Confirmation of active heronries are to be achieved through site visits conducted during the nesting season (April to August) or by evidence such as the presence of fresh guano, dead young and/or eggshells	
Colonially - Nesting Bird Breeding Habitat (Ground) Rationale; Colonies are important to local bird population, typically sites are only known colony in area and are used annually.	Herring Gull Great Black-backed Gull Little Gull Ring-billed Gull Common Tern Caspian Tern Brewer's Blackbird	Any rocky island or peninsula (natural or artificial) within a lake or large river (two-lined on a 1;50,000 NTS map). Close proximity to watercourses in open fields or pastures with scattered trees or shrubs (Brewer's Blackbird) MAM1 – 6; MAS1 – 3; CUM CUT CUS	Nesting colonies of gulls and terns are on islands or peninsulas associated with open water or in marshy areas. Brewers Blackbird colonies are found loosely on the ground in low bushes in close proximity to streams and irrigation ditches within farmlands.	Studies confirming: Presence of > 25 active nests for Herring Gulls or Ring-billed Gulls, >5 active nests for Common Tern or >2 active nests for Caspian Tern. Presence of 5 or more pairs for Brewer's Blackbird. Any active nesting colony of one or more Little Gull, and Great Black-backed Gull is significant. The edge of the colony and a minimum 150m radius area of habitat, or the extent of the ELC ecosites containing the colony or any island <3.0ha with a colony is the SWH Studies would be done during May/June when actively nesting. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects".	Not applicable
Migratory Butterfly Stopover Areas Rationale: Butterfly stopover areas are extremely rare habitats and	Painted Lady Red Admiral Special Concern Monarch	Combination of ELC Community Series; need to have present one Community Series from each landclass:	A butterfly stopover area will be a minimum of 10 ha in size with a combination of field and forest habitat present, and will be located	Studies confirm: The presence of Monarch Use Days (MUD) during fall migration (Aug/Oct). MUD is based on the number of days a site is	Not applicable

are biologically important for butterfly species that migrate south for the winter.		Field: CUM CUT CUS Forest: FOC FOD FOM CUP Anecdotally, a candidate site for butterfly stopover will have a history of butterflies being observed.	within 5 km of Lake Ontario cxlix. The habitat is typically a combination of field and forest, and provides the butterflies with a location to rest prior to their long migration south. The habitat should not be disturbed, fields/meadows with an abundance of preferred nectar plants and woodland edge providing shelter are requirements for this habitat. Staging areas usually provide protection from the elements and are often spits of land or areas with the shortest distance to cross the Great Lakes	used by Monarchs, multiplied by the number of individuals using the site. Numbers of butterflies can range from 100-500/day significant variation can occur between years and multiple years of sampling should occur. Observational studies are to be completed and need to be done frequently during the migration period to estimate MUD. MUD of >5000 or >3000 with the presence of Painted Ladies or Red Admiral's is to be considered significant.	
Landbird Migratory Stopover Areas Rationale: Sites with a high diversity of species as well as high numbers are most significant.	All migratory songbirds. Canadian Wildlife Service Ontario website: http://www.ec.gc.ca/nature/default.asp?lang=En&n=421B7A9D-1 All migrant raptors species: Ontario Ministry of Natural Resources: Fish and Wildlife Conservation Act, 1997. Schedule 7: Specially Protected Birds (Raptors)	All Ecosites associated with these ELC Community Series; FOC FOM FOD SWC SWM SWD	Woodlots need to be >10 ha in size and within 5 km of Lake Ontario. If multiple woodlands are located along the shoreline those Woodlands <2km from Lake Ontario are more significant Sites have a variety of habitats; forest, grassland and wetland complexes The largest sites are more significant. Woodlots and forest fragments are important habitats to migrating birds, these features located along the shore and located within 5km of Lake Ontario are Candidate SWH.	Studies confirm: Use of the habitat by >200 birds/day and with >35 spp with at least 10 bird spp. recorded on at least 5 different survey date. This abundance and diversity of migrant bird species is considered above average and significant. Studies should be completed during spring (Apr./May) and fall (Aug/Oct) migration using standardized assessment techniques. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"	Not applicable
Deer Yarding Areas	White-tailed Deer	Note: OMNRF to determine this habitat.	Deer yarding areas or winter concentration areas (yards) are	No Studies Required: Snow depth and temperature are	Not applicable

Rationale: Winter habitat for deer is considered to be the main limiting factor for northern deer populations. In winter, deer congregate in “yards” to survive severe winter conditions. Deer yards typically have a long history of annual use by deer, yards typically represent 10-15% of an areas summer range.		ELC Community Series providing a thermal cover component for a deer yard would include; FOM, FOC, SWM and SWC. Or these ELC Ecosites; CUP2 CUP3 FOD3 CUT	areas deer move to in response to the onset of winter snow and cold. This is a behavioural response and deer will establish traditional use areas. The yard is composed of two areas referred to as Stratum I and Stratum II. Stratum II covers the entire winter yard area and is usually a mixed or deciduous forest with plenty of browse available for food. Agricultural lands can also be included in this area. Deer move to these areas in early winter and generally, when snow depths reach 20 cm, most of the deer will have moved here. If the snow is light and fluffy, deer may continue to use this area until 30 cm snow depth. In mild winters, deer may remain in the Stratum II area the entire winter. The Core of a deer yard (Stratum I) is located within the Stratum II area and is critical for deer survival in areas where winters become severe. It is primarily composed of coniferous trees (pine, hemlock, cedar, spruce) with a canopy cover of more than 60%. OMNRF determines deer yards following methods outlined in “Selected Wildlife and Habitat Features: Inventory Manual" Woodlots with high densities of deer due to	the greatest influence on deer use of winter yards. Snow depths > 40cm for more than 60 days in a typically winter are minimum criteria for a deer yard to be considered as SWH. Deer Yards are mapped by OMNRF District offices. Locations of Core or Stratum 1 and Stratum 2 Deer yards considered significant by OMNRF will be available at local MNRF offices or via Land Information Ontario (LIO). Field investigations that record deer tracks in winter are done to confirm use (best done from an aircraft). Preferably, this is done over a series of winters to establish the boundary of the Stratum I and Stratum II yard in an "average" winter. MNRF will complete these field investigations.	

			artificial feeding are not significant.		
Deer Winter Congregation Areas Rationale: Deer movement during winter in the southern areas of Ecoregion 6E are not constrained by snow depth, however deer will annually congregate in large numbers in suitable woodlands to reduce or avoid the impacts of winter conditions.	White-tailed Deer	All Forested Ecosites with these ELC Community Series; FOC FOM FOD SWC SWM SWD Conifer plantations much smaller than 50 ha may also be used.	Woodlots will typically be >100 ha in size. Woodlots <100ha may be considered as significant based on MNRF studies or assessment. Deer movement during winter in the southern areas of Ecoregion 6E are not constrained by snow depth, however deer will annually congregate in large numbers in suitable woodlands. If deer are constrained by snow depth refer to the Deer Yarding Area habitat within Table 1.1 of this Schedule. Large woodlots > 100ha and up to 1500 ha are known to be used annually by densities of deer that range from 0.1-1.5 deer/ha. Woodlots with high densities of deer due to artificial feeding are not significant.	Studies confirm: Deer management is an MNRF responsibility, deer winter congregation areas considered significant will be mapped by MNRF. Use of the woodlot by white- tailed deer will be determined by MNRF, all woodlots exceeding the area criteria are significant, unless determined not to be significant by MNRF Studies should be completed during winter (Jan/Feb) when >20cm of snow is on the ground using aerial survey techniques , ground or road surveys. or a pellet count deer density survey.	Not applicable

1.2 Rare Vegetation Communities

Rare vegetation communities often contain rare species, particularly plants and small invertebrates, which depend on such habitats for their survival and cannot readily move to or find alternative habitats. When assessing rare vegetation communities, one of the most important criteria is the current representation of the community in the planning area based on its area relative to the total landscape or the number of examples within the planning area. There are a number of criterion used to define rare vegetation communities, however the NHIC uses a system that considers the provincial rank of a species or community type as a tool to prioritize protection efforts. These ranks are not legal designations but have been assigned using the best available scientific information, and follow a systematic ranking procedure developed by The Nature Conservancy (U.S.). The ranks are based on three factors: estimated number of occurrences, estimated community aerial extent, and estimated range of the community within the province:

S1 Extremely rare - usually 5 or fewer occurrences in the province, or very few remaining hectares.
S2 Very rare - usually between 5 and 20 occurrences in the province, or few remaining hectares.
S3 Rare to uncommon - usually between 20 and 100 occurrences in the province; may have fewer occurrences, but with some extensive examples remaining.

The setting of criteria for significant wildlife habitat (SWH) has incorporated this ranking system into its process of determining rare vegetation communities and as such, a rare vegetation community is defined to include areas that contain a provincially rare vegetation community and/or areas that contain a vegetation community that is rare within the planning area.					
Rare Vegetation Community	**ELC Ecosite Code**	**Habitat Description**	**Detailed Information**	**Defining Criteria**	**Site Confirmation/ Comments**
Cliffs and Talus Slopes Rationale: Cliffs and Talus Slopes are extremely rare habitats in Ontario.	Any ELC Ecosite within Community Series: TAO CLO TAS CLS TAT CLT	A Cliff is vertical to near vertical bedrock >3m in height. A Talus Slope is rock rubble at the base of a cliff made up of coarse rocky debris	Most cliff and talus slopes occur along the Niagara Escarpment.	Confirm any ELC Vegetation Type for Cliffs or Talus Slopes	Not applicable
Sand Barren Rationale; Sand barrens are rare in Ontario and support rare species. Most Sand Barrens have been lost due to cottage development and forestry	ELC Ecosites: SBO1 SBS1 SBT1 Vegetation cover varies from patchy and barren to continuous meadow (SBO1), thicket-like (SBS1), or more closed and treed (SBT1). Tree cover always < 60%.	Sand Barrens typically are exposed sand, generally sparsely vegetated and caused by lack of moisture, periodic fires and erosion. Usually located within other types of natural habitat such as forest or savannah. Vegetation can vary from patchy and barren to tree covered, but less than 60%.	A sand barren area >0.5ha in size.	Confirm any ELC Vegetation Type for Sand Barrens Site must not be dominated by exotic or introduced species (<50% vegetative cover are exotic sp.).	Not applicable
Alvar Rationale; Alvars are extremely rare habitats in Ecosregion 6E. Most alvars in Ontario are in Ecoregions 6E and 7E. Alvars in 6E are small and highly localized just north of the Palaeozoic-Precambrian contact.	ALO1 ALS1 ALT1 FOC1 FOC2 CUM2 CUS2 CUT2-1 CUW2 Five Alvar Indicator Species: *1)Carex crawei* *2)Panicum philadelphicum* *3)Eleocharis compressa* *4)Scutellaria parvula* *5)Trichostema brachiatum* These indicator species are very specific to Alvars within Ecoregion 6E	An alvar is typically a level, mostly unfractured calcareous bedrock feature with a mosaic of rock pavements and bedrock overlain by a thin veneer of soil. The hydrology of alvars is complex, with alternating periods of inundation and drought. Vegetation cover varies from sparse lichen-moss associations to grasslands and shrublands and comprising a number of characteristic or indicator plants. Undisturbed alvars can be phyto- and	An Alvar site > 0.5 ha in size.	Field studies that identify four of the five Alvar Indicator Species at a Candidate Alvar site is Significant. Site must not be dominated by exotic or introduced species (<50% vegetative cover are exotic sp.). The alvar must be in excellent condition and fit in with surrounding landscape with few conflicting land uses	Not applicable

		zoogeographically diverse, supporting many uncommon or are relict plant and animals species. Vegetation cover varies from patchy to barren with a less than 60% tree cover.			
Old Growth Forest Rationale; Due to historic logging practices, extensive old growth forest is rare in the Ecoregion. Interior habitat provided by old growth forests is required by many wildlife species.	Forest Community Series: FOD FOC FOM SWD SWC SWM	Old Growth forests are characterized by heavy mortality or turnover of over- storey trees resulting in a mosaic of gaps that encourage development of a multi-layered canopy and an abundance of snags and downed woody debris.	Woodland areas 30 ha or greater in size or with at least 10 ha interior habitat assuming 100 m buffer at edge of forest.	Field Studies will determine: If dominant trees species of the are >140 years old, then the area containing these trees is Significant Wildlife Habitat The forested area containing the old growth characteristics will have experienced no recognizable forestry activities (cut stumps will not be present) The area of forest ecosites combined or an eco-element within an ecosite that contains the old growth characteristics is the SWH. Determine ELC vegetation types for the forest forest area containing the old growth characteristics.	Not applicable
Savannah Rationale: Savannahs are extremely rare habitats in Ontario.	TPS1 TPS2 TPW1 TPW2 CUS2	A Savannah is a tallgrass prairie habitat that has tree cover between 25 – 60%.	No minimum size to site Site must be restored or a natural site. Remnant sites such as railway right of ways are not considered to be SWH.	Field studies confirm one or more of the Savannah indicator should be present. Note: Savannah plant spp. list from Ecoregion 6E should be used. Area of the ELC Ecosite is the SWH. Site must not be dominated by exotic or introduced species (<50% vegetative cover are exotic sp.).	Not applicable
Tallgrass Prairie	TPO1 TPO2	A Tallgrass Prairie has ground cover dominated by	No minimum size to site. Site must be restored or a	Field studies confirm one or more of the Prairie	Not applicable

Rationale: Tallgrass Prairies are extremely rare habitats in Ontario.		prairie grasses. An open Tallgrass Prairie habitat has < 25% tree cover.	natural site. Remnant sites such as railway right of ways are not considered to be SWH.	indicator species should be present. Note: Prairie plant spp. list from Ecoregion 6E should be used. Area of the ELC Ecosite is the SWH. Site must not be dominated by exotic or introduced species (<50% vegetative cover are exotic sp.).	
Other Rare Vegetation Communities Rationale: Plant communities that often contain rare species which depend on the habitat for survival.	Provincially Rare S1, S2 and S3 vegetation communities. Any ELC Ecosite Code that has a possible ELC Vegetation Type that is Provincially Rare is Candidate SWH.	Rare Vegetation Communities may include beaches, fens, forest, marsh, barrens, dunes and swamps.	ELC Ecosite codes that have the potential to be a rare ELC Vegetation Type.	Field studies should confirm if an ELC Vegetation Type is a rare vegetation community. Area of the ELC Vegetation Type polygon is the SWH.	Not applicable

1.**2.1 Specialized Habitat for Wildlife**

Some wildlife species require large areas of suitable habitat for their long-term survival. Many wildlife species require substantial areas of suitable habitat for successful breeding. Their populations decline when habitat becomes fragmented and reduced in size. Specialized habitat for wildlife is a community or diversity-based category, therefore, the more wildlife species a habitat contains, the more significant the habitat becomes to the planning area. The largest and least fragmented habitats within a planning area will support the most significant populations of wildlife.

Specialized Wildlife Habitat	**Wildlife Species**	**ELC Ecosite Codes**	**Habitat Criteria**	**Defining Criteria**	**Site Confirmation/ Comments**
Waterfowl Nesting Area Rationale; Important to local waterfowl populations, sites with greatest number of species and highest number of individuals are significant.	American Black Duck Northern Pintail Northern Shoveler Gadwall Blue-winged Teal Green-winged Teal Wood Duck Hooded Merganser Mallard	All upland habitats located adjacent to these wetland ELC Ecosites are Candidate SWH: MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 SWT1 SWT2 SWD1 SWD2 SWD3 SWD4 Note: includes adjacency to Provincially Significant Wetlands	A waterfowl nesting area extends 120 m from a wetland (> 0.5 ha) or a wetland (>0.5ha) and any small wetlands (0.5ha) within 120m or a cluster of 3 or more small (<0.5 ha) wetlands within 120 m of each individual wetland where waterfowl nesting is known to occur. Upland areas should be at least 120 m wide so that predators such as racoons, skunks, and foxes have difficulty finding nests.	Studies confirmed: Presence of 3 or more nesting pairs for listed species excluding Mallards, or; Presence of 10 or more nesting pairs for listed species including Mallards. Any active nesting site of an American Black Duck is considered significant. Nesting studies should be completed during the spring breeding season (April - June). Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”	Not applicable

			Wood Ducks and Hooded Mergansers utilize large diameter trees (>40cm dbh) in woodlands for cavity nest sites. nesting habitat.	A field study confirming waterfowl nesting habitat will determine the boundary of the waterfowl nesting habitat for the SWH, this may be greater or less than 120 m from the wetland and will provide enough habitat for waterfowl to successfully nest.	
Bald Eagle and Osprey Nesting, Foraging and Perching Habitat Rationale; Nest sites are fairly uncommon in Eco-region 6E and are used annually by these species. Many suitable nesting locations may be lost due to increasing shoreline development pressures and scarcity of habitat.	Osprey Special Concern Bald Eagle	ELC Forest Community Series: FOD, FOM, FOC, SWD, SWM and SWC directly adjacent to riparian areas – rivers, lakes, ponds and wetlands	Nests are associated with lakes, ponds, rivers or wetlands along forested shorelines, islands, or on structures over water. Osprey nests are usually at the top a tree whereas Bald Eagle nests are typically in super canopy trees in a notch within the tree's canopy. Nests located on man-made objects are not to be included as SWH (e.g. telephone poles and constructed nesting platforms).	Studies confirm the use of these nests by: One or more active Osprey or Bald Eagle nests in an area. Some species have more than one nest in a given area and priority is given to the primary nest with alternate nests included within the area of the SWH. For an Osprey, the active nest and a 300 m radius around the nest or the contiguous woodland stand is the SWH, maintaining undisturbed shorelines with large trees within this area is important. For a Bald Eagle the active nest and a 400-800 m radius around the nest is the SWH. Area of the habitat from 400-800m is dependant on site lines from the nest to the development and inclusion of perching and foraging habitat To be significant a site must be used annually. When found inactive, the site must be known to be inactive for > 3 years or suspected of not being	Not applicable

				used for >5 years before being considered not significant. Observational studies to determine nest site use, perching sites and foraging areas need to be done from mid March to mid August. Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”	
Woodland Raptor Nesting Habitat Rationale: Nests sites for these species are rarely identified; these area sensitive habitats and are often used annually by these species.	Northern Goshawk Cooper’s Hawk Sharp-shinned Hawk Red-shouldered Hawk Barred Owl Broad-winged Hawk	May be found in all forested ELC Ecosites. May also be found in SWC, SWM, SWD and CUP3	All natural or conifer plantation woodland/forest stands >30ha with >10ha of interior habitat. Interior habitat determined with a 200m buffer. Stick nests found in a variety of intermediate-aged to mature conifer, deciduous or mixed forests within tops or crotches of trees. Species such as Coopers hawk nest along forest edges sometimes on peninsulas or small off-shore islands. In disturbed sites, nests may be used again, or a new nest will be in close proximity to old nest.	Studies confirm: Presence of 1 or more active nests from species list is considered significant. Red-shouldered Hawk and Northern Goshawk – A 400m radius around the nest or 28 ha area of habitat is the SWH. (the 28 ha habitat area would be applied where optimal habitat is irregularly shaped around the nest) Barred Owl – A 200m radius around the nest is the SWH. Broad-winged Hawk and Coopers Hawk,– A 100m radius around the nest is the SWH. Sharp-Shinned Hawk – A 50m radius around the nest is the SWH. Conduct field investigations from mid-March to end of May. The use of call broadcasts can help in locating territorial (courting/nesting) raptors and facilitate the discovery of nests by narrowing down the search area.	Not applicable

Turtle Nesting Areas Rationale; These habitats are rare and when identified will often be the only breeding site for local populations of turtles.	Midland Painted Turtle Special Concern Species Northern Map Turtle Snapping Turtle	Exposed mineral soil (sand or gravel) areas adjacent (<100m) or within the following ELC Ecosites: MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 BOO1 FEO1	Best nesting habitat for turtles are close to water and away from roads and sites less prone to loss of eggs by predation from skunks, raccoons or other animals. For an area to function as a turtle- nesting area, it must provide sand and gravel that turtles are able to dig in and are located in open, sunny areas. Nesting areas on the sides of municipal or provincial road embankments and shoulders are not SWH. Sand and gravel beaches adjacent to undisturbed shallow weedy areas of marshes, lakes, and rivers are most frequently used.	Studies confirm: Presence of 5 or more nesting Midland Painted Turtles One or more Northern Map Turtle or Snapping Turtle nesting is a SWH. The area or collection of sites within an area of exposed mineral soils where the turtles nest, plus a radius of 30-100m around the nesting area dependant on slope, riparian vegetation and adjacent land use is the SWH. Travel routes from wetland to nesting area are to be considered within the SWH as part of the 30-100m area of habitat. Field investigations should be conducted in prime nesting season typically late spring to early summer. Observational studies observing the turtles nesting is a recommended method.	Potential on adjacent lands in golf course. Development area is sufficiently buffered.
Seeps and Springs Rationale; Seeps/Springs are typical of headwater areas and are often at the source of coldwater streams.	Wild Turkey Ruffed Grouse Spruce Grouse White-tailed Deer Salamander spp.	Seeps/Springs are areas where ground water comes to the surface. Often they are found within headwater areas within forested habitats. Any forested Ecosite within the headwater areas of a stream could have seeps/springs.	Any forested area (with <25% meadow/field/pasture) within the headwaters of a stream or river system. Seeps and springs are important feeding and drinking areas especially in the winter will typically support a variety of plant and animal species.	Field Studies confirm: Presence of a site with 2 or more seeps/springs should be considered SWH. The area of a ELC forest ecosite or an ecoelement within ecosite containing the seeps/springs is the SWH. The protection of the recharge area considering the slope, vegetation, height of trees and groundwater condition need to be considered in delineation the habitat.	Not applicable
Amphibian Breeding Habitat (Woodland).	Eastern Newt	All Ecosites associated with these ELC Community	Presence of a wetland, pond or woodland pool	Studies confirm;	Not applicable due to insufficient calls, however

Rationale: These habitats are extremely important to amphibian biodiversity within a landscape and often represent the only breeding habitat for local amphibian populations	Blue-spotted Salamander Spotted Salamander Gray Treefrog Spring Peeper Western Chorus Frog Wood Frog	Series;FOC FOM FOD SWC SWM SWD Breeding pools within the woodland or the shortest distance from forest habitat are more significant because they are more likely to be used due to reduced risk to migrating amphibians	(including vernal pools) >500m2 (about 25m diameter) within or adjacent (within 120m) to a woodland (no minimum size). Some small wetlands may not be mapped and may be important breeding pools for amphibians. Woodlands with permanent ponds or those containing water in most years until mid-July are more likely to be used as breeding habitat.	Presence of breeding population of 1 or more of the listed newt/salamander species or 2 or more of the listed frog species with at least 20 individuals (adults or eggs masses) or 2 or more of the listed frog species with Call Level Codes of 3. A combination of observational study and call count surveys will be required during the spring (March-June) when amphibians are concentrated around suitable breeding habitat within or near the woodland/wetlands. The habitat is the wetland area plus a 230m radius of woodland area. If a wetland area is adjacent to a woodland, a travel corridor connecting the wetland to the woodland is to be included in the habitat.	wetland will be protected as a feature and sufficient buffer to be provided. Call level codes insufficient to establish significant wildlife habitat, although it is noted that both Spring Peepers and American Toads reached level 3.
Amphibian Breeding Habitat (Wetlands) Rationale; Wetlands supporting breeding for these amphibian species are extremely important and fairly rare within Central Ontario landscapes.	Eastern Newt American Toad Spotted Salamander Four-toed Salamander Blue-spotted Salamander Gray Treefrog Western Chorus Frog Northern Leopard Frog Pickerel Frog Green Frog Mink Frog Bullfrog	ELC Community Classes SW, MA, FE, BO, OA and SA. Typically these wetland ecosites will be isolated (>120m) from woodland ecosites, however larger wetlands containing predominantly aquatic species (e.g. Bull Frog) may be adjacent to woodlands.	Wetlands>500m2 (about 25m diameter), supporting high species diversity are significant; some small or ephemeral habitats may not be identified on MNRF mapping and could be important amphibian breeding habitats. Presence of shrubs and logs increase significance of pond for some amphibian species because of available structure for calling, foraging, escape and	Studies confirm: Presence of breeding population of 1 or more of the listed newt/salamander species or 2 or more of the listed frog/toad species with at least 20 individuals (adults or eggs masses) or 2 or more of the listed frog/toad species with Call Level Codes of 3. or; Wetland with confirmed breeding Bullfrogs are significant. The ELC ecosite wetland area and the shoreline are the SWH.	Not applicable due to insufficient calls, however wetland will be protected as a feature and sufficient buffer to be provided. Call level codes insufficient to establish significant wildlife habitat, although it is noted that both Spring Peepers and American Toads reached level 3.

			concealment from predators. Bullfrogs require permanent water bodies with abundant emergent vegetation.	A combination of observational study and call count surveys will be required during the spring (March-June) when amphibians are concentrated around suitable breeding habitat within or near the wetlands. If a SWH is determined for Amphibian Breeding Habitat (Wetlands) then Movement Corridors are to be considered as outlined in Table 1.4 of this Schedule.	
Woodland Area-Sensitive Bird Breeding Habitat Rationale: Large, natural blocks of mature woodland habitat within the settled areas of Southern Ontario are important habitats for area sensitive interior forest song birds.	Yellow-bellied Sapsucker Red-breasted Nuthatch Veery Blue-headed Vireo Northern Parula Black-throated Green Warbler Blackburnian Warbler Black-throated Blue Warbler Ovenbird Scarlet Tanager Winter Wren Special Concern: Cerulean Warbler Canada Warbler	All Ecosites associated with these ELC Community Series; FOC FOM FOD SWC SWM SWD	Habitats where interior forest breeding birds are breeding, typically large mature (>60 yrs old) forest stands or woodlots >30 ha.Interior forest habitat is at least 200 m from forest edge habitat.	Studies confirm: Presence of nesting or breeding pairs of 3 or more of the listed wildlife species. Note: any site with breeding Cerulean Warblers or Canada Warblers is to be considered SWH. Conduct field investigations in spring and early summer when birds are singing and defending their territories. Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”.	Not applicable

1.3 Habitat for Species of Conservation Concern (Not including Endangered or Threatened Species)

Habitats of Species of Conservation Concern include wildlife species that are listed as Special Concern or rare, that are declining, or are featured species. Habitats of Species of Conservation Concern do not include habitats of Endangered or Threatened species as identified by the Endangered Species Act 2007.

Wildlife	Species	ELC Ecosite	Habitat Criteria	Defining Criteria	Site Confirmation/ Comments
Marsh Breeding Bird Habitat Rationale; Wetlands for these bird	American Bittern Virginia Rail Sora	MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 SAS1 SAM1 SAF1 FEO1 BOO1	Nesting occurs in wetlands.	Studies confirm: Presence of 5 or more nesting pairs of Sedge	Not applicable

species are typically productive and fairly rare in Southern Ontario landscapes.	Common Moorhen American Coot Pied-billed Grebe Marsh Wren Sedge Wren Common Loon Sandhill Crane Green Heron Trumpeter Swan Special Concern: Black Tern Yellow Rail	For Green Heron: All SW, MA and CUM1 sites.	All wetland habitat is to be considered as long as there is shallow water with emergent aquatic vegetation present. For Green Heron, habitat is at the edge of water such as sluggish streams, ponds and marshes sheltered by shrubs and trees. Less frequently, it may be found in upland shrubs or forest a considerable distance from water.	Wren or Marsh Wren or or 1 pair of Sandhill Cranes; or breeding by any combination of 5 or more of the listed species. Note: any wetland with breeding of 1 or more Black Terns, Trumpeter Swan, Green Heron or Yellow Rail is SWH. Area of the ELC ecosite is the SWH. Breeding surveys should be done in May/June when these species are actively nesting in wetland habitats. Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”	
Open Country Bird Breeding Habitat Rationale; This wildlife habitat is declining throughout Ontario and North America. Species such as the Upland Sandpiper have declined significantly the past 40 years based on CWS (2004) trend records.	Upland Sandpiper Grasshopper Sparrow Vesper Sparrow Northern Harrier Savannah Sparrow Special Concern Short-eared Owl	CUM1 CUM2	Large grassland areas (includes natural and cultural fields and meadows) >30 ha Grasslands not Class 1 or 2 agricultural lands, and not being actively used for farming (i.e. no row cropping or intensive hay or livestock pasturing in the last 5 years). Grassland sites considered significant should have a history of longevity, either abandoned fields, mature hayfields and pasturelands that are at least 5 years or older. The Indicator bird species are area sensitive requiring larger grassland areas than the common grassland species.	Field Studies confirm: Presence of nesting or breeding of 2 or more of the listed species. A field with 1 or more breeding Short-eared Owls is to be considered SWH. The area of SWH is the contiguous ELC ecosite field areas. Conduct field investigations of the most likely areas in spring and early summer when birds are singing and defending their territories. Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”	Not applicable
Shrub/Early Successional Bird Breeding Habitat Rationale;	Indicator Spp: Brown Thrasher Clay-coloured Sparrow	CUT1 CUT2 CUS1 CUS2 CUW1 CUW2	Large field areas succeeding to shrub and thicket habitats>10ha in size.	Field Studies confirm: Presence of nesting or breeding of 1 of the indicator species and at	Not applicable

This wildlife habitat is declining throughout Ontario and North America. The Brown Thrasher has declined significantly over the past 40 years based on CWS (2004) trend records.	Common Spp. Field Sparrow Black-billed Cuckoo Eastern Towhee Willow Flycatcher Special Concern: Yellow-breasted Chat Golden-winged Warbler	Patches of shrub ecosites can be complexed into a larger habitat for some bird species	Shrub land or early successional fields, not class 1 or 2 agricultural lands, not being actively used for farming (i.e. no row-cropping, haying or live-stock pasturing in the last 5 years). Shrub thicket habitats (>10 ha) are most likely to support and sustain a diversity of these species. Shrub and thicket habitat sites considered significant should have a history of longevity, either abandoned fields or pasturelands	least 2 of the common species. A habitat with breeding Yellow- breasted Chat or Golden-winged Warbler is to be considered as Significant Wildlife Habitat. The area of the SWH is the contiguous ELC ecosite field/thicket area. Conduct field investigations of the most likely areas in spring and early summer when birds are singing and defending their territories Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”	
Terrestrial Crayfish Rationale: Terrestrial Crayfish are only found within SW Ontario in Canada and their habitats are very rare. ccii	Chimney or Digger Crayfish; (Fallicambarus fodiens) Devil Crayfish or Meadow Crayfish; (Cambarus Diogenes)	MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 MAS1 MAS2 MAS3 SWD SWT SWM CUM1 with inclusions of above meadow marsh or swamp ecosites can be used by terrestrial crayfish.	Wet meadow and edges of shallow marshes (no minimum size) should be surveyed for terrestrial crayfish. Constructs burrows in marshes, mudflats, meadows, the ground can’t be too moist. Can often be found far from water. Both species are a semi-terrestrial burrower which spends most of its life within burrows consisting of a network of tunnels. Usually the soil is not too moist so that the tunnel is well formed.	Studies Confirm: Presence of 1 or more individuals of species listed or their chimneys (burrows) in suitable meadow marsh, swamp or moist terrestrial sites Area of ELC ecosite or an ecoelement area of meadow marsh or swamp within the larger ecosite area is the SWH. Surveys should be done April to August in temporary or permanent water. Note the presence of burrows or chimneys are often the only indicator of presence, observance or collection of individuals is very difficult.	Not applicable
Special Concern and Rare Wildlife Species Rationale: These species are quite rare or have experienced	All Special Concern and Provincially Rare (S1-S3, SH) plant and animal species. Lists of these species are tracked by the Natural Heritage	All plant and animal element occurrences (EO) within a 1 or 10km grid. Older element occurrences were recorded prior to	When an element occurrence is identified within a 1 or 10 km grid for a Special Concern or provincially Rare species; linking candidate habitat on	Studies Confirm: Assessment/inventory of the site for the identified special concern or rare species needs to be completed during the time	Common Five-Lined Skink, Golden Winged Warbler and Eastern Meadowlark as discussed in report.

significant population declines in Ontario.	Information Centre.	GPS being available, therefore location information may lack accuracy	the site needs to be completed to ELC Ecosites.	of year when the species is present or easily identifiable. The area of the habitat to the finest ELC scale that protects the habitat form and function is the SWH, this must be delineated through detailed field studies. The habitat needs be easily mapped and cover an important life stage component for a species e.g. specific nesting habitat or foraging habitat.	

1.4 Animal Movement Corridors

Animal Movement Corridors are elongated areas used by wildlife to move from one habitat to another. They are important to ensure genetic diversity in populations, to allow seasonal migration of animals (e.g. deer moving from summer to winter range) and to allow animals to move throughout their home range from feeding areas to cover areas. Animal movement corridors function at different scales often related to the size and home range of the animal. For example, short, narrow areas of natural habitat may function as a corridor between amphibian breeding areas and their summer range, while wider, longer corridors are needed to allow deer to travel from their winter habitat to their summer habitat.

Identifying the most important corridors that provide connectivity across the landscape is challenging because of a lack of specific information on animal movements. There is also some uncertainty about the optimum width and mortality risks of corridors. Furthermore, a corridor may be beneficial for some species but detrimental to others. For example, narrow linear corridors may allow increased access for racoons, cats, and other predators. Also, narrow corridors dominated by edge habitat may encourage invasion by weedy generalist plants and opportunistic species of birds and mammals. Corridors often consist of naturally vegetated areas that run through more open or developed landscapes. However, sparsely vegetated areas can also function as corridors. For example, many species move freely through agricultural land to reach natural areas. Despite the difficulty of identifying exact movement corridors for all species, these landscape features are important to the long-term viability of certain wildlife populations.

Animal Movement Corridors should only be identified as SWH where a Confirmed or Candidate SWH has been identified by MNRF or the planning authority based on documented evidence of a habitat identified within these Criterion Schedules or the Significant Wildlife Habitat Technical Guide. The identified wildlife habitats will have distinct passageways or rely on well defined natural features for movements between habitats required by the species to complete its life cycle.

Habitat	Species	ELC Eco-sites	Habitat Criteria	Defining Criteria	**Site Confirmation/ Comments**
Amphibian Movement Corridors Rationale; Movement corridors for amphibians moving from their terrestrial habitat to breeding habitat can be	Eastern Newt American Toad Spotted Salamander Four-toed Salamander Blue-spotted Salamander Gray Treefrog Western Chorus Frog Northern Leopard Frog	Corridors may be found in all ecosites associated with water. Corridors will be determined based on identifying the significant breeding habitat for these species in Table 1.1	Movement corridors between breeding habitat and summer habitat. Movement corridors must be determined when Amphibian breeding habitat is confirmed as SWH from Table 1.2	Field Studies must be conducted at the time of year when species are expected to be migrating or entering breeding sites. Corridors should consist of native vegetation, with	Not applicable

extremely important for local populations.	Pickerel Frog Green Frog Mink Frog Bullfrog		(Amphibian Breeding Habitat –Wetland) of this Schedule.	several layers of vegetation. Corridors unbroken by roads, waterways or bodies, and undeveloped areas are most significant. Corridors should have at least 15m of vegetation on both sides of waterway or be up to 200m wide of woodland habitat and with gaps <20m. Shorter corridors are more significant than longer corridors, however amphibians must be able to get to and from their summer and breeding habitat.	
Deer Movement Corridors Rationale: Corridors important for all species to be able to access seasonally important life-cycle habitats or to access new habitat for dispersing individuals by minimizing their vulnerability while travelling.	White-tailed Deer	Corridors may be found in all forested ecosites. A Project Proposal in Stratum II Deer Wintering Area has potential to contain corridors.	Movement corridor must be determined when Deer Wintering Habitat is confirmed as SWH from Table 1.1 of this schedule. A deer wintering habitat identified by the OMNRF as SWH in Table 1.1 of this Schedule will have corridors that the deer use during fall migration and spring dispersion. Corridors typically follow riparian areas, woodlots, areas of physical geography (ravines, or ridges).	Studies must be conducted at the time of year when deer are migrating or moving to and from winter concentration areas . Corridors that lead to a deer wintering habitat should be unbroken by roads and residential areas. Corridors should be at least 200m wide with gaps <20m and if following riparian area with at least 15m of vegetation on both sides of waterway. Shorter corridors are more significant than longer corridors.	Not applicable
1.5 Exceptions for EcoRegion 6E **Exceptions are candidate wildlife habitats that will have different criteria than what is proposed in the above schedules for an area within the Eco-region. The Exceptions will be based on Eco-Districts and municipalities can apply the exception for the eco-district within their planning area**					
EcoDistrict and Wildlife Habitat/Species	Ecosites	Habitat Description	Habitat Criteria and Information	Defining Criteria	
6E-14	All Forested habitat represented by ELC Community Series:	Black bears require forested habitat that provides cover, winter	Woodland ecosites >30ha with mast-producing tree	All woodlands > 30 ha with a 50% composition of these ELC Vegetation	Not applicable

Rationale: The Bruce Peninsula has an isolated and distinct population of black bears. Maintenance of large woodland tracts with mast- producing tree species is important for bears. Mast Producing Areas Black Bear	FOM FOD	hibernation sites, and mast- producing tree species. Forested habitats need to be large enough to provide cover and protection for black bears.	species, either soft (cherry) or hard (oak and beech),	Types are considered significant: FOM1-1 FOM2-1 FOM3-1 FOD1-1 FOD1-2 FOD2-1 FOD2-2 FOD2-3 FOD2-4 FOD4-1 FOD5-2 FOD5-3 FOD5-7 FOD6-5	
6E- 17 Rationale: Sharp-tailed grouse only occur on Manitoulin Island in Eco-region 6E, Leks are an important habitat to maintain their population Lek Sharp-tailed Grouse	CUM CUS CUT	The lek or dancing ground consists of bare, grassy or sparse shrubland. There is often a hill or rise in topography. Leks are typically a grassy field/meadow >15ha with adjacent shrublands and >30ha with adjacent deciduous woodland. Conifer trees within 500m are not tolerated.	Grasslands (field/meadow) are to be >15ha when adjacent to shrubland and >30ha when adjacent to deciduous woodland. Grasslands are to be undisturbed with low intensities of agriculture (light grazing or late haying) Leks will be used annually if not destroyed by cultivation or invasion by woody plants or tree planting.	Studies confirming lek habitat are to be completed from late March to June. Any site confirmed with sharp-tailed grouse courtship activities is considered significant. The field/meadow ELC ecosites plus a 200 m radius area with shrub or deciduous woodland is the lek habitat.	Not applicable