

**Environmental Impact Study (EIS)
&
Headwater Assessment**

Valley Street

**Part Lot 18, Concession 7
Township of North Stormont
United Counties of Stormont, Dundas and Glengarry**

July 2022

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1.0. Introduction

As requested by Richard Theoret, an Environmental Impact Study (EIS) was completed to assess the environmental impacts of the proposed creation of a new subdivision at the property located at Lot 18 Concession 7, Valley Street, Moose Creek, ON (Figure 1).

1.1. Site Context

The entire property parcel is approximately 13 ha in size and the legal land description is part of Lot 18, Concession 7, Township of North Stormont, United Counties of Stormont, Dundas and Glengarry. The proponent wishes to develop these lands to create a subdivision. These lands have been designated as the Subject Lands and are the focus of this study. A residential dwelling with a large man-made pond was present within the northern portion of the subject lands. This pond has a manmade outflow to the south which travel along Valley Street before veering east, parallel to the train track (no inflow observed). This manmade ditch then empties into the Angus Grant Municipal Drain, which is a tributary to Moose Creek. The proponent wishes to remove the outflow and redirect all water to the proposed stormwater pond (Appendix B).

The subject lands are bordered to the west by Valley Street and to the south by train tracks (Figure 1).

Within the townships zoning bylaw NO. 08-2014 the subject lands are designated as Residential (R1, R1-3h, R2-6, R2-2h). The subject lands within the United Counties of Stormont, Dundas and Glengarry Official Plan the subject lands are designated as Urban Settlement Area (Residential District), Natural Heritage Feature (Significant Woodland)

Through a background review, potential environmental constraints have been identified as; Significant Woodland, Potential Wetland, and Potential Fish Habitat. Additionally, the proposed development is located in Ecoregion 6E.

The PPS states that site development and alteration shall not be permitted in provincially significant wetlands in Ecoregion 6E and site development and alteration shall not be permitted in provincially significant woodlands in Ecoregion 6E unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions. Additionally, development and site alteration shall not be permitted in fish habitat except in accordance with provincial and federal requirements

No portion of the subject lands appear to be within one of the South Nation Conservation Authority regulated areas.

2.0. Methodology

This report is prepared in accordance with the Official Plan for the United Counties of Stormont, Dundas and Glengarry (2018) with guidance from the Natural Heritage Reference Manual (OMNR, 2010). This EIS includes an assessment of the identified environmental constraints and the potential for Species at Risk.

This EIS will provide the methodology to mitigate, as required, negative impacts on significant features and functions. Potential Species at Risk in the general area were identified from the Ministry of Natural Resources and Forestry databases, the Department of Fisheries and Ocean databases, the Ontario Breeding Bird Atlas, Ontario Reptile and Amphibian Atlas, iNaturalist and the Global Biodiversity Information Facility.

A rapid headwater study (excluding amphibians surveys), at this location was the appropriate approach in determining the appropriate recommendations for the management of all headwaters. Recommendations set out in the Evaluation, Classification and Management of Headwater Drainage Features Guidelines and Ontario Stream Assessment Protocol will be utilised.

Colour aerial photography was used to assess the natural environment features in the general vicinity of the proposed building.

See Table 1 for a summary of field surveys of the site and adjacent lands. All surveys were completed by BCH Environmental (S.St.Pierre and C.Fontaine)

TABLE 1: Summary of Field Surveys

DATE	TIME	AIR TEMP. (°C)	WIND (Beaufort Scale)	CLOUD COVER / PRECIPITATION
May 18, 2022	0700h-1500h	10-17	Light Breeze	Clear Skies
June 6, 2022	0700h-1030h	21	Light Breeze	Clear Skies
July 5, 2022	1130-1230h	22	Light Breeze	Overcast

The area was extensively walked and surveyed for significant natural areas, potential species at risk (butternut) and their associated habitat (bat tree cavity).

Observed plants were recorded for each individual community, the plants utilized in the descriptions are the most abundant specimens observed. A complete observed species list is provided in Appendix A. Plants that could not be identified in the field were collected for a more detailed examination. Nomenclature used in this report follows the Southern Ontario Vascular Plant List (Bradley, 2013) which aligns with the Integrated Taxonomic Information System (ITIS).

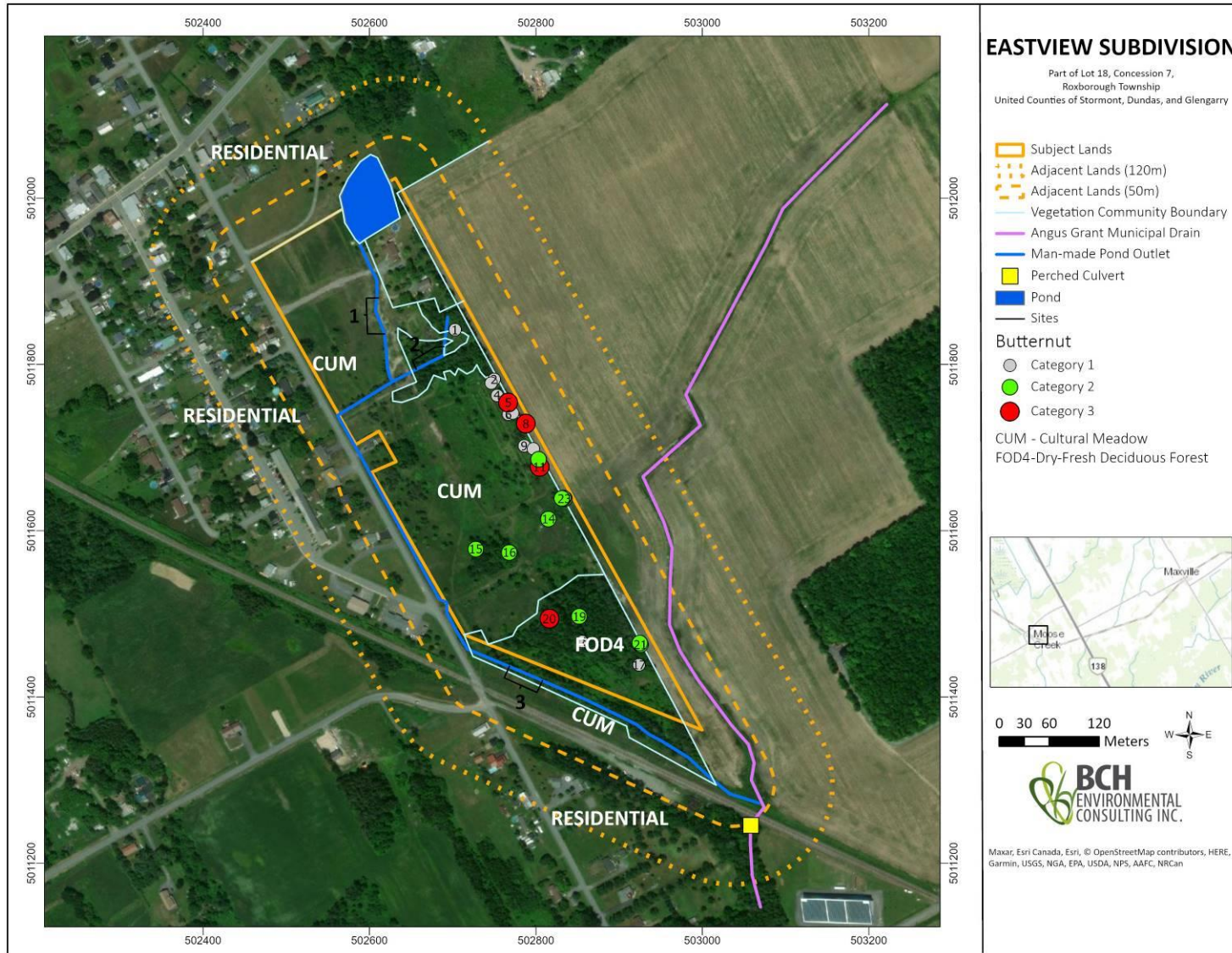
3.0. Field Surveys

A butternut survey was conducted along with a search for cavity trees by systematically moving through the subject lands and adjacent lands (discussed in section 4.3 and 4.4). Vegetation communities and Watercourses are described in section 3.1. The headwater assessment is discussed in section 8.0.

3.1. Existing Conditions

The subject lands consisted mostly of a mixture of meadow and forest. Within the northern portion of the subject lands a residential dwelling with accessory buildings were present along with a large man-made pond. A man-made watercourse (pond outlet) was present flowing in a southerly direction, much of which was along the western and southern borders of the subject lands. This water then empties into the Angus Grant Municipal Drain, which is a tributary to Moose Creek. Much of the eastern adjacent lands was agricultural field while the remainder was residential lands.

FIGURE 1: SUBJECT LANDS



3.1.1. Cultural Meadow (CUM)

This meadow was present throughout the subject lands. This area was regularly mowed, and kept at a height no greater than 10cm (indicated by the proponent). Ground cover (100%) was dominated by grasses, goldenrods, common ragweed, and cow vetch. Individual and clump of trees and shrubs were present throughout (ash, scot's pine, white cedar and common buckthorn). Some portions included rows of planted pine.



Photo 1: Cultural Meadow (May 18, 2022)

3.1.2. Dry-Fresh Deciduous Forest (FOD4)

The forest was present throughout the central and southern areas of the subject lands. The average tree diameter was highly variable with a range of 5-25cm DBH. The canopy was the dominant layer within most of the location. Some areas contained a high amount of dead ash within these areas the sub-canopy and understory where overdeveloped and dominate. The canopy (12m tall; 85% cover) was dominated almost equally by trembling aspen and white ash (lots of dead) with the occasional butternut. The sub-canopy (8m tall; 60% cover) consisted of trembling aspen and white ash. The understory (1-4m tall; 80% cover) was dominated by alternate-leaved dogwood followed by nannyberry and American elm. The ground layer provided 20% cover with common species including Canada enchanter's nightshade, horsetail, common strawberry, and Virginia Creeper. Within the southern portion of this community there is evidence of past clearing activity and an access road/trail. Along some portions of this road/trail there are depression areas on each side containing willows.



Photo 2: Dry-Fresh Deciduous Forest (May 18, 2022)



Photo 3: Dry-Fresh Deciduous Forest (May 18, 2022)

3.1.3. Tributary to Angus Grant Municipal Drain

A man-made tributary to Angus Grant Municipal Drain was located within the subject lands. This tributary originates at the north end of the subject lands at a large man-made pond and flows towards the south end of the subject lands. The outlet of this pond where water can exit and flow downstream into the tributary is piped. Therefore, the water discharge is currently being controlled. Within the subject lands the tributary travels through different types of riparian habitat including: forest, meadow,

roadside, disturbed area, and mowed lawn. At the downstream end, the tributary enters Angus Grant Municipal Drain before entering a culvert and passes under the railroad tracks, continuing offsite. During the May 18, and June 13th, 2022 site visit the culvert downstream of the tracks was perched 10cm in the air, representing an upstream barrier to fish movement. Fish were observed in schools downstream of the above mentioned culvert. The Angus Grant Municipal Drain eventually flows into Moose Creek. The entire tributary within the subject lands was man-made and confined with a straight pattern, with a large portion consisting of roadside ditch. Multiple culvert crossings were noted throughout. Three sampling sites were established within the tributary. Site 1 and 3 on the main branch and Site 2 on a small side branch.



Photo 4: Perched Culvert Downstream of Tracks (May 18, 2022)



Photo 5: Portions of the Tributary Running along Valley Road (May 18, 2022)

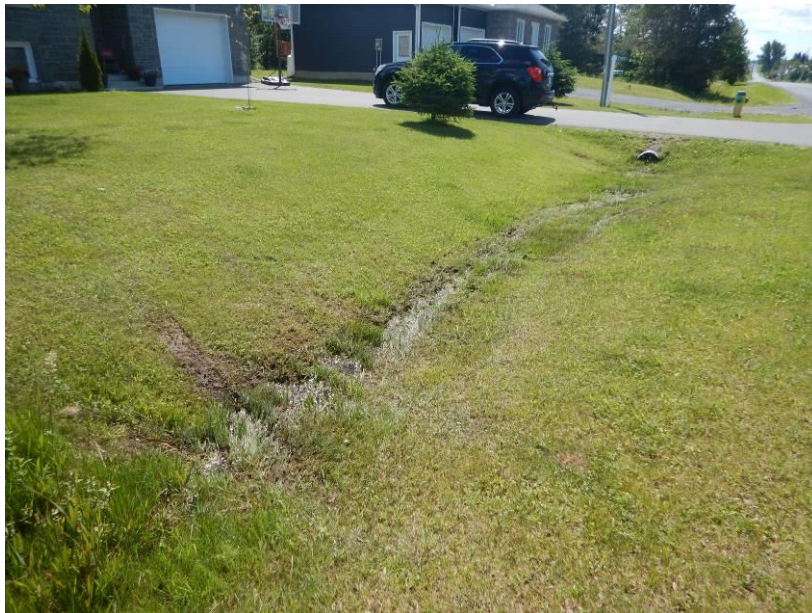


Photo 6: Portions of the Tributary Running along Valley Road - Dry (June 13, 2022)

3.1.4. Site 1

This site was established approximately 90m downstream of the man-made pond. It is located within meadow riparian habitat along the western banks and disturbed/residential land with an access road along the eastern bank. Site 1 was approximately 43m in length and flows in a southern direction. The average channel width was 2.2m and the average bankfull height 30cm. The substrate consisted of fines. The in-water cover consisted entirely of aquatic vegetation which included: narrowleaf cattail, purple

loosestrife and horsetail. The canopy cover ranged from poor to moderate, with 100% bank vegetation throughout the site. The most common species were: trembling aspen, white spruce, balsam poplar, Bebb's willow, alternate-leaved dogwood, grasses, cow vetch, and goldenrods. No signs of erosion were noted.

During the May 18, 2022 visit, the average wetted width and water depth was 1.6m and 9cm (range: 1-54cm), respectively. The hydrological flow habitat consisted mostly of glide, with a small section of run habitat at the upstream end and a pooled area towards the downstream end.

During the June 13, 2022 visit, the average wetted width and water depth was 1.3m and 6cm (range: 1-14cm), respectively. The hydrological flow habitat consisted of standing water (downstream portions of the tributary was dry). The site was sampled for fish during the June 13, 2022 visit using a dip net (100+ dips). One brown bullhead was captured within the pooled area at the downstream end of the station. Although one fish was present (due to the pond) it is this authors opinions that this site should not be considered fish habitat.

During the July 5, 2022 visit, the average wetted width and water depth was 1.4m and 7cm (range: 2-25cm), respectively. The hydrological flow habitat consisted of standing water (downstream portions of the tributary was dry).



Photo 7: Site 1 Looking Downstream from Upstream (May 18, 2022)



Photo 8: Site 1 Looking Downstream from Upstream (June 13, 2022)



Photo 9: Site 1 Looking Downstream from Upstream (July 5, 2022)

3.1.5. Site 2

This site was established approximately 180m downstream of the man-made pond. It is located within forest habitat along a side branch. Site 2 was approximately 40m in length and flows in a westerly direction. The average channel width was 1.3m and the average bankfull height 20cm. The substrate consisted of fines. The in-water cover consisted of areas of small woody debris. The canopy within the site contained full cover, with 100% bank vegetation. The most common species were: white ash,

American elm, trembling aspen, alternate-leaved dogwood, Tartarian honeysuckle, wild red raspberry, grasses, common strawberry, and goldenrod. No signs of erosion were noted.

During the May 18, 2022 visit, the average wetted width and water depth was 0.6m and 2cm (range: 1-7cm), respectively. The hydrological flow habitat consisted of standing water (downstream portions were dry).

During the June 13 and July 5, 2022 visit, the entire site was dry. This site was not sampled for fish due to a lack of water. This site should not be considered fish habitat.



Photo 10: Site 2 Looking Upstream from Downstream (May 18, 2022)



Photo 11: Site 2 Looking Upstream from Downstream (June 13, 2022)



Photo 12: Site 2 Looking Upstream from Downstream (July 5, 2022)

3.1.6. Site 3

Site 3 was established approximately 630m downstream of the man-made pond. It is located within forest and meadow habitat. Site 3 was approximately 70m in length and flows in a southeast direction. The average channel width was 4m and the average bankfull height 29cm. The substrate consisted of fines. The in-water cover consisted entirely of aquatic vegetation which included: narrowleaf cattail, purple loosestrife and horsetail. The canopy within the station contained full cover, with 100% bank vegetation. The most common species were: black willow, white ash, American elm, cottonwood, alternate-leaved dogwood, red-osier dogwood, grasses, cow vetch, and goldenrod. No signs of erosion were noted.

During the May 18, 2022 visit, the average wetted width and water depth was 3.3m and 7cm (range: 2-14cm), respectively. The hydrological flow habitat consisted of glide.

During the June 13, 2022 visit, the average wetted width and water depth was 1.1m and 2cm (range: 1-6cm), respectively. The hydrological flow habitat consisted of standing water (upstream and downstream portions where dry). The station was sampled for fish during the June 13, 2022 visit using a dip net (100+ dips). No fish were captured or observed. This site should not be considered fish habitat.

During the July 5, 2022 visit, the station was dry.



Photo 13: Site 3 Looking Upstream from Downstream (May 18, 2022)



Photo 14: Site 3 Looking Upstream from Downstream (June 13, 2022)



Photo 15: Site 3 Looking Upstream from Downstream (July 5, 2022)

3.1.7. Man-made Pond

This man-made pond, located at the upstream end of the tributary, was approximately 77mx55m in size. As previously mentioned, there is an outlet at the southwest corner in which water can exit the pond through a pipe and continue into the tributary. The banks surrounding the pond consisted of meadow, manicured lawn, residential, and agricultural land. There is a gradual drop moving towards the center of the pond with depths greater than 2m. During the June 13, 2022 visit, the pond was sampled using a seine net to determine the presence or absence of fish. After a total of 5 seine net pulls, approximately 350-400 fish were captured representing 5 species: rock bass, creek chub, brown bullhead, finescale dace, and fathead minnow. Koi were also observed within the pond (observed jumping). This pond represents fish habitat. The proponent has indicated that all fish within the pond have been added by people over the year. Either purchases to purposely add to the pond or by dumping bait buckets. The ponds outlet is capped in the spring, water is only present within the pond because of this. The presence of koi is problematic they should not be allowed to escape the pond. This is not a natural system.



Photo 16: Pond (June 13, 2022)



Photo 17: Pond Outlet (June 13, 2022)

4.0. Potential Species at Risk

The Make a Map: Natural Heritage online database (OMNRF) was reviewed on May 12, 2022. This database provides sightings of provincially tracked species including Threatened and Endangered species covered by the 2008 Endangered Species Act in 1 km squares across most of Ontario. A search was conducted on the site and adjacent lands (18WR0311, 18WR0211, 18WR0312, and 18WR0210). The following species were identified for these squares:

- Eastern Meadowlark (Threatened)

The Ontario Breeding Bird Atlas provides a searchable database in the form of a 10km square grid. A query revealed the following Species at Risk and species of special concern identified within the 10km square that encompasses the site and adjacent lands (18WR01):

- Whip-poor-will (Threatened)
- Eastern Wood-Pewee (Special Concern)
- Bank Swallow (Threatened)
- Barn Swallow (Threatened)
- Wood Thrush (Special Concern)
- Bobolink (Threatened)
- Eastern Meadowlark (Threatened)

Similar to the Ontario Breeding Bird Atlas, the Ontario Reptile and Amphibian Atlas provides a searchable database in the form of a 10km square grid. A query revealed no Species at Risk within the 10km square that encompasses the subject lands and adjacent lands (18WR01).

iNaturalist and the Global Biodiversity Information Facility provides a searchable database. A query revealed no Species at Risk in the vicinity of the Subject Lands.

The Department of Fisheries and Oceans provide species at risk sightings via their online map tool. A query found no results in the vicinity of the site.

In addition to the above potential Species at Risk, other endangered and threatened species may potentially occur in the general area:

- Little Brown Myotis (Endangered)
- Northern Myotis (Endangered)
- Tri-coloured Bat (Endangered)
- Butternut (Endangered)
- Black Ash (Endangered)

4.1. Birds

Eastern wood-pewee and wood thrush are designated special concern under the Ontario Endangered Species Act (ESA). The habitat of species of special concern is not regulated under the Ontario ESA.

Eastern whip-poor-will, bank swallow, barn swallow, bobolink, and eastern meadowlark are designated as threatened under the Ontario Endangered Species Act (ESA). Eastern whip-poor-will avoid both wide-open spaces and closed canopy forests. Semi-open forests or patchy forests with clearings, such as barrens or forests that are regenerating following major disturbances are preferred. Areas with little ground cover are also preferred (COSEWIC 2009b). This habitat was not present. Bank swallow are generally associated with sand-silt vertical banks (COSEWIC 2013a). This habitat was not present. Barn swallow nest sites are commonly found along the interior or exterior of building structures, under bridges and wharves, and in road culverts (Heagy et al. 2014.). No barn swallow or barn swallow nests were observed. No suitable nesting structures were present. Bobolink and eastern meadowlark are associated with native and non-native larger grassland habitats such as hayfields (COSEWIC 2010, and COSEWIC 2011). This habitat was not present, the cultural meadow is regularly mowed by the proponent if maintenance activity ceases then this area would need to be accessed for bobolink and meadowlark.

4.2. Mammals

Little brown Myotis, northern Myotis, and tri-coloured bat are designated endangered under the Ontario Endangered Species Act (ESA). All three species overwinter in hibernacula. Maternity colonies are established by females in the summer, often in buildings or large-diameter trees with suitable cavities (COSEWIC 2013b). No caves, bedrock fissures, mining shafts, abandoned buildings (describe building), or other features which may function as bat hibernacula habitat were noted on the site. No suitable cavity trees that may be used for summer maternal colonies by bats were observed within the subject lands.

4.3. Vegetation

Butternut (designated as endangered by the ESA) tends to reach greatest abundance in rich well-drained mesic loams in floodplains, streambanks, terraces and ravine slopes, but can occur in a wide range of other situations (COSEWIC 2017). Twenty-five butternut trees were observed during a survey conducted on May 18, 2022 within the subject lands and the adjacent 50 m (Figure 1). Of the twenty-five butternut present, eleven were found to be Category 1, ten were found to be Category 2, and four were found to be category 3. Butternut is protected under the Endangered Species Act, 2007 (ESA) from being killed, harmed, or removed. If you are planning to undertake an activity that may affect Butternut, you may be eligible to follow the requirements set out in section 23.7 of Ontario Regulation 242/08 under the ESA. You are eligible to remove any Category 1 tree without registration or permitting but only after waiting 30 days after submitting the BHA report to MECP.

Black ash (designated as endangered by the ESA) occurs most frequently in floodplain forests, basin, seepage and lacustrine swamp forests, shoreline forest margins, and fens (COSEWIC 2017). The ministry temporarily suspended protections for Black Ash for a period of two years from the time the species was added to the Species at Risk in Ontario List (Ontario Regulation 230/08). During this time, proponents will not need to seek authorizations for activities that impact Black Ash and its habitat. Black ash was not observed within the subject lands.

4.4. Species at Risk Summary

In summary, based on the habitat present within the subject lands and the field visit, other than the 25 butternut trees found, no Species at Risk are anticipated to be present within said area. Indirect impacts on these species as a result of the proposed development can be mitigated provided the mitigation measures in this report are properly implemented.

5.0. Significant Woodland

The significance of woodlands has been evaluated using the criteria in the Natural Heritage Reference Manual (OMNR, 2010) by The Ministry of Natural Resources and Forestry (MNRF).

The woodland within the subject lands was part of a larger woodland which it has been severed from for agricultural purposes. Only the forest within the subject lands now remains. This forest is approximately 2.69ha in size. The proponent wishes to remove the entire woodland. The significance of this woodland was evaluated using the criteria in the Natural Heritage Reference Manual (OMNR, 2010). The PPS does not permit development in significant woodlands south and east of the Canadian Shield unless it has been demonstrated that there will be no negative impacts on the natural features or the ecological functions. Woodlands are significant if they meet the criteria presented in the NHRM: size, ecological function, uncommon characteristics, and economical and social functional values. If the woodland meets any one of these criteria then it could be deemed to be significant. Table 2 demonstrates the factors determining significance pre and post construction as per the NHRM.

Within the portion proposed to be removed there were no seasonal concentration areas of animals, rare vegetative communities, raptor overwintering sites, caves, or suitable tree cavities.

TABLE 2: WOODLAND ANALYSIS

CRITERIA		PRE CONSTRUCTION	POST CONSTRUCTION	DISCUSSION
WOODLAND SIZE		DOES NOT MEET THE CRITERIA		The townships overall woodland cover is estimated to be 5-30% of the land cover. The NHRM stat that where woodlands cover is about 5–30% of the land cover, woodlands 4 ha in size or larger should be considered significant. The woodland size is 2.69ha before clearing therefore does not meets this criteria.
ECOLOGICAL FUNCTION CRITERIA	Woodland Interior	DOES NOT MEET THE CRITERIA		This woodland had no interior habitat
	Proximity to other woodlands or other habitats	DOES NOT MEET THE CRITERIA		The woodland does connect to a watercourse but due to size and

CRITERIA	PRE CONSTRUCTION	POST CONSTRUCTION	DISCUSSION
<p>Linkages</p> <p>Water protection</p> <p>Woodland diversity</p>	<p>DOES NOT MEET THE CRITERIA</p> <p>DOES NOT MEET THE CRITERIA</p> <p>DOES NOT MEET THE CRITERIA</p>	<p>DOES NOT MEET THE CRITERIA</p> <p>DOES NOT MEET THE CRITERIA</p> <p>DOES NOT MEET THE CRITERIA</p>	<p>placement of the watercourse (edge of woodland) it is not receiving ecological benefit from the woodland.</p> <p>Woodland is no located within a defined natural heritage system.</p> <p>Watercourses are present but are not located within a sensitive or threatened watershed or a specified distance (e.g., 50 m or top of valley bank if greater) of a sensitive groundwater discharge, sensitive recharge, sensitive headwater area, sensitive watercourse or sensitive fish habitat.</p> <p>This forest did not contain any declining natural communities or a high variety of native diversity through composition or terrain.</p>
<p>UNCOMMON CHARACTERISTICS CRITERIA</p>	<p>DOES NOT MEET THE CRITERIA</p>	<p>DOES NOT MEET THE CRITERIA</p>	<p>Within the subject lands there are no uncommon species composition, cover type, age or structure.</p>
<p>ECONOMIC AND SOCIAL FUNCTIONAL VALUES CRITERIA</p>	<p>DOES NOT MEET THE CRITERIA</p>	<p>DOES NOT MEET THE CRITERIA</p>	<p>Within the subject lands the woodlands did not have high economic or social values through particular site characteristics or deliberate management.</p>

As per the criteria set out in the NHRM this woodland should be not be considered significant.

6.0. Potential Wetland

No wetland habitat was present within the subject or adjacent lands.

7.0. Significant Wildlife Habitat

The potential for significant wildlife habitat was assessed using the guidance in OMNR (2010) and MNRF (2015). Potential components which may lead to a designation of significant wildlife habitat include seasonal concentration areas of animals, rare vegetation communities or specialized habitat for wildlife, habitat for species of conservation concern, and animal movement corridors. No rare vegetative communities, raptor overwintering sites, old growth forest, valley, or caves were located within the subject or adjacent lands. No habitat for species of conservation concern was present (see section 4.0)

No significant wildlife habitat has been identified within the development area. No identified significant wildlife habitat or species at risk habitat will be negatively impacted.

There was nothing regarding the characteristic within the development area to warrant significance. Prescribed mitigation measures in section 11.0 will limit the potential for indirect impacts.

8.0. Headwater Drainage Features Assessment

8.1.1. Classification

8.1.1.1. Hydrology Classification

The flow is classified based on the amounts recorded during the three visits. These are summarized in Table 3 (as per OSAP S4.M10).

TABLE 3: HYDROLOGY CLASSIFICATION

Site #	Definition of Flow Influence	Flow Condition	Types of Headwater Drainage Features	Hydrology Classification
1	May 18, 2022	Surface Flow Substantial (5)	Pond Outlet (9)	Contributing
	June 6, 2022	Standing Water (2)		
	July 5, 2022	Standing Water (2)		
2	May 18, 2022	Standing Water (2)	Channelized (2)	Limited
	June 6, 2022	No Surface Water (2)		
	July 5, 2022	No Surface Water (2)		
3	May 18, 2022	Surface Flow Substantial (5)	Pond Outlet (9)	Contributing
	June 6, 2022	Standing Water (2)		
	July 5, 2022	No Surface Water (2)		

The amount of rainfall recorded in the seven days preceding each station visit is summarized in Table 4 to provide context to Tables 3.

TABLE 4: Rainfall Recorded in the Seven Days Preceding Each Station Visit.

Date	Cumulative Amount of Rain (7 Day Before Site Visit)*
May 18, 2022	56.9 mm
June 6, 2022	21.3 mm
July 5, 2022	3.2 mm

*taken from Environment Canada

8.1.1.2. Riparian Classification

The riparian habitat is classified based on the width and type of vegetation on the banks. These are summarized in Table 5.

TABLE 5: Riparian Classification

Site #	OSAP S4.M10 Code	Riparian Classification
1	2 (Lawn)/4 Meadow	Contributing Functions
2	6 (Forest)	Important Functions
3	6 (Forest)/4 Meadow	Contributing Functions

8.1.1.3. Fish and Fish Habitat Classification

The fish habitat is classified based on fish observations during the spring and summer. Sites that provide habitat for species at risk or critical (spawning) habitat are considered the most significant.

Site 1 to 3 are classified as Contributing for the following reasons:

- No critical habitat or species at risk or species of conservation is present in any of the three headwater features.
- No fish were present in Site 3
- One brown bullhead was captured at site 1. This was a wet spring. The presence of one common fish does not make for 'valued' fish habitat. A perched culvert was also present downstream limiting upstream movement.
- The contribution of allochthonous material downstream via this ephemeral channel with little flow would not affect the overall productivity of such a large watercourse.
- Site 2 was dry during the second visit and third visit, fish cannot utilise this portion of the watercourse.

8.1.1.4. Terrestrial Habitat Classification

This is more of a classification of amphibian habitat than of the terrestrial habitat. Based on the field visits all sites would receive Important Function Classification. However, this is inappropriate for the quality of habitat found. Limited Function seems more appropriate. This watercourse normally has water present for the short periods after rain events, wetland habitat was available.

8.1.1.5. Management Recommendations

The options for management recommendations are grouped into six categories: protection, conservation, mitigation, maintain recharge, maintain/ replicate terrestrial linkage, and no management required.

Utilising the guideline and the data collected at each site and throughout the watercourse the management recommendations are: Mitigation for the main watercourse (Site 1 and 3), and Maintain Recharge for the side branch (Site 2) (Table 6). The proponent is proposing the removal of all the watercourses, to do so the below measures must be addressed.

Mitigation refers to having to:

- Replicate on-site flow and outlet flows at the top end of system to maintain feature functions with vegetated swales, bioswales, etc.
- Replicate functions by lot level conveyance measures (e.g. vegetated swales) connected to the natural heritage system, as feasible and/or Low Impact Development (LID) stormwater options (refer to Conservation Authority Water Management Guidelines for details)

Maintain Recharge refers to having to:

- Maintain overall water balance by providing mitigation measures to infiltrate clean stormwater.

Table 6: Evaluation, Classification and Management Summary

Site #	Hydrology Classification	Riparian Classification	Fish and Fish Habitat Classification	Terrestrial Habitat Classification	Management Recommendations
1	Contributing Function	Contributing Functions	Contributing Function	Limited Function	Mitigation
2	Limited Function	Important Functions	Contributing Function	Limited Function	Maintain Recharge
3	Contributing Function	Contributing Functions	Contributing Function	Limited Function	Mitigation

9.0. Tree Protection

Tree removal will occur as needed within the subject lands; a reasonable effort will be made to retain as many trees as possible. Potential impacts during construction of the proposed subdivision and associated removal of trees and other vegetation include impacts on wildlife, increased erosion and release of sediments and other potential contaminants from truck traffic and construction activity, harm to wildlife remaining in the work area during construction, and impacts associated with an increase in noise, dust, and light.

Removal of tree cover within the subject lands is not anticipated to result in significant negative impacts to the environmental features and functions of the general area. Any tree in the vicinity of works but not slated for removal will have its critical roots zone protected by temporary fencing (snow fencing) to ensure it is not affected.

Prescribed mitigation measures in section 11.0 will limit the potential for indirect impacts.

10.0. Development Constraints and Cumulative Impacts

No constraints or regulatory requirements have been identified in relation to the removal of the woodland.

Regarding fish habitat, this is an odd situation, the watercourse in question appears to have been modified multiple times over the years, no natural portions remain. The pond certainly represents fish

habitat, how the fish got there isn't relevant anymore. The ponds outlet all the way to the municipal drain contains no viable fish habitat.

Fish habitat is defined in subsection 2(1) of the Fisheries Act to include all waters frequented by fish and any other areas upon which fish depend directly or indirectly to carry out their life processes. The types of areas that can directly or indirectly support life processes include, but are not limited to: spawning grounds and nursery, rearing, food supply and migration areas. In this circumstance the ponds outlet does not directly or indirectly support life processes of fish. The outlet ditch contributed nothing to the pond and fish. The pond is capped from the spring to the fall blocking all downstream movement. There is only opportunity for downstream movement during extreme high flows (perched culvert restricting upstream movement). The presence of Koi makes downstream movement not ok, these are an invasive and should not be allowed access to the watercourses. A 30m setback from the pond is recommended to protect fish and fish habitat. Any modifications made to the ponds outlet ditch will have no negative impact on any fish habitat present. The pond receives most of its water due to snow accumulation, rain and runoff from lands to the north and east, this proposed development should not impact water levels within the pond. As long as measures mentioned in section 8.1.1.5 are followed no further constraints are associated with the outlet/watercourse present onsite.

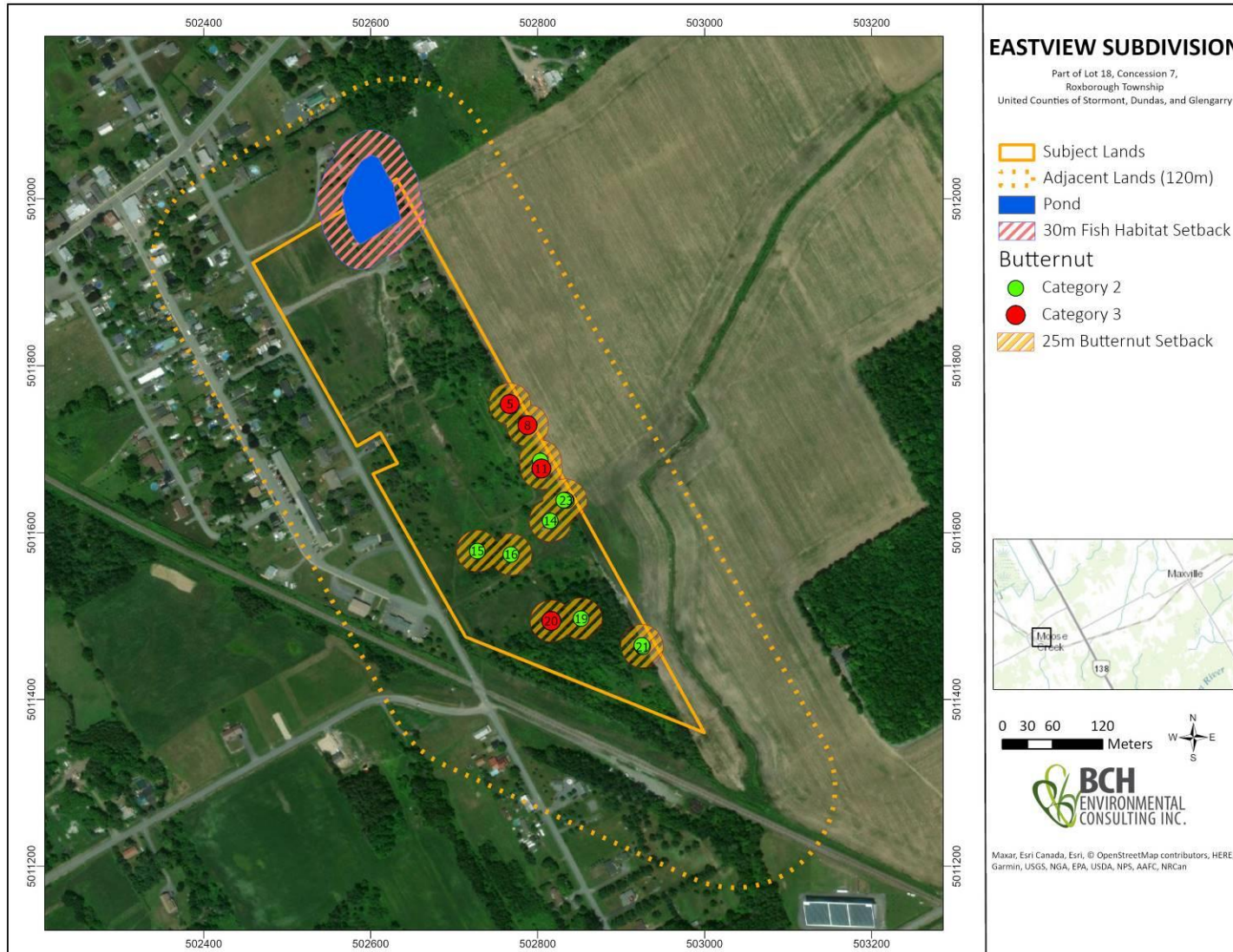
Regulatory requirements related to Butternut Trees vary depending on the health status of the trees. If work is to be completed within 25m of a category 2 or 3 Butternut you are required to follow the requirements set out in section 23.7 of Ontario Regulation 242/08 under the ESA, or you may need to seek an authorization under the ESA.

The Canadian Environmental Assessment Agency (CEAA) defines cumulative effects as..."the effects on the environment caused by an action in combination with other past, present, and future human actions..." They occur when two or more project-related environmental effects, or two or more independent projects, combine to produce an augmented effect. These cumulative effects may be positive or negative.

There are no significant natural heritage features within the development area. Cumulative impact due to this development consist of a slow chipping away at the natural features. Although this proposed development and presumably the ones that came before it did not impact any significance natural features, continual development will put more stress on those significant systems. Where there is opportunity to preserve the natural features by means of wetland and watercourse setbacks and strategic severances this should be accomplished. The area surrounding the stormwater pond and parks should be allowed to re-naturalize to aid with offsetting cumulative impacts.

With proper implementation of the mitigation measures described in this report it is anticipated that the construction of the proposed development will not increase the potential for cumulative effects in the general landscape.

FIGURE 2: CONSTRAINTS



11.0. Recommendations and Conclusion

This study's recommendations are intended to mitigate potential negative impacts due to the proposed creation of residential development and should be implemented through a development agreement between the owners and the municipality in order to control development of the site. Properly implemented controls within this agreement are deemed sufficient to mitigate the potential impacts of the proposed development

- 1- The edge of the 30 m buffer from the pond will be clearly marked on drawings and in the field and protected by a barrier (i.e. sediment or snow fencing) to prevent machinery from accidentally removing vegetation from this area.
- 2- No changes to the natural vegetation within the buffer is permitted.
- 3- Any stock piles of soil or fill material will be stored 30 m from the edge of the pond and protected by silt fencing.
- 4- No work will occur until the appropriate sediment and erosion control measures have been properly implemented through a sediment and erosion control plan developed by the contractor. It will be designed to prevent the movement of suspended sediments outside of the work area. At a minimum, they will include the following items and steps:
 - a. Properly installed sediment fencing along the edge of the work area to contain any particles which may enter the water. Fencing will be installed on the edge of the work area.
 - b. Monitoring of sedimentation outside of the sediment fencing will occur throughout the day. Additional monitoring during rain events will be needed.
 - c. The contractor will be responsible to ensure that the measures chosen are appropriate for the site and are functioning as intended.
- 5- Should dust particles be created during construction they will be suppressed using the appropriate method (i.e. water spraying).
- 6- There will be no use of herbicides in clearing of vegetation.
- 7- Additional materials (i.e. rip-rap, filter cloth and silt fencing) should be readily available in case they are needed promptly for erosion and/or sediment control.
- 8- The sediment fencing will not be removed until the terrestrial vegetation has become re-established.
- 9- The extent of any vegetation removal within the development area is to be minimized where possible. All lands outside of the proposed development area are to be maintained in a natural vegetated state.
- 10- All rules governing septic systems and wells must be followed and be kept in good operational order.
- 11- Municipal by-laws and provincial regulations for noise will be followed.
- 12- To protect breeding birds, no tree or shrub removal should occur between April 15th and August 15th, unless a breeding bird survey is completed by a qualified biologist within five days of the woody vegetation removal and identifies no nesting activity.

- 13- Construction staff is to be made aware of the characteristics of Species at Risk in the vicinity, and in the event that any are encountered during site clearing, work in the area will be stopped immediately. Measures will be undertaken to ensure the animal is not harmed and the project biologist and the Ministry of the Environment, Conservation and Parks contacted to discuss how to proceed.
- 14- Any tree in the vicinity of works but not slated for removal will have its critical roots zone protected by sturdy temporary fencing at least 1.3 metres in height installed from the tree trunk to a distance of ten times the retained tree's diameter where possible.
- 15- No grading, heavy machinery traffic, stockpiling of material, machinery maintenance and refueling, or other activities that may cause soil compaction are to occur within three metres of the critical root zone of the trees to be protected.
- 16- The root system, trunk, or branches of the trees to be protected are to be protected and not damaged. If any roots of trees to be retained are exposed during site alterations, the roots shall be immediately reburied with soil or covered with filter cloth, burlap or woodchips and kept moist until the roots can be buried permanently. A covering of plastic should be used to retain moisture during an extended period when watering may not be possible. Any roots that must be cut are to be cut cleanly to facilitate healing and as far from the tree as possible. Overhanging branches from protected trees that may be damaged during construction are to be pruned by a qualified arborist prior to construction.
- 17- Exhaust fumes from all equipment during construction will not be directed towards the canopy of the adjacent protected trees.
- 18- To discourage wildlife from entering the work areas during construction, the site should be kept clear of food wastes and other garbage. Proper drainage should be provided to avoid accumulation of standing water, which could attract amphibians, birds, and other wildlife to the work areas.
- 19- The contractor will have a spill kit on-hand at all times in case of spills or other accidents;
- 20- The extent of exposed soils is to be kept to a minimum at all times. Revegetation of exposed, non-developed areas is to be achieved as soon as possible;
- 21- All in water work is to occur during the in-water work window (July 1st until March 14th, inclusive).
- 22- Sediment and erosion control measures will be installed prior to the clearing of vegetation within 30 m of a watercourse.
- 23- Where possible, all work in-water will also be completed during periods of low flow or dry period.
- 24- Work area is required to be isolated, pumped dry, fish salvaged before construction begins. If flow is present at the time of construction it must be maintained to the downstream reaches.
- 25- In-water work will require an SNCA permit and may require permit from DFO and MNRF.
- 26- The Category 2 and 3 Butternuts will be protected with a 25 m buffer or an authorization under the Ontario ESA will be obtained for its removal or harm and associated compensation.



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To conclude this EIS, it is the professional opinion of the author that with proper implementation and maintenance of the mitigation measures (see above), the proposed development will not negatively any natural heritage features present, or any habitat of species at risk.

Thank you for the opportunity to work with you. If you have any questions or comments please do not hesitate to contact our office.

A handwritten signature in black ink, appearing to read "Shaun St. Pierre".

Shaun St.Pierre, B.Sc. Biology

A handwritten signature in black ink, appearing to read "Cody Fontaine".

Cody Fontaine, Wildlife Technologist

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APPENDIX A: OBSERVED SPECIES LIST

COMMON NAME	SCIENTIFIC NAME	SRANK	SARA STATUS	SARO STATUS	COEFF. CONSERVATISM
Reed Canary Grass	<i>Phalaris arundinacea</i>	S5			0
Field Horsetail	<i>Equisetum arvense</i>	S5			0
Bracken Fern	<i>Pteridium aquilinum</i>	S5			2
Common Lady Fern	<i>Athyrium filix-femina</i>	S5			4
Sensitive Fern	<i>Onoclea sensibilis</i>	S5			4
White Spruce	<i>Picea glauca</i>	S5			6
Red Pine	<i>Pinus resinosa</i>	S5			8
Eastern White Cedar	<i>Thuja occidentalis</i>	S5			4
Narrowleaf Cattail	<i>Typha angustifolia</i>	SNA			
Broad-leaved Cattail	<i>Typha latifolia</i>	S5			1
Black Willow	<i>Salix nigra</i>	S4			6
Slender Willow	<i>Salix petiolaris</i>	S5			3
Smooth Brome	<i>Bromus inermis</i>	SNA			
Yellow Trout-lily	<i>Erythronium americanum</i>	S5			5
Common Reed	<i>Phragmites australis</i>	S4?			0
White Trillium	<i>Trillium grandiflorum</i>	S5			5
Balsam Poplar	<i>Populus balsamifera</i>	S5			4
Eastern Cottonwood	<i>Populus deltoides</i>	S5			4
Trembling Aspen	<i>Populus tremuloides</i>	S5			2
Bebb's Willow	<i>Salix bebbiana</i>	S5			4
Pussy Willow	<i>Salix discolor</i>	S5			3
Bitternut Hickory	<i>Carya cordiformis</i>	S5			6
Butternut	<i>Juglans cinerea</i>	S2?	END	END	6
Gray Birch	<i>Betula populifolia</i>	S4			5
American Elm	<i>Ulmus americana</i>	S5			3
European Stinging Nettle	<i>Urtica dioica ssp. dioica</i>	SNA			
White Baneberry	<i>Actaea pachypoda</i>	S5			6
Canada Anemone	<i>Anemonastrum canadense</i>	S5			3
Field Mustard	<i>Brassica rapa</i>	SNA			
Wild Black Currant	<i>Ribes americanum</i>	S5			4
Common Strawberry	<i>Fragaria virginiana</i>	S5			2
Pin Cherry	<i>Prunus pensylvanica</i>	S5			3
Black Cherry	<i>Prunus serotina</i>	S5			3
Common Blackberry	<i>Rubus allegheniensis</i>	S5			2
Black Raspberry	<i>Rubus occidentalis</i>	S5			2
Wild Red Raspberry	<i>Rubus idaeus ssp. strigosus</i>	S5			2

COMMON NAME	SCIENTIFIC NAME	SRANK	SARA STATUS	SARO STATUS	COEFF. CONSERVATISM
Red Clover	<i>Trifolium pratense</i>	SNA			
White Clover	<i>Trifolium repens</i>	SNA			
Cow Vetch	<i>Vicia cracca</i>	SNA			
Staghorn Sumac	<i>Rhus hirta</i>	S5			1
Manitoba Maple	<i>Acer negundo</i>	S5			0
Norway Maple	<i>Acer platanoides</i>	SNA			
Red Maple	<i>Acer rubrum</i>	S5			4
Virginia Creeper	<i>Parthenocissus quinquefolia</i>	S4?			6
Riverbank Grape	<i>Vitis riparia</i>	S5			0
American Basswood	<i>Tilia americana var. americana</i>	S5			4
Purple Loosestrife	<i>Lythrum salicaria</i>	SNA			
Wild Carrot	<i>Daucus carota</i>	SNA			
Wild Parsnip	<i>Pastinaca sativa</i>	SNA			
Alternate-leaved Dogwood	<i>Cornus alternifolia</i>	S5			6
Red-osier Dogwood	<i>Cornus sericea</i>	S5			2
White Ash	<i>Fraxinus americana</i>	S4			4
Common Milkweed	<i>Asclepias syriaca</i>	S5			0
Ground Ivy	<i>Glechoma hederacea</i>	SNA			
Common Elderberry	<i>Sambucus canadensis</i>	S5			5
Common Plantain	<i>Plantago major</i>	SNA			
Tatarian Honeysuckle	<i>Lonicera tatarica</i>	SNA			
Nannyberry	<i>Viburnum lentago</i>	S5			4
Common Ragweed	<i>Ambrosia artemisiifolia</i>	S5			0
Common Burdock	<i>Arctium minus</i>	SNA			
Common Dandelion	<i>Taraxacum officinale</i>	SNA			
Wild Lily-of-the-valley	<i>Maianthemum canadense ssp. canadense</i>	S5			5
Scots Pine	<i>Pinus sylvestris var. sylvestris</i>	SNA			
Cinquefoil sp.					
Goldenrod sp.					
Grass sp.					
Pussytoes sp.					
Sedge sp.					
Willow sp.					
Crabapple sp.					
Fathead Minnow	<i>Pimephales promelas</i>	S5			
Creek Chub	<i>Semotilus atromaculatus</i>	S5			
Brown Bullhead	<i>Ameiurus nebulosus</i>	S5			

COMMON NAME	SCIENTIFIC NAME	SRANK	SARA STATUS	SARO STATUS	COEFF. CONSERVATISM
Rock Bass	<i>Ambloplites rupestris</i>	S5			
Finescale Dace	<i>Chrosomus neogaeus</i>	S5			
Koy	<i>Cyprinus rubrofuscus</i>	SNA			
American Toad	<i>Bufo americanus</i>	S5			
Green Frog	<i>Rana clamitans</i>	S5			
Wood Frog	<i>Rana sylvatica</i>	S5			
Northern Leopard Frog	<i>Rana pipiens</i>	S5			
Killdeer	<i>Charadrius vociferus</i>	S5B, S5N			
Mourning Dove	<i>Zenaida macroura</i>	S5			
Northern Flicker	<i>Colaptes auratus</i>	S4B			
Eastern Kingbird	<i>Tyrannus tyrannus</i>	S4B			
Warbling Vireo	<i>Vireo gilvus</i>	S5B			
Blue Jay	<i>Cyanocitta cristata</i>	S5			
American Crow	<i>Corvus brachyrhynchos</i>	S5B			
Tree Swallow	<i>Tachycineta bicolor</i>	S4B			
Black-capped Chickadee	<i>Poecile atricapilla</i>	S5			
White-breasted Nuthatch	<i>Sitta carolinensis</i>	S5			
American Robin	<i>Turdus migratorius</i>	S5B			
Gray Catbird	<i>Dumetella carolinensis</i>	S4B			
Brown Thrasher	<i>Toxostoma rufum</i>	S4B			
European Starling	<i>Sturnus vulgaris</i>	SNA			
Common Yellowthroat	<i>Geothlypis trichas</i>	S5B			
Song Sparrow	<i>Melospiza melodia</i>	S5B			
Northern Cardinal	<i>Cardinalis cardinalis</i>	S5			
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	S4			
Common Grackle	<i>Quiscalus quiscula</i>	S5B			
Brown-headed Cowbird	<i>Molothrus ater</i>	S4B			
American Goldfinch	<i>Carduelis tristis</i>	S5B			

