City of Markham

Natural Environment Report

Markham Highway 404 North Collector Roads

February 28, 2020

B000801

Submitted by:

CIMA Canada Inc
415 Baseline Road West, 2nd Floor
Bowmanville, ON L1C 5M2

City of Markham

Natural Environment Report

Markham Highway 404 Collector Roads
Schedule 'C' Class Environmental Assessment

Project No. B000801

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Table of Contents

1. Introduction

CIMA Canada Inc. (CIMA+) was retained by the City of Markham to conduct a Municipal Class Environmental Assessment (MCEA) for the Highway 404 North Planning District Secondary Plan. The study area extends approximately 400 metres north of 19th Avenue in the north, 600 metres north of Elgin Mills Road in the south, to Highway 404 in the west and Woodbine Avenue in the East (Figure 1). The project has been categorized under the MCEA process as a Schedule 'C' Class EA project which has the potential for significant environmental effects as outlined in the Municipal Class Engineers Association *Municipal Class Environmental Assessment* (October 2000, as amended in 2007, 2011 and 2015). This Natural Environment Review is provided as part of the background information necessary for the evaluation of alternatives.

2. Scope of the Assessment

Previous studies have been completed for the Study Area from 2008 to 2015 to support development plans in the area. Available existing information relevant to the Study Area was reviewed to document known or potential natural heritage features and functions. These data sets included:

- Aerial imagery (current and historic);
- Ontario Geological Survey Maps;
- Prior site investigations and reports conducted in relation to the proposed development;
  - 2008 Highway 404 North Planning District (OPA 149);
  - 2010 Master Environmental Servicing Plan (MESP);
  - 2015 Road Crossing of Highway 404 EA;
- Data published through wildlife atlases;
- Environment mapping in Official Plans;
- Fish and wildlife data records from the Natural Heritage Information Centre (NHIC);
- Watershed monitoring reports related to the Rouge River Watershed;
- Natural heritage features identified through Land Information Ontario; and
- Data sets provided by Toronto and Region Conservation Authority (TRCA), the Ministry of Environment, Conservation and Parks (MECP) and the Ministry of Natural Resources and Forestry (MNRF)

A site visit was completed within the preferred road corridors by CIMA+ biologists on June 11th and 12th, 2019 to confirm presence or absence of the features identified from the background review, and make general observations of habitat conditions on site. Site photographs from this

site visit are presented in Appendix B, and incidental observations of wildlife were all recorded and are provided in section 4.6 to 4.11.

3. Landscape Features

3.1 Ecoregion

The study area is located within Ecoregion 7E (Lake Erie-Lake Ontario). 7E is the most southern ecoregion and extends from Windsor and Sarnia in the east to the Niagara Peninsula and Toronto, with the shoreline on Lakes Huron, Erie and Ontario. The flora and fauna of this ecoregion are the most diverse in Canada, and this ecoregion supports the largest remnants of tall-grass prairie in the province (Ministry of Natural Resources, 2019).

3.2 Surficial Geology, Bedrock Geology and Topography

The Ontario Geological Survey Surficial Geology of Southern Ontario Map (Miscellaneous Release— Data 128) describes the soils of the south-east portion of the Study Area as fine textured massive to well laminated glaciolacustrine deposits made of silt and clay with minor sand and gravel. As for the north-west portion of the study Area it is described as coarse-textured foreshore and basinal glaciolacustrine deposits made of sand and gravel with minor silt and clay. As small portion of the Study Area soils including the northern portion of the Fletcher's Field Sportsplex, are composed of clay to silt textured till derived from glaciolacustrine deposits or shale.

The Ontario Geological Survey 1:250 000 scale bedrock geology of Ontario Map (Miscellaneous Release–Data 126 - Revision 1) describes the bedrock of the Study Area as shale, limestone, dolostone and siltstone from the Georgian Bay Formation, Blue Mountain Formation, Billings Formation, Collingwood Member or Eastview Member.

As for topography, Natural Resources Canada Map 030M14 – MARKHAM was consulted on Toporama Website. The map indicates that the site is relatively flat with elevation located between 230 and 240 m. Based on that map, natural surface water flows would be towards the south-east.

3.3 Watershed

3.3.1 Watershed and Watercourses

The study area is located within the Rouge River Watershed. This watershed spans 336 km^2 in the Regions of York and Durham, including the City of Toronto, City of Pickering, City of Markham, City of Richmond Hill and Town of Whitchurch-Stouffville. It starts in the Oak Ridges Moraine and flows south towards Lake Ontario (TRCA, 2007). The Provincial Greenbelt Plan (2005) recognizes the Rouge River watershed as an important ecological corridor linking the environmental system

of Lake Ontario to the Oak Ridges Moraine. Land use in the Rouge watershed are approximately 40% rural, 35% urban, 24% natural cover and 1% open water (TRCA, 2007).

Within the study area, there is a tributary of Berczy Creek that is identified in the MESP as the West Tributary of Berczy Creek. The MESP separates the creek in 2 reaches: Reach 1 from 19th avenue northward to the northern edge of the OPA 149 boundary and Reach 2 from the 19th Avenue in a southeasterly direction to Woodbine Avenue. Both are channelized and have little or no natural meander with Reach 1 having a very low, poorly defined valley bank and Reach 2 being generally confined within a steep linear ditch with a high valley wall. No evidence of slope instability or erosion was noted within either Reach 1 or Reach 2. Limited evidence of active groundwater discharge was observed along these reaches except for some discharge evidence at the downstream end of Reach 2 near Woodbine Avenue. The existing riparian vegetation within both reaches consist mainly of meadow marsh with smaller segments of cattail marsh and scattered willows and dogwoods and no locally or provincially rare vegetation communities. As such, the creek valleyland does not meet all the Natural Heritage Reference Manual Table 8-1 criteria to be identified as a *significant valleyland* (e.g. landform prominence and distinctive geomorphic landforms standards are not met).

3.4 Wetland Habitat

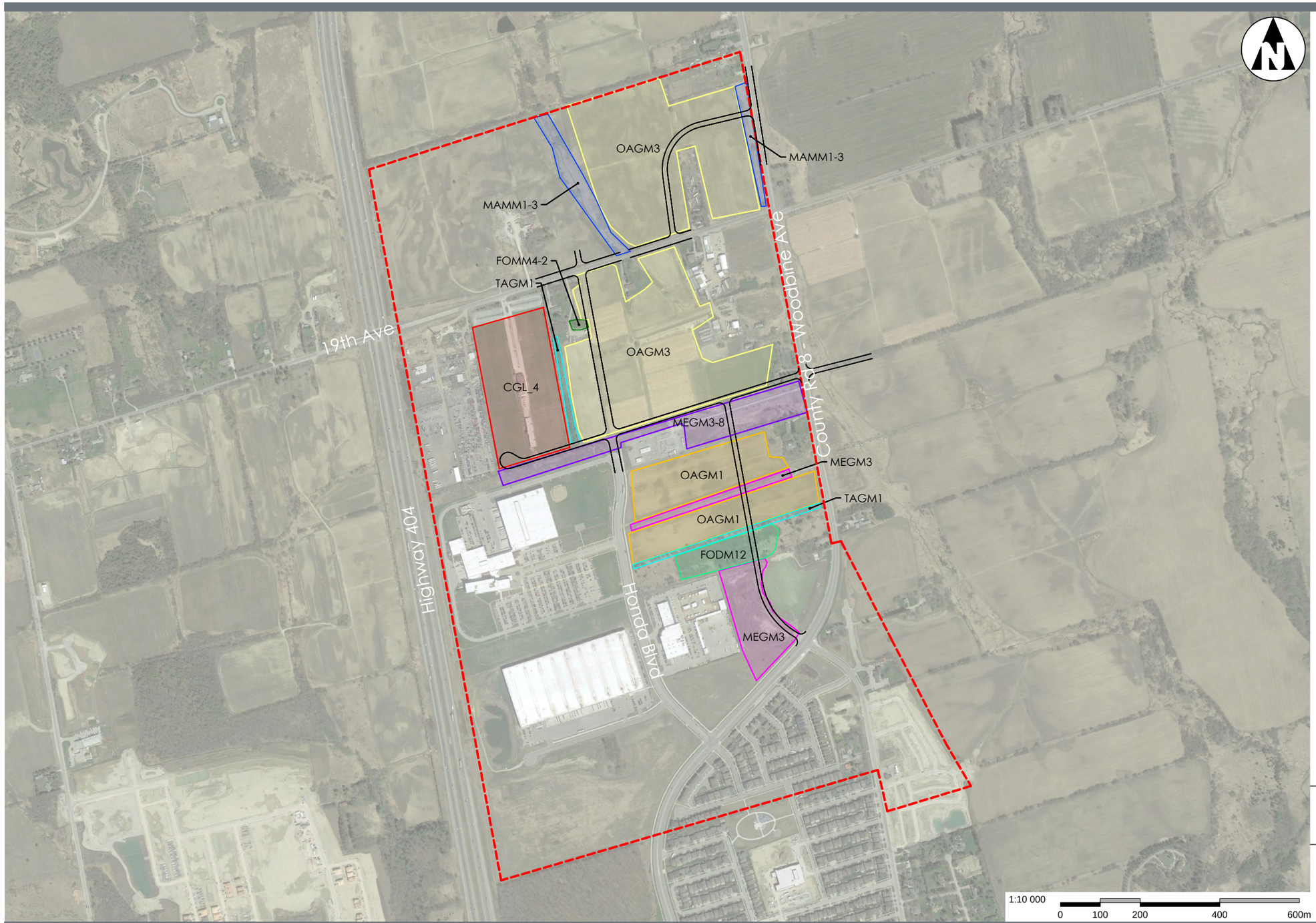
A Provincially Significant Wetland (PSW) Complex known as the Bruce & Berczy Creek Wetland Complex is situated within the northern portion of the study area (see Figure 2). This designation was made in May 2017 and updated in August 2017. Wetlands units no.14 and 15 of this PSW are being crossed by the preferred road corridors. These units are both connected hydraulically to Berczy Creek and consist of palustrine marshes composed mainly of the invasive Reed-canary Grass (*Phalaris arundinacea*). While smaller than 2 hectares, wetland no. 15 which is located in a ditch along the west side of Woodbine Avenue, has been included in the PSW because it is a headwater area for watercourses, it contributes spring base flows, it serves as groundwater seepage areas that contribute base flows, is hydrologically connected to other wetlands and provides intervening wetland habitat between wetlands two hectares or greater in size that are within the complex or to the north and east of the complex (MNRF, 2017).

This PSW serves as a wildlife movement corridor, with confirmed observations of wildlife moving across the road network between wetlands in the complex and to and from the surrounding uplands. Biodiversity of the PSW includes 452 vascular plant species, 10 reptiles and amphibians, 87 breeding bird species, 9 mammal species and 34 fish species. Wetland No.14 & 15 are considered Redside Dace (*Clinostomus elongatus*) contributing habitat (MNRF, 2017).

3.5 Vegetation Community

The preferred road corridors and adjacent lands were surveyed by **CIMA+** biologists on June 11th and 12th, 2019 to delineate the vegetation communities being affected by the preferred road corridors. Vegetation communities were categorized according to the Ecological Land Classification guide for Southern Ontario (MNRF, 2008). Nine vegetation communities were identified and can be seen in Figure 1:

- Reed-canary Grass Graminoid Mineral Meadow Marsh Type (MAMM1-3). These lands correspond to portions of Wetlands no. 14 and 15 of the Bruce & Berczy Creek Wetland Complex PSW.
- Annual Row Crops (OAGM1). These lands correspond to corn and soy fields.
- Specialty Crops (OAGM3). These lands correspond to fruits and vegetables fields, including strawberries and plants of the Cucurbitaceae family.
- Green Lands – Recreational (CGL_4). These lands correspond to Fletcher's Field football fields and sports complex.
- Dry - Fresh Graminoid Meadow Ecosite (MEGM3). Two different units are present within the preferred road corridors. The first one corresponds to a windbreak mound located within the 2 OAGM1 units. Species observed on this mound are a mix of Reed-canary Grass, goldenrods (*Solidago* sp.) and Bull thistle (*Cirsium arvense*). The second one corresponds to revegetalized soil piles adjacent to the artificial pond located on Woodbine Bypass.
- Reed Canary Grass Graminoid Meadow Type (MEGM3-8). This unit surrounds Trans Canada Pipeline's property on Woodbine Avenue.
- Coniferous Plantation (TAGM1). Two different units are present within the preferred road corridors. The first one corresponds to a row of planted White Spruce (*Picea* glauca.) west of Fletcher's Field. Presence of dead Ash trees were also observed within the row. The second one corresponds to a row of White Spruce and Eastern White Pine (*Pinus strobus*) individuals growing along the OAGM1 fence line.
- Naturalized Deciduous Plantation Ecosite (FODM12). This unit corresponds to a former Little-leaf Linden (*Tilia cordata*) plantation. A few Trembling Aspen (*Populus tremuloides*) individuals are also present as well as 2 mature Red Maple individuals west of the preferred road. The intermediate layer consists mainly of the invasive exotic European and Glossy Buckthorn (*Rhamnus cathartica* and *Rhamnus frangula*), while the herbaceous layer consists of goldenrods and Wood Avens (*Geum urbanum*). This less than 2 hectares woodlot has a 80-90% density, a 7-12 m height class and its estimated age is around 20 years old.
- Dry – Fresh White Cedar – Poplar Mixed Forest Type (FOMM4-2). This unit correspond to a small woodlot composed mainly of Eastern White Cedar (*Thuja occidentalis*) and Trembling Aspen. European White Poplar (*Populus alba*) and Manitoba Maple (*Acer negundo*) are also present.



Legend

- Study Area
- Preferred Road Network
- MAMM1-3 Reed-canary Grass Graminoid Mineral Meadow Marsh Type
- OAGM1 Annual Row Crops
- OAGM3 Specialty Crops
- CGL_4 Green Lands - Recreational
- MEGM3 Dry - Fresh Graminoid Meadow Ecosite
- MEGM3-8 Reed Canary Grass Graminoid Meadow Type
- TAGM1 Coniferous Plantation
- FODM12 Naturalized Deciduous Plantation Ecosite
- FOMM4-2 Dry - Fresh White Cedar - Poplar Mixed Forest Type

References :

- Aerial picture, Google, 2018
- Preferred Road Network, CIMA+, 2019

General Notes :

The dimensions on the plan must be read and not measured. Any errors or omissions must be reported to CIMA+. Boundaries, areas and property titles should be verified by a surveyor.

Figure 1- Ecological Land Classification

404 Collectors EA - City of Markham, ON
City of Markham

Ref. # : B000801

Drawn by: V. Fauvel-Benoît
Design by: V. Bédard
Verified by: N. Bertrand
Revision 01 - Issued for Natural Environment Report - August 7, 2019

3.6 Bird Community

No breeding bird survey was conducted as part of the natural heritage assessment. However, CIMA+ biologists observed the following species of birds while on site:

- Multiple Barn Swallow (*Hirundo rustica*) individuals feeding in all ELC units south of the 19th Avenue.
- Eastern Wood-Pewee (*Contopus virens*) - with possible breeding individuals (Singing male(s) present, or breeding calls heard, in suitable nesting habitat in breeding season) in the FODM12.
- Black-billed Cuckoo (*Coccyzus erythropthalmus*) - with possible breeding individuals (Singing male(s) present, or breeding calls heard, in suitable nesting habitat in breeding season) in the FODM12.
- Red-winged Blackbird (*Agelaius phoeniceus*) – with possible breeding individuals in a small moist cattail area (less than 25 m^2) that has formed in the MEGM3 unit adjacent to the artificial pond located on Woodbine Bypass.

Data from the Ontario Bird Atlas and previous studies were compiled and reviewed. The results are summarized in Appendix D, representing all known observations in the vicinity of the Study Area.

3.7 Amphibian and Reptile Community

No amphibian or reptile survey was conducted as part of the natural heritage assessment. However, CIMA+ biologists observed Green Frog (*Lithobates clamitans*) individuals in the small moist cattail area that has formed in the MEGM3 unit adjacent to the artificial pond located on Woodbine Bypass. Historical records from the Ontario Amphibian and Reptile Atlas and previous studies were compiled and reviewed. The results are summarized in Appendix D, representing all known observations in the vicinity of the Study Area.

3.8 Mammal Community

No mammal survey was conducted as part of the natural heritage assessment. However, CIMA+ biologists observed Coyote (*Canis latrans*) tracks and Eastern Cottontail Rabbit (*Sylvilagus floridanus*) individuals in the MEGM3 unit adjacent to the artificial pond located on Woodbine Bypass. Historical records from previous studies were compiled and reviewed. The results are summarized in Appendix D, representing all known observations in the vicinity of the Study Area.

3.9 Insect Community

No insect survey was conducted as part of the natural heritage assessment. Historical records from the Ontario Butterfly Atlas and previous studies were compiled and reviewed. The results

are summarized in Appendix D, representing all known observations in the vicinity of the Study Area.

3.10 Aquatic Community

No fish survey was conducted as part of the natural heritage assessment. Historical records from previous studies were compiled and reviewed. The results are summarized in Appendix D, representing all known observations in the vicinity of the Study Area. The Redside Dace population in the Berczy Creek and Bruce Creek is considered one of the three most significant populations in Ecodistrict 7E4, and in Ecoregion 7E (MNRF, 2017). Temperatures are generally cool through Berczy Creek and target species in the Toronto and Region Conservation Authority (TRCA) Draft Fisheries Management Plan for this sub-watershed are the Redside Dace, the American Brook Lamprey, the Rainbow Darter, the Brassy Minnow and the Rainbow Trout, with a timing window for construction between July 1st and September 15th (TRCA, 2010).

It is to be noted that the Woodbine Avenue ditch that contains Wetland no.15 is not being considered a fish habitat, as its amount of open water is too limited; i.e. Reed-canary Grass is occupying all of the ditch channel.

4. Assessment of Natural Heritage System

The Natural Heritage System (NHS) at a site is comprised of the features and functions of the natural landscape that are integral to maintenance and long-term function. This includes Designated Areas, features and habitats protected under regulation and policy, and other important components identified through a Natural Heritage Evaluation (Figure 2).

4.1 Result of Background Review

4.1.1 Provincial Designations

The northwest corner of the study area is located used to be located within the Oak Ridges Moraine Boundary. However in 2018, the City of Markham Council approved Official Plan Amendment 27 to re-designate the lands from ‘Greenway’ to ‘Business Park Employment’ and to remove the Greenbelt and Oak Ridges Moraine Plan overlay from this area.

A small northern section of the study area was also previously located within the Greenbelt. However, in 2017, this designation was removed from these lands by the Government of Ontario through the review and approval of the 2017 Greenbelt Plan.

As discussed in Section 4.4 of this report, a PSW Complex known as the Bruce & Berczy Creek Wetland Complex is also situated within the northern portion of the study area and is being crossed by the preferred road network.

4.1.2 Conservation Authority Designation

The study area is located within the jurisdiction of the Toronto and Region Conservation Authority (TRCA). As the study area is part of the ORMCP, the TRCA has maintenance, restoration and enhancement objectives for the study area. Portions of the study area are regulated under Ontario Regulation 166/06: Toronto and Region Conservation Authority Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses.

4.1.3 Municipal Planning Designations

York Region Official Plan (2016)

The Official Plan of York Region sets the structural and policy framework for growth and development in the Region of York. In the Official Plan, the study area is designated as an Urban Area on Map 2, as well as a Transit Priority Network on Map 11 (York Region, 2016).

In addition to the presence of a PSW within the Study Area, the Regional Official Plan also identifies the presence of 2 other Natural Heritage System Components:

- a Local Municipal Greenlands System along Berczy Creek tributary; and
- Woodlands.

Section **2.2.45** of the Regional Official Plan define *significant woodlands* as those *woodlands* meeting one of the following criteria:

> **a.** is 0.5 hectares or larger and: **i.** directly supports *globally* or *provincially rare plants, animals* or *communities* as assigned by the Natural Heritage Information Centre; or, **ii.** directly supports *threatened* or *endangered species,* with the exception of specimens deemed not requiring protection by the Province (e.g. as is sometimes the case with Butternut); or, **iii.** is within 30 metres of a provincially significant *wetland* or *wetland* as identified on Map 4, *waterbody, permanent stream* or *intermittent stream;*
>
> **b.** is 2 hectares or larger and: **i.** is located outside of the Urban Area and is within 100 metres of a *Life Science Area of Natural and Scientific Interest,* a provincially significant *wetland* or *wetland* as identified on Map 4, *significant valleyland, Environmentally Significant Area,* or *fish habitat;* or, **ii.** occurs within the Regional Greenlands System;
>
> **c.** is south of the Oak Ridges Moraine and is 4 hectares or larger in size;
>
> **d.** is north of the Oak Ridges Moraine and is 10 hectares or larger in size.

As ELC unit FODM12 meets criteria 2.2.45a due to its size (larger than 0.5 hectares) and directly supports the Eastern Wood-Pewee, a species of provincial and federal Special Concern status during breeding season, it meets this definition and must be considered a significant

woodland. As per section 2.2.47 of this plan, a vegetation protection zone of no less than 10 metres would be required for this significant woodland.

Section 2.2.37 states that a vegetation protection zone no less than 30 metres is required for any part of the PSW.

Details regarding the protection of the Local Municipal Greenlands System are presented within the City of Markham Official Plan.

City of Markham Official Plan (2018)

The City of Markham's Official Plan sets the structural and policy framework for growth and development in the City. The Official Plan is a living document and is regularly updated through a consultative process that includes opportunity for public input and review. In the Official Plan, the study area is designated as Highway 404 North (Employment) and the land use objective is to provide for the development of a significant employment area (City of Markham, 2018).

In this Official Plan, the Berczy Creek tributary located within the Study Area and its riparian zone are identified as being part of the Markham Greenway System and the Natural Heritage Network which include remaining examples of Markham's natural ecosystem which are essential for preserving *biodiversity* and providing representation of the natural environment in which Markham was established. The creek is also located within the Rouge Watershed Protection Area which comprises the Rouge River watercourses, their associated *valleylands* and riparian zones, *key natural heritage features* and *key hydrologic features* and *woodlands* associated with the corridor and the associated *vegetation protection zones*.
A Vegetation protection zone is established by the City of Markham and is 10 m from the outermost drip line of edge trees as determined by field staking with the City in consultation with the TRCA and relevant agencies for significant woodlands and woodlands and 30 m for PSW from the wetland boundary as determined through field staking with relevant agencies. Channel protection and setback requirements for the West Tributary of Berczy Creek is identified in the OPA 149 MESP and shown on Figure 2. This setback was based on the following parameters: erosion, meander belt width, fisheries, floodline, Rouge North Management Plan boundary criteria, and TRCA Valley and Stream Corridor Management Program policies with the overriding limit of development being identified as the Regulatory Floodplain flood line plus a 10 m buffer. Vegetation protection zones associated with Special Concern and Rare Wildlife Species Significant Wildlife Habitat are discussed in Section 7.4.1.

Definitions for Significant Woodlands is the same as the one provided in the Regional Official Plan. As for Woodlands, they are defined in this Official Plan as:

> an area of land of at least 0.2 hectares and includes at least:
>
> a) 1,000 trees of any size, per hectare;
> b) 750 trees measuring over 5 centimetres diameter at breast height, per hectare;
> c) 500 trees measuring over 12 centimetres diameter at breast height, per hectare; or,

d) 250 trees measuring over 20 centimetres diameter at breast height, per hectare.

Only ELC unit FODM12 is larger than 0.2 hectares and meets this requirement.

Based on section 3.1.2.10 definition, the following key natural heritage features and key hydrologic features are located within the Study Area: wetlands (PSW), fish habitat (Berczy Creek tributary), significant woodlands (FODM12 unit), significant wildlife habitat (Eastern Wood-pewee, see section 6) and seepage areas and springs (wetland no. 15 of PSW).

Highway 404 North Planning District (Official Plan Amendment 149)

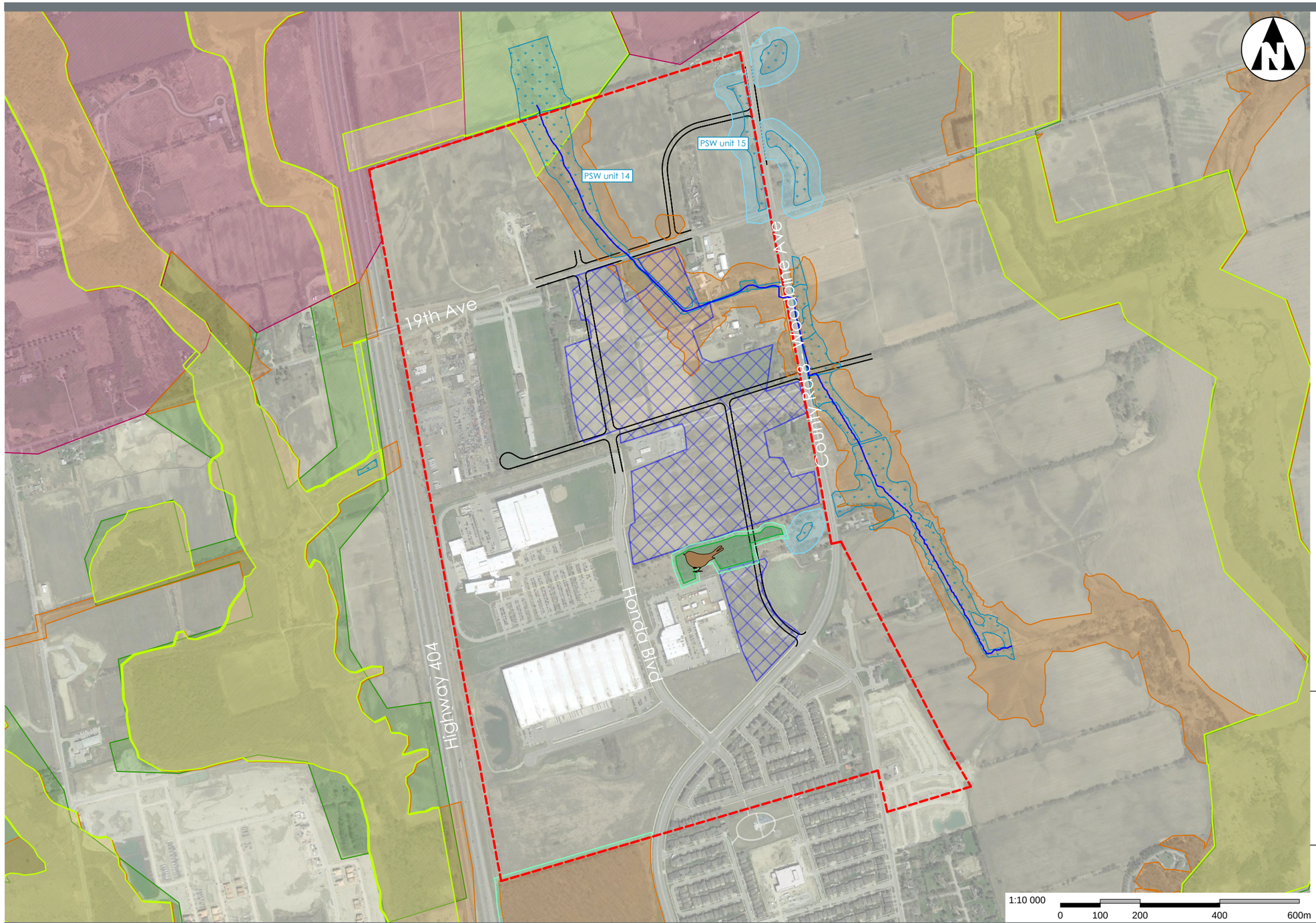
In 2008, the City of Markham approved an Official Plan Amendment (OPA) and Secondary Plan for the Highway 404 North Planning District, under Official Plan Amendment 149. This Amendment was put forth by the 404 North Developers Group. OPA 149 established a proposed layout for the road network within the District.

Since 2008, development in the area has proceeded to include the Honda Campus, Mobis Parts Canada and Enbridge. The road network proposed in OPA 149 is now no longer feasible and a new road network plan is required to serve the future developments in this planning district.

As per the designations of OPA 149, the developable lands in the study area are divided into two categories of land use: Business Park and Business Corridor. 50% of the total employment and service land within the study area was projected to be developed within 10 years, while 100% of the total employment and service land was projected to be developed within 20 years (Year 2037).

As part of OPA 149, a Master Environmental Servicing Plan (MESP) was prepared in 2008 and revised in 2010 with an Addendum in 2011. The MESP characterized and analyzed the natural heritage features and functions with the planning district, established the limits of development and addressed potential impacts to the natural environment. The MESP and its Addendum identified the following environmental constraints applicable to this Study Area:

- Limit of development along the West Tributary of Berczy Creek. The overriding criteria were the Regulatory Flood Line and the vegetation features, and thus the limit of development along the Creek is the greater of the Flood Line plus a 10 m buffer or the features' edge plus a 20 m buffer as shown on Figure 4 of the MESP and Figure 2 of this report.
- Protection buffer from the deciduous woodland south of the southwest portion of the study area has been set as 10 m from the staked dripline, also shown on Figure 4 of the MESP and Figure 2 of this report.
- Presence of Redside Dace downstream of the West Tributary of Berczy Creek requiring consultation with MECP on all activities that could result in impacts to this species and/or its habitat downstream of this location to determine if these activities contravene the regulations and protection afforded under the *Endangered Species Act, 2007* and/or if a permit(s) is required.



Legend

- Study Area
- Preferred Road Network
- Local Municipal Greenlands System (including City of Markham Official Plan Amendment no. 27)
- Regional Municipal Greenlands System (including City of Markham Official Plan Amendment no. 27)
- Greenbelt Plan Boundary (including City of Markham Official Plan Amendment no. 27)
- Oak Ridges Moraine Conservation Plan boundary (including City of Markham Official Plan Amendment no. 27)
- Bruce & Berczy Creek Provincially Significant Wetlands Complex
- West Berczy Creek Tributary Watercourse
- Significant Woodland
- Vegetation Protection Zone (10 m)
- Vegetation Protection Zone (30 m)

Wildlife

- Confirm Observation of Barn Swallow Individuals
- Confirmed Special Concern and Rare Wildlife Species Significant Wildlife Habitat - Eastern Wood-Pewee

References :

- Aerial picture, Google, 2018
- Preferred Road Network, CIMA+, 2019
- Local Municipal Greenlands System, York Municipal Government, 2019
- Regional Municipal Greenlands System, York Municipal Government, 2019
- Greenbelt Plan Boundary, York Municipal Government, 2019
- Oak Ridges Moraine Conservation Plan boundary, York Municipal Government, 2019
- Bruce & Berczy Creek Provincially Significant Wetlands Complex, MNRF, 2019
- West Berczy Creek Tributary Watercourse, City of Markham
- Woodland, York Municipal Government, 2019
- Confirm Observation of Barn Swallow Individuals, CIMA+, 2019
- Confirmed Observation of Eastern Wood-Pewee, CIMA+, 2019

General Notes :

The dimensions on the plan must be read and not measured. Any errors or omissions must be reported to CIMA+. Boundaries, areas and property titles should be verified by a surveyor.

Figure 2 - Natural Heritages Systems

404 Collectors EA - City of Markham, ON
City of Markham

Ref. # : B000801

Drawn by: V. Fauvel-Benoît
Design by: V. Bédard
Verified by: N. Bertrand
Revision 03 - Issued for Natural Environment Report - February 26th, 2020

4.2 Species at Risk Screening

A Species at Risk (SAR) screening was completed to evaluate potential for the presence of SAR in the Study Area. SARs were identified by the MNRF (whom were the responsible ministry for species at risk at the time the information was requested), third party data sources, or observed during the field assessment, were included in the screening. Habitat requirements for these species were compared to the habitat available in the Study Area. SAR considered for this report include those species listed under the Provincial *Endangered Species Act* (ESA) (Ontario 2007) and the federal *Species at Risk Act* (SARA) (Canada 2002).

Redside Dace presence has been confirmed by MNRF (MNRF, 2017) in Berczy Creek, although the tributary and ditch being crossed by the proposed road corridors are only contributing habitats; i.e. not occupied habitat. Redside Dace are listed as endangered under the ESA and SARA.

The Natural Heritage Information Centre was also consulted for atlas squares 17PJ2964, 17PJ3064, 17PJ3063 and 17PJ2963. Ministry of Natural Resources and Forestry (MNRF) noted records of Eastern Wood-Pewee (*Contopus virens*) and Wood Thrush (*Hylocichla mustelina*) were found within the study area. Both species are listed as Special Concern under ESA and SARO.

Data from the Ontario Reptile and Amphibian Atlas was compiled for the 10 km x 10 km grid squares 17PJ36 and 17PJ26 that covers the Study Area. A record of Blanding's Turtle (*Emydoidea blandingii*) was noted within the study area and this species of turtles are listed as threatened under SARO and ESA. There are also records of Snapping Turtles (*Chelydra serpentina*) which are listed as Special Concern under SARO. However, the PSW Evaluation Report (MNRF, 2017) identifies that these species were observed and could potentially use PSW ponds that are located outside of the Study Area.

Data from the Atlas of Breeding Birds of Ontario was compiled for the 10 km x 10 km grid squares 17PJ36 and 17PJ26 that covers the Study Area. Species at risk records in the area include the following species:

Species Name	SARA Status	ESA Status	Potential use of the Study Area
Least Bittern (*Ixobrychus exilis*)	Threatened	Threatened	None. No cattail marsh area large enough within the Study Area.
Chimney Swift (*Chaetura pelagica*)	Threatened	Threatened	Feeding. No hollow trees or large chimneys were observed within the preferred road network.

Barn Swallow (*Hirundo rustica)*	Threatened	Threatened	Feeding. Could use barns and other buildings for breeding and rearing
Bank Swallow (*Riparia riparia*)	Threatened	Threatened	Could use soil piles and exposed banks present in MEGM3 unit located adjacent to Woodbine Avenue Bypass for feeding, breeding and rearing.
Bobolink (*Dolichonyx oryzivorus*)	Threatened	Threatened	Could use MEGM3-8 for feeding, breeding and rearing
Eastern Meadowlark (*Sturnella magna*)	Threatened	Threatened	Could use MEGM3-8 for feeding, breeding and rearing
Wood Thrush (*Hylocichla mustelina*)	Threatened	Special Concern	None. There is no mature forest within the Study Area.
Evening Grosbeak (*Coccothraustes vespertinus*)	Special Concern	Special Concern	None. Absence of large mature mixedwood forest stands within the Study Area.
Canada Warbler (*Cardellina canadensis*)	Threatened	Special Concern	None. Forest understory and large shrubby areas are absent from riparian areas of Berczy Creek in the Study Area.
Eastern Wood-pewee (*Contopus virens*)	Special Concern	Special Concern	Feeding, breeding, and rearing in FODM12

Presence of both Barn Swallow and Eastern Wood-Pewee were confirmed by **CIMA+** during the 2019 site visits. Barn Swallow use all ELC units south of 19th Avenue, while the Eastern Wood-Pewee was observed within the FODM12 Naturalized Deciduous Plantation Ecosite unit. No Bank Swallow nests or individuals were observed by **CIMA+** within the exposed banks or soil piles

present in the preferred road network. No Bobolink or Eastern Meadowlark nests or individuals were observed by CIMA+ within the meadow areas in the preferred road corridors.

Both the Ontario Butterfly atlas and the Background Natural Environmental Report for OPA 149 Highway 404 North Secondary Plan confirmed the presence within the Study Area of the Monarch, a Special Concern status species under both ESA and SARA. No Monarch were observed by CIMA+ within the preferred road corridors.

No Butternut (*Juglans cinerea*) trees or other flora species at risk were observed by CIMA+ biologists within 25 m of the preferred road corridors network during the June 2019 site visits.

4.3 Significant Wildlife Habitat Assessment

Significant Wildlife Habitat (SWH) is generally defined as critical areas where animals and other organisms live, and find adequate amounts of food, water, shelter, and space needed to sustain their populations. SWH can be considered ecologically important in terms of features, functions, representation or amount, or contributing to the quality and diversity of an identifiable geographic area or Natural Heritage System. Specific wildlife habitats of concern may include areas where species concentrate at a vulnerable time, areas of rare or specialized habitat, habitats of species of conservation concern, or animal movement corridors.

Based on the information presented in the previous sections, it has been assessed that the following significant habitats could potentially be found within the limits of the preferred road network:

- Special Concern and Rare Wildlife Species Habitat: Eastern Wood-Pewee

While the PSW has been identified as a Waterfowl Stopover and Staging Areas and Amphibian Breeding Habitat, these significant wildlife habitats are not located within Wetlands no. 14 and 15. While Wetlands no. 14 and 15 could serve as Amphibian Movement Corridors, they would not be considered as SWH, as their vegetation consist mainly of an exotic invasive species, the Reed-canary Grass. Furthermore, the woodlots located within the site don't meet the criteria for a Bat Maternity Colonies SWH, as they don't have >10/ha large diameter (>25cm diameter at breast height) wildlife trees.

5. Preferred Alternative

The preferred collector road network was selected to be a combination of the following:

- Road A
- Road C1
- Road D
- Road E1

Road A crosses a small portion of the PSW however impact is expected to be minimal with appropriate mitigation measures.

Road B was not carried forward because of the impact to the Berczy Creek tributary and the high cost associated with providing a structure to span the regulation area. An access from 19th Avenue is provided in place of Road B for the parcels north of 19th Avenue and west of the tributary.

Road C1 provides less impact to the PSW compared to Road C2.

Road E1 provides for larger development parcels on the west side compared to Road E2, and E1 has less fragmentation to the woodlot than E2.

Exhibit-1: Alternative Design Concepts

6. Potential Impacts and Proposed Mitigation Measures

6.1 Impacts to Bruce & Berczy Creek Provincially Significant Wetland Complex

The preferred road network will cross Wetland no. 15 of the PSW. Therefore, measures will need to be proposed to avoid, minimize or mitigate the project impact on this designated area.

The following measures are proposed to protect the identified Redside Dace habitat located downstream of Wetland #15 (relevant measures extracted from MRNF *Guidance for Development Activities in Redside Dace Protected Habitat, version 1.2*):

- In-water work will only be conducted during the recommended construction timing window of July 1st to Sept 15th. This will ensure that Redside Dace and their habitat downstream are protected during the sensitive spawning period, as well as ensuring that the stream has stabilized, and the riparian habitat is established before the winter months. Once construction is completed, the riparian habitat must be restored using native species.
- Construction will be undertaken during periods when the channel is dry or with minimal flow. Although flows may be absent, contingency plans will be established to address potential flows resulting from unanticipated storm events.
- Work will be planned so that the duration of in-water work is kept to a minimum.
- An Erosion and Sediment Control Plan (ESCP) will be designed to meet the above objectives by incorporating measures such as the following:
  - Appropriate sediment controls will be in place and measures taken to prevent sediment from exceeding 25 mg/L above background level during construction.
  - Erosion will be prevented by limiting the size of disturbed areas through such measures as:
    - Phasing grading and infrastructure installation;
    - Minimizing nonessential clearing and grading; and
    - Retaining existing vegetation.
  - Erosion will be minimized through measures including:
    - Minimizing the time that any area is exposed to erosion;
    - Focusing construction during a time of year when flows are minimal (e.g., summer) will help mitigate against potential erosion;
    - Any surface left exposed would have the soil stabilized (e.g., erosion control blankets, lockdown netting, seeding, spraying, utilization of methods to roughen the surface);
    - Minimize the slope length and gradient of disturbed areas; and

  - Store/stockpile soil outside of direct Redside Dace habitat and at least 30 m away from indirect Redside Dace habitat.
- Sediment from the construction site will be captured through measures including:
  - A multi-barrier approach to prevent sediment entering the stream;
  - Effective sediment and erosion ponds (i.e., appropriate structure, size and type required for site);
  - Methods to trap sediment (i.e., filter berms, sediment traps, vegetation, etc.); and
  - Monitor and maintain sediment and erosion controls at all times to ensure they are effective as well as monitor the receiving stream to ensure erosion and sediment controls are working effectively. Regular site meetings between the site inspector and contractors will ensure sediment and erosion controls are being emphasized and minor changes to improve effectiveness are being completed, as needed.
  - Exposed soil will be graded to a stable angle and revegetated in a manner that prevents erosion.
  - Slopes of culverts will mimic the natural stream bed.
  - Materials moved during construction activities will not be stockpiled where they can adversely affect drainage patterns and be a minimum of 30 m from the watercourse.
- Utilities near the ditch will be located either over or under streams to avoid impact to Redside Dace habitat. Utilities should be planned to be built in conjunction with new or replacement road crossings as part of the planning process.
- That the thermal management threshold of 24 ° C be applied to the design of all new stormwater management facilities where outfalls empty into Redside Dace habitat, in either occupied reaches or supporting upstream reaches. Thermal targets should also be applied to the cumulative contributions of multiple stormwater facilities at the subcatchment level (TRCA, 2010).

The following measure is proposed to protect Wetland #15 as an identified groundwater seepage area:

- Subsurface investigations should be undertaken to confirm the need and extent of dewatering to construct footings, to ensure groundwater resources are not impacted.

The following measure if proposed to preserve Wetland #15 as a wildlife movement corridor (mainly for amphibians as wetlands downstream are recognized as a breeding ground):

- Design an Option B stream crossing as per *TRCA Crossings Guideline for Valley and Stream Corridors*. These structures are expected to provide some level of connectivity for wildlife, provided the crossing design includes other important

elements such as appropriate spacing between openings, adequate size, substrate, lighting condition, fencing considerations as outlined in Appendix 2C of the Guideline.

6.2 Impacts to Significant Wildlife Habitat and Species at Risk, Wildlife and Migratory Birds

- Workers will be provided with information on identifying Species at Risk and Species of Special Concern. If an unexpected rare plant or animal species is encountered, construction activities will be halted, and the MECP will be contacted to provide advice on additional mitigation measures or permits which may be required.
- Vegetation removal/clearing and site preparation for construction will occur before March 1st or after October 31st to protect habitat of amphibians, reptiles, butterflies, mammals and migratory birds (including the Special Concern Eastern Wood-Pewee) during critical life stages, and comply with provincial and federal legislation;
- Any wildlife incidentally encountered during construction will not be knowingly harmed;
- Nesting migratory birds will be protected in accordance with the *Migratory Birds Convention Act, 1994;*
    - The Proponent/Contractor will not destroy active nests (i.e. nests with eggs or young birds), or wound or kill birds, of species protected under the *Migratory Birds Convention Act, 1994* and/or regulations under the *Act*;
    - If a nesting migratory bird or nest containing eggs or young of migratory birds are identified within the study area adjacent lands, all activities will stop and the Canadian Wildlife Services of Environment and Climate Change Canada will be contacted to discuss mitigation measures;
    - Any nest found will be protected with a buffer zone determined by a setback distance appropriate to the species, the intensity of the disturbance and the surrounding habitat until the young have naturally and permanently left the vicinity of the nest;
    - The Contractor will ensure that the work site is kept clean and that no garbage or food scraps that could attract animals or alter their behaviour are left behind;
    - The Contractor will ensure that all debris and solid waste left on site, as well as temporary fencing and signs are removed after completion of the works;
- When possible, work should be completed during daylight hours. If nighttime lights are used, they will be installed so as to illuminate the work area only to minimize impacts to nighttime activities of wildlife; and
- Existing access roads will be used as much as possible and speed limits will be clearly posted on site access and construction roads to minimize the potential for wildlife road mortality.

6.3 Impacts to trees and woodlands

Approximately 0.07 hectares of FODM12 woodland will need to be removed for the construction of the proposed road corridor E1. Trees not part of a woodland as defined within the City of Markham Official Plan may also need to be removed in FOMM4-2 and TAGM-1 ELC units.

- Cutting of vegetation will be limited to that which interferes with the proposed works and movement of machinery.
- Construction vehicles will have designated access routes from and to the construction area.
- All trees susceptible to being damaged and/or within 2 m of equipment in operation, excavation activities and the installation of structures will have protectors installed (e.g. protective fencing) at the dripline of the tree to ensure the protection of the critical root zone.
- Where feasible, vegetation will be pruned or topped instead of being uprooted.
- All vegetation or tree debris that may fall or enter any waterbodies must be removed immediately with as little disturbance as possible.
- Trees or shrub clippings, branches, or log pieces that show signs of disease or pests must be appropriately disposed of following all federal, provincial, and municipal regulations in order to minimize spread of the disease or pests (e.g. Dutch elm disease, emerald ash borer, etc.). Healthy material will be collected and composted on-site, where possible.
- Materials will be stored within temporary storage areas outside of the dripline of any trees, where feasible.
- The movement of vehicles and machinery will be restricted to the work areas and designated access points.
- During the pre-construction phase, vegetation clearing will occur which will result in the loss of individual trees in the landscape. It is recommended that grading and sloped be minimized to retain as many trees as possible, and that a forest edge management plan be developed along the FODM12 community.

6.4 Impacts to Biodiversity through the spread of Invasive Plant Species

- As multiple invasive plant species have been observed within the Study Area (ex. Garlic Mustard, Reed-canary Grass, Purple Loosestrife, Buckthorn, etc.) an Invasive Plant Species Management Plan must be design by an environmental professional before the start of the work. This plan will include the location of all exotic invasive plant species individuals/colonies within the work area, as well as required

management and disposal measures to be implemented by the contractor. When available, these management and disposal measures will be based on the Ontario Invasive Plant Council Best Practices.

- To prevent the spread of invasive species, the *Clean Equipment Protocol for Industry* will be followed for the cleaning of all equipment being used on the work site. Worker boots must also be clean of soils and plant parts before arriving and leaving the site.

6.5 Impacts to Air Quality Associated with Construction Activities

- Equipment and machinery will be kept in good working condition.
- To the extent possible, minimize unnecessary idling of equipment and vehicles.
- All air emissions must meet regulatory requirements. Where required, an environmental compliance approval must be obtained from provincial authorities for stationary sources of air pollution (e.g. stacks, boilers, fume hoods).
- Use low-sulphur diesel or ethanol-based fuel wherever possible to reduce vehicle emissions.
- Regularly service vehicles and practice preventive maintenance to reduce vehicle emissions.
- The use of energy efficient vehicles and machinery is encouraged to reduce carbon emissions.
- Whenever possible, it is recommended to use renewable sources of electricity to prevent unnecessary emissions.
- Areas of stockpiled or exposed soils will be stabilized using tarps or other similar covers to prevent the mobilization of windborne dust.
- Construction activities with the potential to release airborne particles will be avoided during extended periods of drought or high winds.
- Water and dust control agent, approved at the provincial and federal level, using watering trucks, will be applied on unpaved surfaces exposed to wind and erosion, in order to minimize dust by keeping the soil wet.
- Construction activities that have the potential to release airborne particles will be avoided during extended periods of drought or high winds.
- Dust conditions will be monitored and actions to suppress dust will be taken as necessary.
- Movement of machinery on exposed soil will be minimized.
- Disturbed areas will be rehabilitated as soon as possible in order to reduce the duration of soil exposure.

- Fire and garbage burning will be prohibited at all times on the construction site and surrounding area.

6.6 Impacts associated with changes in noise levels

- The proposed works and noise levels emitted by all equipment and machinery will be in compliance with the applicable municipal Noise Control By-law.
- Speed limits shall be respected and the speed of vehicles on the work site shall be limited.
- Motorized equipment and other noisy equipment will be equipped with mufflers, acoustic enclosures or other noise-control devices.
- Any powered equipment will be shut off when not in use.
- Nearby residents will be advised of construction schedules, specifically for work that generates specific nuisances.

6.7 Spills Management Associated with Construction Activities

- All spills must be reported to the MECP Spills Action Centre (1-800-268-6060) where a spill discharges to air, land or water, is in excess of normal usage, has escaped its means of containment, or has been combined with other products affecting its chemical stability which could cause an adverse effect (i.e. negative impact on health, environment or property).
- Spill response materials will be available wherever hazardous materials are used or stored. These spill response materials will be suitable in type and quantity to the type and quantity of hazardous materials being used at that location.
- All Contractors and their staff must be trained on how to use the spill material and equipment.
- All used absorbent material must be disposed of in accordance with applicable regulatory requirements.
- Spills must be contained and cleaned up in accordance with all federal, provincial, and local regulatory requirements.

7. Policy and Legislation Review

7.1 *Environmental Assessment Act*

The *Environmental Assessment Act* (R.S.O. 1990, c.E-18) provides as mechanism for review and assessment of potential environmental impacts of public sector projects. The *Act* applies to any plan, project or activity carried out by, or on behalf of, a public body.

Under the *Act*, “environment” is comprised of natural, social, cultural and economic components.

- A Natural Environment Assessment is required to define and assess impact on the natural component of the environment.

7.2 *Fisheries Act*

The *Fisheries Act* is administered by the Department of Fisheries and Oceans (DFO) and is intended to manage threats to the sustainability and ongoing productivity of Canada's fisheries. Section 35 of the *Act* prohibits the carrying on of a work, undertaking or activity that results in serious harm to fish that are part of or support a commercial recreational or Aboriginal fishery. Serious harm to fish is defined as the death of fish or the permanent alteration to, or destruction of, fish habitat. Fish habitat is defined as spawning grounds and any other areas, including nursery, rearing, food supply and migration areas, on which fish depend directly or indirectly to carry out their life processes.

The Study Area does support fish species. However, has no new culvert is being proposed on Berczy Creek tributary, no DFO review is required under the *Fisheries Act*. Measures presented in section 6.1 will protect all fish habitat located downstream of the Wetland no. 15 proposed crossing.

7.3 *Migratory Birds Convention Act*

The *Migratory Birds Convention Act, 1994* regulates the protection and conservation of migratory birds as populations and individuals, and also protects their nests. The *Act* applies to any areas that provide potential for nesting habitat of migratory birds.

Section 6 of the Migratory Bird Regulations made under the *Act* states that no person shall disturb, destroy or take a nest, egg, nest shelter, eider duck shelter or duck box of a migratory bird except under authority of a permit.

The Study Area may provide nesting opportunities for migratory birds. Therefore, provisions of this *Act* apply. The recommended mitigation measures provided in section 6.2 of this report provide compliance with this legislation.

7.4 *Planning Act*

The *Planning Act* establishes the framework through which local and regional municipalities prepare Official Plans, and the province establishes policies governing matters of provincial interest. These planning documents provide direction on planning policies, including policies for the management of natural heritage.

For this project, the Regional Municipality of York Official Plan and the City of Markham Official Plan policies apply, as well as the Provincial Policy Statement.

7.4.1 Provincial Policy Statement

The Provincial Policy Statement (PPS) provides the policy foundation for protection of natural features and areas in Ontario. The Policy states that natural heritage systems should be identified, and the biodiversity and ecological function of those systems should be maintained.

Relevant sections of PPS policies for protection of significant features are as follows:

Policy 2.1.4 states that:

> Development and site alteration shall not be permitted in significant wetlands in Ecoregions 5E, 6E and 7E.

Policy 2.1.5 states that:

> Development and site alteration shall not be permitted Significant Wildlife Habitat unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions.

Policy 2.1.8 states that:

> *Development* and *site alteration* shall not be permitted on *adjacent lands* to the *natural heritage features and areas* identified in policies 2.1.4, 2.1.5, and 2.1.6 unless the *ecological function* of the *adjacent lands* has been evaluated and it has been demonstrated that there will be no *negative impacts* on the natural features or on their *ecological functions*.

Environmental design and mitigation measures were developed for the Project to minimize negative impacts on natural heritage. Measures proposed in section 6.1 to protect the Bruce & Berczy Creek Provincially Significant Wetland Complex have been presented to the OMNRF for their review and approval. As for the Eastern Wood-pewee Significant Wildlife Habitat, the preferred road network should have no negative impacts on the natural feature or its ecological functions if measures proposed in section 6.2 are being implemented, since this bird species shows no preference for the size of the woodlot it occupies (COSEWIC, 2012), and that only around 5% of the woodlot area would be removed for the road infrastructure construction. The 10 m vegetation protection zone to be established around the woodlot remnants should also serve to adequately to protect its nest (Environment Canada, 2014).

7.4.2 Region of York Official Plan

As identified in section 5.1.3, a significant woodland as defined by the Region of York Official Plan is being crossed by the preferred road network.

Section 2.2.44 of the Plan states:

> That notwithstanding policy 2.2.4 of this Plan, *development* and *site alteration* is prohibited within *significant woodlands* and their associated *vegetation protection zone* except as provided for elsewhere within this Plan.

Section 2.2.48 of the Plan states:

> That within the Urban Area or within the existing settlement areas as defined in the Lake Simcoe Protection Plan, and outside of the Oak Ridges Moraine Conservation Plan and Greenbelt Plan areas, a *woodland,* or portions thereof, which would be defined as *significant woodland* in accordance with policy 2.2.45 of this Plan, is not considered significant if all of the following are met: **a.** the *woodland* is located outside of the Regional Greenlands System as shown on Map 2 of this Plan; **b.** the *woodland* is located in an area strategic to the achievement of the community objectives of Section 5.2 and 5.6 of this Plan or is identified within an intensification area detailed in a local municipal intensification strategy, and is evaluated through an official plan amendment process, or other appropriate study; **c.** the *woodland* does not meet the criteria in policy 2.2.45.a of this Plan.

As the significant woodland being impacted by the preferred road network is not meeting condition **c.** of section 2.2.48, no exception is applicable to it regarding *development* and *site alteration* prohibitions. Therefore, discussions will have to be undertaken with the Region of York regarding the acceptability of this road corridor.

The regional official plan also has policies for wetlands protection. Section 2.2.37 of the Plan states:

> To permit *development* and *site alteration* within 120 metres of *wetlands* identified on Map 4, but not within the *vegetation protection zone,* subject to an approved *environmental impact study* that demonstrates no negative impacts to the wetland feature or its ecological functions. Notwithstanding the aforementioned, within the *vegetation protection zone, development* and *site alteration* may be permitted in accordance with policies 2.1.10.a and 2.1.10.e of this Plan.

Section 2.1.10e of this Plan states:

> That notwithstanding policy 2.1.9, within the Regional Greenlands System, the following uses may be permitted subject to meeting the requirements of applicable Provincial Plans:
>
> e. new infrastructure required to service the community including water and wastewater systems, and streets if: i. no other reasonable alternative location exists and if an approved environmental impact study demonstrates that it can be constructed without negative impact, and shall be subject to the policies of the Greenbelt Plan, where applicable; or, ii. authorized through an Environmental Assessment.

Environmental design and mitigation measures were developed for the Project to minimize negative impacts on natural heritage. Measures proposed in section 6.1 to protect the Bruce &

Berczy Creek Provincially Significant Wetland Complex have been presented to the OMNRF for their review and approval. The preferred road network should have no negative impacts on the natural feature or its ecological functions if these measures are being implemented.

7.4.3 City of Markham Official Plan

As identified in section 5.1.3, the Greenway System, Natural Heritage Network, Rouge Watershed Protection Area and a significant woodland is being crossed by the preferred road network.

Section 3.1.1.11 of this Plan states:

> **To ensure** to the extent possible that connectivity is maintained or enhanced between *key natural heritage* and/or *key hydrologic features* to accommodate the movement of native plants and animals across the landscape where development, *redevelopment* and *site alteration* is proposed in the Greenway System.

Connectivity will be maintained in the Greenway System by the design of a crossing that allows for movement of amphibian through the wetland no.15 crossing (see section 6.1).

Section 3.1.1.12 of this Plan states:

> **To discourage** the removal of other natural heritage features, including hedgerows and smaller woodlot features not identified as part of the Natural Heritage Network identified in Section 3.1.2.1, where they:
>
> a) provide a linkage to other natural heritage features;
>
> b) provide for wildlife habitat and movement; or
>
> c) comprise healthy and mature trees.

No hedgerow or smaller woodlot will be impacted by the project in a significant way that would affect their ecological functions.

Section 3.1.1.13 of this Plan states:

> **To encourage** the incorporation of other natural heritage features referred to in Section 3.1.1.12 into the planning and design of proposed development, wherever possible, and where identified for protection in an environmental impact study.

No hedgerow or smaller woodlot will be impacted by the project in a significant way that would affect their ecological functions.

Section 3.1.1.16 of this Plan states:

> **To protect and enhance** *woodlands* and *significant woodlands*, as defined by the Province, the Region and the City by:
>
> A. prohibiting development, redevelopment and site alteration except:

i. where infrastructure is provided in accordance with Section 3.1.2.9; or
ii. as provided for in Section 3.1.2.17;

B. securing vegetation protection zones in accordance with Section 3.1.2.22; and

C. seeking public ownership of significant woodlands and woodlands through the development approval process where appropriate, and where this is not appropriate, securing conservation easements and other protection tools for the long-term protection of significant woodlands and woodlands in private ownership.

Environmental design and mitigation measures were developed for the Project to minimize negative impacts on natural heritage. Measures proposed in section 6.2 and 6.3 would serve to minimize the impacts on the significant woodland trees and ecological functions as a significant wildlife habitat.

Section 3.1.2.9 of this Plan states:

> **That** where the need for infrastructure in the Natural Heritage Network is demonstrated and no reasonable alternative is available as identified through an appropriate study and in consultation with the City and appropriate agencies, the impact of the infrastructure shall be minimized and mitigated by:
>
> a) avoiding *natural heritage and hydrologic features*, where possible;
> b) avoiding provincially significant wetlands except where addressed through an environmental assessment process;
> c) minimizing the length of crossings through the Natural Heritage Network;
> d) only considering the location of stormwater management facilities in accordance with Section 3.3.3.9;
> e) locating nature-based recreation infrastructure, as described in Section 3.1.1.9, to avoid natural heritage and hydrologic features, where possible;
> f) optimizing existing and planned capacity through coordination and co-location of infrastructure among service providers;
> g) providing appropriate mitigation measures to address the impacts on natural heritage and hydrologic features; and
> h) ensuring compliance with the applicable policies of the Oak Ridges Moraine Conservation Plan and the Greenbelt Plan and consistency with the Provincial Policy Statement.

Efforts have been made at the planning stage to avoid as much as possible impacts to natural heritage and hydrologic features, PSW and length crossing of the Natural Heritage Network. Environmental design and mitigation measures were developed for the Project to minimize negative impacts on natural heritage. Measures proposed in section 6 would serve to minimize the impacts on these features.

Section 3.1.2.11 of the Plan states that:

To protect and enhance *key natural heritage features* and *key hydrologic features* and their functions by:

a) prohibiting development, *redevelopment* and *site alteration* within *key natural heritage features* and *key hydrologic features* as determined through an environmental impact study, natural heritage evaluation and/or hydrological evaluation, or equivalent study except as otherwise provided for in the policies of this Plan;

b) securing *vegetation protection zones* in accordance with Section 3.1.2.22;

c) evaluating features not identified on Map 5 – Natural Heritage Features and Landforms and Map 6 – Hydrologic Features using procedures developed or applied by the Province, or where determined appropriate by the City in consultation with relevant agencies, an environmental study, to determine if they qualify for protection as *key natural heritage features* and *key hydrologic features*; and

d) working with other governments and agencies to identify and protect:

i. *habitat of endangered and threatened species*, and habitat of *special concern species*; and

ii. Life Science Areas of Natural and Scientific Interest and providing protection policies consistent with senior government requirements.

Efforts have been made at the planning stage to avoid possible impacts to *key natural heritage features* and *key hydrologic features*. Environmental design and mitigation measures were developed for the Project to minimize negative impacts on natural heritage. Measures proposed in section 6 would serve to minimize the impacts on these features.

Section 3.1.2.19 of the Plan states that:

To protect and enhance *wetlands* including *provincially significant wetlands* by:

a) prohibiting development, *redevelopment* and *site alteration* except:

i. where infrastructure is provided in accordance with Section 3.1.2.9; or

ii. in *wetlands* that are not *provincially significant wetlands*, or identified in the York Region Official Plan, in accordance with Section 3.1.2.20;

b) securing *vegetation protection zones* in accordance with Section 3.1.2.22;

c) integrating *wetlands* into new communities as appropriate: and

d) seeking public ownership of *wetlands* through the *development approval* process.

Environmental design and mitigation measures were developed for the Project to minimize negative impacts on natural heritage. Measures proposed in section 6.1 to protect the Bruce & Berczy Creek Provincially Significant Wetland Complex have been presented to the OMNRF for their review and approval. The preferred road network should have no negative impacts on the natural feature or its ecological functions if these measures are being implemented.

Section 3.1.4.1 of the Plan states that:

That where development, *redevelopment* or *site alteration* is proposed adjacent to a watercourse within the Rouge *watershed*, the refinement and confirmation of the boundary of the 'Rouge Watershed Protection Area' as shown on Map 4 – Greenway System will be required in accordance with the 'Rouge Watershed Protection Area' objectives contained in Table 3.1.4.1 below and the requirements of the boundary delineation criteria for the 'Rouge Watershed Protection Area' contained in the Rouge North Implementation Manual.

Environmental design and mitigation measures were developed for the Project to minimize negative impacts on natural heritage. Measures proposed in section 6.1are in compliance with the "Rouge Watershed Protection Area" objectives.

Section 3.2.1 of the Plan states that:

To protect, expand and integrate the *urban forest* in existing and new communities by:

a) encouraging the enhancement of a resilient and healthy *urban forest* by increasing *tree canopy* coverage and encouraging a diversity of *tree* species through *tree* planting and restoration of public lands in appropriate locations;

b) providing sustainable growing environments for *trees* by allocating adequate soil volumes and landscaped area through development, *redevelopment* and *site alteration* and infrastructure;

c) reviewing applications for development, *redevelopment* and *site alteration* to minimize impacts on the *urban forest*. Where *woodlands* or other *trees* cannot be retained in situ, as supported by appropriate studies in accordance with the policies of this Plan, compensation will be provided in accordance with Council policy and best practices determined as follows:

i. Compensation for *woodlands* that meet the criteria of Section 3.1.2.17 shall take into consideration the following principles:

- achieving no net loss of *woodland* area, ecological functions including ecological services, and the overall area of the Greenway System;
- providing appropriate locations for ecological restoration in Markham with a priority given to Natural Heritage Network Enhancement Lands;
- providing appropriate implementation mechanisms including cash-in-lieu; and
- other considerations deemed appropriate by Council; and

ii. Compensation for *trees* not within *significant woodlands* or *woodlands*, shall be applied using tree replacement standards in accordance with City policy and guidelines;

d) regulating the injury of destruction of *trees* on public and private property through York Region and Markham tree protection by-laws; and

e) increasing awareness of the benefits of the *urban forest* and promoting education and involvement in the stewardship of Markham's *urban forest*. (Markham Mod. 229).

As trees within significant woodlands would need to be removed as part of this project, compensation requirement will be applicable and need to meet the objectives of section 3.2.1 c)i.

7.5 *Endangered Species Act*

The *Endangered Species Act,* 2007 identifies species at risk in Ontario in an effort to protect them and their habitat and to promote the recovery of these species.

Section 10. (1)(a) of the *Act* states that:

> No person shall damage or destroy the habitat of,
>
> > (a) a species that is listed on the Species at Risk in Ontario List as an endangered or threatened species; or

Section 17. (1) of the *Act* states that:

> The Minister may issue a permit to a person that, with respect to a species specified in the permit that is listed on the Species at Risk in Ontario List as an extirpated, endangered or threatened species, authorizes the person to engage in an activity specified in the permit that would otherwise be prohibited by section 9 or 10. 2007, c. 6, s. 17 (1).

Environmental design and mitigation measures were developed for the Project to minimize negative impacts on the habitats and SAR within the Study Area. As identified in section 7.8, potential impacts to Bobolink, Eastern Meadowlark, Barn Swallow and Bank Swallow will need to be confirmed through the detail design phase. Consultation and possibly approvals from the MNRF could be required if the presence of these species and their habitat is confirmed within the preferred road network corridors.

An Information Gathering Form under the *Endangered Species Act* will need to be sent to the MECP for all activities that may impact Berczy Creek Redside Dace occupied habitat, including wetland no. 15 crossing.

Species listed as special concern are not protected under the ESA, however, these species receive protection under the *Fish and Wildlife Conservation Act* and the *Planning Act*. These acts offer protection to individuals and their habitat.

7.6 *Conservation Authorities Act*

The *Conservation Authorities Act,* 1990 allows for the establishment of Conservation Authorities with the purpose of developing and implementing watershed-based programs for the conservation, restoration, development, and management of natural resources other than oil, gas, coal, and minerals. Conservation Authorities have the power to develop watershed management plans, work with private landowners for conservation projects, implement flood control measures, own and operate Conservation Areas, and create regulations pertaining to water bodies and flooding.

The Study Area is within the jurisdiction of the Toronto Region Conservation Authority (TRCA) therefore, this *Act* applies to the Project. The section of the Study Area located within the Local Greenlands System corresponds to Berczy Creek tributary bed and buffer zones and is within TRCA Regulated Area.

TRCA permitting process is mandated under Section 28 of the *Conservation Authorities Act*. The regulation currently administered by TRCA is Ontario Regulation 166/06: Development, Interference with Wetlands, and Alterations to Shorelines and Watercourses.

A permit is required from TRCA prior to any of the following:

1. Development within the Regulated Area which includes Berczy Creek tributary, stream valley, hazard lands, wetlands and other areas adjacent to a wetland and associated regulation allowances
2. Straightening. Changing, diverting or interfering in any way with the existing channel of a river, creek, stream or watercourse, or for changing or interfering in any way with a wetland.

7.7 Invasive Species Act

The *Invasive Species Act, 2015* sets out rules to prevent and control the spread of invasive species in Ontario. The presence of two restricted species under this Act, Dog-strangling vine (*Cynanchum rossicum*) and Phragmites (*Phragmites australis subsp. Australis*) has been confirmed within the Study Area (Dog-strangling vine) and the PSW (Dog-strangling vine and Phragmites). Under this Act, it is illegal to import, deposit, release, breed/grow, buy, sell, lease or trade these restricted invasive species.

If the measures proposed in section 6.4 are being implemented, the project will be in compliance with this legal requirement.

7.8 Actions Required During Final Design

- An Information Gathering Form under the Endangered Species Act will need to be provided to the MECP for all activities that may impact Berczy Creek Redside Dace occupied habitat, including Wetland no. 15 crossing;
- Additional surveys will be required to confirm the absence of Bobolink and Eastern Meadowlark in MEGM3-8 and Bank Swallow within the MEGM3 communities located in preferred road corridors network. Should their presence be confirmed, MECP needs to be contacted to confirm the need for the submission of an Information Gathering Form under the Endangered Species Act;
- Additional surveys will be required during the final design stage of the project to confirm the absence of Barn Swallow nests within 200 m of the preferred road corridors network. Should a nest be found on a structure or building within this

distance, MECP needs to be contacted to confirm the need for the submission of an Information Gathering Form under the Endangered Species Act;

- Additional surveys will be required during the final design stage of the project to confirm the absence of Monarch within the MEGM3 communities located in preferred road corridors network. Should their presence be confirmed, meadow areas that are being disturbed by the proposed construction activities should be re-vegetated with an Ontario native wildflowers seed mix that contains milkweed as habitat for the Monarch.
- Preparation of a 'forest edge management plan' along the FODM12 community. The edge management plan should assess minimizing fill/construction impacts, tree protection fencing, hazard tree removal and buffer plantings. Design options that would improve the relationship of Road E1 with forest community FODM12 should be considered as part of this plan. Options include maximizing the width of the landscaped/planting zone and using a 'naturalized' landscaping treatment within the right-of-way.
- Confirmation of the acceptability of the significant woodland crossing with the Region of York and MNRF;
- Confirmation of the required compensation for the trees to be removed for the project with the City of Markham. As recommended by TRCA, basal area for the impacted woodland vegetation community should be determined during detail design. This will allow for an accurate assessment of the compensation ratio required for this project based on the TRCA Guideline to Determining Ecosystem Compensation. City's Natural heritage staff recommend that the vegetation protection zones associated with the MAMM1-3 wetland on city-owned lands (2780 19th Avenue) be fully restored to offset woodland losses associated with this project. At the detailed design and construction stage, it is recommended that appropriate funds be set aside and budgeted for natural heritage restoration;
- Confirmation of the required Eastern Wood-Pewee significant wildlife habitat vegetation protection zone with the MECP and MNRF;
- Confirmation of the required mitigation measures for the activities located within the PSW with the MNRF;
- Submission of a permit application to TRCA under Ontario Regulation 166/06 for the activities located within the Regulated Area; and
- Integration of all the mitigation measures described in Section 6 of this report as well as in MECP, MNRF, Region of York and TRCA approvals in the final plans and specifications.

8. Conclusion

In conclusion, the Study Area for the proposed Markham Highway 404 Collector Roads Environmental Assessment contains several Natural Heritage Features including a Provincially Significant Wetland, a Significant Woodland and a Significant Wildlife Habitat. Potential negative impacts to the hydrological and ecological functions of these features associated with the preferred road network as described herein, are expected to be minimal if the proposed recommendations and mitigation measures are implemented.

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A

Appendix A

Records of Correspondence

Ministry of
Natural Resources
and Forestry
Aurora District Office
50 Bloomington Road
Aurora, Ontario L4G 0L8

Ministère des
Richesses naturelles
et des Forets

Telephone: (905) 713-7400
Facsimile: (905) 713-7361

March 7, 2018

Lauren Cymbaly
CIMA Canada Incorporated (CIMA+)
Lauren.cymbaly@cima.ca

Re: Highway 404 North Collectors Roads Municipal Class EA, City of Markham.

Dear Ms. Cymbaly;

The Ministry of Natural Resources and Forestry (MNRF) has received our inquiry of March 6, 2018. We offer the following;

Species at Risk in the vicinity of each location include Barn Swallow (threatened) and a watercourse considered to be contributing to Redside Dace (endangered) habitat. Further, there is potential for endangered bats (i.e., Eastern Small-footed Myotis, Little Brown Myotis, Northern Myotis and Tri-colored Bat) in cavities.

Requested fisheries information can be obtained through the Rouge River Watershed Plan. Fish Dot data is out of date, please contact the local Conservation Authority for contemporary fisheries data. Please contact Steve Varga (steve.varga@ontario.ca) for specific OWES data.

Additional natural heritage information including information on wetlands and Areas of Natural and Scientific Interest (ANSIs) can be obtained through Land Information Ontario (LIO).

Absence of information provided by MNRF for a given geographic area, or lack of current information for a given area or element, does not categorically mean the absence of sensitive species or features. Many areas in Ontario have never been surveyed and new plant and animal species records are still being discovered for many localities. Appropriate inventory work is needed depending on the undertakings proposed. Approval from MNRF may be required if work you are proposing could cause harm to any species that receive protection under the *Endangered Species Act 2007*.

Species at risk information is highly sensitive and is not intended for any person or project unrelated to this undertaking. Please do not include any specific sensitive information in reports that will be available for public record. As you complete your fieldwork in these areas, please report all information related to any species at risk to our office. This will assist with updating our database and facilitate early consultation regarding your project.

If you have any questions or comments, please do not hesitate to contact ESA.aurora@ontario.ca or jeff.andersen@ontario.ca.

Sincerely,

Jeff J. Andersen
Management Biologist
Ontario Ministry of Natural Resources and Forestry, Aurora District

Bruce & Berczy Creek Wetland Complex
Provincially Significant
May 2017, Updated August 2017

TOWN OF RICHMOND HILL

TOWN OF WHITCHURCH-STOUFFVILLE

TOWN OF MARKHAM

Rouge River Headwater Wetland Complex

Rouge River

Berczy Creek

Bruce Creek

Unnamed Tributaries of Bruce Creek

HIGHWAY 404

WOODBINE AVENUE

WARDEN AVENUE

KENNEDY ROAD

19TH AVENUE

MOBIS DRIVE

HONDA BOULEVARD

LIVANTE COURT

LIVING CRESCENT

HELFORD STREET

GILLINGS STREET

PRINCE OF WALES DRIVE

LORD MELBORNE STREET

DUKE OF YORK STREET

VICTORIA SQUARE BOULEVARD

THOMAS REID ROAD

VICTORIA STREET

BOYD COURT

ELGIN MILLS ROAD EAST

REFLECTION ROAD

RINAS AVENUE

JAMES JOYCE DRIVE

BETTY ROMAN BOULEVARD

BONHEUR ROAD

PRINCE REGENT STREET

STONY HILL BOULEVARD

ATLAS PEAK DRIVE

PILLAR ROCK CRESCENT

ANTHONY ROMAN AVENUE

CATHEDRAL HIGH STREET

DONALD BUTTRESS BOULEVARD WEST

VINE CLIFF BOULEVARD

QUINTON DRIVE

MURISON DRIVE

LEBARR ROAD

ANNIBALE DRIVE

HAZELTON AVENUE

MARKLAND STREET

RUSSELL DAWSON ROAD

WOODBINE BYPASS

IVORY SILK DRIVE

STAGLIN COURT

RIVER VALLEY CRESCENT

ADASTRA CRESCENT

CASTLEVIEW CRESCENT

HEATHFIELD AVENUE

BOYNTON CIRCLE

FORSON COURT

RYAN CRESCENT

HERITAGE HILL DRIVE

JENNING GATE

MAJOR MACKENZIE DRIVE EAST

#1 #2 #3 #4 #5 #6 #7 #8 #9 #10 #11 #12 #13 #14 #15

ne M8 re M12-B ne M8 ne M8 ne M8 re M12-B ne M8 su W14 ne M7-A re M10-B ne M7-A re M10-B ne M7-A re M10-B re M10-B ne M7-A h S18-A ne M7 h S9-B gc M1-E h S2-B ts S11-B f W18 ne M7-A c S17 gc S16 re M10-A su W14-B gc M9-A ne M6-A re M5-C re M12 ne M7-A gc M1-J re M19 h S18-B ts S10 ne M6-A ne M7-A h S2-A ne M6-B ne M7-A ne M6-A su W15 gc M11-A gc M11-A re M4-B gc S19 ne M7-A su W14-C ts S21-A gc M11-B X gc M11-C re M4-B X ts S21-B ne S13 h S6-B ne M7-B h S9-B ne S13 h S2-B ne S15 gc M13 gc M9-B gc M1-I gc M1-I re M10-A ts S11-C su W14 re M5-B ne M7-A ne S15 h S2-A gc M1-F gc M1-G re M12-A ne M7-A h S2-C re M12-A gc M1-H h S2-C ne M7-A gc M1-K h S2-C ne M8 ne M7-A su W14-A re M4-B gc S20 ne M7-A re M4-B ne M8 h S9-A re M2 c S7 h S6-A gc M3 gc M1-C gc M1-D h S6-A h S6-A gc M1-C h S8 ne M17 c S5-A c S5-A gc M1-C gc M1-C h S2-B re M12-B h S4 c S3 gc M1-C h S2-A gc M1-C c S1-B h S2-A gc M1-B c S1-A gc M1-A re M16 c S5-B re M4-A ts S11-A re M5-A ne M7-A h S12 ne M6-A

Scale 1:6,000 (approx.)

0 125 250 500 750 Metres

N W E S

Legend

- MNR Evaluated Wetland
- MNRF Wetlands (Evaluated & Identified)
- Waterbody
- Local Municipality
- Road
- Watercourse

PUBLICATION

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August, 2017.

Cartography by Aurora District Geomatics.

Universal Transverse Mercator (6 degree) projection, Zone 17. North American Datum 1983

SOURCE OF INFORMATION

Information provided by the Ministry of Natural Resources & Forestry district office in Aurora.
Ministry of Natural Resources & Forestry- Aurora District, 50 Bloomington Road West, Aurora, ON L4G 0L8

Base information derived from the Ontario Base Map, 1983 at a scale of 1:10,000 and the Natural Resources Values Information System (NRVIS).

NOTE

The information displayed on this map has been compiled from various sources. While every effort has been made to accurately depict the information, this map should be viewed as illustrative only. Do not rely on it as being a precise indicator of routes, locations of features, nor as a guide to navigation.

For detailed information on natural features such as their location, size or status, the individual files held by the Aurora district office of the Ministry of Natural Resources & Forestry should be consulted.

PROVINCIALLY SIGNIFICANT
BRUCE & BERCZY CREEK WETLAND COMPLEX

May 2017, Updated August 2017
Ontario Ministry of Natural Resource & Forestry
Aurora District

Ontario Base Maps: scale 1:10 000 10 17 6250 48600, 6250 48650, 6300 48600, 6300 48650
National Topographic Series Map: 30M/14, scale 1: 50 000
UTM Reference: 17T PJ 633200E 4862150N
Latitude: 43° 54' 00" **Longitude**: 79° 20' 20"
Aerial Photographs: 1:1000 scale, spring 2013 ortho-rectified digital imagery J. D. Barnes and Land Information Ontario
Municipality, Lots & Concessions: Regional Municipality of York, City of Markham and Town of Whitchurch-Stouffville; Markham Geographic Township: Concession 3, Lots 30-34; Concession 4, Lots 21-33; Concession 5, Lots 21-26
Conservation Authority: Toronto and Region (TRCA)
Ownership: 99% private, 1% public (City of Markham)
Wetland Status: Provincially Significant
Number of Wetlands & Area: 15 wetlands, 105.52ha
Wetland Type: Swamp 37%, Marsh 63%
Wetland Substrate: clay/loam 86.6%, silt 0.1%, limestone 0.1%, sand 0.3%, humic/mesic organic 12.9%
Wetland Site Type: Palustrine 33.4% (Palustrine with inflow: 4.0%, Palustrine with no inflow: 30.4%), Isolated 0.7%, Riverine: 64.9%
Dominant Vegetation Form: deciduous trees (h): 21.7%, coniferous trees(c): 9.3%, tall shrubs (ts): 1.2%, ground cover (gc): 21.1%, narrow leaved emergents (ne): 30.3%, robust emergents (re): 15.5%, fixed-floating plants (f): 0.1%, submerged plants (su): 0.8%
Wetland Score: Biological Component 151, Social Component 100, Hydrological Component 143, Special Features 250, Total 644
Investigators & Dates Investigated: OMNR 2014: July 31, Aug. 1, 19, 20, 21, 22, Sept. 4, 5, 10, 23, Oct. 9, 10, 17, 22, Steve Varga, Keegan McKitterick & Alex Kissel; OMNRF 2015: Aug. 31 & Sept. 28, Steve Varga & Katherine Koopman; 2017: April 26, May 26, Steve Varga
Estimated Field Survey Time: 320 person hours
Compilers: Steve Varga, Agneta Szabo and Austeja Vaskeviciute

Rationale for Identifying the Bruce & Berczy Creek Wetland Complex

The provincially significant Bruce & Berczy Creek Wetland Complex largely occurs on the Peel Plain physiographic region (part of ecodistrict 7E4) with the northwestern portion extending into the South Slope physiographic region (part of ecodistrict 6E7) (Chapman and Putnam 1984). It is situated in the northern portion of the City of Markham and the southern edge of the Town of Whitchurch-Stouffville.

The Bruce & Berczy Creek Wetland Complex is a new wetland complex that has been inventoried by the Ontario Ministry of Natural Resources and Forestry (OMNRF), Aurora District in 2014 and 2015 (OMNR 2014a, OMNRF 2015). It includes one wetland which was formerly part of the Rouge River Headwater Wetland Complex (northern portion of Wetland No. 14). Additional fieldwork by MNRF in the spring of 2017 resulted in the addition of Wetland No. 15 and the expansion of Wetland No. 5 on the north side of 19th Avenue (OMNRF 2017).

The Bruce Creek portion of the complex extends from Major MacKenzie Drive north to just past Elgin Mills Road, east to Kennedy Road and west to Warden Avenue (Wetland Nos. 1-3). The Berczy Creek portion extends from Major Mackenzie Drive north to a kilometre past 19th Avenue, west to Highway 404 and east to Warden Avenue (Wetland Nos. 4-15). Each individual wetland is located from 5 to 590 metres to its nearest neighbouring wetland with an average distance of 112 metres between wetlands (wetlands are allowed to be up to 750 metres apart in a wetland complex).

Most of the wetlands are hydrologically linked by watercourses within the complex, and further upstream to additional wetlands which are currently being evaluated for inclusion in the wetland complex. Four of the wetlands in the complex are not hydrologically connected, including Wetland Nos. 4, 6, 10 and 13.

The wetland complex occurs in an agricultural setting with scattered tableland woodlots and is situated along the existing urban edge of the city of Markham. The majority of the wetlands occur along Bruce Creek and Berczy Creek (Wetland Nos. 1, 3, 5-10, 14 & 15) or in depressions surrounded by agricultural fields or golf courses, or residential properties (Wetland Nos. 2, 4, 11-13). The wetlands are linked by intervening woodlands, hedgerows and fields. Roads bisect the complex, with bridges and large culverts along the Bruce and Berczy Creeks to assist in wildlife movement and, on the tablelands, wildlife has been noted moving across the road network between wetlands in the complex and to and from the surrounding uplands.

There are connections downstream and upstream of the wetland complex along the Bruce and

Berczy Creeks and their tributary streams. They provide links to the numerous wetland complexes and woodlands on the Oak Ridges Moraine, a major east-west corridor in southern Ontario, and south along Bruce and Berczy Creeks to the main Rouge Valley and Lake Ontario. There is also an overland connection being proposed between Bruce and Berczy Creek as part of Markham's Greenway System.

The wetland complex captures the diversity of wetland types along the Bruce and Berczy Creeks. It consists largely of riverine wetlands with scattered isolated wetlands, and a few palustrine wetlands mostly on clay loams. The creeks support coldwater Rainbow Trout and Redside Dace habitat maintained by numerous seeps. The dominant wetland vegetation forms are deciduous swamps and graminoid marshes followed by herbaceous marshes, cattail marshes, coniferous swamps, and, and the occasional thicket swamps and open water aquatic communities. The wetlands support a diversity of 40 vegetation communities, as well as 456 plant species and 87 breeding bird species in the wetlands and adjacent lands.

Reasons for the Inclusion of Wetland Units under two hectares in Size

There are eleven wetlands that are under two hectares (ha) in size (Wetland Nos. 2, 4, 6-13 & 15). These smaller wetlands have been included in the complex because they comprise the majority of wetlands in ecodistricts 7E4 and 6E7 (formerly known as site districts 7-4 and 6-7). For example, in this wetland complex, 71% of the wetland units are under two ha in size. Wetlands are considered very rare in ecodistrict 7E4 and rare in ecodistrict 6E7 (OMNR 1993-2002). Wetlands are also very rare on the the Peel Plain physiographic region portion of ecodistrict 7E4, and the South Slope physiographic region portion of ecodistrict 6E7, with an estimate of less than 1% wetland coverage.

Each of the wetlands under two ha in size were included in the wetland complex for one or more of the following additional reasons:

1) Support wetland types and dominant vegetation forms that are uncommon in the wetland complex (Wetland Nos. 2, 4, 6, 7, 9-13). These include coniferous swamps, thicket swamps, fixed-floating and submerged open water marshes that each occupies less than 10% of the complex.
2) Sustain significant species/communities (i.e. conservation priority bird species, or reptile/amphibian species that are declining, or rare or uncommon species/communities in ecodistrict 6E7 or 7E4, ecoregion 6E or 7E, or provincial) (Wetland Nos. 2, 7, 9 & 13 support locally and regionally rare plant species) and Wetland No. 13 supports Bullfrog which is considered an amphibian species in decline.
3) Support amphibian breeding areas (Wetland Nos. 2, 8 & 13)
4) Function as migratory waterfowl stopovers, summer feeding areas or breeding areas (Wetland No. 2, 11 & 13)
5) Support native fish (Wetland Nos. 4, 6-10 & 13)
6) Are headwater areas for watercourses and contribute spring base flows (Wetland Nos. 2, 7-9, 12 & 15); or serve as groundwater seepage areas that contribute base flows (Wetland Nos. 7-9 & 15)
7) Are hydrologically connected to other wetlands (Wetland Nos. 2, 4, 6-11 & 15)
8) Provide intervening wetland habitat between wetlands two ha or greater in size that are within the complex (Wetland Nos. 6, 9, 12, 13 & 15) or to the north and east of the complex (Wetland Nos. 11 & 15)

In addition, all the wetlands in the Bruce & Berczy Creek Wetland Compex occur along corridors (Wetland Nos. 1-15). These corridors include the tributaries of Bruce and Berczy Creeks and the overland connections between adjacent tableland woodlots.

Rationale for Wetland Vegetation Communities under 0.5 ha in Size

All wetlands in the complex have been mapped at the finer scale of at least 1:2000 providing for a more accurate and detailed delineation of boundaries for the wetlands and their associated wetland communities. They have undergone infield vegetation community descriptions, and boundary delineations on 2013 ortho-rectified digital photographs.

There are a total of 60 vegetation community polygons in the wetland complex that are under 0.5 ha in size. Nine of these are single vegetation communities in wetlands less than 0.5 ha in size. The rest have been mapped and identified because they represent major divisions in wetland types such as between marsh, open water marsh and swamp types or between dominant forms such as

open water aquatic communities, robust emergent marsh, ground cover marsh, narrow-leaved emergent marsh, thicket swamp, deciduous swamp and coniferous swamp. These vegetation divisions reflect differences in plant species and often in animal communities.

Biological Component

The Bruce & Berczy Creek Wetland Complex has a score of 151 for its biological component. It consists of 15 wetlands covering a total of 105.52 hectares.

About 86.6% of the wetland complex is situated on clays/loams (ranging from silty clays to loams) and 12.9% on mesic organics. The remainder occur on fine sands (0.3%), silts (0.1%) and gravel (0.1%).

About 34.4% of the wetland complex is palustrine. Of these, 30.4% are palustrine areas with no inflows, those at the headwater source for a watercourse, and 4% are palustrine areas that occur further downstream and thus have stream inflows. Another 64.9% of the wetlands are riverine and the remaining 0.7% of the wetland complex is isolated with no outflows. There are eight permanent ponds in Wetland Nos. 4, 5, 6, 10, 12, 13 & 14; and at least seven of the wetlands have groundwater seeps including Wetland Nos. 1, 3, 5, 7-9 & 15.

The Bruce & Berczy Creek wetlands sustain 40 different vegetation communities with 37% of the wetland area grouped into swamp types and 63% into marsh types. These wetlands have a moderate level of complexity or interspersion.

The most frequent swamps are deciduous ones that cover 21.7% of the wetland complex. They are dominated by trees of Reddish Willow (*Salix* X *rubens*) and Manitoba Maple (*Acer negundo*), and the occasional stands of Hybrid Soft Maple (*Acer* X *freemanii*), Green Ash (*Fraxinus pennsylvanica*), Black Ash (*Fraxinus nigra*) and Balsam Poplar (*Populus balsamifera*).

The second most common swamps are conifer ones that cover 9.3% of the wetland area. They are dominated by Eastern White Cedar (*Thuja occidentalis*) with scattered American Larch (*Larix laricina*) and Balsam Fir (*Abies balsamea*).

Tall shrub or thicket swamps cover another 1.2% of the wetland complex. They are dominated in descending order by shrubs of Red-osier Dogwood (*Cornus sericea*), Heart-leaved Willow (*Salix eriocephala*), Meadow Willow (*Salix petiolaris*) and Common Buckthorn (*Rhamnus cathartica*), and in one community by saplings of Peach-leaved Willow (*Salix amygdaloides*).

Narrow-leaved emergent dominated marshes and open swamps cover 30.3% of the wetland complex (27.5% marsh and 2.8% open swamp). The marshes are largely dominated by Reed Canary Grass (*Phalaris arundinacea*) and occasionally by Rice Cutgrass (*Leersia oryzoides*), Redtop (*Agrostis gigantea*), Dudley's Rush (*Juncus dudleyi*) and Creeping Bent Grass (*Agrostis stolonifera*). The open swamp communities are also dominated by Reed Canary Grass and occasionally Water Horsetail (*Equisetum fluviatile*), with a scattering of various trees, or saplings, or shrubs and some herbs.

Ground cover dominated marshes and open swamps cover another 21.1% of the wetlands (19.5% marsh and 1.6% open swamp). The most frequent forbs in the marshes are Panicled Aster (*Symphyotrichum lanceolatum*) followed by Spotted Joe-pye-weed (*Eupatorium maculatum*), Grass-leaved Goldenrod (*Euthamia graminifolia*), Eastern Tall Goldenrod (*Solidago altissima*), Spotted Jewelweed (*Impatiens capensis*), Purple-stemmed Aster (*Symphyotrichum puniceum*), Canada Anenome (*Anemone canadensis*), New England Aster (*Symphyotrichum novae-angliae*), Northern Willow-herb (*Epilobium ciliatum)* and Wild Mock-Cucumber (*Echinocystis lobata*). The open swamp communities are dominated by Panicled Aster, Eastern Tall Goldenrod, Hairy Willow-herb (*Epilobium hirsutum*), Spotted Jewelweed, and Spotted Joe-pye-weed with a scattering of various trees, saplings or shrubs and some grasses.

Another 15.5% of the wetland complex support robust emergent dominated marshes and open swamps (15.1% marsh and 0.4% open swamp). They are dominated by Common Cattail (*Typha latifolia*), Narrow-leaved Cattail (*Typha angustifolia*), and European Common Reed (*Phragmites australis* ssp. *australis*). An open swamp community of Common Cattail also has scattered Red-Osier Dogwood shrubs.

Open water marshes make up 0.9% of the wetland complex. Most frequent are submerged plants

such as an algae known as Starwort (*Chara* sp.) and Common Coontail (*Ceratophyllum demersum*) and fixed-floating plants of Floating Pondweed (*Potamogeton natans*).

Bruce and Berczy Creek supports a diversity of adjacent upland habitats including deciduous, mixed and conifer forests, plantations, thickets, regenerating meadows, agricultural fields, pastures, hedgerows and floodplains.

The wetlands and adjacent uplands at Bruce & Berczy Creek support a diversity of 452 vascular plant species (456 taxa) (OMNR 2014a, OMNRF 2015, TRCA 2014, Beacon Environmental 2014, Savanta Inc. 2014, Dougan & Assoc. 2014). There are ten reptiles and amphibians including Eastern Redback Salamander, American Toad, Spring Peeper, Wood Frog, Northern Leopard Frog, Green Frog, Bullfrog, and, in wetlands north of the complex, Common Snapping Turtle, Midland Painted Turtle and Blanding's Turtle, 87 breeding bird species, and incidental observations of nine mammal species such as Eastern Chipmunk, Woodchuck, Grey Squirrel, Red Squirrel, Beaver, Coyote, Red Fox, Raccoon and White-tailed Deer (OMNR 2014a, TRCA 2014, Ian Downer 2014, Beacon Environmental 2014, Dougan & Assoc. 2014, Savanta Inc. 2014). Thirty-four fish species have also been recorded in and around the wetland complex (OMNR 1975-2005). They include: Bluntnose Minnow, Fathead Minnow, Brassy Minnow, Redside Dace, Longnose Dace, Blacknose Dace, Finescale Dace, Rainbow Darter, Iowa Darter, Johnny Darter, Common Shiner, Spottail Shiner, Blacknose Shiner, Emerald Shiner, Brook Stickleback, Creek Chub, Mottled Sculpin, Stonecat, Brown Bullhead, White Sucker, Rock Bass, Pumpkinseed, Blue Gill, Pumpkinseed, Largemouth Bass, Smallmouth Bass, American Brook Lamprey, Northern Brook Lamprey, Goldfish, Black Crappie, Common Carp, Sea Lamprey, Brook Trout, Rainbow Trout and Brown Trout.

Adjacent uplands are important for many wetland species at Bruce & Berczy Creek, and are critical for the maintenance of its wetland functions. The populations of Wood Frog, Spring Peeper and American Toad rely on the wetlands for breeding, but forage and hibernate in upland forests and, in the case of the American Toad, also in meadows. Northern Leopard Frogs forage in fields a considerable distance from their wetlands. They also move between wetlands, hibernating in the bottom of deeper permanent ponds and breeding in more shallow wetlands. Green Frogs, Bullfrogs and turtles are largely found in the more permanent wetland ponds. The turtles will move from wetland to wetland during the year and female turtles lay their eggs in surrounding uplands, generally close to a wetland. Green Frogs will forage in the nearby uplands around their wetlands and have been noted in spring road surveys travelling longer distances.

Social Component

The Bruce & Berczy Creek Wetland Complex has a score of 100 for its social component.

The wetlands come up to the existing urban area of the City of Markham. About 99% of the wetlands are in private ownership with the remainder on municipal lands. They score for low use in regards to nature enjoyment and fishing, while hunting is not permitted.

The Bruce & Berczy Creek wetlands are generally in good condition. There has been some localized disturbance from trails through the wetlands in the Angus Glen Golf Club, the digging out of ponds in a few wetlands, and farming practises have occasionally cut into wetland edges. As well, the invasive plants, Purple Loosestrife (*Lythrum salicaria)*, Garlic Mustard (*Alliaria petiolata*), European Common Reed and Common Buckthorn occur in some of the wetlands. One headwater discharge wetland has recently been tile-drained and converted into an agricultural field.

A non-research report, the Rouge River Fisheries Management Plan has been carried out in and around the wetland complex (OMNR & TRCA, 2010).

Hydrological Component

The Bruce & Berczy Creek Wetland Complex has a score of 143 for its hydrological component. The wetlands contribute flood attenuation, short term water quality improvement and groundwater recharge and discharge.

The wetlands constitute 31% of all the water detention or storage areas in the upstream catchment basin of Bruce and Berczy Creek that covers an area of 5838 ha.

Eleven of the wetlands are headwater areas and provide spring base flows to tributaries (Wetland

Nos. 1-3, 5, 7-9, 11, 12, 14 & 15). Another seven of the wetlands (Wetland Nos. 1, 3, 5, 7-9 & 15) have groundwater seeps. In the riverine portion of the wetland complex its dominant emergent vegetation also minimizes erosion.

Special Features

The Bruce & Berczy Creek Wetland Complex has the maximum score of 250 for its special features. The Bruce & Berczy Creek wetlands straddle two ecodistricts along the dividing line between the deciduous forest region (ecoregion 7E) and the southern deciduous-coniferous forest region or mixed forest region (ecoregion 6E). All 15 of the wetlands in the complex are situated in ecodistrict 7E4 and, in the northwestern corner, a small portion of Wetland No. 14 occurs in Ecodistrict 6E7.

Wetlands are considered very rare in ecodistrict 7E4 and rare in ecodistrict 6E7 (OMNR 2014b). The Ministry has subdivided the province into 65 ecodistricts, which are characterised by similar physiography and climate.

Ecodistrict 7E4 forms the northeastern extent of the deciduous forest region or the Carolinian zone, which is noted for its southern species of plants and animals. The ecodistrict encompasses the largest and most urbanized area in Canada, including all of the City of Toronto and southern Peel, Halton and York Regions. It extends from the edge of the South Slope down to Lake Ontario, west to the Niagara Escarpment and east to the Rouge River.

Ecodistrict 7E4 is subdivided into three physiographic units: the Trafalgar Moraine/South Slope, the Lake Iroquois Plain and the Peel Plain (Chapman and Putnam 1984). The majority of the Bruce & Berczy Creek wetlands occur on the Peel Plain. This area consists of an extensive lake plain that gradually slopes down to Lake Ontario and is dissected by the valleys of Bronte, Sixteen Mile, Mimico and Etobicoke Creeks, and the Credit, Humber, Don and Rouge Rivers. The underlying material consists of a glacial till rich in shale and limestone, topped in many areas by a veneer of clays and, in a few areas, by alluvial sands laid down in Glacial Lake Peel (Chapman and Putnam 1984). The sands were laid down as deltas by glacial meltwaters flowing into Lake Peel. Further out into the lake, finer clays were laid down, in some areas, up to several metres thick. The Peel Plain encompasses 777 square kms in the central portions of the Regional Municipalities of Halton, Peel and York and the northwestern portion of the City of Toronto.

In ecodistrict 7E4, wetlands cover less than 1% of the surface area. These wetlands consist of lakeshore marshes, groundwater-fed and riverine valley wetlands and small tableland wetlands. It is estimated that over 60% of the wetlands in ecodistrict 7E4 have been lost to agriculture and urbanization. The remaining wetlands, including the small ones, play a critical role in the overall health of the district's ecosystem. Wetland loss has been particularly severe on the Peel Plain, which was largely drained and converted to agriculture, with the exception of the valleys and the occasional tableland woodlot.

Ecodistrict 6E7 on the southern edge of the deciduous-coniferous forest region encompasses two physiographic regions: the Oak Ridges Moraine, the largest moraine in southern Ontario, stretching from Orangeville east to Rice Lake, and, to the south, the glacial tills of the South Slope that gradually rise up to meet the Moraine.

The northwestern corner of the Bruce & Breczy Creek wetlands occurs on the South Slope portion of the ecodistrict. They are situated on a broad stretch of the South Slope that extends from southern York Region west through central Peel Region and into northeastern Halton Region.

In ecodistrict 6E7, wetlands cover about 6% of the surface area and less than 1% on the South Slope portion. These wetlands consist of valley wetlands and small tableland wetlands on the South Slope portion and, on the Oak Ridges Moraine, larger groundwater discharge wetlands, kettles lakes and generally small kettle wetlands. Wetland loss has been particularly severe on the South Slope, which was largely drained and converted to agriculture, with the exception of the valleys and the occasional tableland woodlot. It is estimated that most of the wetlands in the South Slope portion of ecodistrict 6E7 have been lost to agriculture and urbanization. The remaining wetlands, including the small ones, play a critical role in the overall health of the district's ecosystem.

The Bruce & Breczy Creek wetlands are noted for their significant species; 41 in total (see Table 1). There are two provincially endangered species: Redside Dace and Butternut, the provincially significant Eastern Wood-pewee, and 42 locally rare plants for ecodistrict 7E4

(Varga et al. 2004). An historic record from 1994 of the provincially significant Northern Brook Lamprey was also found in Bruce Creek at Wetland No. 1 (OMNR 1975-2005). This provincial species of special concern may still be present in the creek. Another species of concern, the Common Snapping Turtle may reside in the permanent ponds in the wetland complex but have not been confirmed to date. They are known from other permanent ponds in wetlands just upstream of the complex.

Redside Dace occupied habitat is found along the main Berczy and Bruce Creeks in Wetland Nos. 1 & 5, while Wetland Nos. 2, 3, 7-11, 14 & 15, are considered Redside Dace contributing habitat. The retainable Butternuts, as of a 2014 survey, are restricted to the edge of Wetland No. 5. The special concern Eastern Wood-pewee is a probable breeder in Wetland No. 5. The 38 locally rare plants occur in a variety of communities in Wetland Nos. 1, 2, 5, 7, 9 & 13.

Table 1. Significant species

Reproductive Habitat for an Endangered or Threatened Species
Source: M- MNRF Redside Dace occupied habitat, S- Steve Varga, Alexander Kissel & Margaret Berube (OMNR 2014a), SV- Savanta Inc. 2014, B- Beacon Environmental 2014, D- Dougan & Assoc. 2014
Status: provincially endangered species based on OMNRF, Species at Risk Section, Species at Risk in Ontario List; S2 ranked species tracked by the OMNRF Natural Heritage Information Centre (NHIC) being known from between 5 and 20 locations in Ontario
Location: The wetland in which the species occurs is indicated by wetland number from W1 to W15
1. *Clinostomus elongates* (Redside Dace) M; W1 & 5
2. *Juglans cinerea* (Butternut) S, SV, B, D; W5

Provincially Significant Animal Species
Source: observed by Dougan & Associates in May & June 2014
Status: special concern species based on OMNRF, Species at Risk Section, Species at Risk in Ontario List; species tracked by the OMNRF Natural Heritage Information Centre (NHIC): S4B- ranked breeding species known from over 100 locations in Ontario
Location: The wetland in which the species occurs is indicated by wetland number from W1 to W15
1. *Contopus virens* (Eastern Wood-pewee) W5

Locally Significant Plant Species (Rare in Ecodistrict 7E4)
Source: M- Steve Varga, Alexander Kissel & Margaret Berube (OMNR 2014a) Markham portion; S- Steve Varga, Alexander Kissel, Keegan McKitterick & Margaret Berube (OMNR 2014a) Whitchurch-Stouffville portion, B- Beacon Environmental 2014, SV- Savanta Inc. 2014, T- TRCA 2004
Status: based on Varga S. et al. 2004, being known from 12 or less locations in Ecodistrict 7E4
Location: The wetland in which the species occurs is indicated by wetland number from W1 to W15
1. *Abies balsamea* (Balsam Fir) M, T; W2
2. *Bidens tripartita* (Three-parted Beggar Ticks) S, M; W5
3. *Carex crinita* (Fringed Sedge) B
4. *Carex hitchcockiana* (Hitchcock's Sedge) T; W1
5. *Carex interior* (Inland Sedge) T; W1
6. *Carex pellita* (Woolly Sedge) M; W1 & 5
7. *Carex stricta* (Tussock Sedge) M; W5
8. *Ceratophyllum demersum* (Common Coontail) S, M; W5
9. *Cicuta bulbifera* (Bulb-bearing Water-hemlock) S, B
10. *Cyperus bipartitus* (River Umbrella Sedge) M; W5
11. *Dryopteris cristata* (Crested Wood Fern) M, T; W1
12. *Elodea canadensis* (Canada Waterweed) S, T; W5
13. *Equisetum fluviatile* (Water Horsetail) S, M, T; W1 & 5
14. *Equisetum pratense* (Meadow Horsetail) B; W1
15. *Equisetum variegatum* (Variegated Horsetail) S, M; W5 & 7
16. *Geum rivale* (Water Avens) T; W1
17. *Gymnocarpium dryopteris* (Oak Fern) M, T; W1
18. *Hydrocotyle americana* (Marsh Pennywort) T; W1 & 5
19. *Lactuca biennis* (Tall Blue Lettuce) M; W1
20. *Larix larcina* (Tamarack) B, M; W1
21. *Lemna trisulca* (Star Duckweed) B; W13
22. *Mitella nuda* (Naked Mitrewort) T; W1
23. *Nymphaea odorata* (Fragrant Water-lily) S, B
24. *Osmunda regalis* (Royal Fern) M, T; W1
25. *Persicaria amphibia* (Water Smartweed) S, SV
26. *Persicaria pensylvanica* (Pink Knotweed) B
27. *Picea glauca* (White Spruce) B, SV, M; W2
28. *Pilea fontana* (Spring Clearweed) M, T; W5
29. *Potamogeton natans* (Common Floating Pondweed) S, M, T; W5
30. *Ribes triste* (Swamp Red Current) B; W1
31. *Salix lucida* (Shining Willow) M; W13
32. *Salix petiolaris* (Slender Willow) S, M, T, B; W7 & 9
33. *Schizachne purpurascens* (False Melic Grass) T; W1
34. *Solidago rugosa* (Rough Goldenrod) S, D; W5
35. *Spirodela polyrhiza* (Greater Duckweed) S, T; W13
36. *Teucrium canadense* (Wood Germander) M; W5
37. *Wolffia borealis* (Northern Water-meal) SV
38. *Wolffia columbiana* (Columbia Water-meal) SV

The Bruce & Berczy Creek Wetlands are important for wildlife. Its swamps and associated upland forests support area sensitive forest bird species (Couturier 1999, Cadman 1999, OMNR 2000) such as Pileated Woodpecker, Hairy Woodpecker, Winter Wren, Wood Thrush, Veery, Blue-gray Gnatcatcher, White-breasted Nuthatch, Black-throated Green Warbler, Pine Warbler, Black-and-White Warbler, American Redstart, Ovenbird and Northern Waterthrush..

Its spring-flooded wetlands and ponds provide a stopover for migrating waterfowl such as Wood Duck, Canada Goose, and Mallard (OMNR 2014a). These species also breed in and around the Bruce & Berczy Creek wetlands. Those observed supporting staging, breeding or feeding waterfowl include Wetland Nos. 5 & 13. Other

wetland birds breeding in the Bruce & Berczy Creek wetlands include: Sora, Virginia Rail, Green Heron, Swamp Sparrow, Northern Waterthrush, and the more frequent Common Yellowthroat, Tree Swallow and Red-winged Blackbird.

As well, the Bruce & Berczy Creek wetlands support breeding populations of amphibians at Wetland Nos. 1, 2, 3, 5, 8 & 13. Some of these wetlands are smaller ones, with 21% of the amphibian breeding records occurring in wetlands less than two hectares in size. The Wood Frog and Spring Peeper are considered sensitive species because they are becoming uncommon in ecodistrict 7E4 and are exhibiting declines in abundance in this area. These declines are probably attributable to the loss of wetland habitat, the loss of adjacent upland forests and meadows, and the loss of their connecting corridors. These frogs and salamanders require spring-flooded wetlands for breeding and forested habitats for feeding and hibernating and they have to be able to travel between these habitats. Bullfrogs are also considered sensitive species that are found in more permanently-flooded wetlands. Other more common species breeding in the wetlands include American Toad, Green Frog and Northern Leopard Frog.

The Bruce & Berczy Creek wetlands support ecoergion significant fish spawning and nursery habitat. They contain the provincially endangered Redside Dace, and other indicators of coldwater habitats such as Brook Trout and Mottled Sculpin. The Redside Dace population in the creeks is considered one of the three most significant populations in Ecodistrict 7E4, and in Ecoregion 7E (Heaton pers. comm. 2017). The Bruce Creek wetlands are also considered locally significant for fish migration (Heaton pers. comm. 2017). Rainbow Trout are known to migrate in Bruce Creek via the Toogood Pond fishway to the south.

Conclusion

The Bruce & Berczy Creek Wetland Complex is provincially significant with a total score of 644 points and a score of 250 points for special features. A wetland that scores 600 or more points or has 200 or more points in either the biological or special features component is deemed to be provincially significant.

The Bruce & Berczy Creek's 15 wetlands comprise a wetland complex, noted for supporting one of the best Redside Dace habitats in the ecoregion, as well as many other significant species, and numerous groundwater seeps.

Recommendations

Major wetland functions to be maintained at Bruce & Berczy Creek Wetland Complex include: its diversity of wetlands; its diversity of species; its groundwater seeps; its association of wetlands and uplands and its wildlife corridors.

To ensure that wetland functions are maintained, it is important to maintain water quality, quantity and seasonal duration to the wetlands. Alterations to water regimes could have impacts on wetland communities and their resident species.

To maintain species and community diversity, the interconnected network of wetlands and uplands should be maintained and strengthened to the extent possible. Adjacent uplands for Bruce & Berczy Creek species include the surrounding woodlands as well as hedgerows, regenerating meadows, agricultural crops and pastures.

The resident populations of Wood Frog and Spring Peeper are dependent on upland forests for hibernating and foraging, and they can travel a considerable distance to get to resident forests. It is also critical that travel corridors be maintained between their forest habitats and their breeding ponds. The presence of forest bird species also necessitates maintaining swamps and associated forests. Many of these forest birds can experience declines following urban development (Friesen et al. 1995).

Adjacent agricultural uplands for the wetlands include the surrounding pastures, croplands regenerating meadows and hedgerows. These habitats could be utilized by wetland species such as nesting waterfowl, which can nest several hundred metres from a wetland. The resident Green Frogs, Northern Leopard Frogs and American Toads will forage in them.

Wildlife corridors in the Bruce & Berczy Creek Wetland Complex need to be maintained and strengthened. Studies have shown the importance of wildlife corridors in maintaining diversity and resiliency in an ecosystem (Riley and Mohr 1994, OMNR 2000a, b, 2001). In addition to the travel corridors between breeding ponds and upland habitats, there are also wildlife corridors

along tributaries of the Bruce and Berzcy Creeks and the Rouge River and overland corridors between the two creeks. The Rouge River is a major north-south corridor from Lake Ontario to the Oak Ridges Moraine. The Moraine is the longest east-west corridor (OMNR 2000, 2001).

Encouragement should be given to increasing forest cover in and around the Bruce & Berczy Creek Wetland Complex. Restoration should be focussed around the wetlands, the woodlands, connecting hedgerows and along the tributary streams. Efforts should also be made to remove and control invasive plant species found in the wetlands.

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Bruce & Berczy Creek Wetland Complex

Wetland Evaluation 2014, 3rd Edition, Version 3.3

May 2017, Updated August 2017

Comments

Attached documents include:

1) Provincially Significant Bruce and Berczy Creek Wetland Complex summary
2) Rationale for identifying this wetland complex, reasons for the inclusion of wetland units under 2.0 ha in size, and rationale for wetland vegetation communities under 0.5 ha in size
3) List of vegetation communities in the Bruce and Berczy Creek Wetland Complex (includes significant species and wildlife records)
4) Map of interspersion for the Bruce and Berczy Creek Wetland Complex
5) Map of catchment area and detention area for the Bruce and Berczy Creek Wetland Complex
6) List of significant species in the Bruce and Berczy Creek Wetland Complex
7) Fish records in and around the Bruce and Berczy Creek Wetland Complex
8) List of vascular plant species in the Bruce and Berczy Creek Wetland Complex& adjacent lands
9) List of mammal, herpetofauna, bird and fish species in the Bruce and Berczy Creek Wetland Complex & adjacent lands
10) Map of the Bruce and Berczy Creek Wetland Complex

Additional Information

Include relevant information that can not be entered in the wetland data record (Ex. Sections that have not been completed.)

Official Name:	Bruce & Berczy Creek Wetland Complex						
Evaluation Edition:	3rd 2014	Class:	\	\			
Wetland Significance:	Month/Year Last Evaluated			May 2017			
Provincially Significant	Month/Year Last Updated			August 2017			
Special Planning Considerations:					**Scores**		
Wetland Area:	105.52 ha				Biological:	151	
Other Detention Areas:	555.40 ha				Social:	100	
Catchment Area:	5837.60 ha				Hydrological:	143	
Coastal Unit Area:	0.00 ha				Special Features:	250	
OMNRF Source:	OMNRF 2014, 2015 & 2017				Overall:	644	
Information Source:	TRCA, Savanata Inc. Beacon Environmental, Dougan and Assoc.						
Submitted by:	Ministry of Natural Resources & Forestry, Aurora District				Date	August 2017	

General Information

Wetland Evaluator(s)

Name:	Steve Varga, Keegan McKitterick & Alex Kissel	Affiliation:	Ministry of Natural Resources, Aurora District Office (2014)
Name:	Steve Varga & Katherine Koopman	Affiliation:	Ministry of Natural Resources, Aurora District Office (2015)
Name:	Steve Varga	Affiliation:	Ministry of Natural Resources & Forestry, Aurora District Office (2017)
Name:		Affiliation:	
Name:		Affiliation:	

Date(s) wetland visited (in field): 2017: April 26, May 26; 2015: August 31 & September 28 ; 2014: July 31, August 1, 19, 20, 21, 22, September 4, 5, 10, 23, October 9, 10, 17, 22

Date evaluation completed: May 2017, Updated August 2017

Estimated time devoted to completing the field survey in person hours: OMNRF 2014, 2015, 2017: 320 person hours

Weather Conditions

i) at time of field work:

ii) summer conditions in general:

WETLAND EVALUATION DATA AND SCORING RECORD

i) Wetland Name: Bruce & Berczy Creek Wetland Complex

ii) MNR Administrative Region: Southern
MNR District: Aurora
MNR Area Office:

iii) Conservation Authority Jurisdiction: Toronto & Region

iv) County of Regional Municipality: Regional Municipality if York

v) Township/Geographic Twp and/or Local Municipality: City of Markham, Town of Whitchurch-Stouffville

vi) Lots & Concessions: Markham Geographic Township: Concession 3, Lots 30-34; Concession 4, Lots 21-33; Concession 5, Lots 21-26

vii) Ecodistrict/Ecoregion: Ecodistrict 7E-4

viii) Map and Air Photo References:

a) Latitude: 43 54' 00" Longitude: 79 20' 20"

b) UTM grid reference:

Zone: 17T Block: PJ E: 633200 N: 4862150

c) National Topographic Series:

Map name(s): Markham

Map number(s): 30M/14

Edition:
Scale: 1: 50 000

d) Aerial photographs:

Date(s) photo taken: 2013 Scale: 1: 1 000
Flight & plate numbers: Spring Digital Ortho-rectified Imagery J.D. Barnes and Land Information Ontario

e) Ontario Base Map numbers & scale: 1:10 000 scale, 10 17 6250 48600, 6250 48650; 6300 48600, 6300 48650

ix) Wetland Size
(circle appropriate category, a or b)

a) Single contiguous wetland area:

Total wetland size = _____ ha

b) Wetland complex comprised of **15** individual wetlands:

Wetland Unit No.	1	19.75
Wetland Unit No.	2	0.86
Wetland Unit No.	3	6.09
Wetland Unit No.	4	0.20
Wetland Unit No.	5	59.27
Wetland Unit No.	6	0.07
Wetland Unit No.	7	0.49
Wetland Unit No.	8	0.09
Wetland Unit No.	9	0.04
Wetland Unit No.	10	0.19
Wetland Unit No.	11	1.16
Wetland Unit No.	12	0.51
Wetland Unit No.	13	0.23
Wetland Unit No.	14	15.77
Wetland Unit No.	15	0.80
Wetland Unit Totals:		105.52

Total Wetland Size = **105.52** ha

Documentation requirements for evaluated wetland complexes:

: a statement of rationale for identifying a wetland complex;
: a statement of rationale for identifying any wetland complex less than 2 ha in total size;
: a statement of rationale for any vegetation community less than 0.5 ha in size;
: adherence to the wetland complexing rules (750 m; “watershed rule”; lacustrine wetlands); and
: written documentation of the reasons for including wetland units smaller than 2 ha.

See Attached Sheets 3 A, B

Bruce & Berczy Creek Wetland Complex – Rationale for Identifying This Wetland Complex, Reasons for the Inclusion of Wetland Units Under Two Hectares in Size, and Rationale for Wetland Vegetation Communities Under 0.5 ha in Size

Rationale for Identifying the Bruce & Berczy Creek Wetland Complex

The provincially significant Bruce & Berczy Creek Wetland Complex largely occurs on the Peel Plain physiographic region (part of ecodistrict 7E4) with the northwestern portion extending into the South Slope physiographic region (part of ecodistrict 6E7) (Chapman and Putnam 1984). It is situated in the northern portion of the City of Markham and the southern edge of the Town of Whitchurch-Stouffville.

The Bruce & Berczy Creek Wetland Complex is a new wetland complex that has been inventoried by the Ontario Ministry of Natural Resources and Forestry (OMNRF), Aurora District in 2014 and 2015 (OMNR 2014a, OMNRF 2015). It includes one wetland which was formerly part of the Rouge River Headwater Wetland Complex (northern portion of Wetland No. 14). Additional fieldwork by MNRF in the spring of 2017 resulted in the addition of Wetland No. 15 and the expansion of Wetland No. 5 on the north side of 19th Avenue (OMNRF 2017).

The Bruce Creek portion of the complex extends from Major MacKenzie Drive north to just past Elgin Mills Road, east to Kennedy Road and west to Warden Avenue (Wetland Nos. 1-3). The Berczy Creek portion extends from Major Mackenzie Drive north to a kilometre past 19th Avenue, west to Highway 404 and east to Warden Avenue (Wetland Nos. 4-15). Each individual wetland is located from 5 to 590 metres to its nearest neighbouring wetland with an average distance of 112 metres between wetlands (wetlands are allowed to be up to 750 metres apart in a wetland complex).

Most of the wetlands are hydrologically linked by watercourses within the complex, and further upstream to additional wetlands which are currently being evaluated for inclusion in the wetland complex. Four of the wetlands in the complex are not hydrologically connected, including Wetland Nos. 4, 6, 10 and 13.

The wetland complex occurs in an agricultural setting with scattered tableland woodlots and is situated along the existing urban edge of the city of Markham. The majority of the wetlands occur along Bruce Creek and Berczy Creek (Wetland Nos. 1, 3, 5-10, 14 & 15) or in depressions surrounded by agricultural fields or golf courses, or residential properties (Wetland Nos. 2, 4, 11-13). The wetlands are linked by intervening woodlands, hedgerows and fields. Roads bisect the complex, with bridges and large culverts along the Bruce and Berczy Creeks to assist in wildlife movement and, on the tablelands, wildlife has been noted moving across the road network between wetlands in the complex and to and from the surrounding uplands.

There are connections downstream and upstream of the wetland complex along the Bruce and Berczy Creeks and their tributary streams. They provide links to the numerous wetland complexes and woodlands on the Oak Ridges Moraine, a major east-west corridor in southern Ontario, and south along Bruce and Berczy Creeks to the main Rouge Valley and Lake Ontario. There is also an overland connection being proposed between Bruce and Berczy Creek as part of Markham's Greenway System.

The wetland complex captures the diversity of wetland types along the Bruce and Berczy Creeks. It consists largely of riverine wetlands with scattered isolated wetlands, and a few palustrine wetlands mostly on clay loams. The creeks support coldwater Rainbow Trout and Redside Dace habitat maintained by numerous seeps. The dominant wetland vegetation forms are deciduous swamps and graminoid marshes followed by herbaceous marshes, cattail marshes, coniferous swamps, and, and the occasional thicket swamps and open water aquatic communities. The wetlands support a diversity of 40 vegetation communities, as well as 456 plant species and 87 breeding bird species in the wetlands and adjacent lands.

Rationale for the Inclusion of Wetland Units Under Two Hectares in Size

There are eleven wetlands that are under two hectares (ha) in size (Wetland Nos. 2, 4, 6-13 & 15). These smaller wetlands have been included in the complex because they comprise the majority of wetlands in ecodistricts 7E4 and 6E7 (formerly known as site districts 7-4 and 6-7). For example, in this wetland complex, 71% of the wetland units are under two ha in size. Wetlands are considered very rare in ecodistrict 7E4 and rare in ecodistrict 6E7 (OMNR 1993-2002). Wetlands are also very rare on the the Peel Plain physiographic region portion of ecodistrict 7E4, and the South Slope physiographic region portion of ecodistrict 6E7, with an estimate of less than 1% wetland coverage.

Each of the wetlands under two ha in size were included in the wetland complex for one or more of the following additional reasons:

1) Support wetland types and dominant vegetation forms that are uncommon in the wetland complex (Wetland Nos. 2, 4, 6, 7, 9-13). These include coniferous swamps, thicket swamps, fixed-floating and submerged open water marshes that each occupies less than 10% of the complex.
2) Sustain significant species/communities (i.e. conservation priority bird species, or reptile/amphibian species that are declining, or rare or uncommon species/communities in ecodistrict 6E7 or 7E4, ecoregion 6E or 7E, or provincial) (Wetland Nos. 2, 7, 9 & 13 support locally and regionally rare plant species) and Wetland No. 13 supports Bullfrog which is considered an amphibian species in decline.
3) Support amphibian breeding areas (Wetland Nos. 2, 8 & 13)
4) Function as migratory waterfowl stopovers, summer feeding areas or breeding areas (Wetland No. 2, 11 & 13)
5) Support native fish (Wetland Nos. 4, 6-10 & 13)
6) Are headwater areas for watercourses and contribute spring base flows (Wetland Nos. 2, 7-9, 12 & 15); or serve as groundwater seepage areas that contribute base flows (Wetland Nos. 7-9 & 15)
7) Are hydrologically connected to other wetlands (Wetland Nos. 2, 4, 6-11 & 15)
8) Provide intervening wetland habitat between wetlands two ha or greater in size that are within the complex (Wetland Nos. 6, 9, 12, 13 & 15) or to the north and east of the complex (Wetland Nos. 11 & 15)

In addition, all the wetlands in the Bruce & Berczy Creek Wetland Compex occur along corridors (Wetland Nos. 1-15). These corridors include the tributaries of Bruce and Berczy Creeks and the overland connections between adjacent tableland woodlots.

Rationale for the Inclusion of Wetland Vegetation Communities Under 0.5 hectares in Size

All wetlands in the complex have been mapped at the finer scale of at least 1:2000 providing for a more accurate and detailed delineation of boundaries for the wetlands and their associated wetland communities. They have undergone infield vegetation community descriptions, and boundary delineations on 2013 ortho-rectified digital photographs.

There are a total of 60 vegetation community polygons in the wetland complex that are under 0.5 ha in size. Nine of these are single vegetation communities in wetlands less than 0.5 ha in size. The rest have been mapped and identified because they represent major divisions in wetland types such as between marsh, open water marsh and swamp types or between dominant forms such as open water aquatic communities, robust emergent marsh, ground cover marsh, narrow-leaved emergent marsh, thicket swamp, deciduous swamp and coniferous swamp. These vegetation divisions reflect differences in plant species and often in animal communities.

1.0 BIOLOGICAL COMPONENT

1.1 Productivity

1.1.1 Growing Degree-Days/Soils

Refer to page 43 of manual for further explanation.

1. Determine the correct GDD value for your wetland (use Figure 5).
2. Circle the appropriate GDD value from the evaluation table below.
3. Determine the Fractional Area (FA) of the wetland for each soil type.
4. Multiply the fractional area of each soil type by the applicable score-factor in the evaluation table.
5. Sum the scores for each soil type to obtain the final score (maximum score is 30 points).

Note: In wetland complexes the evaluator should aim at determining the fractional area occupied by the categories for the complex as a whole.

Growing Degree- Days	Clay- Loam	Silt- Marl	Lime- stone	Sand	Humic- Mesic	Fibric	Granite
<2800	15	13	11	9	8	7	5
2800-3200	18	15	13	11	9	8	7
3200-3600	**22**	**18**	**15**	**13**	**11**	9	7
3600-4000	26	21	18	15	13	10	8
>4000	30	25	20	18	15	12	8

Soil Type	FA of wetland in soil type	Enter appropriate score-factor from above table				
clay/loam:	0.866	X	**22**	=	**19.05**	(91.39 ha)
silt/marl:	0.001	X	**18**	=	**0.02**	(0.13 ha)
limestone:	0.001	X	**15**	=	**0.01**	(0.06 ha)
sand:	0.003	X	**13**	=	**0.04**	(0.32 ha)
humic/mesic:	0.129	X	**11**	=	**1.42**	(13.62 ha)
fibric:	0.000	X		=	**0.00**	(0.00 ha)
granite:	0.000	X		=	**0.00**	(0.00 ha)
Total					**20.54**	

GDD/ Soils Score **21**
(maximum 30 points)

1.1.2 Wetland Type

(Fractional Area = area of wetland type/ total wetland area)

	Fractional Area				Score	
Bog	0.00	X	3	=	**0.0**	(0.00 ha)
Fen	0.00	X	6	=	**0.0**	(0.00 ha)
Swamp	0.37	X	8	=	**3.0**	(39.01 ha)
Marsh	0.63	X	15	=	**9.5**	(66.51 ha)
Total				=	**12.4**	

Wetland Type Score **12**
(maximum 15 points)

1.1.3 Site Type

(Fractional Area = area of site type/ total wetland area)

	Fractional Area				Score	
Isolated	0.01	X	1	=	**0.01**	(0.69 ha)
Palustrine (permanent or intermittent flow)	0.34	X	2	=	**0.69**	(36.36 ha)
Riverine	0.65	X	4	=	**2.60**	(68.47 ha)
Riverine (at rivermouth)	0.00	X	5	=	**0.00**	(0.00 ha)
Lacustrine (at rivermouth)	0.00	X	5	=	**0.00**	(0.00 ha)
Lacustrine (on enclosed bay,with barrier beach)	0.00	X	3	=	**0.00**	(0.00 ha)
Lacustrine (exposed to lake)	0.00	X	2	=	**0.00**	(0.00 ha)
			Subtotal:		**3.29**	

Site Type Score **3**
(maximum 5 points)

1.2 Biodiversity

1.2.1 Number of Wetland Types

(Check only one)

	one	=	9 points
x	two	=	13
	three	=	20
	four	=	30

Number of Wetland Types Score **13**
(maximum 30 points)

1.2.2. Vegetation Communities

Use the data sheet provided in Appendix 4 to record and score vegetation communities (the completed form must be attached to this data record)

Scoring (circle only one option for each of the columns below):

Total # of communities with 1-3 forms	
1 =	1.5 points
2 =	2.5
3 =	3.5
4 =	4.5
5 =	5
6 =	5.5
7 =	6
8 =	6.5
9 =	7
10 =	7.5
11 =	8
+ 0.5 for each additional community	
=	**16.5**
Total of 28 Communities	

Total # of communities with 4-5 forms	
1 =	2 points
2 =	3.5
3 =	5
4 =	6.5
5 =	7.5
6 =	8.5
7 =	9.5
8 =	10.5
9 =	11.5
10 =	12.5
11 =	13
+ 0.5 for each additional community	
=	**13.5**
Total of 12 Communities	

Total # of communities with 6 or more forms	
1 =	3 points
2 =	5
3 =	7
4 =	9
5 =	10.5
6 =	12
7 =	13.5
8 =	15
9 =	16.5
10 =	18
11 =	19
+ 0.5 for each additional community	
=	**0.0**
Total of 0 Communities	

See vegetation community sheets 6A

Subtotal: **30.0**

Vegetation Communities Score **30**
(maximum 45 points)

1.2.2. Vegetation Communities - Bruce & Berczy Creek Wetland Complex

Wetland #	Field #, Date	Map Code	Vegetation Forms	Dominant Species[1], Secondary Species[2] (size in hectares; site type: P- palustrine with no inflow, Pi: Palustrine with inflow, R- riverine, I- isolated; g- depth to mottling & G- depth to gley in centimeters (cm) when present; O- depth of organics (cm) when present; wt- depth to water table (cm) when available; ow- estimated percent permanent open water; presence of seepage and/or iron precipitates; significant species, wildlife records & comments: (E)- endangered species, (T)- threatened species, (SC)- special concern species, (LU)- locally uncommon plant species & (LR)- locally rare plant species in Ecodistrict 7E-4 based on Varga et al. 2004, B- Beacon Environmental, CF- Chris Fahner landowner, D- Dougan & Associates, DC- David Cunningham, E- Ellie Zajc TRCA, EM- Emily Funnell MNRF, G- Gavin Miller TRCA, GD- Guito DiVito landowner, I- Ian Downer landowner, J- John Brett TRCA, KP- Kelly Purves TRCA, M- Mike King TRCA, P- Paul Heydon TRCA, S- Steve Varga, Keegan McKitterick & Alex Kissel OMNRF, SH- Sue Hayes TRCA, SJ- Scott Jarvie TRCA, SV- Savanta Inc., V- Steve Varga & Katherine Koopman OMNRF, Z- Steve Varga OMNRF Aurora District April 26, May 26, 2017, X- MNRF Redside Dace occupied habitat & date (month/day/year))
1	2014-226	cS1-A	h,c*,ts,gc,m	h: Acer negundo[1], Salix xrubens[1], Populus tremuloides[2], Fraxinus nigra[2], Tilia americana[2]; c: Thuja occidentalis[1], Larix laricina[2]; ts: Thuja occidentalis[1], Cornus sericea[2]; gc: Impatiens capensis[1], Aralia nudicaulis[1], Onoclea sensibilis[2], Cystopteris bulbifera[2] (2.22; R: 1.11, P: 1.11; mesic organic: O-40+; ow-5; seepage; iron precipitates; significant species: X- Redside Dace(E), S- Dryopteris cristata (LR), Larix laricina (LR), Lactuca biennis (LR), Carex pellita (LR), Fraxinus nigra (LU) (10/10/14); comments: permanent stream flowing through community)
1	2014-229	cS1-B	h,c*,ts,gc,m	h: Fraxinus nigra[1], Betula alleghaniensis[1], Salix xrubens[2], Acer negundo[2]; c: Thuja occidentalis; ts: Thuja occidentalis[1], Fraxinus nigra[1], Alnus incana[2]; gc: Impatiens capensis[1], Onoclea sensibilis[1], Cystopteris bulbifera[1], Laportea canadensis[1], Ranunculus hispidus var. caricetorum[2]; m: mosses (3.86; R: 0.39, P: 3.47; mesic organic: O-40+; ow-0; seepage; significant species: X- Redside Dace (E), B- Equisetum pratense (LR), Ribes triste (LR) (present in Angus Glen Golf Course, location based on habitat requirement), P- Geum rivale (LR), Carex hitchcockiana (LR), Schizachne purpurascens (LR), Viola affinis (LU), Carex retrorsa (LU) (6/25/2008), S- Alnus incana (LR), Fraxinus nigra (LU) (10/10/14); wildlife records: S- Northern Leopard Frog, Chimney Crayfish (10/10/14), J- Gray Catbird, Great Crested Flycatcher, White-breasted Nuthatch (6/19/2008), D- Piliated Woodpecker (6/7/14); comments: permanent stream flowing through community)
1	2014-228	hS2-A	h*,ts,gc	h: Acer negundo[1], Salix xrubens[1]; ts: Acer negundo[1], Cornus sericea[2]; gc: Matteuccia struthiopteris[1], Impatiens capensis[1], Laportea canadensis[1], Alliaria petiolata[1] (0.54 + 0.20 = 0.74; R; loam: A horizon-silty loam 60 cm, B horizon- sand 10+ cm; g-0; wt-60; ow-5; significant species: X- Redside Dace (E); comments: permanent stream flowing through community)

1	2014-232	hS2-B	h*,ts,gc	h: Populus balsamifera; ts: Ulmus americana[1], Acer negundo[1]; gc: Matteuccia struthiopteris[1], Onoclea sensibilis[1] (0.28; R: 0.14, P: 0.14; loam; ow-5; significant species: X- Redside Dace (E); comments: permanent stream flowing through community)
1	2014-230	cS3	h,c*,gc	h: Populus balsamifera; c: Thuja occidentalis; gc: Impatiens capensis[1], Eutrochium maculatum[2] (0.28; R: 0.14, P: 0.14; mesic organic: O-40+; ow-0; comments: permanent stream flowing through community)
1	2014-231	hS4	h*,c,ts,gc	h: Acer negundo[1], Salix xrubens[1]; c: Thuja occidentalis; ts: Acer negundo[1], Fraxinus nigra[2], Cornus sericea[2]; gc: Impatiens capensis[1], Eutrochium maculatum[2], Matteuccia struthiopteris[2], Onoclea sensibilis[2], Laportea canadensis[2], Solidago altissima[2] (0.36; R; loam: silty loam; g-20; G-30; ow-5; seepage; significant species: X- Redside Dace (E), S- Fraxinus nigra (LU) (10/10/14); comments: permanent stream flowing through community)
1	2014-233	cS5-A	h,c*,ts,gc	h: Fraxinus nigra[1], Betula alleghaniensis[1]; c: Thuja occidentalis[1], Larix laricina[2]; ts: Thuja occidentalis[1], Rhamnus cathartica[1], Betula alleghaniensis[2]; gc: Onoclea sensibilis[1], Cystopteris bulbifera[1], Tussilago farfara[1], Clematis virginiana[2] (0.14 + 0.13 + 0.12 + 0.11 = 0.50; P; mesic organic: O-40+; ow-0; seepage; significant species: S- Equisetum fluviatile (LR), Larix laricina (LR), Fraxinus nigra (LU) (10/10/14))
1	2014-270	hS6-A	h*,gc	h: Salix xrubens[1], Acer negundo[2]; gc: Impatiens capensis[1], Eutrochium maculatum[1], Symphyotrichum lanceolatum[1], Laportea canadensis[1], Hesperis matronalis[1] Solidago altissima[2], Thalictrum pubescens[2], Anemone canadensis[2], Onoclea sensibilis[2] (1.97 + 0.79 + 0.29 = 3.05; R;
1	2014-272	cS7	c*,gc	c: Thuja occidentalis[1]; gc: Cystopteris bulbifera[1], Onoclea sensibilis[1], Athyrium filix-femina[1], Matteuccia struthiopteris[1] (1.92; R: 0.20 P: 1.72; loam; g-0; G-15; ow-0; seepage; significant species: X- Redside Dace (E), S- Osmunda regalis (LR) (10/17/14); comments: permanent stream flowing through community)
1	2014-274	hS8	h*,c,ts,gc,m	h: Fraxinus nigra[1], Fraxinus pennsylvanica[1], Betula alleghaniensis[2], Salix xrubens[2]; c: Thuja occidentalis; ts: Thuja occidentalis[1]; gc: Impatiens capensis[1], Ranunculus hispidus var. caricetorum[2], Onoclea sensibilis[2], Symphyotrichum puniceum[2], Matteuccia struthiopteris[2]; m: mosses (1.11; P; loam; g-0; G-0; ow-0; seepage; significant species: E- Osmunda regalis (LR), Mitella nuda (LR), Dryopteris cristata (LR), Gymnocarpium dryopteris (LR) (9/19/2002), S- Fraxinus nigra (LU) (10/17/2014))
1	2014-307	hS9-A	h*,ts,gc,ne	h: Salix xrubens[1], Acer negundo[2]; ts: Cornus sericea; gc: Symphyotrichum lanceolatum[1], Symphyotrichum puniceum[2], Eupatorium maculatum[2], Solidago altissima[2]; ne: Phalaris arundinacea (0.32; R; loam; ow-5; comments: permanent stream flowing through community)
1	2014-225	gcM1-A	gc*,ne	gc: Eutrochium maculatum[1], Impatiens capensis[2], Solidago altissima[2], Symphyotrichum lanceolatum[2], Symphyotrichum novae-angliae[2]; ne: Phalaris arundinacea[1], Bromus inermis[2] (1.32; R: 0.66, P: 0.66; loam: A horizon- silty loam 35 cm, B horizon- fine sand 20+ cm; g-35; G-40; ow-5; seepage; significant species: X- Redside Dace (E), B- Barn Swallow breeding under bridge over wetland (T) (5/27/14); seepage; comments: permanent stream flowing through community)

1	2014-227	gcM1-B	gc*,ne	gc: Symphyotrichum lanceolatum[1], Eutrochium maculatum[1], Solidago altissima[1], Impatiens capensis[1]; ne: Phalaris arundinacea (0.13; R; loam: silty loam; g-0; G-30; ow-5; significant species: X- Redside Dace (E); comments: permanent stream flowing through community)
1	2014-271	gcM1-C	gc*,ne	gc: Symphyotrichum lanceolatum[1], Eutrochium maculatum[1], Anenome candensis[2], Myosotis laxa[2]; ne: Phalaris arundinacea[1], Carex pellita[1] (0.68; P; loam; g-0; G-0; ow-0; seepage; significant species: S- Carex pellita (LR), Cuscuta gronovii (LU) (10/17/14))
1	2014-227B	gcM1-C	gc*,ne	gc: Eutrochium maculatum[1], Symphyotrichum lanceolatum[1]; ne: Glyceria grandis[1], Phalaris arundinacea (0.19 + 0.17 + 0.12 + 0.25 = 0.73; R; loam: A horizon- silty loam 60 cm, B horizon- sand 10+ cm; g-0; wt-60; ow-5; significant species: X- Redside Dace (E); comments: permanent stream flowing through community)
1	2014-275	gcM1-C	gc*,ne	gc: Symphyotrichum lanceolatum[1], Eutrochium maculatum[1], Symphyotrichum puniceum[2]; ne: Phalaris arundinacea[1] (1.21; R: 0.24, P: 0.97; loam; g-5; G-20; ow-0; significant species: X- Redside Dace (E); comments: permanent stream flowing through community)
1	2014-273	gcM1-D	gc*,ne	gc: Symphyotrichum lanceolatum[1], Impatiens capensis[1], Epilobium ciliatum[2], Eutrochium maculatum[2], Symphyotrichum puniceum[2]; ne: Phalaris arundinacea[1], Glyceria grandis[1] (0.21; P; loam; g-5; G-10; ow-0; seepage)
1	2014-268	reM2	gc,m,re*,ne	gc: Eutrochium maculatum[1], Symphyotrichum lanceolatum[2], Epilobium hirsutum[2], Symphyotrichum puniceum[2]; m: mosses; re: Typha angustifolia[1], Typha latifolia[2]; ne: Equisetum fluviatile[1], Poa palustris[2], Equisetum arvense[2] (0.15; P; loam: A horizon- sandy loam with organics 20 cm, B horizon- sandy loam; g-25; G-50; ow-0; seepage; significant species: S- Equisetum fluviatile (LR) (10/17/14))
1	2014-269	gcM3	gc*,m	gc: Symphyotrichum lanceolatum[1], Eutrochium maculatum[2]; m: mosses (0.48; P; loam: A horizon- loam 25 cm, B horizon- clay 10+ cm; g-10; G-20; ow-0; seepage; comments: community on gradual seepage slope at the base of a steeper slope)
1	2014-234	reM12-B	re*,ne	re: Typha latifolia; ne: Phalaris arundinacea (0.05; P; mesic organic: O-40+; ow-0; seepage; significant species: S- Hydrocotyle americana (LR), Equisetum fluviatile (LR) (10/10/14))
1	2014-235	neM17	re,ne*	re: Typha latifolia; ne: Phalaris arundinacea (0.15; P; loam: silty loam; g-0; G-0; ow-0; iron precipitates; significant species: E- Carex interior (LR) (9/19/2002))
2	2014-4	cS5-B	h,c*,ts,gc	h: Fraxinus pennsylvanica[1], Betula alleghaniensis[2], Rhamnus cathartica[2]; c: Thuja occidentalis[1], Abies balsamea[2]; ts: Thuja occidentalis[1], Picea glauca[1]; gc: Impatiens capensis[1], Circaea canadensis[2] (0.69; P; loam: A horizon- silty loam 60 cm, B horizon-silty loam 20+ cm; g-25; G-60; wt-60; ow-0; significant species: S- Abies balsamea (LR), Picea glauca (LR) (8/19/14))
2	2014-5	tsS11-A	ts*,ne	ts: Rhamnus cathartica[1], Cornus sericea[1], Thuja occidentalis[2]; ne: Glyceria striata (0.03; P; loam: silty loam 20+ cm; O-25; g-0; G-0; wt-0; ow-95; wildlife records: S- Green Frog just transformed (8/19/14))
2	2014-2	reM4-A	gc,re*	gc: Impatiens capensis[1], Solanum dulcamara[1]; re: Phragmites australis ssp. australis (0.04; P; loam: A horizon- silty loam 50 cm, B horizon- silty loam 15+ cm; g-35; G-50; ow-0)
2	2014-6	reM5-A	re*	re: Typha angustifolia (0.05; P; loam 20+ cm; O-10; g-0; G-0; ow-0)
2	2014-3	reM16	ls,gc,re*	ls: Cornus sericea; gc: Impatiens capensis; re: Typha angustifolia (0.05; P; loam: clay loam 20+ cm; g-0; G-10; ow-50; wildlife records: S- Belted Kingfisher, Green Frog just transformed (8/19/14))

3	2014-10	hS12	h*,gc,ne	h: Salix xrubens[1], Rhamnus cathartica[2]; gc: Impatiens capensis; ne: Phalaris arundinacea (1.95; R; mesic organic: O-40+; ow-0; seepage; comments: permanent stream flowing through community)
3	2014-9	neM6-A	gc,re,ne*	gc: Impatiens capensis[1], Verbena hastata[1], Symphyotrichum lanceolatum[1], Inula helenium[1]; re: Typha latifolia[1], Scirpus microcarpus[1], Typha xglauca[1], Phragmites australis ssp. australis[1]; ne: Phalaris arundinacea (3.68; R; loam; g-0; G-0; ow-0; wildlife records: S- American Toad just transformed (8/19/14); seepage; comments: permanent stream flowing through community)
3	2014-11	neM7-A	gc,ne*	gc: Symphyotrichum lanceolatum[1], Impatiens capensis[2], Inula helenium[2]; ne: Phalaris arundinacea (0.46; R; loam 35+ cm; g-35; G-55; ow-5; iron precipitates; comments: permanent stream flowing through community)
4	2014-276	neM8	ne*	ne: Phalaris arundinacea (0.05; P; loam; ow-0)
4	2014-277	suW14-A	su*	su: Chara sp. (0.15; I; loam; g-5; G-35; wt- 30; ow-100)
5	2014-253	hS2-A	h*,ts,gc	h: Salix xrubens[1], Acer negundo[1]; ts: Acer negundo; gc: Impatiens capensis[1]; Symphyotrichum lanceolatum[1], Solidago altissima[2] (1.37; R; loam; ow-5; significant species: X- Redside Dace (E); comments: permanent stream flowing through community)
5	2014-243	hS2-A	h*,ts,gc	h: Salix xrubens[1], Acer negundo[1]; ts: Acer negundo[1], Cornus sericea[1]; gc: Impatiens capensis[1], Symphyotrichum lanceolatum[1] (2.16; R; loam: A horizon- loam 30 cm, B horizon- sandy loam 10+ cm; g-15; G-30; ow-0; significant species: SJ- Redside Dace (E), B- Eastern Wood-pewee (SC); wildlife records: SJ- Red-eyed Vireo; comments: permanent stream flowing through community)
5	2014-46	hS2-A	h*,ts,gc	h: Salix xrubens[1], Acer negundo[1], Fraxinus pennsylvanica[2], Ulmus americana[2]; ts: Acer negundo[1], Ulmus americana[2], Fraxinus pennsylvanica[2], Cornus sericea[2], Rhamnus cathartica[2]; gc: Impatiens capensis[1], Symphyotrichum lanceolatum[1], Circaea canadensis[2], Anemone canadensis[2] (4.51; R; loam: A horizon- loam 55 cm, B horizon- fine sand 10+ cm; g-56; G-35; ow-0; significant species: D- Eastern Wood-pewee (SC) (6/5/14), Solidago rugosa (LR), Carex lupulina (LU); wildlife records: D- American Robin, Brown-headed Cowbird, Cedar Waxwing, Downy Woodpecker, Eastern Kingbird, European Starling, Great Horned Owl, Veery, Red-eyed Vireo, Song Sparrow, Baltimore Oriole (5/27/14), Belted Kingfisher, Black-capped Chickadee, Blue-grey Gnatcatcher, Gray Catbird, Gray Squirrel, Northern Cardinal, Rose-breasted Grosbeak, Tennessee Warbler, Warbling Vireo (6/5/14); comments: permanent stream flowing through community)
5	2014-256	hS2-B	h*,ts,gc	h: Populus balsamifera; ts: Cornus sericea[1], Rhamnus cathartica[2]; gc: Symphyotrichum puniceum[1], Solidago altissima[1], Lysimachia ciliata[2], Lycopus uniflorus[2], Anemone canadensis[2], Epilobium ciliatum[2], Symphyotrichum lanceolatum[2] (0.08; P; loam; g-0; G-35; ow-0; seepage; wildlife records: SH- Eastern Kingbird, Common Yellowthroat, Willow Flycatcher (7/11/14); comments: stream originating from up-slope seepage area and flowing through the wetland)

5	2014-45	hS2-B	h*,ts,gc	h: Populus balsamifera; ts: Rhamnus cathartica; gc: Symphyotrichum lanceolatum[1], Impatiens capensis[1], Eutrochium maculatum[2], Solidago altissima[2] (0.19; R; loam: A horizon- loam 40 cm, B horizon- sandy loam 20+ cm; g-40; G-40; ow-0; significant species: D- retainable Juglans cinerea (E); wildlife records: D- Baltimore Oriole, Red-winged Blackbird, Song Sparrow (6/6/14); comments: permanent stream flowing through community)
5	2014-279	hS2-C	h*,ts,gc	h: Salix xrubens[1], Acer negundo[2], Populus balsamifera[2]; ts: Acer negundo[1], Rhamnus cathartica[1]; gc: Impatiens capensis[1], Eutrochium maculatum[1], Symphyotrichum lanceolatum[1], Symphyotrichum lateriflorum[1], Lysimachia ciliata[1], Hesperis matronalis[1], Symphyotrichum puniceum[1]; ne: Phalaris arundinacea[1] (4.68 + 0.34 + 0.20 = 5.22; R; loam; g-15; G-35; ow-0; significant species: X- Redside Dace (E); comments: permanent stream flowing through community)
5	2014-16B	hS6-B	h*,gc	h: Acer negundo; gc: Impatiens capensis (0.13; P; mesic organic: O-50+; ow-0)
5	2014-43	hS9-B	h*,ts,gc,ne	h: Fraxinus pennsylvanica; ts: Cornus sericea[1], Fraxinus pennsylvanica[1], Rhamnus cathartica[1]; gc: Symphyotrichum lanceolatum[1], Solidago altissima[1], Eutrochium maculatum[2], Symphyotrichum puniceum[2], Euthamia graminifolia[2]; ne: Equisetum arvense (0.25; R; loam: A horizon- loam 40 cm, B horizon- sandy loam 20+ cm; g-40; G-40; ow-0; wildlife records: D- American Redstart, Black-headed Cowbird (6/6/14), Common Loon, Warbling Vireo (5/28/14))
5	2014-250	hS9-B	h*,ts,gc,ne	h: Fraxinus pennsylvanica; ts: Fraxinus pennsylvanica[1], Cornus sericea[2]; gc: Symphyotrichum lanceolatum[1], Symphyotrichum puniceum[2], Inula helenium[2]; ne: Scirpus atrovirens[1], Agrostis gigantea[1], Agrostis stolonifera[1], Phleum pratense[1] (0.42; P; loam; g-5cm; G-20 cm; ow-0; seepage)
5	2014-20	tsS11-B	ts*,ne	ts: Salix eriocephala; ne: Phalaris arundinacea (0.09; P; loam; ow-0; wildlife records: D- Northern Cardinal (6/7/14), Song Sparrow (5/29/14); comments: community based on observations from 19th Avenue and air-photo interpretation)
5	2014-15	neS13	ts,ls,gc,ne*	ts: Cornus sericea; ls: Salix discolor[1], Cornus sericea[1]; gc: Symphyotrichum puniceum[1], Solidago altissima[2], Inula helenium[2], Lycopus americanus[2], Symphyotrichum lanceolatum[2]; ne: Equisetum fluviatile[1], Agrostis gigantea[2], Carex cristatella[2], Carex vulpinoidea[2], Phalaris arundinacea[2], Scirpus atrovirens[2] (1.22; P; loam: silty loam 30+ cm; g-10; G-25; ow-0; seepage; significant species: S- Equisetum fluviatile (LR) (8/21/14))
5	2014-16	reS14	ts,gc,re*,ne	ts: Cornus sericea; gc: Impatiens capensis[1], Persicaria maculosa[1], Echinocystis lobata[1], Lythrum salicaria[2]; re: Typha latifolia[1]; ne: Equisetum arvense[1] (0.13; P; mesic organic: O-50+; ow-0; seepage)
5	2014-12	neS15	ts,gc,re,ne*	ts: Populus balsamifera[1], Cornus sericea[1]; gc: Symphyotrichum puniceum[1], Eutrochium maculatum[1], Symphyotrichum lanceolatum[1], Anemone canadensis[1], Equisetum arvense[2], Impatiens capensis[2]; re: Typha angustifolia[1], Scipus microcarpus[2], Scirpus atrovirens[2]; ne: Phalaris arundinacea[1], Carex pellita[2] (0.15; P; loam: loam 20+ cm; g-10; G-25; ow-0; seepage; significant species: S- Carex pellita (LR) (7/31/14)

5	2014-24	gcS16	ts,gc*,re,ne	ts: Cornus sericea[1], Rhamnus cathartica[2]; gc: Impatiens capensis[1], Epilobium hirsutum[2], Verbena hastata[2], Symphyotrichum lanceolatum[2], Symphyotrichum puniceum[2]; re: Typha latifolia[1] (0.34; P; loam; ow-0; seepage)
5	2014-25	cS17	c*,dc,ds,gc,ne	c: Thuja occidentalis[1], Larix laricina[2]; dc: Thuja occidentalis; ds: Thuja occidentalis; gc: Impatiens capensis[1], Cystopteris bulbifera[1], Symphyotrichum puniceum[2]; ne: Equisetum arvense[1], Equisetum fluviatile[2] (0.32; P; mesic organic: O-50+; ow-0; seepage; significant species: S- Larix laricina (LR) (8/21/14), Equisetum fluviatile (LR) (8/21/14); wildlife records: D- American Redstart (6/2/14))
5	2014-33W	hS18-A	h*,ts	h: Acer xfreemanii[1], Fraxinus pennsylvanica[1], Tilia americana[2]; ts: Rhamnus cathartica[1], Fraxinus pennsylvanica[1] (0.69; P; loam; ow-0; comments: community based on observations from adjacent property to the south and air-photo interpretation)
5	2014-39	gcS19	ts,gc*	ts: Cornus sericea; gc: Symphyotrichum lanceolatum[1], Solidago altissima[1] (0.13; P; silt: A horizon- 15 cm sandy silt, B horizon- 5+ cm silty sand; g-25; G-30; ow-0)
5	2014-266	gcS20	h,gc*,ne	h: Salix xrubens; gc: Eutrochium maculatum[1], Symphyotrichum lanceolatum[1], Epilobium hirsutum[1], Solidago altissima[1]; ne: Phalaris arundinacea[1], Carex pellita[2] (2.64; R; loam; g-15; G-35; ow-5; significant species: S- Carex pellita (LR) (10/17/14), X- Redside Dace (E), D- Eastern Wood-pewee (5/27/14); wildlife records: D- American Goldfinch, Belted Kingfisher, Cedar Waxwing, Common Grackle, Common Yellowthroat, Song Sparrow, Mallard (5/27/14), Red-winged Blackbird, European Starling, Willow Flycatcher, Yellow Warbler (6/5/14); comments: permanent stream flowing through community)
5	2014-42	gcM1-E	gc*,ne	gc: Eutrochium maculatum[1], Impatiens capensis[1], Symphyotrichum lanceolatum[1], Symphyotrichum puniceum[1], Euthamia graminifolia[1], Solidago altissima[1]; ne: Phalaris arundinacea[1], Bromus inermis[1] (6.64; R; loam: A horizon- loam 40 cm, B horizon- sandy loam 20+ cm; g-40; G-40; ow-0; significant species: X- Redside Dace (E), D- Eastern Wood-pewee (SC) (6/6/14); wildlife records: D- Barn Swallow flyover, Alder Flycatcher, Black-capped Chickadee, Black-headed Cowbird, Cedar Waxwing (5/28/14), American Goldfinch (5/29/14), Willow Flycatcher, American Robin (5/19/14), Black-billed Cuckoo, Common Yellowthroat, Gray Catbird, Yellow Warbler, Red-eyed Vireo (6/6/14), Red-winged Blackbird, Song Sparrow (6/7/14); comments: permanent stream flowing through community, southern portion of the community based on observations from Stouffville Road and air-photo interpretation)
5	242	gcM1-F	gc*,ne	gc: Symphyotrichum lanceolatum[1], Euthamia graminifolia[1], Solidago altissima[1], Symphyotrichum novae-angliae[2]; ne: Phalaris arundinacea[1], Agrostis gigantea[1], Phleum pratense[2], Bromus inermis[2] (0.28; P; loam: A horizon- loam 30 cm, B horizon- sandy loam 10+ cm; g-15; G-30; ow-0)
5	2014-244	gcM1-G	gc*,ne	gc: Eutrochium maculatum[1], Symphyotrichum lanceolatum[1], Epilobium ciliatum[1], Symphyotrichum puniceum[1], Euthamia graminifolia[1]; ne: Carex stricta[1] (10/10/14), Equisetum arvense[1] (0.14; P; mesic organic: O-40+; ow-0; significant species: S- Teucrium canadense (LR), Carex stricta (LR); wildlife records: B- Black-billed Cuckoo)

5	2014-247	gcM1-H	gc*,ne	gc: Eutrochium maculatum[1], Symphyotrichum lanceolatum[1], Euthamia graminifolia[2], Symphyotrichum puniceum[2]; ne: Phalaris arundinacea (0.54; R; loam; g-25; G-35; ow-0; significant species: X- Redside Dace (E); comments: permanent stream flowing through community)
5	2014-252	gcM1-I	gc*,ne	gc: Eutrochium maculatum[1], Symphyotrichum lanceolatum[1], Symphyotrichum puniceum[1], Euthamia graminifolia[1]; ne: Phalaris arundinacea; (0.08 + 0.06 = 0.14; R; loam: clay loam; g-15; G-35; wt- 10; ow-0; seepage; comments: community is an old oxbow)
5	2014-32	neM6-B	gc,re,ne*	gc: Symphyotrichum lanceolatum[1], Bidens cernua[1], Solidago altissima[2]; re: Typha latifolia; ne: Leersia oryzoides[1], Equisetum arvense[2] (0.73; R: 0.50, P: 0.23; loam: A horizon- clay loam 20 cm, B horizon- clay loam 20+ cm; g-15; G-20; wt- 20; ow-0; seepage; significant species: S- Cyperus bipartitus (LR), Bidens tripartita (LR) (8/22/14); wildlife records: S- 67 Green Frogs, Northern Leopard Frog, American Toad just tranformed, Green Frog just transformed, dragonfly, aquatic snails (6/24/14), SV- Northern Leopard Frog (call level 1), Green Frog (call level 1) (6/24/14), D- Swamp Sparrow (5/27/14), Willow Flycatcher, Rose-breasted Grosbeak, Common Yellowthroat, Spotted Sandpiper (6/6/14); comments: permanent stream flowing through community)
5	2014-322	neM7	gc,ne*	gc: herbaceous plants; ne: grasses (2.27; Pi; loam; ow-0; comments: community based on air-photo interpretation)
5	2014-241	neM7-A	gc,ne*	gc: Eutrochium maculatum[1], Impatiens capensis[1], Symphyotrichum lanceolatum[2]; ne: Phalaris arundinacea (0.08; P; mesic organic: O-40+; ow-0; seepage)
5	2014-267	neM7-A	gc,ne*	gc: Symphyotrichum lanceolatum; ne: Phalaris arundinacea (0.11; P; loam; ow-0)
5	2014-278	neM7-A	gc,ne*	gc: Symphyotrichum lanceolatum[1], Euthamia graminifolia[2], Symphyotrichum puniceum[2], Eutrochium maculatum[2]; ne: Phalaris arundinacea (0.34; R; loam; g-5; G-25; wt- 30; ow-0; comments: permanent stream flowing through community)
5	2014-34	neM7-A	gc,ne*	Symphyotrichum lanceolatum[1], Solidago altissima[1], Impatiens capensis[2]; ne: Phalaris arundinacea (0.55; R; loam: A horizon- silty loam 50 cm, B horizon- loam 10+ cm; g-20; G-50; ow-0; significant species: D- Calystegia sepium (LU); wildlife records: D- American Redstart, American Robin, Baltimore Oriole, Yellow Warbler (5/27/14); comments: permanent stream flowing through community)
5	2014-246	neM7-A	gc,ne*	gc: Eutrochium maculatum; ne: Phalaris arundinacea (0.57; R; loam; ow-5; significant species: X- Redside Dace (E); comments: permanent stream flowing through community)
5	2014-203	neM7-A	gc,ne*	gc: Symphyotrichum lanceolatum[1], Eutrochium maculatum[2], Anemone canadensis[2], Impatiens capensis[2]; ne: Phalaris arundinacea (0.61; R; loam; g-0; G-10; wt-0; ow-0; significant species: S- retainable Juglans cinerea seedling (E) (10/9/14); comments: permanent stream flowing through community)
5	2015-281	neM7-A	gc,ne*	gc: Eutrochium maculatum[1], Symphyotrichum lanceolatum[1]; ne: Phalaris arundinacea (0.65; R; loam; g-0; G-5; ow-0; significant species: X- Redside Dace (E))
5	2014-259	neM7-A	gc,ne*	gc: Impatiens capensis[1], Eutrochium maculatum[2]; ne: Phalaris arundinacea (0.77; R; loam; g-5; G-10; ow-5; wildlife records: SH- Common Yellowthroat (7/11/14); comments: permanent stream flowing through community)

5	2014-261	neM7-A	gc,ne*	gc: Symphyotrichum lanceolatum; ne: Phalaris arundinacea (0.82; R; loam; ow-5; significant species: X- Redside Dace (E); comments: permanent stream flowing through community)
5	2017-500	neM7-A	gc,ne*	gc: Symphyotrichum lanceolatum; ne: Phalaris arundinacea (1.07; P; loam; ow-0; seepage; comment: community based on observations from 19th Avenue because permission was not given to enter the property)
5	2014-27	neM7-A	gc,ne*	gc: Symphotrichum lanceolatum[1], Solidago altissima[1], Calystegia sepium[1], Echinocystis lobata[1], Lycopus uniflorus[2], Solidago dulcamara[2], Symphyotrichum puniceum[2]; ne: Phalaris arundinacea[1], Carex vulpinoidea[2], Agrostis gigantea[2] (4.13 + 0.84 + 0.21 + 0.16 = 5.34; R; loam: A horizon- clay loam 45 cm, B horizon- sandy clay loam 20+ cm; g-45; G-45; wt-55; ow-2; seepage; iron precipitates; significant species: S- Calystegia sepium (LU), Carex retrorsa (LU) (8/22/14); wildlife: S- White-tailed deer tracks, Northern Leopard Frog, American Toad just transformed, Raccoon tracks, water boatmen, water striders, aquatic worms (8/22/14), D- Green Frog (call level 1), American Toad (call level 1) (6/19/14), Brown Thrasher, Mallard, Mourning Dove, Red-winged Blackbird (6/5/14), Common Yellowthroat, Song Sparrrow, Swamp Sparrow, Warbling Vireo (5/27/14), SV- 3 American Toads (call level 1) (6/4/15); comments: permanent stream flowing through community)
5	2014-280	neM8	ne*	ne: Phalaris arundinacea (2.51; P; loam; g-5; G-25; wt-30; ow-0; comments: community observations from south-western public portion and air-photo interpretation)
5	2014-21	gcM9-A	gc*,re,ne	gc: Symphyotrichum lanceolatum[1], Echinocystis lobata[1], Lythrum salicaria[2]; re: Typha latifolia[1], Phragmites australis ssp. australis[1]; ne: Phalaris arundiacea[1] (0.43; P; loam: A horizon- silty loam 50+ cm; g-20; G-50; ow-0; seepage; comment: Z- water flowing north into culvert under 19th Avenue on April 26, 2017 and no flows on May 26, 2017 but water still present in front of the culvert)
5	2014-200	gcM9-B	gc*,re,ne	gc: Symphyotrichum lanceolatum[1], Eutrochium maculatum[2], Symphyotrichum novae-angliae[2], Solidago altissima[2], Euthamia graminifolia[2], Urtica dioica var. gracilis[2]; re: Typha latifolia; ne: Phalaris arundinacea (1.57; R; loam; g-20; G-53; ow-0; seepage; significant species: EM- Redside Dace (E) (7/31/14); wildlife records: D- Barn Swallow flyover (6/5/14); Belted Kingfisher (7/11/14), House Wren, White-tailed Deer (5/27/14); comments: permanent stream flowing through community)
5	2014-26	reM10-A	gc,re*,ne	gc: Impatiens capensis[1], Solanum dulcamara[2], Eutrochium maculatum[2], Eupatorium perfoliatum[2], Symphyotrichum puniceum[2]; re: Typha latifolia[1]; ne: Equisetum fluviatile[1] (0.23; P; mesic organic: O-50+; ow-0; seepage; significant species: S- Equisetum fluviatile (LR) (8/21/14))
5	2014-255	reM10-A	gc,re*,ne	gc: Eutrochium maculatum[1], Symphyotrichum puniceum[1]; re: Typha latifolia[1]; ne: Phalaris arundinacea[1], Equisetum fluviatile[2] (0.53; R; loam; ow-0; seepage; significant species: S- Equisetum fluviatile (LR), E-Hydrocotyle americana (LR), Pilea fontana (LR) (9/9/02); comments: permanent stream flowing through community)

5	2014-28	reM10-B	gc,re*,ne	gc: Symphyotrichum lanceolatum[1], Epilobium parviflorum[1], Impatiens capensis[1], Lycopus americanus[2], Lycopus uniflorus[2], Lythrum salicaria[2], Glechoma hederacea[2], Inula helenium[2]; re: Typha angustifolia[1], Phragmites australis ssp. austalis[2]; ne: Scirpus atrovirens[1], Equisetum arvense[1], Phalaris arundinacea[1] (0.72 + 0.60 + 0.37 + 0.26 = 1.95; R; mesic organic: O-50+; ow-0; seepage; iron precipitates; wildlife records: D- Common Yellowthroat, Song Sparrrow, Swamp Sparrow, Willow Flycatcher (5/27/14), Yellow Warbler (5/29/14), Mourning Dove, Tree Swallow (6/5/14); comments: permanent stream flowing through community)
5	2014-258	reM12	re*,ne	re: Typha sp.; ne: Phalaris arundinacea (0.59; R; loam; ow-5; significant species: X- Redside Dace (E); comments: permanent stream flowing through wetland)
5	2014-245	reM12-A	re*,ne	re: Typha angustifolia[1], Typha latifolia[1]; ne: Carex stricta[1], Carex lacustris[1] (0.81 + 0.54 = 1.35; P; mesic organic: O 40+; ow-0; significant species: S- Carex stricta (LR), Carex lacustris (LU) (10/10/14))
5	2014-36	gcM11-A	gc*	gc: Symphyotrichum lanceolatum[1], Solidago altissima[1], Anemone canadensis[1], Euthamia graminifolia[1], Symphyotrichum puniceum[1], Impatiens capensis[1], Inula helenium[2], Calystegia sepium[2], Eutrochium maculatum[2], Lysimachia ciliata[2], Echinocystis lobata[2] (0.74 + 0.14 = 0.88; R: 0.44, P: 0.44; loam: A horizon- silty loam 50 cm, B horizon- sandy loam 10+ cm; g-17; G-50; ow-0; significant species: S- Calystegia sepium (LU) (8/22/14); wildlife records: D- Song Sparrow (6/5/14), Warbling Vireo, Wilson's Warbler (5/27/14); comments: permanent stream flowing through community)
5	2014-47	gcM11-B	gc*	gc: Eutrochium maculatum[1], Symphyotrichum lanceolatum[1], Symphyotrichum puniceum[2], Anemone canadensis[2], Solidago altissima[2], Impatiens capensis[2] (0.73; Pi; loam: clay loam; g-23; G-23; ow-0; wildlife records: D- Eastern Kingbird, Red-winged Blackbird, Song Sparrow (5/27/14), Belted Kingfisher, Black-capped Chickadee, Downy Woodpecker, Warbling Vireo, Willow Flycatcher, Yellow Warbler (6/5/14))
5	2014-251	gcM13	gc*,re	gc: Symphyotrichum lanceolatum[1]; Euthamia graminifolia[2]; Symphyotrichum puniceum[2], Eutrochium maculatum[2]; re: Typha angustifolia[1] (0.08; P; loam; ow-0; seepage; significant species: S- Equisetum variegatum (LR) (10/10/14)
5	2014-260	gcM1-J	gc*,ne	gc: Symphyotrichum lanceolatum[1], Solidago altissima[1], Eutrochium maculatum[1], Euthamia graminifolia[1]; ne: Phalaris arundinacea[1] (2.30; R; loam; ow-5; significant species: X- Redside Dace (E), KP- Elodea canadensis (LR) (9/24/04); comments: permanent stream flowing through community)
5	2015-279B	gcM1-K	gc*,ne	gc: Impatiens capensis[1], Eutrochium maculatum[1], Symphyotrichum lanceolatum[1], Symphyotrichum puniceum[1], Anemone canadensis[2], Bidens frondosa[2], Cicuta maculata[2], Taraxacum officinale[2]; ne: Phalaris arundinacea (0.05; P; loam; ow-0)
5	2014-37	reM4-B	gc,re*	gc: Symphyotrichum lanceolatum[1], Symphyotrichum puniceum[1], Impatiens capensis[1], Lysimachia ciliata[2], Lycopus uniflorus[2]; re: Typha angustifolia (0.09; P; loam: A horizon- loam 20+ cm; O-10; g-1; G-1; ow-0)
5	2014-265	reM4-B	gc,re*	gc: Symphyotrichum lanceolatum[1], Euthamia graminifolia[1]; re: Typha angustifolia (0.16 + 0.09 + 0.04 = 0.29; P; loam; g-5; G-20; ow-0; wildlife: D- Red-winged Blackbird (6/5/14))
5	2014-240	reM5-B	re*	re: Typha latifolia (0.08; P; mesic organic: O-40+; ow-0; seepage)

5	2014-257	reM5-C	re*	re: Typha angustifolia[1], Typha latifolia[1], Phragmites australis ssp. australis[2] (1.18; P; loam; g-5; G-25; ow-5; seepage)
5	2014-33	neM6-A	gc,re,ne*	gc: Symphyotrichum lanceolatum[1], Impatiens capensis[2]; re: Typha angustifolia[1], Phragmites australis ssp. australis[1]; ne: Phalaris arundinacea (0.16; P; loam 30+ cm; g-10; G-25; ow-0; wildlife records: D- Yellow Warbler (5/27/14), American Goldfinch, Baltimore Oriole, Spotted Sandpiper (6/5/14))
5	2014-23	neM6-A	gc,re,ne*	gc: Impatiens capensis[1], Symphyotrichum lanceolatum[1]; re: Typha latifolia[1], Phragmites australis ssp. australis[2]; ne: Phalaris arundinacea[1], Agrostis gigantea[2], Equisetum arvense[2] (1.71; P; loam; g-5; G-10; ow-0; seepage; wildlife records: M- Chimney Swift flyover, D- American Robin, Gray Catbird, Swamp Sparrow, Yellow Warbler (5/29/14), Eastern Kingbird, Red-winged Blackbird (6/7/14); comment: Z- considerable amount of water flowing south under culvert at 19th Avenue on April 26 & May 26, 2017)
5	2014-22	suW14-B	su*	su: Chara sp.[1], Ceratophyllum demersum[1] (0.35; P; mesic organic: O-50+ cm; ow-100; significant species: S- Ceratophyllum demersum (LR) (21/08/14); wildlife records: S- 15 Bullfrogs, 10 Bullfrogs just transformed, 8 Green Frogs, 2 Mallards, water striders, scuds, water boatmen, dragonflies (8/21/14), SV- Green Frog (call level 1), Bullfrog (call level 1) (6/4/15))
5	2014-48	suW14-C	su*	su: Ceratophyllum demersum (0.12; Pi; loam; ow-100; significant species: S- Ceratophyllum demersum (LR) (9/4/14); wildlife records: S- Green Frog, dragonfly (9/4/14), D- Northern Leopard Frog (6/5/14))
5	2014-35	suW15	re,su*	re: Schoenoplectus tabernaemontani; su: Chara sp. (0.06; P; limestone gravel; ow-70; wildlife records: S- Green Frogs, Green Frog just transformed, Bullfrogs, Bullfrogs just transformed, scuds, water striders, water boatmen, damselfly nymphs (8/22/14), D- Song Sparrow (6/5/14); comments: dug-out pond)
5	2014-19	fW18	f*,su	f: Potamogeton natans; su: submerged plants (0.11; P; loam; ow-100; significant species: S- Potamogeton natans (LR) (8/21/14); wildlife records: S- female Wood Duck, Belted Kingfisher flyover (8/21/14), D- Mallard, Green Frog (6/7/14); comments: community based on observations from 19th Avenue and air photo interpretation)
6	2014-319	suW14	su*	su: submerged plants (0.07; I; loam; ow-100; comments: community based on air-photo interpretation because permission was not given to enter the property)
7	2014-14	neS15	ts,gc,re,ne*	ts: Salix exigua[1], Salix petiolaris[2], Salix discolor[2], Salix bebbiana[2], Cornus sericea[2]; gc: Symphyotrichum lanceolatum[1], Euthamia graminifolia[1], Eupatorium perfoliatum[2], Eutrochium maculatum[2], Symphyotrichum puniceum[2]; re: Typha latifolia; ne: Phalaris arundinacea[1], Agrostis gigantea[2], Scirpus atrovirens[2], Juncus dudleyi[2] (0.49; P; loam: A horizon- loam 20 cm, B horizon- sandy loam 15+ cm; g-20; G-20; wt-4; ow-0; seepage; significant species: S- Salix petiolaris (LR), Equisetum variegatum (LR) (8/21/14))
8	2015-14C	neM7-B	gc,ne*	gc: Symphyotrichum lanceolatum[1], Euthamia graminifolia[1], Impatiens capensis[1], Symphyotrichum puniceum[1], Tussilago farfara[1], Eutrochium maculatum[2]; ne: Phalaris arundinacea[1], Agrostis gigantea[1], Juncus dudleyi[1], Agrostis stolonifera[1], Scirpus atrovirens[2], Glyceria striata[2] (0.09; P; sand: A horizon- clay loam 15 cm, B horizon- fine sand 15+ cm; g-10; G-10; wt-50; ow-5; seepage; wildlife records: V- 15 Green Frogs, scuds, water striders; comments: watercourse dry during August 31, 2015 site visit)

9	2014-254	tsS11-C	ts*,ne	ts: Salix petiolaris[1], Cornus sericea[1]; ne: Equisetum arvense (0.04; P; loam; g-5; G-15; ow-0; seepage; significant species: S- Salix petiolaris (LR))
10	2014-49	tsS21-A	ts*,gc	ts: Salix eriocephala[1], Salix discolor[2], Cornus sericea[2]; gc: Symphyotrichum lanceolatum[1], Eutrochium maculatum[2], Symphyotrichum puniceum[2], Impatiens capensis[2] (0.19; I; loam: A horizon- clay loam 20+ cm; g-15; G-15; ow-0)
11	2015-204A	tsS21-B	ts*,gc	ts: Cornus sericea[1], Rhamnus cathartica[2]; gc: Symphyotrichum lanceolatum[1], Euthamia graminifolia[2], Solidago altissima[2], Eutrochium amcualtum[2], Symphyotrichum puniceum[2] (0.74; Pi; loam; g-10; G-25; ow-0; wildlife records: SH- Common Yellowthroat (7/11/14))
11	2015-204B	reM4-B	gc,re*	gc: Symphyotrichum lanceolatum; re: Typha angustifolia (0.07; Pi; loam; ow-0)
11	2015-204C	gcM11-C	gc*	gc: Symphyotrichum lanceolatum (0.35; Pi; loam; g-5; G-15; ow-0)
12	2014-31B	tsS10	h,ts*,gc,re	h: Salix xrubens[1], Acer negundo[2]; ts: Cornus sericea[1], Salix eriocephala[1], Salix amygdaloides[1]; gc: Impatiens capensis[1]; re: Typha latifolia[1], Phragmites australis ssp. australis[1] (0.13; P; loam: A horizon- loam 20+ cm; g-5; G-20; wt-20; ow-0)
12	2014-31A	neM6-A	gc,re,ne*	gc: Impatiens capensis[1]; re: Typha latifolia[1], Phragmites australis ssp. australis[1]; ne: Phalaris arundinacea (0.38; P; loam: A horizon- loam 20+ cm; g-5; G-20; wt- 20; ow-0)
13	2014-30B	hS18-B	h*,ts	h: Salix amygdaloides[1], Salix xrubens[2]; ts: Salix eriocephala (0.07; I; sand: A horizon- sand 20+ cm; g-0; G-10; ow-0; significant species: S- Salix lucida (LR) (08/22/14))
13	2014-30A	reM19	re*,ff	re: Typha angustifolia; ff: Spirodela polyrhiza[1], Lemna trisulca[1] (0.16; I; sand; O-20; g-0; G-0; ow-50; significant species: S- Spirodela polyrhiza (LR), Lemna trisulca (LR) (8/22/14); wildlife records: S- Red-winged Blackbird, Bullfrog, Green Frog, scuds, water striders, damselfly larvae (8/22/14), SV- Wood Frog (call level 1) (5/12/15), 3 Green Frogs (call level 1), American Toad calling, White-tailed Deer, Mallard (6/4/15); comments: no turtle survey has been carried out for this wetland, open water over 30 cm deep is present in the wetland)
14	2014-30C	neM8	ne*	ne: Phalaris arundinacea (3.14; R; loam; ow-0; wildlife records: S- Barn Swallow flyover (8/1/14), D- American Robin, Willow Flycatcher (5/19/14), American Goldfinch (5/29/14), Red-winged Blackbird, Song Sparrow (6/7/14); comments: permanent stream flowing through community, community based on observations from 19th Avenue and air-photo interpretation)
14	2000	neM8	ne*	ne: Phalaris arundinacea (1.83 + 0.84 + 0.58 = 3.25; P; loam: clay loam; ow-0; comments: soils based on York Region soils map; formerly part of the Rouge River Headwater Wetland Complex)
14	2014-305	gcM9-C	gc*,re,ne	gc: Solidago altissima[1], Symphyotrichum lanceolatum [1], Symphyotrichum novae-angliae[1]; re: Typha angustifolia[1], Phragmites australis ssp. australis[1]; ne: Phalaris arundinacea[1] (0.06; R; loam; ow-0; comments: community based on observations from 19th Avenue and Woodbine Avenue and and air-photo interpretation, permanent stream flowing through community)
14	2000	reM12-B	re*,ne	re: Typha latifolia; ne: Phalaris arundinacea (9.22; R; loam: clay loam; ow-0; comments: soils based on York Region soils map; formerly part of the Rouge River Headwater Wetland Complex)
14	2014-306	suW14	su*	su: submerged plants (0.10; R; loam; ow-100; comments: community based on air-photo interpretation, permanent stream flowing through community)

15	2014-29; 2017	neM8	ne*	ne: Phalaris arundinacea (0.80; P; loam; ow-0; comments: community based on observations from Woodbine Avenue; Z- stream in ditch along the west side of Woodbine Avenue flowing on April 26 and May 26, 2017 with Small-leaved Water-cress present in the stream)

MNRF Identified Wetlands

2014-27B	neM	gc,re,ne*	gc: Symphotrichum lanceolatum[1], Solidago altissima[1]; re: Typha sp.; ne: Phalaris arundinacea (0.04; P; loam; ow-0)
2014-29	reS	ts,gc,re*,ne	ts: Cornus sericea[1], Salix eriocephala[2]; gc: Symphyotrichum lanceolatum[1], Impatiens capensis[1], Symphyotrichum puniceum[1], Solidago altissima[1], Persicaria maculosa[2], Lythrum salicaria[2], Epilobium parviflorum[2], Solanum dulcamara[2], Bidens vulgata[2]; re: Typha latifolia[1], Typha xglauca[1], Phragmites australis ssp. australis[2]; ne: Leersia oryzoides[1], Agrostis gigantea[2], Echinochloa crusgalli[2], Equisetum arvense[2] (0.38; Pi; loam: A horizon- loam 20 cm, B horizon- clay loam 10+ cm; O-5; g-0; G-15; ow-0; wildlife records: D- Red-winged Blackbird (06/06/14))
2014-32B	neM	gc,re,ne*	gc: Symphyotrichum lanceolatum[1], Solidago altissima[2]; re: Typha latifolia; ne: Leersia oryzoides[1], Equisetum arvense[2] (0.26; P; loam; ow-0)
2014-40	neM	re,ne*	re: Typha angustifolia[1], Typha latifolia[2]; ne: Phalaris arundinacea[1], Agrostis gigantea[2], Agrostis stolonifera[2] (0.68; P; loam: A horizon- clay loam 40+ cm; g-34; G-34; ow-0; wildlife records: D- Red-winged Blackbird, Song Sparrow)
2014-41	neM	re,ne*	re: Typha latifolia; ne : Phalaris arundinacea[1], Agrostis stolonifera[2], Agrostis gigantea[2] (0.42; P; loam: clay loam 40+ cm; g-34; G-34; ow-0; wildlife records: D- Black-bellied Plover, Killdeer, Red-winged Blackbird, Spotted Sandpiper)
2015-204D	gcM	gc*	gc: Symphyotrichum lanceolatum (0.08; Pi; loam; g-5; G-15; ow-0)
2015-204E	gcM	gc*	gc: Symphyotrichum lanceolatum (0.02; Pi; loam; g-5; G-15; ow-0)

Legend

Vegetation Forms:

h- deciduous trees
c- coniferous trees
dh- dead deciduous trees
dc- dead coniferous trees
ts- tall shrubs
ls- low shrubs
ds- dead shrubs
gc- ground cover
m- mosses
re- robust emergents
ne- narrow-leaved emergents
be- broad-leaved emergents
f- fixed-floating plants
ff- free floating plants
su- submerged plants
u- unvegetated
*- dominant form

Map Codes:

M- marsh
W- open water marsh
S- swamp

Wetland Name: Bruce & Berczy Creek Wetland Complex

Wetland Size (ha): 105.52

Vegetation Form	% area in which form is dominant	
h	21.7	(22.90 ha)
c	9.3	(9.79 ha)
dh	0.0	(0.00 ha)
dc	0.0	(0.00 ha)
ts	1.2	(1.22 ha)
ls	0.0	(0.00 ha)
ds	0.0	(0.00 ha)
gc	21.1	(22.29 ha)
m	0.0	(0.00 ha)
ne	30.3	(31.99 ha)
be	0.0	(0.00 ha)
re	15.5	(16.37 ha)
ff	0.0	(0.00 ha)
f	0.1	(0.11 ha)
su	0.8	(0.85 ha)
u (unvegetated)	0.0	(0.00 ha)
Total = 100%	100.0	

1.2.3 Diversity of Surrounding Habitat

Check all appropriate items. Only habitat within 1.5 km of the wetland boundary and at least 0.5 ha in size is to be scored.

1	row crop
	pasture
1	abandoned agricultural land
1	deciduous forest
1	coniferous forest
1	mixed forest*
	abandoned pits and quarries
	open lake or deep river
1	fence rows with cover, or shelterbelts
1	terrain appreciably undulating, hilly, or with ravines
1	creek flood plain
8	Subtotal

** "Mixed forest" is defined as either 25% coniferous trees distributed singly or in clumps in deciduous forest, or 25% deciduous treesdistributed singly or in clumps in coniferous forest. Note that Forest Resource Inventory (FRI) maps can be misleading since 25% conifer within a unit could be entirely concentrated around a lake.*

Score 1 point for each feature checked, up to a maximum of 7 points.

Diversity of Surrounding Habitat Score (maximum 7 points) **7**

1.2.4 Proximity to Other Wetlands

Check highest appropriate category. (Note: if the wetland is lacustrine, score option #1 at 8 points).

	Hydrologically connected by surface water to other wetlands (different dominant wetland type) or to open lake or deep river within 1.5 km	8 points
8	Hydrologically connected by surface water to other wetlands (same dominant wetland type) within 0.5 km	8
	Hydrologically connected by surface water to other wetlands (different dominant wetland type), or to open lake or deep river from 1.5 to 4 km away	5
	Hydrologically connected by surface water to other wetlands (same dominant wetland type) from 0.5 to 1.5 km away	5
	Within 0.75 km of other wetlands (different dominant wetland type) or open water body, but not hydrologically connected by surface water	5
	Within 1 km of other wetlands, but not hydrologically connected by surface water	2
	No wetland within 1 km	0

Name and distance (from wetland) of wetlands/water bodies scored above:

Hydrologically connected within 0.5 km to MNRF Identified Wetlands both upstream and downstream.

Proximity to other Wetlands Score (maximum 8 points) **8**

1.2.5 Interspersion

Number of Intersections = **127**

	Number of Intersections *(Check only one)*		
	26 or less	=	3 points
	27 to 40	=	6
	41 to 60	=	9
	61 to 80	=	12
	81 to l00	=	15
	101 to 125	=	18
21	126 to 150	=	21
	151 to 175	=	24
	176 to 200	=	27
	>200	=	30

Interspersion Score **21**
(maximum 30 points)

1.2.6 Open Water Types

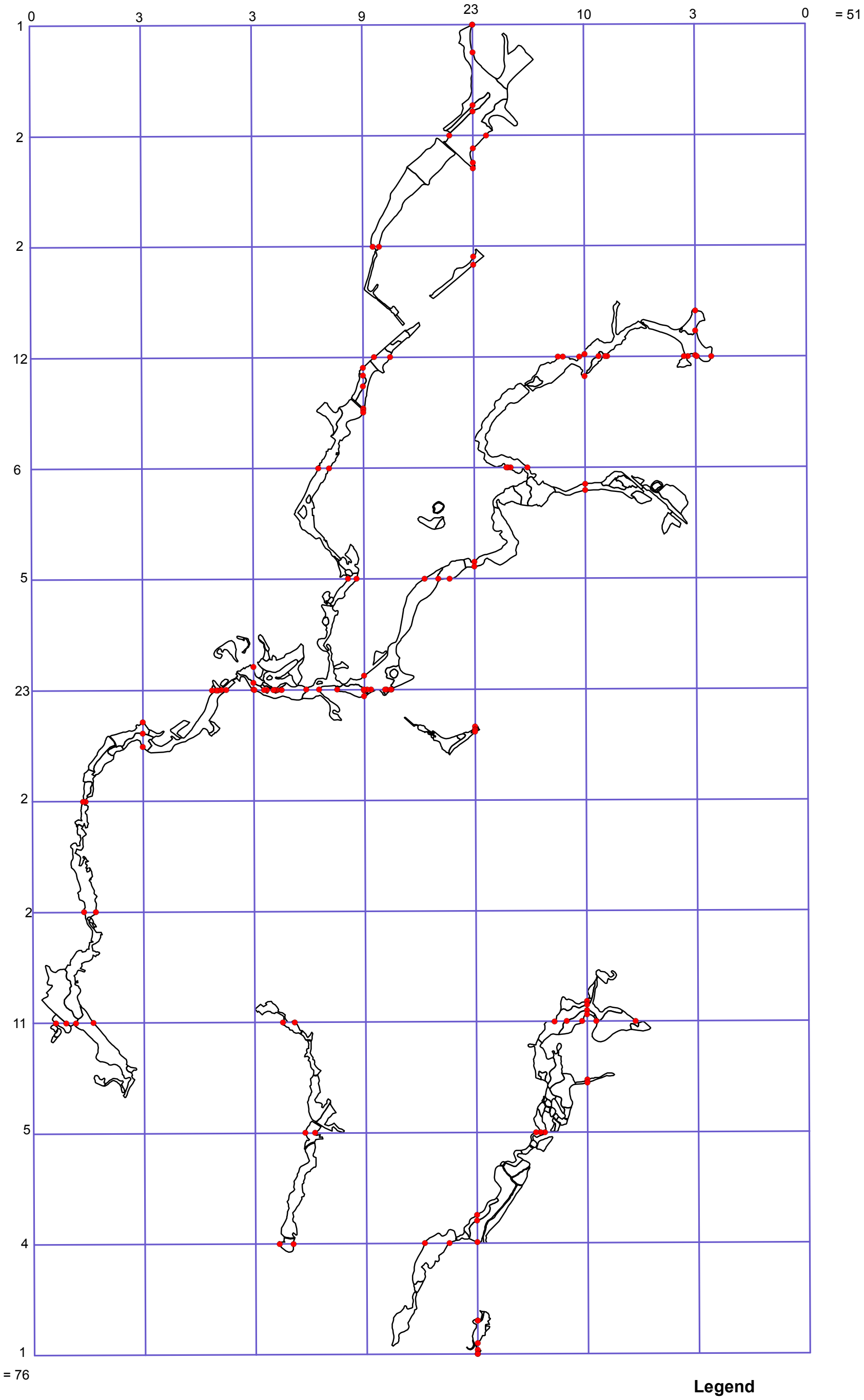
Note: this attribute is only to be scored for permanently flooded open water within the wetland (adjacent lakes do not count). Check one option only.

	Open Water Type	Characteristic	Points
8	type 1	Open water occupies < 5 % of wetland area	8
	type 2	Open water occupies 5-25% of wetland (occurring in central area)	8
	type 3	Open water occupies 5-25% (occurring in various-sized ponds, dense patches of vegetation or vegetation in diffuse stands)	14
	type 4	Open water occupies 26-75% of wetland (occurring in a central area)	20
	type 5	Open water occupies 26-75% of wetlands (small ponds and embayments are common)	30
	type 6	Open water occupies 76%-95% of wetland (occurring in large central area; vegetation is peripheral)	8
	type 7	Open water occupies 76-95% of wetland (vegetation in patches or diffuse open stands)	14
	type 8	Open water occupies more than 95% of wetland area	3
	no open water		0

Open water occupies **1.92 % (2.03 ha) of wetland complex.**

Open Water Type Score **8**
(maximum 30 points)

Bruce & Berczy Creek Wetland Complex
INTERSPERSION GRID = 127



1:19,000

0 175 350 700 1,050 1,400 Meters

Legend

- Intersections (127)
- Grid
- Bruce & Berczy Creek Wetland Complex

1.3 Size (Biological Component)

Total Size of Wetland = **105.52** ha

Sum of scores from Biodiversity Subcomponent

1.2.1
+1.2.2
+1.2.3
+1.2.4
+1.2.5
+1.2.6

87

Wetland Size (ha)	Total Score for Biodiversity Subcomponent									
	<37	37-48	49-60	61-72	73-84	**85-96**	97- 108	109-120	121- 132	>132
<20 ha	1	5	7	8	9	17	25	34	43	50
20-40	5	7	8	9	10	19	28	37	46	50
41-60	6	8	9	10	11	21	31	40	49	50
61-80	7	9	10	11	13	23	34	43	50	50
81-100	8	10	11	13	15	25	37	46	50	50
101-120	9	11	13	15	18	**28**	40	49	50	50
121-140	10	13	15	17	21	31	43	50	50	50
141-160	11	15	17	19	23	34	46	50	50	50
161-180	13	17	19	21	25	37	49	50	50	50
181-200	15	19	21	23	28	40	50	50	50	50
201-400	17	21	23	25	31	43	50	50	50	50
401-600	19	23	25	28	34	46	50	50	50	50
601-800	21	25	28	31	37	49	50	50	50	50
801-1000	23	28	31	34	40	50	50	50	50	50
1001-1200	25	31	34	37	43	50	50	50	50	50
1201-1400	28	34	37	40	46	50	50	50	50	50
1401-1600	31	37	40	43	49	50	50	50	50	50
1601-1800	34	40	43	46	50	50	50	50	50	50
1801-2000	37	43	47	49	50	50	50	50	50	50
>2000	40	46	50	50	50	50	50	50	50	50

Size Score (Biological Component) **28**
(maximum 50 points)

2.0 SOCIAL COMPONENT

2.1 Economically Valuable Products

2.1.1 Wood Products

Check the option that best reflects the total area (ha) of forested wetland (i.e., areas where the dominant vegetation form is h or c). Note that this is the area of all the forested vegetation communities, not total wetland size.

Do not include areas where harvest is not permitted. Check only one option.

Area of wetland used for scoring 2.1.1:

h:	22.90	c:	9.79

	<5 ha	=	0
	5 -25 ha	=	3
	26 -50 ha	=	6
	51- l00 ha	=	9
	101-200 ha	=	12
	>200 ha	=	18

Source of information:

OMNRF 2014, 2015 & 2017

No logging permitted, therefore scores 0

Wood Products Score **0**
(maximum 18 points)

2.1.2 Wild Rice

(Check only one)

	Present (minimum size 0.5 ha)	=	6 points
0	Absent	=	0
	Harvest not permitted	=	0

Source of information:

OMNRF 2014, 2015 & 2017

Wild Rice not present

Wild Rice Score **0**
(maximum 6 points)

2.1.3 Commercial Bait Fish

(Check only one)

12	Present	=	12 points
	Absent	=	0
	Fishing not permitted	=	0

Source of information:

Bait harvest area currently allocated under an active commercial bait harvest license.

Natosha Fortini, OMNRF Aurora District Biologist

Commercial Fish Score 12
(maximum 12 points)

2.1.4 Furbearers

Only species recognized as furbearers under the Fish & Wildlife Conservation Act may be scored here. Score 3 points for each furbearer species listed, up to a maximum of 12 points.

		Name of furbearer	Source of information
1			OMNRF 2014, 2015 & 2017
2			OMNRF 2014, 2015 & 2017
3			OMNRF 2014, 2015 & 2017
4			OMNRF 2014, 2015 & 2017
5			OMNRF 2014, 2015 & 2017
6			OMNRF 2014, 2015 & 2017
	0	Subtotal	

No trapping allowed in this area, therefore scores 0

Furbearer Score 0
(maximum 12 points)

2.2 Recreational Activities

Sources of information and reasons for scoring a wetland under high or moderate use below, must be included below.

Circle one score for each of the activities listed. Score is cumulative – add score for hunting, nature enjoyment and fishing together for final score.

Intensity of Use	Type of Wetland-Associated Use					
	Hunting		Nature Enjoyment/ Ecosystem Study		Fishing	
High	40 points		40 points		40 points	
Moderate	20		20		20	
Low	8		8	**8**	8	**8**
Not possible/ Not Known	0	**0**	0		0	
Subtotals		**0**		**8**		**8**
					Total	**16**

Sources of information (include evidence/criteria forming basis for score and any relevant reference used to obtain that information):
- e.g., Hunting scored at 20 points: 5 hunting blinds observed; hunters using area frequently monitored for compliance (source: D. Black, MNR Conservation Officer)

Hunting: No hunting allowed in this area

OMNRF 2014, 2015 & 2017

Nature: Wetlands largely occur on private lands, including Angus Glen Golf Club, therefore nature enjoyment scores low

OMNRF 2014, 2015 & 2017

Fishing: Low fishing use

Mark Heaton, OMNRF Aurora District Management Biologist

Recreational Activities Score **16**
(maximum 80 points)

2.3 Landscape Aesthetics

2.3.1 Distinctness

(Check only one)

3	Clearly distinct	=	3 points
	Indistinct	=	0

Landscape Distinctness Score 3
(maximum 3 points)

2.3.2 Absence of Human Disturbance

(Check only one)

	Human disturbances absent or nearly so	=	7 points
4	One or several localized disturbances	=	4
	Moderate disturbance; localized water pollution	=	2
	Wetland intact but impairment of ecosystem quality intense in some areas	=	1
	Extreme ecological degradation, or water pollution severe and widespread	=	0

Details regarding type, extent and location of disturbance scored:

Some infringing on wetland edges by agricultural practises, golfcart trails have been cut through wetlands in the Angus Glen Golf Club, and a groundwater-fed wetland has been recently tilled-drained and converted into agriculture

Source of information:

OMNRF 2014, 2015 & 2017

Absence of Human Disturbance Score 4
(maximum 7 points)

2.4 Education and Public Awareness

2.4.1 Educational Uses

Check highest appropriate category.

	Frequent	=	20 points
	Infrequent	=	12
0	No visits	=	0

Details regarding the type and frequency of education uses scored above:

No known visits.

Source of information:

OMNRF 2014, 2015 & 2017

Educational Uses Score **0**
(maximum 20 points)

2.4.2 Facilities and Programs

Check all appropriate options, score highest category checked.

	Staffed interpretation centre	=	8 points
	No interpretation centre or staff but a system of self-guiding trails or brochures available	=	4
	Facilities such as maintained paths (e.g., woodchips) boardwalks, boat launches or observation towers but no brochures or other interpretation	=	2
0	No facilities or programs	=	0

Additional Notes/Comments:

No known facilities or programs.

Source of information:

OMNRF 2014, 2015 & 2017

Facilities and Programs Score **0**
(maximum 8 points)

2.4.3 Research and Studies

Check all that apply; score highest category checked.

	Long term research has been done	=	12 points
	Research papers published in refereed scientific journal or as a thesis	=	10
5	One or more (non-research) reports have been written on some aspect of the wetland's flora, fauna,hydrology etc.	=	5
	No research or reports	=	0
5	Subtotal:		

List of reports, publications, research studies etc. scored above:

OMNR & TRCA. 2010. Rouge River Fisheries Management Plan. Ontario Ministry of Natural Resources and Toronto and Region Conservation Authority, Ontario, Canada.

Research and Studies Score 5
(maximum 12 points)

2.5 Proximity to Areas of Human Settlement

Name of Settlement: City of Markham

Distance of wetland from settlement: adjoining settlement

Population of settlement: 349,000 (Source: City of Markham)

Circle only the highest score applicable

Distance of wetland to settlement	population >10,000		population 2,500-10,000		population <2,500 or cottage community	
Within or adjoining settlement	40 points	40	26 points		16 points	
0.5 to 10 km from settlement	26		16		10	
10 to 60 km from settlement	12		8		4	
>60 km from settlement	5		2		0	
Total		40		0		0

Proximity to Human Settlement Score 40
(maximum 40 points)

2.6 Ownership

FA of wetland held by or held under a legal contract by a conservation body (as defined by the Conservation Land Act) for wetland protection		x	10	=	0.00	(0.0ha)
FA of wetland occurring in provincially or nationally protected areas (e.g., parks and conservation reserves)		x	10	=	0.00	(0.0ha)
FA of wetland area in Crown/ public ownership, not as above	0.01	x	8	=	0.08	(1.04ha)
FA of wetland area in private ownership, not as above	0.99	x	4	=	3.96	(102.61ha)

Source of information:

OMNRF assessment parcel information

Ownership Score 4

(maximum 10 points)

2.7 Size (Social Component)

Total Size of Wetland = 105.52 ha

Sum of scores from Subcomponents 2.1, 2.2, and 2.5 = 68

Circle the appropriate score from the table below.

	Total for Size Dependent Score									
	<31	31-45	46-60	**61-75**	76-90	91-105	106-120	121-135	136-150	>150
<2 ha	1	2	4	8	10	12	14	14	14	15
2 - 4ha	1	2	4	8	12	13	14	14	15	16
5 - 8ha	2	2	5	9	13	14	15	15	16	16
9 - 12ha	3	3	6	10	14	15	15	16	17	17
13-17	3	4	7	10	14	15	16	16	17	17
18-28	4	5	8	11	15	16	16	17	17	18
29-37	5	7	10	13	16	17	18	18	19	19
38-49	5	7	10	13	16	17	18	18	19	20
50-62	5	8	11	14	17	17	18	19	20	20
63-81	5	8	11	15	17	18	19	20	20	20
82-105	6	9	11	15	18	18	19	20	20	20
106-137	6	9	12	**16**	18	19	20	20	20	20
138-178	6	9	13	16	18	19	20	20	20	20
179-233	6	9	13	16	18	20	20	20	20	20
234-302	7	9	13	16	18	20	20	20	20	20
303-393	7	9	14	17	18	20	20	20	20	20
394-511	7	10	14	17	18	20	20	20	20	20
512-665	7	10	14	17	18	20	20	20	20	20
666-863	7	10	14	17	19	20	20	20	20	20
864-1123	8	12	15	17	19	20	20	20	20	20
1124-1460	8	12	15	17	19	20	20	20	20	20
1461-1898	8	13	15	18	19	20	20	20	20	20
1899-2467	8	14	16	18	20	20	20	20	20	20
>2467	8	14	16	18	20	20	20	20	20	20

Size Score (Social Component) 16

2.8 Aboriginal Values and Cultural Heritage

Either or both Aboriginal or Cultural Values may be scored. However, the maximum score permitted for 2.8 is 30 points.

Full documentation of sources must be attached to the data record.

2.8.1 Aboriginal Values

	Significant	=	30 points
	Not Significant	=	0
	Unknown	=	0
0	Total:		

Additional Comments/Notes:

unknown

2.8.2 Cultural Heritage

	Significant	=	30 points
	Not Significant	=	0
	Unknown	=	0
0	Total:		

Additional Comments/Notes:

unknown

Aboriginal Values/ Cultural Heritage Score **0**

(maximum 30 points)

3.0 HYDROLOGICAL COMPONENT

3.1 Flood Attenuation

Check one of the following four options.

	If wetland is a single contiguous coastal wetland, [a] score 0 points for this section.
	If all wetland units of a wetland complex are coastal wetland units, [a] score 0 points for this section.
	If wetland or wetland complex is entirely isolated in site type, [a] score 100 points automatically.
	Wetland not as above – proceed through 'steps' A through L below.

(A)	Total wetland area	=	105.52	ha				
(B)	Size of wetland's catchment	=	5837.60	ha				
(C)	Size of other detention areas in catchment	=	555.40	ha				
(D)	Size of 'isolated' portions of wetland	=	0.69	(FA =	0.01	)		
(E)	Size of coastal units of wetland complex	=	0.00	(FA =	0.00	)		

Points for Isolated Portion of Wetland (If not applicable, enter '0'):

(F)	(FA of D) x 100 pts	=	0.65	pts

Points for Coastal Portion(s) of Wetland (if not applicable, enter '0')

(G)	(FA of E) x 100 pts	=	0.00	pts

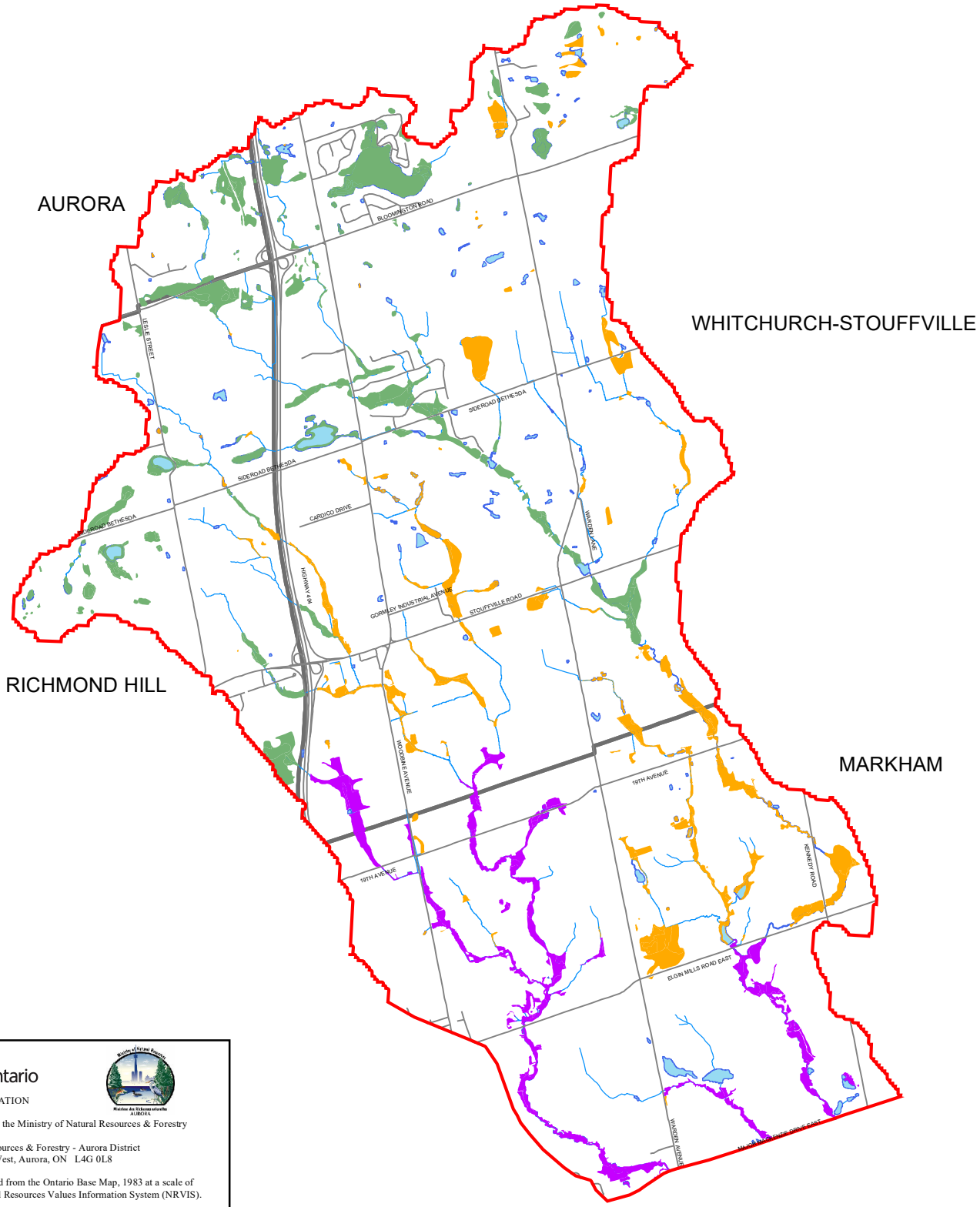
(H)	Size of wetland minus the isolated and coastal portions	=	{A – D – E}	=	104.83	ha	
(I)	Number of points available to score 'rest' of wetland	=	{100 – F – G}	=	99.35	pts	
(J)	Total area of upstream detention areas	=	{A + C }	=	660.92	ha	

(K)	Upstream Detention Factor	{(H/J) x 2}	=	0.32	=	0.32	(maximum 1.0)
(L)	Attenuation Factor	{(H/B) x 10}	=	0.18	=	0.18	(maximum 1.0)

Flood Attenuation Final Score = {[((K + L) /2) x I] + F} = 24.68

Flood Attenuation Score 25
(maximum l00 points)

Bruce & Berczy Creek Wetland Complex Catchment Basin



Ontario

SOURCE OF INFORMATION

Information provided by the Ministry of Natural Resources & Forestry district office in Aurora.
Ministry of Natural Resources & Forestry - Aurora District
50 Bloomington Road West, Aurora, ON L4G 0L8

Base information derived from the Ontario Base Map, 1983 at a scale of 1:10,000 and the Natural Resources Values Information System (NRVIS).

PLEASE NOTE

The information displayed on this map has been compiled from various sources. While every effort has been made to accurately depict the information, this map should be viewed as illustrative only. Do not rely on it as being a precise indicator of routes, locations of features, nor as a guide to navigation.

For detailed information on natural features such as their location, size or status, the individual files held by the Aurora district office of the Ministry of Natural Resources & Forestry should be consulted.

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Universal Transverse Mercator
(6 degree) projection, Zone 17.
North American Datum 1983

N

Wetland Area = 105.5 ha.
Additional Upstream Detention Areas = 555.4 ha.
Size of Catchment Basin = 5,837.6 ha.

Approx. Scale: 1:60,000

0 0.5 1 2 3 4 KM

Legend

- Wetland Catchment Basin
- Evaluated Wetlands
- Bruce & Berczy Creek Wetland Complex
- MNRF Identified Wetland
- Waterbody
- Road
- Watercourse

3.2 Water Quality Improvement

Step 1: Determination of maximum initial score

	Wetland on one of the 5 defined large lakes or 5 major rivers (Go to Step 5A)
x	All other wetlands (Go through Steps 2, 3, 4, and 5B)

Step 2: Determination of watershed improvement factor (WIF)

Calculation of WIF is based on the fractional area (FA) of each site type that makes up the total area of the wetland.

(FA= area of site type/total area of wetland)		Fractional Area					
FA of isolated wetland	=	0.01	x	0.5	=	0.00	(0.69 ha)
FA of riverine wetland	=	0.65	x	1	=	0.65	(68.47 ha)
FA of palustrine wetland with no inflow	=	0.30	x	0.7	=	0.21	(32.08 ha)
FA of palustrine wetland with inflows	=	0.04	x	1	=	0.04	(4.28 ha)
FA of lacustrine on lake shoreline	=	0.00	x	0.2	=	0.00	(0.00 ha)
FA of lacustrine at lake inflow or outflow	=	0.00	x	1	=	0.00	(0.00 ha)
				Sub Total:		0.91	

Sum (WIF cannot exceed 1.0) **0.91**

Step 3: Determination of catchment land use factor (LUF)

(Choose the first category that fits upstream landuse in the catchment)

x	Over 50% agricultural and/or urban	=	1.0
	Between 30 and 50% agricultural and/or urban	=	0.8
	Over 50% forested or other natural vegetation	=	0.6

LUF (maximum 1.0) **1.00**

Step 4: Determination of pollutant uptake factor (PUT)

Calculation of PUT is based on the fractional area (FA) of each vegetation type that makes up the total area of the wetland. Base assessment on the dominant vegetation form for each community except where dead trees or shrubs dominate. In that case base assessment on the domininant live vegetation. (FA = area of vegetation type/total area of wetland)

FA of wetland with live trees, shrubs, herbs or mosses (c,h,ts,ls,gc,m)	0.53	x	0.75	=	0.40	(56.20 ha)
FA of wetland with emergent,submergent or floating vegetation (re,be,ne,su,f,ff)	0.47	x	1	=	0.47	(49.32 ha)
FA of wetland with little or no vegetation (u)	0.00	x	0.5	=	0.00	
			Subtotal:		0.87	

Sum (PUT cannot exceed 1.0) **0.87**

Step 5: Calculation of final score

	Wetland on large lakes or major rivers	0
x	All other wetlands -calculate as follows	
	Initial score	60
	Water quality improvement factor (WIF)	**0.91**
	Land use factor (LUF)	**1.00**
	Pollutant uptake factor (PUT)	**0.87**
	Final score: 60 x WIF x LUF x PUT =	**47.50**

Short Term Water Quality Improvement Score **48**
(maximum 60 points)

3.2.2 Long Term Nutrient Trap

Step 1:

	Wetland on large lakes or 5 major rivers	=	0 points
x	All other wetlands (proceed to Step 2)		

Step 2:

Choose only one of the following settings that best describes the wetland being evaluated

	Wetland located in a river mouth	=	10 points
	Wetland is a bog, fen or swamp with more than 50% of the wetland being covered with organic soil	=	10
	Wetland is a bog, fen or swamp with less than 50% of the wetland being covered with organic soil	=	3
	Wetland is a marsh with more than 50% of the wetland covered with organic soil	=	3
x	None of the above	=	0

Long Term Nutrient Trap Score **0**
(maximum 10 points)

3.2.3 Groundwater Discharge

Circle the characteristics that best describe the wetland being evaluated and then sum the scores. If the sum exceeds 30 points, assign the maximum score of 30). Note: for wetland type, wetland type scored does not have to the dominant type in the wetland.

Percentage of Wetland Area: **1.81** %

	Potential for Discharge						
		None to Little		Some		High	
Wetland Characteristics	Wetland type	Bog = 0		Swamp/Marsh = 2	**2**	Fen = 5	
	Topography	Flat/rolling = 0	**0**	Hilly = 2		Steep = 5	
	Wetland Area: Upslope Catchment Area	Large (>50%) = 0		Moderate (5-50%) = 2		Small <(5%) = 5	**5**
	Lagg Development	None found = 0	**0**	Minor = 2		Extensive = 5	
	Seeps	None = 0		= or < 3 seeps = 2		> 3 seeps = 5	**5**
	Surface marl deposits	None = 0	**0**	= or < 3 sites = 2		> 3 sites = 5	
	Iron precipitates	None = 0		= or < 3 sites = 2		> 3 sites = 5	**5**
	Located within 1 km of a major aquifer	N/A = 0		N/A = 0		Yes = 10	**10**
	Totals		**0**		**2**		**25**

Additional Comments/Notes:

Groundwater Discharge Score **27**
(maximum 30 points)

3.3 Carbon Sink

Check only one of the following:

	Bog, fen or swamp with more than 50% coverage by organic soil	=	5 points
	Bog, fen or swamp with between 10 to 49% coverage by organic soil	=	2
	Marsh with more than 50% coverage by organic soil	=	3
0	Wetlands not in one of the above categories	=	0

Carbon Sink Score **0**
(maximum 5 points)

3.4 Shoreline Erosion Control

Step 1:

	Wetland entirely isolated or palustrine	=	0 points
x	Any part of the wetland riverine or lacustrine	=	Go to step 2

Step 2: *Choose the one characteristic that best describes the shoreline vegetation*
see page 109 for description of "shoreline".)

	Trees and shrubs	=	15 points
8	Emergent vegetation	=	8
	Submergent vegetation	=	6
	Other shoreline vegetation	=	3
	No vegetation	=	0

Shoreline Erosion Control Score **8**
(maximum 15 points)

3.5 Groundwater Recharge

3.5.1 Site Type

Wetland > 50% lacustrine (by area) or located on one of the five major rivers			=	0 points		
Wetland not as above. Calculate final score as follows:						
=	FA of isolated or palustrine wetland	=	0.35	x 50	=	17.5
=	FA of riverine wetland	=	0.65	x 20	=	13.0
=	FA of lacustrine wetland (wetland <50% lacustrine)	=	0.00	x 0	=	0.0
				Subtotal:		30.5

Groundwater Recharge/Wetland Site Type Score (maximum 50 points) **30**

3.5.2 Soil Recharge Potential

Circle only one choice that best describes the soils in the area surrounding the wetland being evaluated (the soils within the wetland are not scored here).

		Group A, B, C (sands, gravels, loams)		Group D (clays, substrates in high water tables, shallow substrates over impervious materials such as bedrock)	
Dominant Wetland Type	Lacustrine or major river	0		0	
	Isolated	10		5	
	Palustrine	7		4	
	Riverine (not on a major river)	5	5	2	
	Totals		5		0

Groundwater Recharge/Wetland Soil Recharge Potential Score (maximum 10 points) **5**

4.0 SPECIAL FEATURES COMPONENT

4.1 Rarity

4.1.1 Wetland Types

Ecodistrict	Rarity within the Landscape (4.1.1.1)	Rarity of Wetland Type (4.1.1.2)			
		Marsh	Swamp	Fen	Bog
6E-1	60	40	0	80	80
6E-2	60	40	0	80	80
6E-3	40	10	0	40	80
6E-4	60	40	0	80	80
6E-5	20	40	0	80	80
6E-6	40	20	0	80	80
6E-7	60	10	0	80	80
6E-8	20	20	0	80	80
6E-9	0	20	0	80	80
6E-10	20	0	20	80	80
6E-11	0	30	0	80	80
6E-12	0	30	0	60	80
6E-13	60	10	0	80	80
6E-14	40	20	0	40	80
6E-15	40	0	0	80	80
7E-1	60	0	60	80	80
7E-2	60	0	0	80	80
7E-3	60	0	0	80	80
7E-4	**80**	**0**	**0**	80	80
7E-5	60	20	0	80	80
7E-6	80	30	0	80	80

4.1.1.1 Rarity within the Landscape

Choose appropriate score from 2nd column above.

Rarity within the Landscape Score **80**
(maximum 80 points)

4.1.1.2 Rarity of Wetland Type

Score is cumulative, based on presence/absence. Circle all appropriate scores from above table and sum.

Rarity of Wetland Type Score **0**
(maximum 80 points)

4.1.2 Species

4.1.2.1 Reproductive Habitat for an Endangered or Threatened Species

Under the "Activity" column, when scoring animal species, record what the animal was doing when observed (e.g., nesting, courtship, singing, etc).

	Common Name	Scientific Name	Activity	Date Observed	Info Source
500	See attached sheet 30A				
500	Total				

For each species score 250 points. (Score is cumulative, no maximum score)

Additional Notes/Comments:

Reproductive Habitat for Endangered or Threatened Species **500**
(no maximum score)

4.1.2.2 Traditional Migration or Feeding Habitat for an Endangered or Threatened Species

Under the "Activity" column, when scoring animal species, record what the animal was doing when observed (e.g., nesting, courtship, singing, feeding, resting etc). Dates that species has been recorded using the wetland must be included in the table below.

	Common Name	Scientific Name	Activity	Date Observed	Info Source
0	Total				

For one species score 150 points; for each additional species score 75 points. (Score is cumulative)

Additional Notes/Comments:

Traditional Habitat for Endangered or Threatened Species **0**
(no maximum score)

4.1.2.3 Provincially Significant Animal Species

	Common Name	Scientific Name	Activity	Date Observed	Info Source
50	See attached sheet 30A				
50	Total				

Additional Notes/Comments:

One	species	=	50 points	9	species	=	140	17 species = 160
2	species	=	80	10	species	=	143	18 species = 162
3	species	=	95	11	species	=	146	19 species = 164
4	species	=	105	12	species	=	149	20 species = 166
5	species	=	115	13	species	=	152	21 species = 168
6	species	=	125	14	species	=	154	22 species = 170
7	species	=	130	15	species	=	156	23 species = 172
8	species	=	135	16	species	=	158	24 species = 174
								25 species = 176

Add one point for every species past 25 (for example, 26 species = 177 points, 27 species = 178 points etc.)

Provincially Significant Animal Species **50**
(no maximum score)

4.1.2.4 Provincially Significant Plant Species

	Common Name	Scientific Name	Activity	Date Observed	Info Source
0	Total				

Additional Notes/Comments:

One	species	=	50 points	9	species	=	140	17 species = 160
2	species	=	80	10	species	=	143	18 species = 162
3	species	=	95	11	species	=	146	19 species = 164
4	species	=	105	12	species	=	149	20 species = 166
5	species	=	115	13	species	=	152	21 species = 168
6	species	=	125	14	species	=	154	22 species = 170
7	species	=	130	15	species	=	156	23 species = 172
8	species	=	135	16	species	=	158	24 species = 174
								25 species = 176

Add one point for every species past 25 (for example, 26 species = 177 points, 27 species = 178 points etc.)

Provincially Significant Plant Species **0**
(no maximum score)

4.1.2.5 Regionally Significant Species

	Common Name	Scientific Name	Activity	Date Observed	Info Source
0	Total				

One	species	=	20 points	4	species	=	45	7 species = 58
2	species	=	30	5	species	=	50	8 species = 61
3	species	=	40	6	species	=	55	9 species = 64
								10 species = 67

For each significant species over 10 in wetland, add 1 point.

Regionally Significant Species Score **0**
(no maximum score)

4.1.2.6 Locally Significant Species

	Common Name	Scientific Name	Activity	Date Observed	Info Source
	See attached sheets 30A-B				
0	Total				

One	species	=	10 points	4	species	=	31	7 species = 43
2	species	=	17	5	species	=	38	8 species = 45
3	species	=	24	6	species	=	41	9 species = 47
								10 species = 49

plus 28 species = 28

For each significant species over 10 in wetland, add 1 point.

Locally Significant Species Score **77**
(no maximum score)

Significant Species – Bruce & Berczy Creek Wetland Complex

4. 1. 2. 1. Reproductive Habitat for an Endangered or Threatened Species
Source: M- MNRF Redside Dace occupied habitat, **S**- Steve Varga, Alexander Kissel & Margaret Berube (OMNR 2014), **SV**- Savanta Inc. 2014, **B**- Beacon Environmental 2014, **D**- Dougan & Associates 2014
Status: provincially endangered species based on OMNRF, Species at Risk Section, Species at Risk in Ontario List; S2 ranked species tracked by the OMNRF Natural Heritage Information Centre (NHIC) being known from between 5 and 20 locations in Ontario
Location: The wetland in which the species occurs is indicated by wetland number from W1 to W15

1. *Clinostomus elongates* (Redside Dace) M; W1 & 5
2. *Juglans cinerea* (Butternut) S, SV, B, D; W5

4. 1. 2. 3. Provincially Significant Animal Species
Source: observed by **D**- Dougan & Associates in May & June 2014
Status: special concern species based on OMNRF, Species at Risk Section, Species at Risk in Ontario List; species tracked by the OMNRF Natural Heritage Information Centre (NHIC): **S4B**- ranked breeding species known from over 100 locations in Ontario
Location: The wetland in which the species occurs is indicated by wetland number from W1 to W15

1. *Contopus virens* (Eastern Wood-pewee) W5

4.1.2.6 Locally Significant Plant Species (Rare in Ecodistrict 7E-4)
Source: M- Steve Varga, Alexander Kissel & Margaret Berube (OMNR 2014) Markham portion; **S**- Steve Varga, Alexander Kissel, Keegan McKitterick & Margaret Berube (OMNR 2014) Whitchurch-Stouffville portion, **B**- Beacon Environmental 2014, **SV**- Savanta Inc. 2014, **T**- TRCA 2004
Status: based on Varga S. et al. 2004. Distribution and Status of the Vascular Plants of the Greater Toronto Area, Ontario, Ministry of Natural Resources, Aurora District, being known from 12 or less locations in Ecodistrict 7E-4
Location: The wetland in which the species occurs is indicated by wetland number from W1 to W15

1. *Abies balsamea* (Balsam Fir) M, T; W2
2. *Bidens tripartita* (Three-parted Beggar Ticks) S; W5
3. *Carex crinita* (Fringed Sedge) B
4. *Carex hitchcockiana* (Hitchcock's Sedge) T; W1
5. *Carex interior* (Inland Sedge) T; W1
6. *Carex pellita* (Woolly Sedge) M; W1 & 5
7. *Carex stricta* (Tussock Sedge) M; W5
8. *Ceratophyllum demersum* (Common Coontail) S, M; W5
9. *Cicuta bulbifera (*Bulb-bearing Water-hemlock) S, B
10. *Cyperus bipartitus* (River Umbrella Sedge) M; W5
11. *Dryopteris cristata* (Crested Wood Fern) M, T; W1
12. *Elodea canadensis* (Canada Waterweed) S, T; W5
13. *Equisetum fluviatile* (Water Horsetail) S, M, T; W1 & 5
14. *Equisetum pratense* (Meadow Horsetail) B; W1
15. *Equisetum variegatum* (Variegated Horsetail) S, M; W5 & 7
16. *Geum rivale* (Water Avens) T; W1
17. *Gymnocarpium dryopteris* (Oak Fern) M, T; W1
18. *Hydrocotyle americana* (Marsh Pennywort) T; W1 & 5
19. *Lactuca biennis* (Tall Blue Lettuce) M; W1
20. *Larix larcina* (Tamarack) B, M; W1
21. *Lemna trisulca* (Star Duckweed) B; W13
22. *Mitella nuda* (Naked Mitrewort) T; W1
23. *Nymphaea odorata* (Fragrant Water-lily) S, B
24. *Osmunda regalis* (Royal Fern) M, T; W1
25. *Persicaria amphibia* (Water Smartweed) S, SV
26. *Persicaria pensylvanica* (Pink Knotweed) B
27. *Picea glauca* (White Spruce) B, SV, M; W2
28. *Pilea fontana* (Spring Clearweed) M, T; W5

29. *Potamogeton natans* (Common Floating Pondweed) S, M, T; W5
30. *Ribes triste (*Swamp Red Current) B; W1
31. *Salix lucida (*Shining Willow) M; W13
32. *Salix petiolaris* (Slender Willow) S, M, T, B; W7 & 9
33. *Schizachne purpurascens* (False Melic Grass) T; W1
34. *Solidago rugosa* (Rough Goldenrod) S, D; W5
35. *Spirodela polyrhiza* (Greater Duckweed) S, T; W13
36. *Teucrium canadense* (Wood Germander) M; W5
37. *Wolffia borealis (*Northern Water-meal) SV
38. *Wolffia columbiana* (Columbia Water-meal) SV

Locally Uncommon Plant Species (Uncommon in Ecodistrict 7E4)*
Source: **M**- Steve Varga, Alexander Kissel & Margaret Berube (OMNR Aurora District 2014) Markham portion; **S**- Steve Varga, Alexander Kissel, Keegan McKitterick & Margaret Berube (OMNR Aurora District 2014) Whitchurch-Stouffville portion, **B**- Beacon Environmental 2014, **T**- TRCA 2014, **D**- Dougan & Associates 2014
Status: based on Varga S. et al. 2004. Distribution and Status of the Vascular Plants of the Greater Toronto Area, Ontario, Ministry of Natural Resources, Aurora District, being known from 13 to 20 locations in ecodistrict 7E-4
Location: The wetland in which the species occurs is indicated by wetland number from W1 to W15
1. *Calystegia sepium* (Hedge Bindweed) D, M; W5
2. *Carex lacustris* (Common Lake Sedge) D, M; W5
3. *Carex lupulina* (Hop Sedge) D; W5
4. *Carex retrorsa* (Retrorse Sedge) M; W1 & 5
5. *Cuscuta gronovii* (Swamp Dodder) B, M, D; W1
6. *Fraxinus nigra* (Black Ash) S, B, T, M; W1
7. *Viola affinis* (Le Conte's Violet) T; W1

*Locally uncommon plant species provided are not assigned points in the wetland scoring record but are provided as one of the reasons for the inclusion of wetland units less than 2.0 ha in size.

4.2 Significant Features and Habitats

4.2.1 Colonial Waterbirds

Record all available information. Score the highest applicable category. Include additional information as possible (e.g., nest locations, etc).

Activity	Species	Info Source	Points	
Currently nesting			= 50	
Known to have nested within the past 5 years			= 25	
Active feeding area (great blue heron excluded)			= 15	
None known			= 0	
Total:				0

Additional Notes/Comments:

none observed

Colonial Waterbird Nesting Score **0**
(maximum 50 points)

4.2.2 Winter Cover for Wildlife

Score highest appropriate category. Include rationale/sources of information.

	Provincially significant	=	00 points
	Significant in Ecoregion	=	50
	Significant in Ecodistrict	=	25
10	Locally significant	=	10
	Little or poor winter cover	=	0
10			

Species/habitat/vegetation community scored (e.g., winter deer cover in hemlock swamp, S3 and S4b):

9.8 ha of conifer dominated swamp on Bruce Creek provide some winter cover for White-tailed Deer

Source of information:

OMNRF 2014 & 2015

Winter Cover for Wildlife Score **10**
(maximum 100 points)

4.2.3 Waterfowl Staging and/or Moulting Areas

Check highest level of significance for both staging and moulting; add scores for staging and for moulting together for final score. However, maximum score for evaluation under this section is 150 points.

	Staging			Moulting		
Nationally/internationally significant	= 150		points	= 150		points
Provincially significant	= 100			= 100		
Significant in the Ecoregion	= 50			= 50		
Significant in Ecodistrict	= 25			= 25		
Known to occur	= 10	10		= 10		
Not possible/Unknown	= 0			= 0		
Subtotal:		10			0	
Total:		10				

Species/habitat/vegetation community scored (e.g., approx 20 mallards in W3):

ducks have been observed staging

Source of information:

OMNRF Field Observations; Dougan & Associates Field Observations

Waterfowl Staging/ Moulting Score 10
(maximum 150 points)

4.2.4 Waterfowl Breeding

Check highest level of significance.

	Nationally/ internationally significant	=	150 points
	Provincially significant	=	100
	Significant in the Ecoregion	=	50
	Significant in Ecodistrict	=	25
10	Habitat Suitable	=	10
	Habitat not suitable	=	0

Species/habitat/vegetation community scored (e.g., mallard in W3):

mallards in W5 and W13

Source of information:

OMNRF Field Observations; Dougan & Associates Field Observations

Waterfowl Breeding Score 10
(maximum 100 points)

4.2.5 Migratory Passerine, Shorebird or Raptor Stopover Area

Check highest level of significance.

	Nationally/ internationally significant	=	150 points
	Provincially significant	=	100
	Significant in Ecoregion	=	50
	Significant in Ecodistrict	=	25
10	Known to occur	=	10
	Not possible/ Unknown	=	0

Species/habitat/vegetation community scored:

Songbirds observed migrating and resting in the wetlands and surrounding forests

Source of information:

OMNRF Field Observations

Passerine, Shorebird or Raptor Stopover Score 10
(maximum 100 points)

4.2.6 Fish Habitat

4.2.6.1 Spawning and Nursery Habitat

Area Factors for Low Marsh, High Marsh and Swamp Communities.

No. of ha of Fish Habitat	Area Factor
< 0.5 ha	0.1
0.5- 4.9	0.2
5.0- 9.9	0.4
10.0- 14.9	0.6
15.0 -19.9	0.8
20.0+ ha	1.0

Step 1:

[ ]	Fish habitat is not present within the wetland	Go to Step 7, Score 0 points
[x]	Fish habitat is present within the wetland	Go to Step 2

Step 2: Choose only one option

[x]	Significance of the spawning and nursery habitat within the wetland is known	Go to Step 3
[ ]	Significance of the spawning and nursery habitat within the wetland is not known	Go through Steps 4, 5 and 6

Step 3: Select the highest appropriate category below, attach documentation:

[ ]	Significant in Ecoregion	Go to Step 7,	l00 points
[ ]	Significant in Ecodistrict	Go to Step 7,	50
[ ]	Locally Significant Habitat (5.0+ ha)	Go to Step 7,	25
[15]	Locally Significant Habitat (<5.0 ha)	Go to Step 7,	15

Subtotal: 15

Source of information:
Mark Heaton OMNRF Auora District Management Biologist & Aurora District fish file records (see sheet 33A)

Step 4: Low Marsh = the 'permanent' marsh area, from the existing water line out to the outer boundary of the wetland.

[ ]	Low marsh not present	Go to Step 5
[ ]	Low marsh present	Continue through Step 4, scoring as noted below

FISH RECORDS IN AND AROUND THE BRUCE & BERCZY CREEK WETLAND COMPLEX

Based on OMNRF Aurora District Office fish records for Bruce and Berczy Creeks sub-watersheds in the Rouge River Watershed (OMNR 1975-2005)

Locality of Station	Fish dot #	collected	Collectors	# caught	Fish type
Tributary of Berczy Creek, east of Highway 404 between Stouffville Rd. and 19th Ave (15 metres (m) west of Wetland No. 14)	378	25/06/1998	DRC CSM	0	no catch
		28/09/1998	DRC CSM	0	no catch
Tributary of Berczy Creek, east of Highway 404 and south of 19th Ave. (3 m west of Wetland No. 14)	408	09/07/1998	A. Brooks S. Kostyniuk	48	Blacknose Dace
				52	Creek Chub
				3	Longnose Dace
				8	Johnny Darter
Berczy Creek, north of Elgin Mills Rd. and east of Woodbine Ave. (n Wetland No. 5)	545	18/08/2005	D. Couture D. Crawford	90	White Sucker
				185	Blacknose Dace
				5	Johnny Darter
				74	Brook Stickleback
				50	Creek Chub
				1	Rainbow Darter
Berczy Creek, south of Elgin Mills Rd. and east of Woodbine (in Wetland No. 5)	130	14/06/1984	not specified	19	White Sucker
				59	Blacknose Dace
				7	Redside Dace
				1	Johnny Darter
				13	Creek Chub
				14	Common Shiner
				5	Longnose Dace
				1	Bluntnose Minnow
				3	Rainbow Darter
		24/06/1985	not specified	20	Johnny Darter
				19	White Sucker
				56	Creek Chub
				2	Brook Stickleback
				5	Longnose Dace
				189	Blacknose Dace
				18	Common Shiner
				4	Northern Redbelly Dace
				3	Bluntnose Minnow
				3	Redside Dace
				2	Fathead Minnow
		17/07/2003	not specified	45	White Sucker
				12	Northern Redbelly Dace
				5	Redside Dace
				2	Bluntnose Minnow
				3	Fathead Minnow
				42	Blacknose Dace
				23	Creek Chub
				8	Brook Stickleback
				7	Darter sp.
Berczy Creek, upstream of Major Mackenzie Dr. and west of Warden Ave. (in Wetland No. 5)	543	06/05/2005	A. Bruce D. Crawford M. Kiddie	9	Bluntnose Minnow
				8	Rainbow Trout
				1	Brown Trout
				8	Longnose Dace
				12	Northern Redbelly Dace
				6	Creek Chub

				77	Blacknose Dace
				25	White Sucker
				6	Rainbow Darter
				20	Brook Stickleback
				46	Johnny Darter
				1	Common Shiner
		28/09/2005	D. Crawford	2	Rainbow Trout
			M. Kiddie	21	White Sucker
				5	Bluntnose Minnow
				8	Rainbow Darter
				2	Brook Stickleback
				2	Fathead Minnow
				15	Creek Chub
				27	Johnny Darter
				39	Blacknose Dace
Tributary of Bruce Creek, upstream of Major Mackenzie Drive crossing east side of the Angus Glen Golf Club (in Wetland No. 3)	295	12/07/1999	C.J. Agnew	2	Rainbow Trout
			G.Z. Katona	13	Creek Chub
				5	Pumpkinseed
				10	Emerald Shiner
				8	Longnose Dace
				3	Blacknose Dace
				1	Brassy Minnow
				4	Johnny Darter
				3	Bluntnose Minnow
				1	Finescale Dace
Bruce Creek, at 4228 Elgin Mills Rd. East (115 m upstream of Wetland No. 1)	37	10/08/1994	C. Hopkins	7	Brown Trout
			H. Orr	11	Rainbow Trout
			T. Ciszkowski	5	Largemouth Bass
			J. Pressey	2	Pumpkinseed
				1	Brown Bullhead
				95	White Sucker
				7	Redside Dace
				59	Blacknose Dace
				18	Longnose Dace
				76	Creek Chub
				63	Common Shiner
				23	Rainbow Darter
				25	Johnny Darter
				15	Bluntnose Minnow
				3	Fathead Minnow
				1	Brook Stickleback
Bruce Creek, in the Angus Glen Golf Club at Major Mackenzie Drive and Kennedy Rd. W. (in Wetland No. 1)	38	05/08/1994	C. Hopkins	9	Largemouth Bass
			H. Orr	5	Pumpkinseed
			T. Ciszkowski	76	Blacknose Dace
			J. Pressey	162	Creek Chub
				4	Longnose Dace
				23	Rainbow Darter
				44	Johnny Darter
				35	White Sucker
				12	Northern Brook Lamprey
				1	Bluntnose Minnow
				2	Emerald Shiner
Bruce Creek, at 4318 Elgin Mills Rd. East (370 m upstream of Wetland No. 1)	22	11/08/1994	C. Hopkins	10	Largemouth Bass
			H. Orr	58	White Sucker
			T. Ciszkowski	6	Redside Dace

			J. Pressey	72	Blacknose Dace
				5	Longnose Dace
				130	Creek Chub
				1	Common Shiner
				3	Rainbow Darter
				27	Johnny Darter
				1	Northern Brook Lamprey
		14/06/1998	A. Brooks	8	Brook Trout
			S. Kostyniuk	99	Blacknose Dace
				2	Longnose Dace
				62	Creek Chub
				57	Johnny Darter
				9	White Sucker
				8	Redside Dace
				1	American Brook Lamprey
				2	Rainbow Trout
				33	Bluntnose Minnow
				3	Rainbow Darter
Bruce Creek, 1 kilometre (km) north of Major Mackenzie Drive on Kennedy Rd. S. (in Wetland No. 1)	40	12/10/1984	Snowden	53	White Sucker
			Sherin	2	Northern Redbelly Dace
			Macpherson	3	Redside Dace
			Merritt	32	Common Shiner
			Overton	1	Bluntnose Minnow
				2	Fathead Minnow
				33	Blacknose Dace
				7	Longnose Dace
				25	Creek Chub
				2	Largemouth Bass
				3	Rainbow Darter
				4	Iowa Darter
				23	Johnny Darter
				5	Mottled Sculpin
Bruce Creek, at Elgin Mills Rd. and east of Warden Ave. (in Wetland No. 1)	564	13/05/2005	A. Bruce	1	Brown Bullhead
			D. Crawford	23	Creek Chub
			M. Kiddie	20	White Sucker
				16	Rainbow Trout
				75	Common Shiner
				11	Longnose Dace
				27	Blacknose Dace
				3	American Brook Lamprey
				20	Johnny Darter
				77	Rainbow Darter
				1	Fathead Minnow
				6	Brown Trout
Bruce Creek, at Elgin Mills Rd. east of Warden Ave. (in Wetland No. 1)	550	08/09/2005	M. Kiddie	16	Brown Trout
			D. Crawford	19	White Sucker
				37	Common Shiner
				9	Longnose Dace
				23	Blacknose Dace
				38	Creek Chub
				6	Pumpkinseed
				4	Largemouth Bass
				8	Fathead Minnow
				14	Johnny Darter
				46	Rainbow Darter

				2	Rainbow Trout
Bruce Creek , Elgin Mills Rd. east of Warden Ave. (in Wetland No. 1)	180	20/08/1987	Shackleton Galamb Ross	1 11 159 2 64 9 1	Redside Dace Common Shiner Creek Chub Fathead Minnow White Sucker Largemouth Bass Pumpkinseed
Bruce Creek, Elgin Mills Rd. west of Kennedy Rd. (in Wetland No. 1)	129	14/06/1984	not specified	12 28 7 9 15 13 5 6 1 1 1	White Sucker Creek Chub Pumpkinseed Longnose Dace Blacknose Dace Common Shiner Johnny Darter Fathead Minnow Bluntnose Minnow Redside Dace Stonecat
		25/06/1985	not specified	6 21 32 11 51 4 35 2 3 40	Pumpkinseed White Sucker Common Shiner Creek Chub Blacknose Dace Bluntnose Minnow Johnny Darter Fathead Minnow Rainbow Darter Longnose Dace
Bruce Creek, north of 19th Ave. and west of Kennedy Rd. (2.3 km upstream from Wetland No. 1)	25	21/08/1985	not specified	33 105 58 36 27 5 41 1 1 1	White Sucker Creek Chub Blacknose Dace Longnose Dace Johnny Darter Largemouth Bass Common Shiner Bluntnose Minnow Rainbow Darter Fathead Minnow
Bruce Creek, north of 19th Ave. and west of Kennedy Rd. (2.1k m upstream from Wetland No. 1)	189	21/08/1985	Steedman	33 105 58 36 27 5 41 1 1 1	White Sucker Creek Chub Blacknose Dace Longnose Dace Johnny Darter Largemouth Bass Common Shiner Bluntnose Minnow Rainbow Darter Fathead Minnow
		16/11/1995	T. Cooey R. Whitehouse P. Donnelly	6 3 1 1	Creek Chub White Sucker Pumpkinseed Largemouth Bass
Bruce Creek, north of 19th Ave. and east of Warden Ave. (2.4	190	16/11/1995	T. Cooey R. Whitehouse	6 14	Blacknose Dace Creek Chub

km upstream from Wetland No. 1)			P. Donnelly	2	White Sucker
				17	Common Shiner
				1	Largemouth Bass
				3	Rainbow Trout
				1	Brown Trout
Bruce Creek, north of 19th Ave. and east of Warden Ave. (2.5 km upstream from Wetland No. 1)	191	16/11/1995	T. Cooey R. Whitehouse P. Donnelly	1	Johnny Darter
				1	Blacknose Dace
				1	White Sucker
				1	Common Shiner
				2	Pumpkinseed
				4	Creek Chub
				2	Largemouth Bass
Bruce Creek, 4165 19th Ave. and east of Warden Ave. (1.9 km upstream from Wetland No. 1)	500	24/07/2003	not specified	5	Sea Lamprey
				59	White Sucker
				5	minnow family
				5	Redside Dace
				12	Common Shiner
				19	Bluntnose Minnow
				21	Blacknose Dace
				87	Creek Chub
				6	Brook Stickleback
				6	Smallmouth Bass
				1	Rainbow Darter
				57	Darter sp.
Bruce Creek, Elgin Mills Rd. & Kennedy Rd. (700 m upstream from Wetland No. 1)	555	06/09/2005	D. Crawford M. Kiddie	1	Largemouth Bass
				3	Common Shiner
				6	Longnose Dace
				29	Blacknose Dace
				14	White Sucker
				73	Creek Chub
				36	Johnny Darter
				2	Rainbow Darter
				2	Rainbow Trout
Bruce Creek, Kennedy Rd. just north of Elgin Mills Rd. (700 m upstream from Wetland No. 1)	549	01/09/2005	D. Couture M. Kiddie	8	Rainbow Trout
				14	Largemouth Bass
				9	White Sucker
				5	Common Shiner
				18	Longnose Dace
				95	Creek Chub
				108	Blacknose Dace
				51	Johnny Darter
				23	Rainbow Darter
				2	American Brook Lamprey
				1	Bluntnose Minnow
Bruce Creek, 1 km north of Unionville (2 km downstream of Wetland No. 3)	39	25/06/1985	not specified	14	Rock Bass
				33	Creek Chub
				9	Pumpkinseed
				38	White Sucker
				77	Common Shiner
				2	Stonecat
				24	Blacknose Dace
				2	American Brook Lamprey
				87	Rainbow Darter
				41	Longnose Dace
				10	Bluntnose Minnow

				35	Johnny Darter
				2	Brook Stickleback
				4	Fathead Minnow
				74	Blacknose Dace
		05/08/1994	C. Hopkins	5	Rock Bass
			H. Orr	211	Creek Chub
			T. Ciszkowski	16	White Sucker
			J. Pressey	21	Common Shiner
				3	Largemouth Bass
				24	Longnose Dace
				10	Blacknose Dace
				12	Johnny Darter
				5	Rainbow Darter
				12	Bluntnose Minnow
				1	Rainbow Trout
Bruce Creek, 1 km north of Unionville (2.1 km downstream of Wetland No. 3)	344	09/07/1984	Steedman	13	Blacknose Dace
				20	Longnose Dace
				5	Rock Bass
				16	White Sucker
				26	Creek Chub
				35	Common Shiner
				9	Bluntnose Minnow
				2	Johnny Darter
				15	Rainbow Darter
				1	Pumpkinseed
				2	Largemouth Bass
				1	Redside Dace
		16/07/2003	TS	6	White Sucker
			LS	21	Common Shiner
				3	Bluntnose Minnow
				18	Blacknose Dace
				18	Longnose Dace
				30	Creek Chub
				8	Rock Bass
				3	Pumpkinseed
				37	Rainbow Darter
				3	Darter sp.
Bruce Creek, upstream of 16th Ave. (2 km downstream of Wetland No. 3)	556	17/05/2005	A. Bruce	4	Rock Bass
			D. Crawford	16	Pumpkinseed
			M. Kiddie	12	White Sucker
				7	Fathead Minnow
				16	Longnose Dace
				24	Creek Chub
				110	Johnny Darter
				72	Rainbow Darter
				9	Bluntnose Minnow
				6	Blacknose Dace
				1	Stonecat
				1	Northern Redbelly Dace
		24/08/2005	D. Couture	198	Bluntnose Minnow
			D. Crawford	4	Blacknose Dace
			A. Bruce	57	Creek Chub
				14	Largemouth Bass
				7	Pumpkinseed
				24	Johnny Darter

				23	White Sucker
				33	Common Shiner
				1	Black Crappie
				1	Brook Stickleback
				1	American Brook Lamprey
				1	Common Carp
				1	Rock Bass
				1	Fathead Minnow
				7	Longnose Dace
				27	Rainbow Darter
				2	Stonecat
Bruce Creek, south of 16th Ave. (2.1 km downstream of Wetland No. 1)	557	04/08/2005	D. Couture A. Featherstone D. Crawford	141	Creek Chub
				55	White Sucker
				67	Common Shiner
				37	Rock Bass
				32	Pumpkinseed
				15	Largemouth Bass
				3	Common Carp
				20	Bluntnose Minnow
				15	Fathead Minnow
				28	Longnose Dace
				39	Blacknose Dace
				88	Johnny Darter
				28	Rainbow Darter
				14	Rainbow Trout
				1	Spottail Shiner
				1	Black Crappie
Bruce Creek, south of 16th Ave. (2.1 km downstream of Wetland No. 1)	558	16/05/2005	A. Bruce D. Couture M. Kiddie	2	Brown Trout
				12	Rainbow Trout
				24	White Sucker
				119	Rainbow Darter
				15	Johnny Darter
				1	Blacknose Dace
				13	Longnose Dace
				1	Stonecat
				1	Bluntnose Minnow
				24	Creek Chub
				7	Common Shiner
				22	Rock Bass
				31	Pumpkinseed
				1	Brook Stickleback
				1	Bluegill
Bruce Creek, in York Downs Golf Club, Hole 3 north (950 m downstream of Wetland No. 3)	551	28/09/2005	D. Crawford M. Kiddie	3	Pumpkinseed
				1	Smallmouth Bass
				8	White Sucker
				2	American Brook Lamprey
				27	Creek Chub
				13	Johnny Darter
				8	Blacknose Dace
				17	Rainbow Darter
				11	Longnose Dace
				29	Bluntnose Minnow
				15	Common Shiner
Bruce Creek, south of 16th Ave & west of Kennedy Rd. (2.1 km	552	27/09/2005	D. Crawford M. Kiddie	1	Rainbow Trout
				1	Blacknose Dace

downstream of Wetland No. 1)				1	White Sucker
				1	Bluntnose Minnow
				3	Pumpkinseed
				6	Creek Chub
				2	Largemouth Bass
				2	Longnose Dace
				10	Rainbow Darter
				3	Johnny Darter
				2	Common Shiner
				15	Black Crappie
Bruce Creek,York Downs Golf Club (1.2 km downstream of Wetland No. 3)	424	-/-/1994	C. Hopkins H. Orr T. Ciszkowski	1 3 5	Rainbow Trout Largemouth Bass Rock Bass
				16	White Sucker
				10	Blacknose Dace
				24	Longnose Dace
				211	Creek Chub
				21	Common Shiner
				5	Rainbow Darter
				12	Johnny Darter
				12	Bluntnose Minnow
Bruce Creek, Major Mackenzie Drive & Kennedy Rd. (550 m downstream of Wetland No. 1)	425	-/-/1994	C. Hopkins H. Orr T. Ciszkowski	9 5 35	Largemouth Bass Pumpkinseed White Sucker
				76	Blacknose Dace
				4	Longnose Dace
				162	Creek Chub
				2	Emerald Shiner
				23	Rainbow Darter
				44	Johnny Darter
				1	Bluntnose Minnow
				12	Northern Brook Lamprey
Berczy Creek, at Gormley (1.3 km upstream from Wetland No. 5)	119	28/05/1984	not specified	21	Redside Dace
				37	Common Shiner
				1	Northern Redbelly Dace
				6	Bluntnose Minnow
				14	Fathead Minnow
		16/07/1985	not specified	3	Common Shiner
				2	Bluntnose Minnow
				32	White Sucker
				75	Creek Chub
				124	Blacknose Dace
				9	Redside Dace
				7	Northern Redbelly Dace
				10	Fathead Minnow
				2	Johnny Darter
				2	Brook Stickleback
Berczy Creek, east of Woodbine Ave. & south of Stouffville Rd. (1.2 km upstream from Wetland No. 5)	504	14/08/2004	CM MH	3 14	Bluntnose Minnow Blacknose Dace
				15	Creek Chub
				28	Brook Stickleback
				8	Darter sp.
Berczy Creek, under Highway 404, south of Bethesda	381	25/06/1998	DRC CSM	0	no catch
Sideroad. (3 km upstream from		28/09/1998	DRC	0	no catch

Wetland No. 5)			CSM		
Berczy Creek, under Highway 404, south of Stouffville Rd. (1.8 km upstream from Wetland No. 5)	379	25/06/1998	DRC CSM	6	Creek Chub
		28/09/1998	DRC CSM	6	Blacknose Dace
Berczy Creek, at Major Mackenzie Dr. (250 m downstream of Wetland No. 5)	562	09/05/2005	A. Bruce M. Kiddie	9 102 5 61 30 1 2 1 1	Rainbow Trout Rainbow Darter Johnny Darter Blacknose Dace Longnose Dace Northern Redbelly Dace White Sucker Creek Chub Bluntnose Minnow
Berczy Creek, north of 16th Ave. (2.2 km downstream of Wetland No. 5)	563	19/05/2005	A. Bruce D. Crawford M. Kiddie	2 2 7 49 44 129 221 2	Brook Stickleback White Sucker Creek Chub Longnose Dace Blacknose Dace Johnny Darter Rainbow Darter Rainbow Trout
Berczy Creek, 16th Ave. & east of County Estates Rd. (2.1 km downstream of Wetland No. 5)	546	30/08/2005	A. Bruce D. Crawford M. Kiddie	8 44 12 23 27 17 103 1 21 69	Largemouth Bass Bluntnose Minnow White Sucker Blacknose Dace Longnose Dace Common Shiner Creek Chub Redside Dace Johnny Darter Rainbow Darter
Berczy Creek, north of end of Milestone Crt. (2.5 km downstream of Wetland No. 5)	542	27/09/2005	D. Crawford M. Kiddie	1 1 1 2 2 12 7 15 4	Rainbow Trout Pumpkinseed Johnny Darter Largemouth Bass White Sucker Bluntnose Minnow Common Shiner Creek Chub Redside Dace
Berczy Creek, 300 m downstream of Warden Ave. (1 km downstream of Wetland No. 5)	302	20/10/1999	R. Baldwin J. Davis	>20 >10 8 3 >15	Creek Chub White Sucker Johnny Darter Common Shiner Blacknose Dace
Berczy Creek, upstream of Warden Ave. (1.4 km downstream of Wetland No. 5)	205	29/10/1991	R. Eakins	29 25 11 8 3	Blacknose Dace Creek Chub Johnny Darter White Sucker Redside Dace
		20/10/1999	R. Baldwin J. Davis	>25 >20 4	Creek Chub White Sucker Johnny Darter

				>20	Blacknose Dace
				1	Common Shiner
				3	Redside Dace
				>10	Bluntnose Minnow
				3	Longnose Dace
Berczy Creek, southeast corner of Warden Ave. and Major Mackenzie Dr. (175 m downstream of Wetland No. 5)	188	20/07/1982	K. Snowden R. Bilz Holm	91	Common Shiner
				6	Fathead Minnow
				1	Bluntnose Minnow
				43	Blacknose Dace
				11	Longnose Dace
				32	Creek Chub
				158	White Sucker
				1	Stonecat
				5	Brook Stickleback
				18	Rainbow Darter
				78	Johnny Darter
				1	Redside Dace
		17/07/1987	Shackleton Galamb Ross	6	Redside Dace
				17	White Sucker
				7	Johnny Darter
				66	Blacknose Dace
				5	Longnose Dace
				11	Creek Chub
		12/07/1999	C.J. Agnew G.Z. Katona	1	Common Shiner
				15	Bluntnose Minnow
				9	Creek Chub
				6	Johnny Darter
				16	Blacknose Dace
				1	Longnose Dace
				1	Finescale Dace
				3	Emerald Shiner
				1	Rainbow Darter
				1	Brassy Minnow
Berczy Creek, 1 km north of Unionville, south of 16th Ave. (2.2 km downstream of Wetland No. 5)	143	09/07/1984	Steedman	66	White Sucker
				24	Blacknose Dace
				47	Common Shiner
				5	Rainbow Darter
				17	Johnny Darter
				35	Creek Chub
				4	Rock Bass
				10	Redside Dace
				21	Fathead Minnow
				12	Bluntnose Minnow
				2	Longnose Dace
				1	Brassy Minnow
		25/06/1985	Steedman	28	White Sucker
				2	Brook Stickleback
				1	Rock Bass
				20	Creek Chub
				44	Common Shiner
				4	Fathead Minnow
				32	Johnny Darter
				74	Blacknose Dace
				29	Longnose Dace
				14	Rainbow Darter

				7	Bluntnose Minnow
				1	American Brook Lamprey
		07/08/2003	MH	1	Rainbow Trout
			PH	12	White Sucker
				11	Fathead Minnow
				34	Blacknose Dace
				65	Creek Chub
				27	Brook Stickleback
				12	Darter sp.
Berczy Creek , upstream from bridge north of 16th Ave. (2 km downstream of Wetland No. 5)	20	22/10/1986	Snowden MacPherson	1	American Brook Lamprey
				57	White Sucker
				1	Redside Dace
				172	Common Shiner
				13	Bluntnose Minnow
				1	Fathead Minnow
				24	Blacknose Dace
				1	Longnose Dace
				29	Creek Chub
				5	Rock Bass
				3	Johnny Darter
Berczy Creek , south of 16th Ave. (2.5 km downstream of Wetland No. 5)	21	21/10/1986	Snowden MacPherson	1	American Brook Lamprey
				73	White Sucker
				3	Redside Dace
				69	Common Shiner
				8	Bluntnose Minnow
				1	Fathead Minnow
				40	Blacknose Dace
				55	Creek Chub
				3	Rock Bass
				1	Pumpkinseed
				1	Rainbow Darter
				16	Johnny Darter
		05/08/2003	SS	2	Sea Lamprey
			NB	62	White Sucker
			AW	1	Goldfish
				3	Redside Dace
				20	Common Shiner
				9	Bluntnose Minnow
				2	Fathead Minnow
				8	Blacknose Dace
				1	Longnose Dace
				79	Creek Chub
				1	Brook Stickleback
				13	Rock Bass
				5	Pumpkinseed
				8	Rainbow Darter
				65	Darter sp.

Scoring of Low Marsh:

1. Check the appropriate **Vegetation Group** (see Appendix 7) for each Low Marsh community. (Based on the one most clearly dominant plant species of the dominant form in each Low Marsh vegetation community.)
2. Sum the areas (ha) of the vegetation communities assigned to each **Vegetation Group.**
3. Use these areas to assign an **Area Factor** for each checked **Vegetation Group**.
4. Multiply the **Area Factor** by the **Multiplication Factor** for each row to calculate Score.
5. Sum all numbers in Score column to get **Total Score for Low Marsh**.

Scoring for Presence of Key Vegetation Groups – Low Marsh

Vegetation Group Number	Vegetation Group Name	Present as a Dominant Form (check)	Total Area (ha)	Area Factor (from Table 8)	Multiplication Factor	Score
1	Tallgrass				6	**0.0**
2	Shortgrass-Sedge				11	**0.0**
3	Cattail-Bulrush-Burreed				5	**0.0**
4	Arrowhead-Pickerelweed				5	**0.0**
5	Duckweed				2	**0.0**
6	Smartweed-Waterwillow				6	**0.0**
7	Waterlily-Lotus				11	**0.0**
8	Waterweed-Watercress				9	**0.0**
9	Ribbongrass				10	**0.0**
10	Coontail-Naiad-Watermilfoil				13	**0.0**
11	Narrowleaf Pondweed				5	**0.0**
12	Broadleaf Pondweed				8	**0.0**
				Subtotal Score		**0.0**
				Total Score for Low Marsh (maximum 75 points)		**0.0**

No. of ha of Fish Habitat	Area Factor
< 0.5 ha	0.1
0.5- 4.9	0.2
5.0- 9.9	0.4
10.0- 14.9	0.6
15.0 -19.9	0.8
20.0+ ha	1.0

Step 5: High Marsh = the 'seasonal' marsh area, from the water line to the inland boundary of marsh wetland type. This is essentially what is commonly referred to as a wet meadow, in that there is insufficient standing water to provide fisheries habitat except during flood or high water conditions.

☐ High marsh not present — Go to Step 6

☐ High marsh present — Continue through Step 5, scoring as noted below

Scoring of High Marsh:

1. Check the appropriate **Vegetation Group** (see Appendix 7) for each High Marsh community. (Based on the one most clearly dominant plant species of the dominant form in each High Marsh vegetation community.)
2. Sum the areas (ha) of the vegetation communities assigned to each **Vegetation Group.**
3. Use these areas to assign an **Area Factor** (from Table 8) for each checked **Vegetation Group**.
4. Multiply the **Area Factor** by the **Multiplication Factor** for each row to calculate Score.
5. Sum all numbers in Score column to get **Total Score for High Marsh**.

Scoring for Presence of Key Vegetation Groups – High Marsh

Vegetation Group Number	Vegetation Group Name	Present as a Dominant Form (check)	Total Area (ha)	Area Factor (from Table 8)	Multiplication Factor	Score
1	Tallgrass				6	**0.0**
2	Shortgrass-Sedge				11	**0.0**
3	Cattail-Bulrush-Burreed				5	**0.0**
4	Arrowhead-Pickerelweed				5	**0.0**
				Subtotal Score		**0.0**
				Total Score for High Marsh (maximum 25 points)		**0.0**

Continue to Step 6

No. of ha of Fish Habitat	Area Factor
< 0.5 ha	0.1
0.5- 4.9	0.2
5.0- 9.9	0.4
10.0- 14.9	0.6
15.0 -19.9	0.8
20.0+ ha	1.0

Step 6:

Scoring of Swamp:

1. Determine the total area (ha) of seasonally flooded swamp communities within the wetland containing fish habitat and record below.
2. Determine the total area (ha) of permanently flooded swamp communities within the wetland containing fish habitat and record below.
3. Use these areas to assign an **Area Factor** (from Table 8).
4. Multiply the Area Factor by the **Multiplication Factor** for each row to calculate Score.
5. Sum all numbers in Score column to get **Total Score for Swamp**.

Scoring Swamps for Fish Habitat (Seasonally flooded; Permanently flooded)					
Swamp Containing Fish Habitat	Present (check)	Total Area (ha)	Area Factor (from Table 8)	Multiplication Factor	Score
Seasonally Flooded Swamp				10	**0.0**
Permanently Flooded Swamp				10	**0.0**
		Subtotal Score			**0.0**
		Total Score for Swamp (maximum 20 points)			**0.0**
		Continue to Step 7			

Step 7: CALCULATION OF FINAL SCORE

NOTE: Scores for Steps 4, 5 and 6 are only recorded if Steps 1 and 3 have not been scored.

A. Score from Step 1 (fish habitat not present)	=	**0**
B. Score from Step 3 (significance known)	=	**100**
C. Score from Step 4 (Low Marsh)	=	**0**
D. Score from Step 5 (High Marsh)	=	**0**
E. Score from Step 6 (Swamp)	=	**0**
Subtotal:		**100**

Calculation of Final Score for Spawning and Nursery Habitat = A or B or Sum of C, D, and E

Score for Spawning and Nursery Habitat **100**
(maximum 100 points)

4.2.6.2 Migration and Staging Habitat

Step 1:

[ ]	Staging or Migration Habitat is not present in the wetland	Go to Step 4, Score 0 points
[x]	Staging or Migration Habitat is present in the wetland significance of the habitat is known	Go to Step 2
[ ]	Staging or Migration Habitat is present in the wetland significance of the habitat is not known	Go to Step 3

Step 2: Select the highest appropriate category below. Ensure that documentation is attached to the data record.

[ ]	Significant in Ecoregion	Score 25 points in Step 4
[ ]	Significant in Ecodistrict	Score 15 points in Step 4
[x]	Locally Significant	Score 10 points in Step 4
[ ]	Fish staging and/or migration habitat present, but not as above	Score 5 points in Step 4

Source of information:

Rainbow Trout migration in Bruce Creek via Toogood Pond fishway

Mark Heaton, OMNRF Aurora District Management Biologist

Step 3: Select the highest appropriate category below based on presence of the designated site type (i.e. does not have to bethe dominant site type). Refer to Site Types recorded earlier (section 1.1.3). Attach documentation.

[ ]	Wetland is riverine at rivermouth or lacustrine at rivermouth	Score 25 points in Step 4
[ ]	Wetland is riverine,within 0.75 km of rivermouth	Score 15 points in Step 4
[ ]	Wetland is lacustrine,within 0.75 km of rivermouth	Score 10 points in Step 4
[ ]	Fish staging and/or migration habitat present, but not as above	Score 5 points in Step 4

Step 4: Enter a score from only one of the three above Steps.

Score for Staging and Migration Habitat (maximum 25 points) **10**

4.3 Ecosystem Age

		Fractional Area				Scoring
Bog	=	**0.00**	x	25	=	**0.0**
Fen, on deeper soils; floating mats or marl	=	**0.00**	x	20	=	**0.0**
Fen, on limestone rock	=	**0.00**	x	5	=	**0.0**
Swamp	=	**0.37**	x	3	=	**1.1**
Marsh	=	**0.63**	x	0	=	**0.0**
				Subtotal:		**1.1**

Ecosystem Age Score **1**
(maximum 25 points)

4.4 Great Lakes Coastal Wetlands

Choose one only. Only coastal wetland units may be scored.

	wetland < 10 ha	=	10 points
	wetland 10 - 50 ha	=	25
	wetland 51 - 100 ha	=	50
	wetland > 100 ha	=	75

Great Lakes Coastal Wetland Score **0**
(maximum 75 points)

5.0 DOCUMENTATION OF WETLAND FEATURES NOT INCLUDED IN THE EVALUATION

5.1 Invasive Species

Attach documentation of invasive species found in wetland (include location information and a coarse estimate of abundance [F = few, C = fairly common, A = abundant]):

5.2 Vernal Pools

Documentation of information on vernal pools encountered during the wetland evaluation but not included as part of the evaluated wetland.

5.3 Species of Special Interest

5.3.1 Osprey

Check all that apply:

	Present and nesting
	Known to have nested in last 5 yr
	Feeding area for osprey
x	Not as above

5.3.2 Common Loon

Check all that apply:

	Nesting in wetland
	Feeding at edge of wetland
	Observed or heard on lake or river adjoining the wetland
x	Not as above

5.4 Important Drinking Water Area

Wetland located within:
(check all that apply)

	Wellhead Protection Area
	Intake Protection Zone
	Significant Recharge Area
	Vulnerable Aquifer Area

Source of information:

Additional Comments:

5.5 Area of Wetland Restoration Potential

Check all that apply. Attach additional pages if necessary.

☐ Area of wetland restoration potential adjacent to evaluated wetland unit(s)

☐ Area of wetland restoration potential within 750m of evaluated wetland unit(s), but not adjacent

☐ Area of wetland restoration potential encountered elsewhere

☐ Area currently functioning as wetland (e.g., showing signs of degradation but still mapped as wetland).

☐ Adjacent Wetland Unit (if applicable): _____

☐ GPS Coordinates of Site: _____

Description of site (e.g., current land use, wetland characteristics of site, etc) and why it is identified as an area of restoration potential:

Additional Notes/Comments (e.g., adjacent lands, etc)

List of Vascular Plants in the Bruce & Berczy Creek Wetland Complex & Adjacent Lands

Legend:

Observers: M- Steve Varga, Alexander Kissel & Margaret Berube (OMNRF Aurora District 2014) Markham portion; W- Steve Varga, Alexander Kissel, Keegan McKitterick & Margaret Berube (OMNRF Aurora District 2014) Whitchurch-Stouffville portion, B- Beacon Environmental 2014, S- Savanta Inc. 2014, T- TRCA 2014, D- Dougan & Associates; **Status**: E- endangered species, PS- provincially significant species, LR- locally rare & LU- locally uncommon native species in ecodistrict 74 (Varga et al. 2004), N- common native species, I- introduced species, I*- possibly introduced species, P- planted species, *- denotes significant species observed outside the wetland boundaries, +- denotes wetland species in wetlands upstream of the wetland complex

Latin Name	Family	Observer	Status
DICOTS			
Acer negundo	ACERACEAE	W,B,M,S,T,D	I
Acer nigrum (Acer saccharum ssp. *nigrum)*	ACERACEAE	T, S	N
Acer platanoides	ACERACEAE	B,W,T	I
Acer rubrum	ACERACEAE	B	N
Acer saccharinum	ACERACEAE	B,W,M,T	N
Acer saccharum (Acer saccharum ssp. *saccharum)*	ACERACEAE	B,W,S,T,D	N
Acer spicatum	ACERACEAE	W,M,T	N
Acer xfreemanii	ACERACEAE	B	N
Amaranthus powellii	AMARANTHACEAE	S,B	I
Amaranthus retroflexus	AMARANTHACEAE	S	I
Rhus glabra	ANACARDIACEAE	B	P
Rhus typhina	ANACARDIACEAE	B,T,D,W	N
Toxicodendron radicans (Rhus radicans)	ANACARDIACEAE	T,D	N
Toxicodendron rydbergii (Rhus rydbergii)	ANACARDIACEAE	M, T	N
Cicuta bulbifera	APIACEAE	B,W	LR
Cicuta maculata	APIACEAE	M,T,B,D	N
Daucus carota	APIACEAE	W,B,S,T,D	I
Hydrocotyle americana	APIACEAE	M,T	LR
Pastinaca sativa	APIACEAE	T	I
Apocynum androsaemifolium	APOCYNACEAE	W,T	N
Apocynum cannabinum	APOCYNACEAE	D	N
Vinca minor	APOCYNACEAE	T	I
Aralia hispida	ARALIACEAE	B	P
Aralia nudicaulis	ARALIACEAE	B,W,M,D	N
Aralia racemosa	ARALIACEAE	W,M,D	LU*
Asclepias incarnata	ASCLEPIADACEAE	W,T	N
Asclepias syriaca	ASCLEPIADACEAE	B,W,M,S,T,D	N
Cynanchum rossicum (Vincetoxicum rossicum)	ASCLEPIADACEAE	S,B,T,D	I
Achillea millefolium	ASTERACEAE	B,T,D	I*
Ageratina altissima (Eupatorium rugosum)	ASTERACEAE	M,T	N
Ambrosia artemisiifolia	ASTERACEAE	W,S,B,T,D	I*
Ambrosia trifida	ASTERACEAE	M	I*
Anthemis arvensis	ASTERACEAE	S	N
Anthemis cotula	ASTERACEAE	S	I
Arctium lappa	ASTERACEAE	B,W	I
Arctium minus	ASTERACEAE	B,W,S,T	I
Artemisia absinthium	ASTERACEAE	B	I
Artemisia annua	ASTERACEAE	B	I
Artemisia biennis	ASTERACEAE	S	I

Bidens cernua	ASTERACEAE	W,M,S,T	N
Bidens frondosa	ASTERACEAE	B,W,M,S,T	N
Bidens tripartita	ASTERACEAE	W,M	LR
Bidens vulgata	ASTERACEAE	W,T,S,M	N
Cichorium intybus	ASTERACEAE	B,W	I
Cirsium arvense	ASTERACEAE	W,S,B,M,T,D	I
Cirsium vulgare	ASTERACEAE	W,S,B,T,D	I
Conyza canadensis	ASTERACEAE	S,B,T	N
Echinacea purpurea	ASTERACEAE	B	P
Erigeron annuus	ASTERACEAE	W,T,D	N
Erigeron philadelphicus	ASTERACEAE	W,T,D	N
Erigeron strigosus	ASTERACEAE	T,S,B	N
Eutrochium maculatum (Eupatorium maculatum)	ASTERACEAE	W,S,B,M,T,D	N
Eupatorium perfoliatum	ASTERACEAE	W,B,M,T,D	N
Eurybia macrophylla (Aster macrophyllus)	ASTERACEAE	W	N
Euthamia graminifolia	ASTERACEAE	W,S,B,M,T,D	N
Hieraciumium lachenalii (H. vulgatum)	ASTERACEAE	B	I
Hieracium piloselloides	ASTERACEAE	S	I
Inula helenium	ASTERACEAE	B,M,S,T,D,W	I
Lactuca biennis	ASTERACEAE	M	LR
Lactuca canadensis	ASTERACEAE	B	LU*
Lactuca serriola	ASTERACEAE	T	I
Leucanthemum vulgare (Chrysanthemum leucanthemum)	ASTERACEAE	D,W	I
Matricaria matricarioides	ASTERACEAE	T,S	I
Matricaria maritima	ASTERACEAE	B	I
Picris hieracoides	ASTERACEAE	D	I
Prenanthes altissima	ASTERACEAE	W,T	N
Rudbeckia hirta	ASTERACEAE	W	N
Senecio vulgaris	ASTERACEAE	S	I
Solidago altissima	ASTERACEAE	B,W,M,S,T	N
Solidago caesia	ASTERACEAE	T	N
Solidago canadensis	ASTERACEAE	W,S,B,T,D	N
Solidago flexicaulis	ASTERACEAE	B,M,T,D	N
Solidago gigantea	ASTERACEAE	T,W	I
Sonchus arvensis	ASTERACEAE	W,T,S,B	I
Sonchus oleraceus	ASTERACEAE	W	I
Symphyotrichum cordifolium (Aster cordifolius)	ASTERACEAE	T	N
Symphyotrichum ericoides (Aster ericoides)	ASTERACEAE	S,B	N
Symphyotrichum novae-angliae (Aster novae-angliae)	ASTERACEAE	W,B,M,S,T,D	N
Symphyotrichum puniceum (Aster puniceus)	ASTERACEAE	W,S,B,M,T,D	N
Symphyotrichum lanceolatum (Aster lanceolatus)	ASTERACEAE	B,M,S,T,D	N
Symphyotrichum lateriflorum (Aster lateriflorus)	ASTERACEAE	W,S,M,T,D	N
Symphyotrichum urophyllus (Aster urophyllus)	ASTERACEAE	T	LR*
Tanacetum vulgare	ASTERACEAE	W	I
Taraxacum officinale	ASTERACEAE	B,W,T,D,S	I
Tragopogon dubius	ASTERACEAE	B	I
Tragopogon pratensis	ASTERACEAE	S,D	I
Tussilago farfara	ASTERACEAE	B,W,M,S,T,D	I
Impatiens capensis	BALSAMINACEAE	B,W,M,S,T,D	N
Caulophyllum giganteum	BERBERIDACEAE	B	N
Alnus incana spp. rugosa	BETULACEAE	B,M,T	N

Betula alleghaniensis	BETULACEAE	B,W,M,T,D	N
Betula papyrifera	BETULACEAE	B,W	N
Carpinus caroliniana	BETULACEAE	S,T	N
Corylus cornuta	BETULACEAE		N
Ostrya virginiana	BETULACEAE	W,T,S	N
Cynoglossum officinale	BORAGINACEAE	D	I
Hackelia virginiana	BORAGINACEAE	B,S,T	LU*
Myosotis arvensis	BORAGINACEAE	D	I
Myosotis laxa	BORAGINACEAE	W,M,D,S	N
Myosotis scorpioides	BORAGINACEAE	S,B,M,T	I
Alliaria petiolata	BRASSICACEAE	B,M,T,D,W	I
Brabarea vulgaris	BRASSICACEAE	W,S,D	I
Capsella bursa-pastoris	BRASSICACEAE	B,S	I
Cardamine diphylla	BRASSICACEAE	W	N
Cardamine pennsylvanica	BRASSICACEAE	M	LU+
Erysimum cheiranthoides	BRASSICACEAE	S	I
Hesperis matronalis	BRASSICACEAE	W,M,T,D	I
*Nasturtium microphyllum (*includes *N. officinale)*	BRASSICACEAE	S,M,T	I*
Rorippa palustris	BRASSICACEAE	W,S,M	N
Sinapis arvensis	BRASSICACEAE	S	I
Thlaspi arvense	BRASSICACEAE	S	I
Lobelia siphilitica	CAMPANULACEAE	B,M,T,W	N
Lonicera tatarica	CAPRIFOLIACEAE	B,T,D,S	I
Lonicera xbella	CAPRIFOLIACEAE	T,W	I
Sambucus canadensis	CAPRIFOLIACEAE	M,T,W	N
Sambucus racemosa (S. pubens)	CAPRIFOLIACEAE	T,S	N
Symphoricarpos albus var. *albus*	CAPRIFOLIACEAE	T	LU*
Viburnum acerifolium	CAPRIFOLIACEAE	B	N
Viburnum lantana	CAPRIFOLIACEAE	T	I
Viburnum lentago	CAPRIFOLIACEAE	B,D,S,T	N
Viburnum opulus	CAPRIFOLIACEAE	B,W,M,S,T,D	I
Cerastium fontanum	CARYOPHYLLACEAE	S	I
Saponaria officinalis	CARYOPHYLLACEAE	D	I
Silene latifolia	CARYOPHYLLACEAE	B	I
Celastrus scandens	CELASTRACEAE	T	N
Ceratophyllum demersum	CERATOPHYLLACEAE	M,W	LR
Chenopodium album	CHENOPODIUM	D,W,S	I
Chenopodium glaucum	CHENOPODIACEAE	S	I
Calystegia sepium	CONVOLVULACEAE	M,D	LU
Convolvulus arvensis	CONVOLVULACEAE	B,S,T	I
Cuscata gronovii	CONVOLVULACEAE	M,D,B	LU
Cornus alternifolia	CORNACEAE	S,T,D,WB	N
Cornus amomum	CORNACEAE	W	LR+
Cornus foemina (C. racemosa)	CORNACEAE	D	N
Cornus sericea (C. stolonifera)	CORNACEAE	B,W,M,S,T,D	N
Sedum spurium	CRASSULACEAE	W	I
Echinocystis lobata	CUCURBITACEAE	B,W,M,S,T,D	N
Dipsacus fullonum	DIPSACACEAE	B,W	I
Dipsacus laciniatus	DIPSACACEAE	B	I
Euphorbia esula	EUPHORBIACEAE	I	N
Euphorbia peplus	EUPHORBIACEAE	S	I
Amphicarpaea bracteata	FABACEAE	B,W,M,T,D	N

Lotus corniculatus	FABACEAE	B,M,W,S	I
Medicago lupulina	FABACEAE	B,D,W	I
Medicago sativa	FABACEAE	W,B	I
Melilotus alba	FABACEAE	B,W,T,D	I
Melilotus officinalis	FABACEAE	B	I
Robinia pseudoacacia	FABACEAE	D,B	I
Securigera varia (Coronilla varia)	FABACEAE	B,W	I
Trifolium pratense	FABACEAE	B,S,W	I
Trifolium repens	FABACEAE	W,T,D	I
Vicia cracca	FABACEAE	W,S,B,T,D	I
Fagus grandifolia	FAGACEAE	B,W,S	N
Quercus macrocarpa	FAGACEAE	B,W,M,T,S,D	N
Quercus rubra	FAGACEAE	B,S	N
Geranium robertianum	GERANIACEAE	B,S,T,D,W	I
Ribes americanum	GROSSULARIACEAE	W,M,T	N
Ribes cynosbati	GROSSULARIACEAE	B,W,S,T,D	N
Ribes hirtellum	GROSSULARIACEAE	M	LR+
Ribes rubrum	GROSSULARIACEAE	W,S,B,D,T	I
Ribes triste	GROSSULARIACEAE	B,D	LR
Myriophyllum spicatum	HALORAGACEAE	W	I
Aesculus hippocastanum	HIPPOCASTANACEAE	W,S,B,D	I
Hydrophyllum virginianum	HYDROPHYLLACEAE	B,S,T,W	N
Hypericum perforatum	HYPERICACAEAE	W,T,B,D	I
Carya cordiformis	JUGLANDACEAE	B	N
Juglans cinerea	JUGLANDACEAE	S,B,M,D,T	E
Juglans nigra	JUGLANDACEAE	B,W,T,D,W	N
Ajuga reptans	LAMIACEAE	T	I
Clinopodium vulgare	LAMIACEAE	B	N
Galeopsis tetrahit	LAMIACEAE	W,T	I
Glechoma hederacea	LAMIACEAE	B,S,T,D	I
Leonurus cardiaca	LAMIACEAE	S,T	I
Lycopus americanus	LAMIACEAE	W,D	N
Lycopus europaeus	LAMIACEAE	T	I
Lycopus uniflorus	LAMIACEAE	B,M,T,D,W,S	N
Mentha canadensis (M. arvensis)	LAMIACEAE	W,M,S	N
Mentha xpiperita	LAMIACEAE	M,T,D	I
Nepeta cataria	LAMIACEAE	B,D	I
Origanum vulgare	LAMIACEAE	B	I
Prunella vulgaris	LAMIACEAE	B,S,W	I*
Scutellaria lateriflora	LAMIACEAE	B	N
Teucrium canadense	LAMIACEAE	M	LR
Utricularia vulgaris	LENTIBULARIACEAE	M	LR+
Lythrum salicaria	LYTHRACEAE	W,S,M,T,D	I
Abutilon theophrasti	MALVACEAE	S,B	I
Malva neglecta	MALVACEAE	S	I
Monotropa uniflora	MONOTROPACEAE	B	LU*
Morus alba	MORACEAE	B,D	I
Nymphaea odorata	NYMPHAEACEAE	B,M,W	LR
Nuphar varigiata	NYMPHAEACEAE	W	LR+
Fraxinus americana	OLEACEAE	B,S,T	N
Fraxinus nigra	OLEACEAE	B,M,T	LU
Fraxinus pennsylvanica	OLEACEAE	B,W,M,S,T,D	N

Syringa vulgaris	OLEACEAE	B,T,S	I
Circaea canadensis (C. lutetiana)	ONAGRACEAE	B,W,M,T,D,S	N
Epilobium ciliatum	ONAGRACEAE	B,M,S,T,D,W	N
Epilobium hirsutum	ONAGRACEAE	M,D,W,T	I
Epilobium parviflorum	ONAGRACEAE	W,S,M,T	I
Epipactis helleborine	ONAGRACEAE	B,T	I
Oenothera biennis complex	ONAGRACEAE	W,S,B,T	N
Oxalis dillenii	OXALIDACEAE	W	I
Oxalis stricta	OXALIDACEAE	B,S,T	I
Chelidonium majus	PAPAVERACEAE	T,D,S	I
Sanguinaria canadensis	PAPAVERACEAE	B,T,W,S	N
Plantago lanceolata	PLANTAGINACEAE	B	I
Plantago major	PLANTAGINACEAE	B,T,D,W,S	I
Plantago rugelii	PLANTAGINACEAE	W	N
Phlox paniculata	POLEMONIACEAE	T	I
Polygonum achoreum	POLYGONACEAE	S	I
Polygonum aviculare	POLYGONACEAE	S	N
Persicaria lapathifolium (Polygonum lapathifolium)	POLYGONACEAE	W	I*
Persicaria amphibia (Polygonum amphibium)	POLYGONACEAE	W,S	LR
Persicaria hydropiper (Polygonum hydropiper)	POLYGONACEAE	M,S	I*
Persicaria maculosa (Polygonum persicaria)	POLYGONACEAE	B,M,W,S,T	I
Persicaria pensylvanica (Polygonum pensylvanica)	POLYGONACEAE	B	LR
Rumex crispus	POLYGONACEAE	B,W,T,D,S	I
Rumex obtusifolius	POLYGONACEAE	T	I
Claytonia caroliniana	PORTULACAEAE	S	LR*
Lysimachia ciliata	PRIMULACEAE	B,M,T,D	N
Lysmiachia nummularia	PRIMULACEAE	M	I
Trientalis borealis	PRIMULACEAE	D	LU+
Actaea pachypoda	RANUNCULACEAE	W	N
Actaea rubra	RANUNCULACEAE	W,T,D	N
Anemone canadensis	RANUNCULACEAE	W,M,T,D,S	N
Anemone quinquefolia	RANUNCULACEAE	B	N
Aquilegia canadensis	RANUNCULACEAE	T	N
Aquilegia vulgaris	RANUNCULACEAE	T	I
Caltha palustris	RANUNCULACEAE	T,D	N
Clematis virginiana	RANUNCULACEAE	T,D	N
Ranunculus abortivus	RANUNCULACEAE	T,S	N
Ranunculus acris	RANUNCULACEAE	B,T,D,W,S	I
Ranunculus hispidus var. *caricetorum*	RANUNCULACEAE	M	N
Ranunculus recurvatus	RANUNCULACEAE	T,W	N
Ranunculus repens	RANUNCULACEAE	T,D	I
Ranunculus sceleratus	RANUNCULACEAE	M,D,W,S	N
Thalictrum dioicum	RANUNCULACEAE	T,W	N
Thalictrum pubescens	RANUNCULACEAE	B,M,T,D	N
Frangula alnus (Rhamnus frangula)	RHAMNACEAE	W	I
Rhamnus cathartica	RHAMNACEAE	B,W,M,S,T,D	I
Agrimonia gryposepala	ROSACEAE	B,T,D,S	N
Amelanchier arborea	ROSACEAE	S	N
Amelanchier laevis	ROSACEAE	W	N
Aruncus dioicus	ROSACEAE	B	P
Crataegus coccinea (C. pedicellata)	ROSACEAE	B	N
Crataegus monogyna	ROSACEAE	B,T,D	I

Crataegus punctata	ROSACEAE	T	N
Crataegus succulenta var. *macracantha* (*C. macracantha*)	ROSACEAE	B,W	N
Filipendula rubra	ROSACEAE	T	I
Fragaria vesca	ROSACEAE	T,W,S	N
Fragaria virginiana	ROSACEAE	B,W,S,T,D	N
Geum aleppicum	ROSACEAE	B,S,D,W	N
Geum canadense	ROSACEAE	S,T,D,W	N
Geum fragarioides (Waldsteinia fragarioides)	ROSACEAE	D	LU*
Geum urbanum	ROSACEAE	W,T,D	I
Malus baccata	ROSACEAE	B	I
Malus pumila	ROSACEAE	B,T,D,W	I
Potentilla norvegica	ROSACEAE	B,W	I
Prunus serotina	ROSACEAE	W,S,T,D,B	N
Prunus virginiana	ROSACEAE	W,S,T,D,B	N
Pyrus communis	ROSACEAE	B	I
Rosa blanda	ROSACEAE	B	N
Rosa multiflora	ROSACEAE	T	I
Rubus strigosus (R. strigosus var. *idaeus)*	ROSACEAE	W,S,B,T,D	N
Rubus occidentalis	ROSACEAE	D	N
Rubus pubescens	ROSACEAE	M,T	N
Sorbus aucuparia	ROSACEAE	W,T,B,S,D	I
Spiraea alba	ROSACEAE	W	LR+
Galium asprellum	RUBIACEAE	M	LU+
Galium palustre	RUBIACEAE	W	N
Galium triflorum	RUBIACEAE	W	N
Galium verum	RUBIACEAE	B,W	I
Populus alba	SALICACEAE	T,D	I
Populus balsamifera	SALICACEAE	B,W,M,T,D	N
Populus deltoides	SALICACEAE	W	N
Populus grandidentata	SALICACEAE	B	N
Populus tremuloides	SALICACEAE	B,W,M,T,D,S	N
Salix alba	SALICACEAE	D,W,B	I
Salix amygdaloides	SALICACEAE	M,W	N
Salix bebbiana	SALICACEAE	D,S,M	N
Salix discolor	SALICACEAE	W,S,B,M,D	N
Salix eriocephala	SALICACEAE	W,S,B,M,T,D	N
Salix exigua	SALICACEAE	M	N
Salix fragilis	SALICACEAE	B,D	I
Salix lucida	SALICACEAE	M	LR
Salix matsudana	SALICACEAE	T	P
Salix nigra	SALICACEAE	W	LR+
Salix petiolaris	SALICACEAE	B,T,S,M	LR
Salix x rubens	SALICACEAE	W,M,T,S	I
Salix x*sepulcralis*	SALICACEAE	W,B,M,T	I
Chrysosplenium americanum	SAXIFRAGACEAE	T	LR+
Mitella diphylla	SAXIFRAGACEAE	M,D	N
Mitella nuda	SAXIFRAGACEAE	T	LR
Tiarella cordifolia	SAXIFRAGACEAE	D	N
Chelone glabra	SCROPHULARIACEAE	B,M,T	N
Linaria vulgaris	SCROPHULARIACEAE	W,S	I
Mimulus ringens	SCROPHULARIACEAE	S	N

Verbascum thapsus	SCROPHULARIACEAE	B,M,W,S	I
Veronica americana	SCROPHULARIACEAE	M	LR+
Veronica officinalis	SCROPHULARIACEAE	T	I
Smilax ecirrhata	SMILACAEAE	B	N
Smilax herbacea	SMILACAEAE	B	N
Solanum dulcamara	SOLANACEAE	B,W,M,S,T,D	I
Tilia americana	TILIACEAE	B,W,M,T,D,S	N
Tilia cordata	TILIACEAE	B	P
Ulmus americana	ULMACEAE	B,W,M,S,T,D	N
Ulmus pumila	ULMACEAE	B	I
Boehmeria cylindrica	URTICACEAE	D	LU+
Laportea canadensis	URTICACEAE	B,W,M,T,D	N
Pilea fontana	URTICACEAE	M	LR
Pilea pumila	URTICACEAE	B,T	N
Urtica dioica ssp. *gracilis*	URTICACEAE	B,W,M,S,T,D	N
Valeriana officinalis	VALERIANACEAE	W,S,M,D	I
Phryma leptostachya	VERBENACEAE	T	N
Verbena hastata	VERBENACEAE	B,W,M,T,D,S	N
Verbena urticifolia	VERBENACEAE	W,M,T	N
Viola affinis	VIOLACEAE	T	LU
Viola conspersa	VIOLACEAE	T,S	N
Viola cucullata	VIOLACEAE	M	LU+
Viola pubescens	VIOLACEAE	W,T,S	N
Viola sororia	VIOLACEAE	T,W,S	N
Parthenocissus inserta (P. vitacea)	VITACEAE	W,S,B,M,T,D	N
Parthenocissus quinquefolia	VITACEAE	B,M,T	N
Parthenocissus tricuspidata	VITACEAE	B	P
Vitis labrusca	VITACEAE	B	I
Vitis riparia	VITACEAE	W,S,B,T,D	N
PTERIDOPHYTES			
Equisetum arvense	EQUISETACEAE	W,S,B,M,T,D	N
Equisetum hyemale	EQUISETACEAE	M,S,T	N
Equisetum fluviatile	EQUISETACEAE	M,S,T	LR
Equisetum pratense	EQUISETACEAE	B	LR
Equisetum variegatum	EQUISETACEAE	W,M	LR
Athyrium filix-femina	FERN FAMILIES	W,M,T,D	N
Cystopteris bulbifera	FERN FAMILIES	B,W,M,T,S	N
Dryopteris carthusiana	FERN FAMILIES	B,W,M,S	N
Dryopteris cristata	FERN FAMILIES	M,T	LR
Dryopteris marginalis	FERN FAMILIES	B,W	N
Gymnocarpium dryopteris	FERN FAMILIES	M	LR
Matteuccia struthiopteris	FERN FAMILIES	B,W,M,T,D,S	N
Onoclea sensibilis	FERN FAMILIES	M,T,D,W,B	N
Osmunda cinnamomea	FERN FAMILIES	M,T	N
Osmunda regalis	FERN FAMILIES	M,T	LR
Phegopteris connectilis	FERN FAMILIES	T	LR+
Thelypteris palustris	FERN FAMILIES	D,T	N
GYMNOSPERMS			
Juniperus virginiana	CUPRESSACEAE	B,T	LR*
Thuja occidentalis	CUPRESSACEAE	B,W,M,T,S,D	N

Abies balsamea	PINACEAE	M,T,B	LR
Larix laricina	PINACEAE	B,M	LR
Picea abies	PINACEAE	S,B,T	I
Picea glauca	PINACEAE	B,M,S,T	LR
Picea nigra	PINACEAE	S	P
Pinus nigra	PINACEAE	T	P
Pinus resinosa	PINACEAE	T,B	P
Pinus strobus	PINACEAE	W,S,B,T	N
Pinus sylvestris	PINACEAE	B,M,S,T	I
Tsuga canadensis	PINACEAE	B,W,M,T	N
Taxus canadensis	TAXACEAE	W,T	N
MONOCOTS			
Alisma plantago-aquatica	ALISMATACEAE	B,W,S,M,T	N
Saggittaria latifolia	ALISMATACEAE	D	N
Arisaema triphyllum	ARACEAE	B,W,M,D	N
Spirodela polyrhiza	ARACEAE	T	LR
Allium tricoccum	CONVALLARIACEAE	B	N
Asparagus officinalis	CONVALLARIACEAE	S	I
Convallaria majalis	CONVALLARIACEAE	T,S	I
Erythronium americanum	CONVALLARIACEAE	T,S	N
Hemerocallis fulva	CONVALLARIACEAE	B,T	I
Hemerocallis lilioasphodelus	CONVALLARIACEAE	B	I
Lilium michiganense	CONVALLARIACEAE	T,D,S	N
Maianthemum canadense	CONVALLARIACEAE	B,W,D	N
Maianthemum racemosum (Smilacina racemosa)	CONVALLARIACEAE	B	N
Maianthemum stellatum (Smilacina stellata)	CONVALLARIACEAE	W,S	N
Najas flexilis	CONVALLARIACEAE	W	LR+
Polygonatum pubescens	CONVALLARIACEAE	B	N
Trillium erectum	CONVALLARIACEAE	T,D	N
Trillium grandiflorum	CONVALLARIACEAE	B,W	N
Carex aquatilis	CYPERACEAE	D	LR+
Carex arctata	CYPERACEAE	W	N
Carex bebbii	CYPERACEAE	W,T	N
Carex blanda	CYPERACEAE	T	N
Carex crinita	CYPERACEAE	B	LR
Carex cristatella	CYPERACEAE	W,S,M,T	N
Carex gracillima	CYPERACEAE	B	N
Carex granularis	CYPERACEAE	M	N
Carex hitchcockiana	CYPERACEAE	T	LR
Carex hystericina	CYPERACEAE	W,S,M	N
Carex interior	CYPERACEAE	T	LR
Carex lacustris	CYPERACEAE	M	LU
Carex lupulina	CYPERACEAE	D	LU
Carex pedunculata	CYPERACEAE	W	N
Carex pellita	CYPERACEAE	M	LR
Carex pseudo-cyperus	CYPERACEAE	W,M,T	N
Carex radiata	CYPERACEAE	T,W	N
Carex retrorsa	CYPERACEAE	M,T	LU
Carex rosea	CYPERACEAE	B,T	N
Carex spicata	CYPERACEAE	S,T	I
Carex stricta	CYPERACEAE	M	LR

Carex stipata	CYPERACEAE	T,D	N
Carex vulpinoidea	CYPERACEAE	W,S,M,T,D	N
Eleocharis erythropoda	CYPERACEAE	W,M	N
Eleocharis smallii	CYPERACEAE	T	LR+
Schoenoplectus tabernaemontani (Scirpus validus)	CYPERACEAE	T,W,S,M,D	N
Scirpus atrovirens	CYPERACEAE	W,M,D	N
Scirpus cyperinus	CYPERACEAE	W,D	N
Scirpus microcarpus	CYPERACEAE	M,W,T	N
Elodea canadensis	HYDROCHARITACEAE	T,W	LR
Elodea nuttallii	HYDROCHARITACEAE	M,W	PS+
Iris pseudacorus	HYDROCHARITACEAE	M,T,W	I
Iris versicolor	IRIDACEAE	B,M,W	N
Juncus bufonius	JUNCACEAE	M	N
Juncus dudleyi	JUNCACEAE	W,S,M,T	N
Juncus gerardii	JUNCACEAE	W	I
Juncus effusus	JUNCACEAE	W,S,T,D,M	N
Juncus nodosus	JUNCACEAE	T	N
Juncus tenuis	JUNCACEAE	D	N
Juncus torreyi	JUNCACEAE	M	N
Lemna minor	LEMNACEAE	B,M,S,T,W	N
Lemna trisulca	LEMNACEAE	B,M	LR
Spirodela polyrhiza	LEMNACEAE	W,T	LR
Wolffia borealis	LEMNACEAE	S	LR
Wolffia columbiana	LEMNACEAE	S	LR
Epipactis helleborine	ORCHIDACEAE	W,S,T	I
Spiranthes cernua	ORCHIDACEAE	M	LR+
Agrostis gigantea	POACEAE	W,M,S,D	I
Agrostis scabra	POACEAE	W	LR+
Agrostis stolonifera	POACEAE	W,M,D	I
Bromus inermis	POACEAE	B,W,M,S,T,D	I
Calamagrostis canadensis	POACEAE	M	I
Dactylis glomerata	POACEAE	W,S,B,M,D,T	I
Digitaria sanguinalis	POACEAE	B	I
Echinochloa crusgalli	POACEAE	B,W,S	I
Elymus repens	POACEAE	M,T,W,S	I
Elymus virginicus	POACEAE	W,M,D	N
Glyceria grandis	POACEAE	W,M,S	N
Glyceria striata	POACEAE	B,M,T,D,W	N
Leersia oryzoides	POACEAE	W,S,M,T	N
Lolium perenne	POACEAE	B	I
Panicum dichotomiflorum	POACEAE	S	I
Phalaris arundinacea	POACEAE	B,W,M,S,T,D	I*
Phleum pratense	POACEAE	B,W,S,T,D	I
Phragmites australis ssp. *australis*	POACEAE	W,S,B,M,D	I
Poa annua	POACEAE	S	I
Poa compressa	POACEAE	T,S	I*
Poa palustris	POACEAE	M,T,W,S	N
Poa pratensis	POACEAE	B,W,S,T,D	I
Puccunellia distans	POACEAE	S	I
Schedonorus arundinaceus (Festuca arundinacea)	POACEAE	W	I
Schedonorus pratensis (Festuca pratensis)	POACEAE	W,T,D,S	I
Schizachne purpurascens	POACEAE	T	LR

Setaria pumila	POACEAE	S	I
Setaria viridis	POACEAE	S	I
Potamogeton crispus	POTAMOGETONACEAE	M,S,T	I
Potamogeton foliosus	POTAMOGETONACEAE	M,T,W	LR
Potamogeton natans	POTAMOGETONACEAE	T,W,M	LR
Potamogeton pectinatus	POTAMOGETONACEAE	M,T	LU+
Potamogeton zosteriformis	POTAMOGETONACEAE	W,M	LR+
Stuckenia pectinata (Potamogeton pectinatus)	POTAMOGETONACEAE	W	LU+
Pontederia cordata	PONTEDERIACEAE	W	P
Typha angustifolia	TYPHACEAE	W,B,M,S,T,D	I
Typha latifolia	TYPHACEAE	W,B,M,T,S,D	N
Typha xglauca	TYPHACEAE	W,S,M,T	I

Birds in and around the Bruce & Berczy Creek Wetland Complex

Legend:

Codes:

c- confirmed, p- probable or o- possible breeder; x- observed in breeding season in suitable habitat, v- summer visitor, f- flying overhead, m- migrant, ?- breeding status unknown.

Observers:

B- Beacon Environmental, CF- Chris Fahner landowner, D- Dougan & Associates, I- Ian Downer landowner, S- Steve Varga, Keegan McKitterick, Alex Kissel & Margaret Berube MNRF Aurora District, SV- Savanta Inc., T- TRCA record

Status:

* - provincially significant species for the purposes of a wetland evaluation, T- threatened, E- endangered, SC- special concern, S- species rank for MNRF Natural Heritage Information Centre (NHIC) tracked species

m-D	Common Loon		Common Tern		Blue-headed Vireo
	Red-necked Grebe *S3B,S4N		Black Tern *SC		Yellow-throat. Vireo
	Pied-billed Grebe *S4B,S4N	p-B; o-SVD	Rock Pigeon	p-B; o-SVD	Warbling Vireo
	D.-c. Cormorant	p-B; o-SVD	Mourning Dove		Philadelphia Vireo
	American Bittern		Cuckoo sp.	p-BT; o-TD	Red-eyed Vireo
	Least Bittern *S4B, T	c-T	Black-billed Cuckoo		Blue-winged Warbler
v-SVDBCFS	Great Blue Heron		Yellow-billed Cuckoo		Gold.-winged Warbler *SC
	Great Egret *S2B		Barn-Owl *E		"Brewster's Warbler"
p-B; o-D; v-CF	Green Heron	o-T	E. Screech-Owl		"Lawrence's Warbler"
v-CF	Night-heron sp.	x-D; c-T	Great Horned Owl	m-D	Tennessee Warbler
	Mute Swan		Snowy Owl		Nashville Warbler
c-CF; p-B; o-SV; x-D	Canada Goose		Barred Owl		Northern Parula
c-S	Wood Duck		Long-eared Owl	p-B; o-SVD	Yellow Warbler
	Green-winged Teal		Short-eared Owl *SC		Chestnut-sided Warbler
o-D	Am. Black Duck		N. Saw-whet Owl		Magnolia Warbler
c-SCF; p-B; o-SVD	Mallard		Common Nighthawk *SC		Cape May Warbler
	Northern Pintail		Whip-poor-will		Black-thr. Blue Warbler
	Blue-winged Teal	o-D	Chimney Swift *T		Yellow-rump. Warbler
	Northern Shoveler	o-D; x-I	Ruby-th. Hummingbird	o-T	Bla.-thr. Green Warbler
	Gadwall *S4	o-D; v-SCF	Belted Kingfisher		Blackburnian Warbler
	American Wigeon		Red-head. Woodpecker *SC	p-T	Pine Warbler
	Redhead *S2B,S4N		Red-bell. Woodpecker		Kirtland's Warbler *E
	Ring-necked Duck		Yellow-b. Sapsucker		Cerulean Warbler *SC
m-B	Lesser Scaup	p-B; o-SVD	Downy Woodpecker	o-T	Bla. & Whi. Warbler
	Greater Scaup	p-B; o-TD	Hairy Woodpecker	p-B; o-D	American Redstart
	Black Scoter		Bl. - b. Woodpecker		Prothonotary Warbler *E
	White-winged Scoter	c-SV; p-B;o-TD	Northern Flicker	o-DT	Ovenbird
	Common Goldeneye	p-B; o-T	Pileated Woodpecker	o-DT	Northern Waterthrush
	Bufflehead		Olive-sid. Flycatcher *SC		Louisiana Waterthrush *SC
	Hooded Merganser	p-B; o-SVTD	Eastern Wood-pewee *SC	p-B; o-T	Mourning Warbler
	Common Merganser		Yel. -bel. Flycatcher	m-D	Wilson's Warbler
	Red-b. Merganser		Acadian Flycatcher *E	p-B; o-SVTD	Common Yellowthroat
	Ruddy Duck	o-D	Alder Flycatcher		Hooded Warbler *SC
o-D; x-I	Turkey Vulture	p-BSV; o-TD	Willow Flycatcher		Canada Warbler *SC
v-CF	Osprey		Least Flycatcher		Yellow-breasted Chat *SC
	Bald Eagle *SC	p-B; o-TD	Eastern Phoebe		Summer Tanager
	Northern Harrier	p-BT; o-D	Great Cr. Flycatcher		Scarlet Tanager
	Sharp-shinned Hawk	p-BS; o-TD	Eastern Kingbird	p-B; o-SVD	Northern Cardinal
o-DT	Cooper's Hawk	p-B; o-TD	Horned Lark	p-B; o-D	Rose-breast. Grosbeak
	Northern Goshawk		Purple Martin	p-B; o-TD	Indigo Bunting
	Red-should. Hawk	p-B; o-D	Tree Swallow		Dickcissel
	Broad-winged Hawk	p-B; o-D	N. Rough-w. Swallow		Eastern Towhee
p-B; o-D; x-I	Red-tailed Hawk	p-B	Bank Swallow *T	p-B; o-SVD	Chipping Sparrow
	American Kestrel	p-B; o-D	Cliff Swallow		Clay-coloured Sparrow
	Merlin	p-B; o-D	Barn Swallow	o-T	Field Sparrow
	Peregrine Falcon *S2, S3B, T	p-B; o-SVD; f-S	Blue Jay	p-B; o-SVTD	Vesper Sparrow
	Gray Partridge	p-B; c-SV; o-D	American Crow	p-B; c-SV; o-TD	Savannah Sparrow
	Ring-neck. Pheasant	?-T	Common Raven		Grasshopper Sparrow
	Ruffed Grouse	p-B; o-SVD	Black-cap. Chickadee		Henslow's Sparrow *E

o-D	Wild Turkey		Tufted Titmouse	p-B; c-SV; o-D	Song Sparrow
	Northern Bobwhite *E	o-TD	Red-breast. Nuthatch	p-B; o-SVD	Swamp Sparrow
	King Rail *E	p-B; o-TD	White-breast. Nuthatch		White-throated Sparrow
p-T	Virginia Rail		Brown Creeper	o-D	Dark-eyed Junco
p-T	Sora		Carolina Wren	p-TB; o-SVD	Bobolink
	Common Moorhen	p-BS; o-D	House Wren	p-B; c-SV; o-D	Red-winged Blackbird
	American Coot	p-T	Winter Wren	p-B; o-DT	Eastern Meadowlark
	Sandhill Crane		Sedge Wren		Western Meadowlark
p-BSV; o-D	Killdeer		Marsh Wren		Rusty Blackbird
m-D	Black-bellied Plover	o-D; p-T	Golden-crown. Kinglet		Brewer's Blackbird
	Solitary Sandpiper	p-D	Blue-gray Gnatcatcher	p-B; c-SV; o-D	Common Grackle
p-SV; o-T D	Spotted Sandpiper		Eastern Bluebird	p-B; c-SV; o-D	Brown-headed Cowbird
	Upland Sandpiper	o-D; p-T	Veery	p-B; o-D	Orchard Oriole
m-D	Least Sandpiper		Swainson's Thrush	p-B; c-SV; o-D	Baltimore Oriole
	Common Snipe		Hermit Thrush	o-T	Purple Finch
o-T; v-S	American Woodcock	?-T	Wood Thrush	p-B; o-D	House Finch
	Whimbrel	p-B; c-SV; o-D	Amerian Robin		Red Crossbill
	Lesser Yellowlegs	p-BSV; o-TD	Gray Catbird	m-T	Pine Siskin
	Wilson's Phalarope *S3B	p-B; o-D; x-I	Northern Mockingbird	p-BSV; o-D	American Goldfinch
v-BSVD	Ring-billed Gull	c-SV; p-B; o-T	Brown Thrasher		Evening Grosbeak
	Herring Gull	p-B; o-SVD	Cedar Waxwing	c-SV; p-B; o-D	House Sparrow
	Great Black -b. Gull *S2B		Loggerhead Shrike *E		Common Goldeneye
	Bonaparte's Gull	p-B; c-SV; o-D	European Starling	m-D	American Pipit
	Caspian Tern *S3B		White-eyed Vireo *S2B	v-S	Trumpeter Swan

Mammals, Reptiles & Amphibians in and around the Bruce & Berczy Creek Wetland Complex

	Mammals
	Masked/Common Shrew
	Water Shrew
	Smoky Shrew
	Pygmy Shrew
	N. Short-tailed Shrew
	Hairy-tailed Mole
	Star-nosed Mole
	Eastern Mole *SC
	Little Brown Bat *E
	Keen's Bat
	Small-footed Bat *E
	Bat sp.
	Tri-Coloured Bat
	Big Brown Bat
	Red Bat
	Hoary Bat
	Northern Long-eared Bat *E
	Eastern Cottontail
	Snowshoe Hare
	European Hare
DT	Eastern Chipmunk
DT	Woodchuck
D	Gray Squirrel - Gray
	Gray Squirrel - Black
DT	Red Squirrel
	Southern Flying Squirrel
	Northern Flying Squirrel
S	Beaver
	Deer Mouse
	White-footed Mouse
	S. Red-backed Vole
	Meadow Vole
	Muskrat
	S. Bog Lemming
	Norway Rat
	House Mouse
	Meadow Jumping Mouse
	Woodland Jumping Mouse
	Virginia Opossum
	Porcupine
DT	Coyote
DTI	Red Fox
	Gray Fox *T
	Black Bear
DS	Raccoon
	Ermine
	Least Weasel *SU
	Long-tailed Weasel
	Short-tailed Weasel
	Mink
	Badger *E
	Striped Skunk
	River Otter
	Bobcat
DTIS	White-tailed Deer

	Amphibians/Reptiles
	Mudpuppy
	Eastern Newt
	Jefferson Salamander *E
	Blue-spotted Salamander
	Jefferson complex (JJL hybrid *S2)
	Jefferson complex (undet.)
	Yellow-spotted Salamander
	Dusky Salamande *E
	Four-toed Salamander
T	East. Redback Salamander
	East. Redback Salamander - Grey phase
DTSBSV	American Toad
DSV	Spring Peeper
	Gray Treefrog
	Western Chorus Frog (Great Lakes / St. Lawrence - Canadian Shield Population) *S3
TSSV	Wood Frog
DSSV	Northern Leopard Frog
	Pickerel Frog
DTSSV	Green Frog
	Mink Frog
S	Bullfrog
TSIDCF	Common Snapping Turtle *SC
	Stinkpot *SC
DIS	Midland Painted Turtle
	Red-eared Slider
	Map Turtle *SC
T	Blanding's Turtle *T
	Wood Turtle *E
	Spotted Turtle *E
	Box Turtle *SU
	Eastern Spiny Softshell *T
	Eastern Garter Snake
	Northern Ribbon Snake *SC
	Northern Water Snake
	Northern Redbelly Snake
	Brown Snake
	East. Smooth Green Snake
	Northern Ringneck Snake
	Gray Rat Snake *E
	Eastern Fox Snake *E
	Eastern Milk Snake *E
	Eastern Massasauga *E
	Red Spotted Newt

Legend

Observers:

B- Beacon Environmental, **CF**- Chris Fahner landowner, **D-** Dougan & Associates, **I**- Ian Downer (landowner), **S-** Steve Varga, Keegan McKitterick, Alex Kissel & Margaret Berube MNRF Aurora District, **SV**- Savanta Inc., **T-** TRCA

Status:

* - provincially significant species for the purposes of a wetland evaluation, T- threatened, E- endangered, SC- special concern, S- species rank for MNRF Natural Heritage Information Centre (NHIC) tracked species

Fish in and around the Bruce & Berczy Creek Wetland Complex

Based on fish records at OMNR Aurora District Office from 1975 to 2005

Scientific Name	**Common Name**
Pimephales notatus	bluntnose minnow
Culaea inconstans	brook stickleback
Clinostomus elongatus	redside dace
Semotilus atromaculatus	creek chub
Lethenteron appendix	american brook lamprey
Pimephales promelas	fathead minnow
Micropterus salmoides	largemouth bass
Rhinichthys cataractae	longnose dace
Chrosomus eos	northern redbelly dace
Lepomis gibbosus	pumpkinseed
Catostomus commersonii	white sucker
Salvelinus fontinalis	brook trout
Rhinichthys atratulus	blacknose dace
Oncorhynchus mykiss	rainbow trout
Hybognathus hankinsoni	brassy minnow
Pomoxis nigromaculatus	black crappie
Lepomis macrochirus	blue gill
Ameiurus nebulosus	brown bullhead
Salmo trutta	brown trout
Cyprinus carpio	common carp
Luxilus cornutus	common shiner
Notropis atherinoides	emerald shiner
Phoxinus neogaeus	finescale dace
Etheostoma exile	iowa dart
Etheostoma nigurm	johnny darter
Micropterus dolomieu	smallmouth bass
Cottus bairdii	mottled sculpin
Ichthyomyzon fossor	northern brook lamprey
Etheostoma caeruleum	rainbow darter
Ambloplites rupestris	rock bass
Petromyzon marinus	sea lamprey
Notropis hudsonius	spottail shiner
Noturus flavus	stonecat
Carassius auratus	goldfish

WETLAND EVALUATION SCORING RECORD

Wetland Name: Bruce & Berczy Creek Wetland Complex

1.0 BIOLOGICAL COMPONENT

1.1 PRODUCTIVITY

21	1.1.1	Growing Degree-Days/Soils
12	1.1.2	Wetland Type
3	1.1.3	Site Type

1.2 BIODIVERSITY

13	1.2.1	Number of Wetland Types
30	1.2.2	Vegetation Communities
7	1.2.3	Diversity of Surrounding Habitat
8	1.2.4	Proximinty to Other Wetlands
21	1.2.5	Interspersion
8	1.2.6	Open Water Type

28	1.3	SIZE (Biological Component)
151		Subtotal
151		TOTAL (Biological Component)

2.0 SOCIAL COMPONENT

2.1 ECONOMICALLY VALUABLE PRODUCTS

0	2.1.1 Wood Products
0	2.1.2 Wild Rice
12	2.1.3 Commerical Fish (Bait Fish and/or Coarse Fish)
0	2.1.4 Furbearers

16	2.2 RECREATIONAL ACTIVITIES

2.3 LANDSCAPE AESTHETICS

3	2.3.1 Distinctness
4	2.3.2 Absence of Human Disturbance

2.4 EDUCATION AND PUBLIC AWARENESS

0	2.4.1 Educational Uses
0	2.4.2 Facilities and Programs
5	2.4.3 Research and Studies

40	2.5 PROXIMITY TO AREAS OF HUMAN SETTLEMENT
4	2.6 OWNERSH1P
16	2.7 SIZE (Social Component)
0	2.8 ABORIGINAL AND CULTURAL VALUES

2.8.1 Aboriginal Values
2.8.2 Cultural Heritage

100	Subtotal
100	TOTAL (Social Component)

3.0 HYDROLOGICAL COMPONENT

25	3.1 FLOOD ATTENUATION
	3.2 WATER QUALITY IMPROVEMENT
48	3.2.1 Short Term Water Quality Improvement
0	3.2.2 Long Term Nutrient Trap
27	3.2.3 Groundwater Discharge
0	3.3 CARBON SINK
8	3.4 SHORELINE EROSION CONTROL
	3.5 GROUNDWATER RECHARGE
30	3.5.1 Site Type
5	3.5.2 Soils
143	Subtotal
143	TOTAL (Hydrological Component)

4.0 SPECIAL FEATURES COMPONENT

4.1 RARITY

4.1.1 Wetland Types

80	4.1.1.1	Rarity within the Landscape
0	4.1.1.2	Rarirty of Wetland Type

4.1.2 Species

500	4.1.2.1	Reproductive Habitat for an Endangered or Threatened Species
0	4.1.2.2	Traditional Migration or Feeding Habitat for an Endangered or Threatened Species
50	4.1.2.3	Provincially Significant Animal Species
0	4.1.2.4	Provincially Significant Plant Species
0	4.1.2.5	Regionally Significant Species
77	4.1.2.6	Locally Significant Species

4.2 SIGNIFICANT FEATURES OR HABITATS

0	4.2.1	Colonial Waterbirds
10	4.2.2	Winter Cover for Wildlife
10	4.2.3	Waterfowl Staging and/or Moulting Areas
10	4.2.4	Waterfowl Breeding
10	4.2.5	Migratory Passerine, Shorebird or Raptor Stopover Area
	4.2.6	Fish Habitat
100	4.2.6.1	Spawning and Nursery Habitat
10	4.2.6.2	Migration and Staging Habitat

1	4.3 ECOSYSTEM AGE
0	4.4 GREAT LAKES COASTAL WETLANDS
858	Subtotal
250	TOTAL (Special Features Component)

SUMMARY OF EVALUATION RESULT

151	1.0	TOTAL FOR BIOLOGICAL COMPONENT
100	2.0	TOTAL FOR SOCIAL COMPONENT
143	3.0	TOTAL FOR HYDROLOGICAL COMPONENT
250	4.0	TOTAL FOR SPECIAL FEATURES COMPONENT
644		TOTAL WETLAND SCORE

FOR OMNRF USE ONLY

OMNRF Reviewer (Name & Position)	Steve Varga, District Management Biologist, OMNRF Aurora District
Reviewer Comments	
OMNRF Approver (Name & Position)	Emily Funnell, Resources Management Supervisor, OMNRF Aurora District
Approval Date	May 2017, Updated August 2017

B

Appendix B

Photographic Log

Site Location		
North-west corner of Woodbine Avenue Bypass and Woodbine avenue		
Photo #	**Date**	**Cardinal Direction**
1	06/11/2019	North
Description		
MEMG3 ELC unit located adjacent to stormwater pond. Vegetalized soil piles with some exposed slopes.		

Site Location		
North-west corner of Woodbine Avenue Bypass and Woodbine avenue		
Photo #	**Date**	**Cardinal Direction**
2	06/11/2019	East
Description		
Stormwater pond inlet or outlet with exposed banks located at the limit of MEGM3 and FODM12 ELC units		

Site Location		
East of Honda Boulevard		
Photo #	**Date**	**Cardinal Direction**
3	06/11/2019	East
Description		
Vegetated Mound (MEGM3) located within 2 annual crops fields (OAGM1)		

Site Location
East of Honda Boulevard

Photo #	Date	Cardinal Direction
4	06/11/2019	East

Description
Inside of FODM12

Site Location		
North of Honda Boulevard (Fletcher's Field)		
Photo #	**Date**	**Cardinal Direction**
5	06/11/2019	West
Description		
Footbal Field		

Site Location		
West of Woodbine Avenue		
Photo #	**Date**	**Cardinal Direction**
6	06/12/2019	West
Description		
Limit between MEGM3-8 ELC unit located around Transcanada Pipelines Facilities and strawberries fields (OAGM3). **TAGM1 ELC unit can be seen in the background**		

Site Location		
South of 19th Avenue		
Photo #	**Date**	**Cardinal Direction**
7	06/12/2019	South
Description		
Berczy Creek tributary south of existing 19th Avenue existing crossing		

Site Location
North of 19th Avenue

Photo #	Date	Cardinal Direction
8	06/12/2019	North

Description
Berczy Creek tributary north of existing 19th Avenue existing crossing. PSW wetland no.14 (MAMM1-3)

Site Location		
West of Woodbine Avenue		
Photo #	**Date**	**Cardinal Direction**
9	06/12/2019	North
Description		
Wetland unit no. 15 (in a ditch along Woodbine Avenue)		

Site Location		
South of 19th Avenue		
Photo #	**Date**	**Cardinal Direction**
10	06/12/2019	North
Description		
Partial view of FOMM4-2 ELC unit		

C

Appendix C

Biological Inventory Lists

Markham Highway 404 Collector Roads
Environmental Assessment
Reptile Records

Common Name	*Scientific Name*	Origin	SARA	ESA	G Rank	N Rank	S Rank	Historical Observation	Recent Observation	Data Sources
Cryptodeira - Turtles										
Chelydridae - Snapping Turtles										
Snapping Turtle	*Chelydra serpentina*		SC	SC	G5	N5	S3		X	1,6
Emydidae - Pond Turtles										
Midland Painted Turtle	*Chrysemys picta marginata*				G5T5	N4	S4		X	1,6
Blanding's Turtle	*Emydoidea blandingii*		THR	THR	G4	N3	S3		X	6
Red-eared slider									X	1
Squamata - Snakes & Skinks										
Colubridae - Non-venomous Snakes										
Ring-necked Snake	*Diadophis punctatus*				G5	N5	S4		X	1
Smooth Greensnake	*Opheodrys vernalis*				G5	N5	S4		X	1
DeKay's Brownsnake	*Storeria dekayi*		NAR	NAR	G5	N5	S5		X	1
Red-bellied Snake	*Storeria occipitomaculata*				G5	N5	S5		X	1
Eastern Gartersnake	*Thamnophis sirtalis sirtalis*				G5T5	N5	S5	X	X	1,5

Common Name	Scientific Name	Origin	SARA	ESA	G Rank	N Rank	S Rank	Historical Observations	Recent Observations	Data Sources
Apiales - Asterids										
Apiaceae - Celeries, Carrots & Parsleys										
Bulb-bearing Water-hemlock	Cicuta bulbifera				G5	N5	S5		X	6
Spotted Water-hemlock	Cicuta maculata var. maculata				G5T5	N5	S5		X	6
Wild Carrot	Daucus carota	E			GNR	NNA	SNA	X	X	5,6
American Water-pennywort	Hydrocotyle americana				G5	N5	S4S5		X	6
Wild Parsnip	Pastinaca sativa	E			GNR	NNA	SNA		X	6
Araliaceae - Ivys & Ginsengs										
Bristly Sarsaparilla	Aralia hispida				G5	N5	S5		X	6
Wild Sarsaparilla	Aralia nudicaulis				G5	N5	S5		X	6
American Spikenard	Aralia racemosa				G4G5	N5	S5		X	6
Asterales - Daiseys										
Asteraceae - Daiseys & Sunflowers										
Common Yarrow	Achillea millefolium	E			G5	N5	SNA	X	X	5,6
White Snakeroot	Ageratina altissima				G5	N5	S5		X	6
Annual Ragweed	Ambrosia artemisiifolia	N			G5	N5	S5	X	X	5,6
Great Ragweed	Ambrosia trifida				G5	N5	S5		X	6
Corn Chamomile	Anthemis arvensis				GNR	NNA	SNA		X	6
Stinking Chamomile	Anthemis cotula				G5	NNA	SNA		X	6
Great Burdock	Arctium lappa				GNR	NNA	SNA		X	6
Common Burdock	Arctium minus	E			GNR	NNA	SNA	X	X	5,6
Absinthe Wormwood	Artemisia absinthium				GNR	NNA	SNA		X	6
Annual Wormwood	Artemisia annua				GNR	NNA	SNA		X	6
Biennial Wormwood	Artemisia biennis				G5	N5	SNA		X	6
Nodding Beggarticks	Bidens cernua				G5	N5	S5		X	6
Devil's Beggarticks	Bidens frondosa				G5	N5	S5	X	X	5,6
Three-parted Beggarticks	Bidens tripartita				GNR	NNR	S5		X	6
Tall Beggarticks	Bidens vulgata				G5	N5	S5		X	6
Black Knapweed	Centaurea nigra				GNR	NNA	SNA	X		5
Chicory	Cichorium intybus	E			GNR	NNA	SNA	X	X	5,6
Canada Thistle	Cirsium arvense	N			GNR	NNA	SNA	X	X	3,5,6
Bull Thistle	Cirsium vulgare				GNR	NNA	SNA	X	X	5,6
Horseweed	Conyza canadensis							X	X	5,6
Eastern Purple Coneflower	Echinacea purpurea				G4	NNA	SNA		X	6
Annual Fleabane	Erigeron annuus				G5	N5	S5	X	X	5,6
Philadelphia Fleabane	Erigeron philadelphicus				G5	N5	S5	X	X	5,6
Rough Fleabane	Erigeron strigosus				G5	N5	S5		X	6
Spotted Joe-Pye Weed	Eupatorium maculatum ssp. maculatum							X	X	5,6
Common Boneset	Eupatorium perfoliatum				G5	N5	S5	X	X	5,6
Large-leaved Aster	Eurybia macrophylla				G5	N5	S5		X	6
Grass-leaved Goldenrod	Euthamia graminifolia	N			G5	N5	S5	X	X	5,6
Spotted Joe Pye Weed	Eutrochium maculatum var. maculatum	N			G5T5	N5	S5		X	6
Orange Hawkweed	Hieracium aurantiacum							X		5
Common Hawkweed	Hieracium vulgatum				GNR	NNA	SNA		X	6
Elecampane	Inula helenium				GNR	NNA	SNA	X	X	5,6
Tall Blue Lettuce	Lactuca biennis				G5	N5	S5		X	6
Canada Lettuce	Lactuca canadensis				G5	N5	S5		X	6
Prickly Lettuce	Lactuca serriola				GNR	NNA	SNA		X	6
Oxeye Daisy	Leucanthemum vulgare	E			GNR	NNA	SNA	X	X	5,6
Rayless camomile	Matricaria matricarioides								X	6
Maritime camomile	Matricaria maritima								X	6
Hawkweed Oxtongue	Picris hieracioides				G5	NNA	SNA		X	6
Tall white lettuce	Prenanthes altissima								X	6
Black-eyed Susan	Rudbeckia hirta				G5	N5	S5		X	6
Common Ragwort	Senecio vulgaris				GNR	NNA	SNA		X	6
Eastern Tall Goldenrod	Solidago altissima var. altissima				GNR	NNR	S5		X	6

Common Name	Scientific Name	Origin	SARA	ESA	G Rank	N Rank	S Rank	Historical Observations	Recent Observations	Data Sources
Blue-stemmed Goldenrod	Solidago caesia				G5	N5	S5		X	6
Canada Goldenrod	Solidago canadensis var. canadensis	N			G5T5	N5	S5	X	X	5,6
Zigzag Goldenrod	Solidago flexicaulis				G5	N5	S5		X	6
Giant Goldenrod	Solidago gigantea				G5	N5	S5		X	6
Gray-stemmed Goldenrod	Solidago nemoralis ssp. nemoralis	N			G5T5	N5	S5	X		5
Field Sow-thistle	Sonchus arvensis ssp. arvensis	E			GNRTNR	NNA	SNA	X	X	5,6
Prickly Sow-thistle	Sonchus asper				GNR	NNA	SNA	X		5
Common Sow-thistle	Sonchus oleraceus				GNR	NNA	SNA		X	6
Heart-leaved Aster	Symphyotrichum cordifolium				G5	N5	S5	X	X	5,6
White Heath Aster	Symphyotrichum ericoides var. ericoides	N			G5T5	N5	S5	X	X	5,6
White Panicled Aster	Symphyotrichum lanceolatum var. lanceolatum	N			G5T5	N5	S5	X	X	5,6
Calico Aster	Symphyotrichum lateriflorum var. lateriflorum				G5T5	N5	S5		X	6
New England Aster	Symphyotrichum novae-angliae	N			G5	N5	S5	X	X	5,6
Swamp Aster	Symphyotrichum puniceum				G5	N5	S5	X	X	5,6
Arrow-leaved Aster	Symphyotrichum urophyllum				G4G5	N4	S4		X	6
Common Tansy	Tanacetum vulgare				GNR	NNA	SNA		X	6
Common Dandelion	Taraxacum officinale	E			G5	N5	SNA	X	X	5,6
Yellow Goat's-beard	Tragopogon dubius				GNR	NNA	SNA		X	6
Meadow Goat's-beard	Tragopogon pratensis				GNR	NNA	SNA	X	X	5,6
Colt's-foot	Tussilago farfara	E			GNR	NNA	SNA	X	X	5,6
Campanulales - Bellflowers										
Campanulaceae - Bellflowers										
Great Blue Lobelia	Lobelia siphilitica				G5	NNR	S5		X	6
Capparales - Mustards, Capers & Mignonettes										
Brassicaceae - Mustards										
Garlic Mustard	Alliaria petiolata	E			GNR	NNA	SNA	X	X	5,6
Bitter Wintercress	Barbarea vulgaris				GNR	NNA	SNA	X	X	5,6
Common Shepherd's Purse	Capsella bursa-pastoris				GNR	NNA	SNA		X	6
Two-leaved Toothwort	Cardamine diphylla				G5	N5	S5		X	6
Pennsylvania Bittercress	Cardamine pensylvanica				G5	N5	S5		X	6
Wormseed Wallflower	Erysimum cheiranthoides				G5	NNR	SNA	X	X	5,6
Dame's Rocket	Hesperis matronalis	E			G4G5	NNA	SNA	X	X	5,6
Field Peppergrass	Lepidium campestre				GNR	NNA	SNA	X		5
Dense-flowered Peppergrass	Lepidium densiflorum	E			G5	N5	SNA	X		5
Small-leaved Watercress	Nasturtium microphyllum				GNR	NNA	SNA	X	X	5,6
Marsh Yellowcress	Rorippa palustris ssp. palustris				G5T5	N5	S5?		X	6
Corn Mustard	Sinapis arvensis				GNR	NNA	SNA		X	6
Field Penny-cress	Thlaspi arvense				GNR	NNA	SNA	X	X	5,6
Caryophyllales - Carnations, Amaranths, Ice Plants, Cacti & Beets										
Amaranthaceae - Amaranths										
Powell's Amaranth	Amaranthus powellii ssp. powellii				G5T5	NNA	SNA	X	X	5,6
Red-root Amaranth	Amaranthus retroflexus				G5	N5	SNA	X		6
Caryophyllaceae - Carnations										
Field Chickweed	Cerastium arvense ssp. arvense				G5T5	NNA	SNA	X		5
Common Mouse-ear Chickweed	Cerastium fontanum				GNR	NNA	SNA	X	X	5,6
Deptford Pink	Dianthus armeria				GNR	NNA	SNA	X		5
Bouncing-bet	Saponaria officinalis				GNR	NNA	SNA	X	X	5,6
White Campion	Silene latifolia	E			GNR	NNA	SNA	X	X	5,6
Night-flowering Catchfly	Silene noctiflora				GNR	NNA	SNA	X		5
Bladder Campion	Silene vulgaris				GNR	NNA	SNA	X		5
Common Chickweed	Stellaria media				GNR	NNA	SNA	X		5
Chenopodiaceae - Goosefoots										
White Goosefoot	Chenopodium album	E			G5	NNA	SNA	X	X	5,6
Oak-leaved Goosefoot	Chenopodium glaucum							X	X	5,6
Prickly Russian Thistle	Salsola tragus				GNRTNR	NNA	SNA	X		5
Portulacaceae - Purslanes										

Common Name	Scientific Name	Origin	SARA	ESA	G Rank	N Rank	S Rank	Historical Observations	Recent Observations	Data Sources
Carolina Spring Beauty	Claytonia caroliniana				G5	NNR	S5		X	6
Celastrales - Bittersweets & Hollies										
Aquifoliaceae - Hollies										
Celastraceae - Bittersweets										
Climbing Bittersweet	Celastrus scandens				G5	N5	S5		X	x
Cornales - Dogwoods & Gums										
Cornaceae - Dogwoods										
Alternate-leaved Dogwood	Cornus alternifolia				G5	N5	S5	X	X	5,6
Pale Dogwood	Cornus obliqua				G5T5	N5	S5		X	6
Gray Dogwood	Cornus racemosa				G5?	N5	S5		X	6
Round-leaved Dogwood	Cornus rugosa				G5	NNR	S5	X		5
Red-osier Dogwood	Cornus stolonifera	N			G5	N5	S5	X	X	3,5,6
Dipsacales - Honeysuckles										
Caprifoliaceae - Honeysuckles										
Tartarian Honeysuckle	Lonicera tatarica	E			GNR	NNA	SNA	X	X	5,6
(Lonicera morrowii X Lonicera tatarica)	Lonicera x bella				GNA	NNA	SNA		X	6
Common Elderberry	Sambucus canadensis				G5T5	NNR	S5		X	6
Red Elderberry	Sambucus racemosa				G5	N5	S5	X	X	5,6
Common Snowberry	Symphoricarpos albus var. albus				G5T5	N5	S5		X	6
Maple-leaved Viburnum	Viburnum acerifolium				G5	N5	S5		X	6
Wayfaring-tree	Viburnum lantana				GNR	NNA	SNA		X	6
Nannyberry	Viburnum lentago				G5	N5	S5	X	X	5,6
Cranberry Viburnum	Viburnum opulus ssp. opulus				GNR	NNR	SNA	X	X	5,6
Highbush Cranberry	Viburnum opulus ssp. trilobum				GNR	NNR	S5		X	3
Dipsacaceae - Teasels										
Common Teasel	Dipsacus fullonum				GNR	NNA	SNA	X	X	5,6
Cut-leaved Teasel	Dipsacus laciniatus				GNR	NNA	SNA		X	6
Valerianaceae - Valerians										
Common Valerian	Valeriana officinalis				GNR	NNA	SNA		X	6
Ericales - Teas, Persimmons, Blueberries, Nuts, & Azaleas										
Monotropaceae - Indian Pipes										
Indian-pipe	Monotropa uniflora				G5	N5	S5		X	6
Euphorbiales - Spurges										
Euphorbiaceae - Spurges										
Leafy Spurge	Euphorbia esula				GNR	NNA	SNA		X	6
Petty Spurge	Euphorbia peplus				GNR	NNA	SNA		X	6
Fabales - Legumes										
Fabaceae - Legumes										
American Hog-peanut	Amphicarpaea bracteata				G5	N5	S5		X	6
Garden Bird's-foot Trefoil	Lotus corniculatus	E			GNR	NNA	SNA	X	X	5,6
Black Medic	Medicago lupulina	E			GNR	NNA	SNA	X	X	5,6
Alfalfa	Medicago sativa ssp. sativa				GNRTNR	NNA	SNA		X	6
White Sweet-clover	Melilotus albus	E			G5	NNA	SNA	X	X	5,6
Yellow Sweet-clover	Melilotus officinalis				GNR	NNA	SNA	X	X	5,6
Black Locust	Robinia pseudoacacia	E			G5	NNA	SNA		X	3,6
Common Crown-vetch	Securigera varia	E			GNR	NNA	SNA		X	6
Yellow Clover	Trifolium aureum				GNR	NNA	SNA	X		5
Low Hop Clover	Trifolium campestre				GNR	NNA	SNA	X		5
Red Clover	Trifolium pratense	E			GNR	NNA	SNA	X	X	5,6
White Clover	Trifolium repens	E			GNR	NNA	SNA	X	X	5,6
Fagales - Beeches, Birches, Alders & Oaks										
Betulaceae - Alders & Birches										
Speckled Alder	Alnus incana				G5	N5	S5		X	6
Yellow Birch	Betula alleghaniensis				G5	N5	S5		X	6
Paper Birch	Betula papyrifera	N			G5	N5	S5	X	X	5,6

Common Name	Scientific Name	Origin	SARA	ESA	G Rank	N Rank	S Rank	Historical Observations	Recent Observations	Data Sources
Weeping Birch	Betula pendula				GNR	NNA	SNA	X		5
Blue-beech	Carpinus caroliniana				G5	N5	S5		X	6
Beaked Hazelnut	Corylus cornuta				G5	N5	S5	X	X	5,6
Eastern Hop-hornbeam	Ostrya virginiana				G5	N5	S5	X	X	5,6
Fagaceae - Chestnuts, Beeches & Oaks										
American Beech	Fagus grandifolia				G5	N5	S4	X	X	5,6
Bur Oak	Quercus macrocarpa				G5	N5	S5	X	X	5,6
Northern Red Oak	Quercus rubra				G5	N5	S5	X	X	5,6
Gentianales - Dogbanes, Milkweeds & Gentians										
Apocynaceae - Dogbanes										
Spreading Dogbane	Apocynum androsaemifolium				G5	N5	S5	X	X	5,6
Hemp Dogbane	Apocynum cannabinum var. cannabinum				G5T5	N5	S5		X	6
Periwinkle	Vinca minor				GNR	NNA	SNA	X		5,6
Asclepiadaceae - Milkweeds										
Swamp Milkweed	Asclepias incarnata				G5	N5	S5		X	6
Common Milkweed	Asclepias syriaca	N			G5	N5	S5	X	X	5,6
European Swallow-wort	Cynanchum rossicum	E			GNR	NNA	SNA	X	X	5,6
Geraniales - Jewelweeds, Geraniums & Wood-sorrels										
Balsaminaceae - Jewelweeds										
Spotted Jewelweed	Impatiens capensis	N			G5	N5	S5	X	X	5,6
Geraniaceae - Geraniums										
Herb-Robert	Geranium robertianum				G5	N4	S5	X	X	5,6
Oxalidaceae - Wood-sorrels										
Slender Yellow Wood-sorrel	Oxalis dillenii				G5	N5	S5?		X	6
European Wood-sorrel	Oxalis stricta	N			G5	N5	S5	X	X	5,6
Haloragales - Water-milfoils										
Haloragaceae - Water-milfoils										
Eurasian Water-milfoil	Myriophyllum spicatum				GNR	NNA	SNA		X	6
Juglandales - Walnuts & Hickories										
Juglandaceae - Walnuts & Hickories										
Bitternut Hickory	Carya cordiformis				G5	N5	S5		X	6
Butternut	Juglans cinerea		END	END	G4	N3N4	S2?		X	6
Black Walnut	Juglans nigra				G5	N4	S4?		X	6
Lamiales - Forget-me-nots, Mints & Verbenas										
Boraginaceae - Forget-me-nots										
Common Hound's-tongue	Cynoglossum officinale				GNR	NNA	SNA		X	6
Common Viper's-bugloss	Echium vulgare	E			GNR	NNA	SNA	X		5
Virginia Stickseed	Hackelia virginiana				G5	N5	S5		X	6
Rough Forget-me-not	Myosotis arvensis				GNR	NNA	SNA		X	6
Small Forget-me-not	Myosotis laxa				G5	N5	S5		X	6
True Forget-me-not	Myosotis scorpioides				G5	NNA	SNA	X	X	5,6
Lamiaceae - Mints										
Creeping Bugleweed	Ajuga reptans				GNR	NNA	SNA		X	6
Field Basil	Clinopodium vulgare				G5	N5	S5		X	6
Common Hemp-nettle	Galeopsis tetrahit				GNR	NNA	SNA		X	6
Ground Ivy	Glechoma hederacea				GNR	NNA	SNA	X	X	5,6
Common Motherwort	Leonurus cardiaca				GNR	NNA	SNA	X	X	5,6
American Water-horehound	Lycopus americanus	N			G5	N5	S5		X	6
European Water-horehound	Lycopus europaeus				GNR	NNA	SNA	X	X	5,6
Northern Water-horehound	Lycopus uniflorus				G5	N5	S5		X	6
Canada Mint	Mentha canadensis				G5T5	N5	S5	X	X	5,6
(Mentha aquatica X Mentha spicata)	Mentha x piperita				GNA	NNA	SNA		X	6
Catnip	Nepeta cataria				GNR	NNA	SNA		X	6
Wild Marjoram	Origanum vulgare				GNR	NNA	SNA		X	6
Self-heal	Prunella vulgaris ssp. vulgaris	E			G5TU	NNA	SNA	X	X	5,6

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Mad Dog Skullcap	Scutellaria lateriflora				G5	N5	S5		X	6
Canada Germander	Teucrium canadense ssp. canadense				G5T5	N5	SU		X	6
Verbenaceae - Verbenas										
Lopseed	Phryma leptostachya				G5	N5	S4S5		X	6
Blue Vervain	Verbena hastata				G5	NNR	S5	X	X	5,6
White Vervain	Verbena urticifolia				G5	N5	S5		X	6
Malvales - Mallows										
Malvaceae - Mallows										
Velvetleaf	Abutilon theophrasti				GNR	NNA	SNA		X	6
Dwarf Cheeseweed	Malva neglecta				GNR	NNA	SNA	X	X	5,6
Tiliaceae - Lime Trees										
American Basswood	Tilia americana				G5	N5	S5	X	X	5,6
Little-leaf Linden	Tilia cordata				GNR	NNA	SNA	X	X	3,5,6
Myrtales - Myrtles										
Lythraceae - Loosestrifes										
Purple Loosestrife	Lythrum salicaria	E			G5	NNA	SNA	X		5,6
Onagraceae - Willowherbs										
Broad-leaved Enchanter's Nightshade	Circaea canadensis				G5T5	N5	S5	X	X	5,6
Northern Willowherb	Epilobium ciliatum ssp. ciliatum				G5T5	N5	S5	X	X	5,6
Hairy Willowherb	Epilobium hirsutum				GNR	NNA	SNA	X	X	5,6
Small-flowered Willowherb	Epilobium parviflorum				GNR	NNA	SNA		X	6
Common Evening Primrose	Oenothera biennis				G5	N5	S5		X	6
Small-flowered Evening Primrose	Oenothera parviflora				G4?	N4?	S5	X		5
Nymphaeales - Water Lilies										
Ceratophyllaceae - Hornworts										
Common Hornwort	Ceratophyllum demersum				G5	N5	S5		X	6
Nymphaeaceae - Water Lilies										
Variegated Pond-lily	Nuphar variegata				G5T5	N5	S5		X	6
Fragrant Water-lily	Nymphaea odorata ssp. odorata				G5T5	N5	S5?		X	6
Papaverales - Poppies & Allies										
Papaveraceae - Poppies										
Greater Celadine	Chelidonium majus				GNR	NNA	SNA		X	6
Bloodroot	Sanguinaria canadensis				G5	N5	S5		X	6
Plantaginales - Plantains										
Plantaginaceae - Plantains										
English Plantain	Plantago lanceolata				G5	NNA	SNA	X		5
Common Plantain	Plantago major	E			G5	NNA	SNA	X	X	5,6
Rugel's Plantain	Plantago rugelii				G5	N5	S5	X	X	5,6
Polygonales - Smartweeds										
Polygonaceae - Smartweeds										
Scarlet Smartweed	Persicaria amphibia var. emersa				G5T5	N5	S5?		X	6
Marshpepper Smartweed	Persicaria hydropiper				GNR	NNR	SNA		X	6
Spotted Lady's-thumb	Persicaria maculosa				G3G5	NNA	SNA		X	6
Pennsylvania Smartweed	Persicaria pensylvanica				G5	N5	S5		X	6
Leathery Knotweed	Polygonum achoreum				G5	N5	S5		X	6
Prostrate Knotweed	Polygonum aviculare ssp. aviculare				GNRTNR	NNA	SNA	X	X	5,6
Black bindweed	Plygonum convolvulus							X		5
Pale Smartweed	Polygonum lapathifolium							X		5,6
Lady's Thumb	Polygonum persicaria							X		5
Sheep Sorrel	Rumex acetosella				GNR	NNA	SNA	X		5
Curly Dock	Rumex crispus				GNR	NNA	SNA	X	X	5,6
Bitter Dock	Rumex obtusifolius				GNR	NNA	SNA	X	X	5,6
Primulales - Primroses										
Primulaceae - Primroses										
Northern Starflower	Lysimachia borealis				G5	NNR	S5		X	6

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Fringed Loosestrife	Lysimachia ciliata				G5	N5	S5		X	6
Creeping Jennie	Lysimachia nummularia				GNR	NNA	SNA		X	6
Ranunculales - Buttercups & Allies										
Berberidaceae - Barberries										
Japanese Barberry	Berberis thunbergii				GNR	NNA	SNA	X		5
Giant Blue Cohosh	Caulophyllum giganteum				G4G5	N4	S4S5		X	6
Blue Cohosh	Caulophyllum thalictroides				G5	N5	S5	X		5
May-apple	Podophyllum peltatum				G5	N5	S5	X		5
Ranunculaceae - Buttercups										
White Baneberry	Actaea pachypoda				G5	NNR	S5		X	6
Red Baneberry	Actaea rubra				G5	N5	S5		X	6
Canada Anemone	Anemone canadensis	N			G5	N5	S5	X	X	5,6
Wood Anemone	Anemone quinquefolia				G5	N5	S5		X	6
Tall Anemone	Anemone virginiana var. virginiana				G5T5	N5	S5	X		5
European Columbine	Aquilegia vulgaris				GNR	NNA	SNA		X	6
Yellow Marsh Marigold	Caltha palustris				G5	N5	S5		X	6
Virginia Virgin's-bower	Clematis virginiana				G5	NNR	S5	X	X	5,6
Kidney-leaved Buttercup	Ranunculus abortivus				G5	NNR	S5		X	6
Tall Buttercup	Ranunculus acris	E			G5	NNA	SNA	X	X	5,6
Swamp Buttercup	Ranunculus hispidus var. caricetorum				G5T5	NNR	S5		X	6
Hooked Buttercup	Ranunculus recurvatus				G5	NNR	S5		X	6
Creeping Buttercup	Ranunculus repens				GNR	NNA	SNA	X	X	5,6
Cursed Buttercup	Ranunculus sceleratus var. sceleratus				G5T5	N5	SNA		X	6
Early Meadow-rue	Thalictrum dioicum				G5	NNR	S5	X	X	5,6
Tall Meadow-rue	Thalictrum pubescens				G5	NNR	S5		X	6
Tall meadowrue	Thalictrum polygonum							X		5
Rhamnales - Buckthorns & Grapevines										
Rhamnaceae - Buckthorns										
Glossy Buckthorn	Frangula alnus				GNR	NNA	SNA		X	3,6
Common Buckthorn	Rhamnus cathartica	E			GNR	NNA	SNA	X	X	3,5,6
Vitaceae - Grapevines										
Virginia Creeper	Parthenocissus quinquefolia	N			G5	N4N5	S4?	X	X	5,6
Boston-ivy	Parthenocissus tricuspidata				GNR	NNA	SNA		X	6
Thicket Creeper	Parthenocissus vitacea	N			G5	N5	S5		X	6
Fox Grape	Vitis labrusca				G5	N1	S1		X	6
Riverbank Grape	Vitis riparia	N			G5	N5	S5	X	X	5,6
Rosales - Roses										
Crassulaceae - Stonecrops										
Two-row Stonecrop	Phedimus spurius				GNR	NNA	SNA		X	6
Grossulariaceae - Currants & Gooseberries										
Wild Black Currant	Ribes americanum	N			G5	N5	S5	x	X	5,6
Prickly Gooseberry	Ribes cynosbati				G5	N5	S5	X	X	5,6
Smooth Gooseberry	Ribes hirtellum				G5	N5	S5		X	6
Northern Red Currant	Ribes rubrum				G4G5	NNA	SNA	X	X	5,6
Rosaceae - Roses										
Hooked Agrimony	Agrimonia gryposepala				G5	N5	S5	X	X	5,6
Downy Serviceberry	Amelanchier arborea				G5	NNR	S5		X	6
Smooth Serviceberry	Amelanchier laevis				G5	N5	S5		X	6
Common Goatsbeard	Aruncus dioicus				G5	N5	SNA		X	6
Hawthorn	Crataegus spp.							X		5
Scarlet Hawthorn	Crataegus coccinea var. coccinea				GNR	NNR	S4		X	6
Large-thorned Hawthorn	Crataegus macracantha				GNR	NNR	S5		X	6
English Hawthorn	Crataegus monogyna				G5	NNA	SNA		X	6
Dotted Hawthorn	Crataegus punctata				G5	N5	S5		X	6
Queen-of-the-prairie	Filipendula rubra				G4G5	NNR	SNA		X	6

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Woodland Strawberry	Fragaria vesca ssp. vesca				G5T4T5	NNA	SNA		X	6
Wild Strawberry	Fragaria virginiana ssp. virginiana	N			G5T5	N5	SU	X	X	5,6
Yellow Avens	Geum aleppicum				G5	N5	S5	X	X	5,6
White Avens	Geum canadense	N			G5	N5	S5		X	6
Barren Strawberry	Geum fragarioides				G5	NNR	S5		X	6
Wood Avens	Geum urbanum	E			G5	NNA	SNA		X	3,6
Siberian Crabapple	Malus baccata				GNR	NNA	SNA		X	6
Common Apple	Malus pumila				G5	NNA	SNA	X	X	5,6
Norwegian Cinquefoil	Potentilla norvegica				G5	N5	S5	X	X	5,6
Sulphur Cinquefoil	Potentilla recta	E			GNR	NNA	SNA	X		5
Sweet Cherry	Prunus avium				GNR	NNA	SNA	X		5
Black Cherry	Prunus serotina				G5	N5	S5	X	X	5,6
Choke Cherry	Prunus virginiana	N			G5	NNR	S5	X	X	5,6
Common Pear	Pyrus communis				G5	NNA	SNA		X	6
Smooth Rose	Rosa blanda				G5	N5	S5		X	6
Multiflora Rose	Rosa multiflora	E			GNR	NNA	SNA	X	X	5,6
Allegheny Blackberry	Rubus allegheniensis	N			G5	N5	S5	X		5
Wild Red Raspberry	Rubus idaeus ssp. strigosus				G5T5	N5	S5	X	X	5,6
Black Raspberry	Rubus occidentalis				G5	N5	S5		X	6
Dewberry	Rubus pubescens				G5	NNR	S5		X	6
White Meadowsweet	Spiraea alba var. alba				G5T5	N5	S5	X	X	5,6
Saxifragaceae - Saxifrages										
American Golden-saxifrage	Chrysosplenium americanum				G5	N5	S4		X	6
Two-leaved Mitrewort	Mitella diphylla				G5	N5	S5		X	6
Naked Mitrewort	Mitella nuda				G5	N5	S5		X	6
Heart-leaved Foam-flower	Tiarella cordifolia				G5	N5	S5		X	6
Rubiales - Coffees, Madders & Bedstraws										
Rubiaceae - Bedstraws										
Rough Bedstraw	Galium asprellum				G5	NNR	S5		X	6
Marsh Bedstraw	Galium palustre				G5	NNR	S5		X	6
Three-flowered Bedstraw	Galium triflorum				G5	NNR	S5	X	X	5,6
Yellow Bedstraw	Galium verum				GNR	NNA	SNA		X	6
Salicales - Willows, Aspens & Poplars										
Salicaceae - Willows, Aspens & Poplars										
White Poplar	Populus alba	E			G5	NNA	SNA	X	X	3,5,6
Balsam Poplar	Populus balsamifera	N			G5	N5	S5		X	6
Eastern Cottonwood	Populus deltoides ssp. deltoides	N			G5T5	NNR	S5		X	6
Large-toothed Aspen	Populus grandidentata				G5	NNR	S5	X	X	5,6
Trembling Aspen	Populus tremuloides	N			G5	N5	S5	X	X	3,5,6
White Willow	Salix alba	E			G5	NNA	SNA	X	X	5,6
Peach-leaved Willow	Salix amygdaloides	N			G5	N5	S5	X		5,6
Bebb's Willow	Salix bebbiana				G5	N5	S5	X	X	5,6
Pussy Willow	Salix discolor	N			G5	N5	S5	X	X	5,6
Heart-leaved Willow	Salix eriocephala	N			G5	N5	S5	X	X	5,6
Crack Willlow	Salix fragilis							X	X	5,6
Sandbar Willow	Salix interior				GNR	NNR	S5		X	6
Shining Willow	Salix lucida				G5	NNR	S5		X	6
Corkscrew Willow	Salix matsudana				GNR	NNA	SNA		X	6
Black Willow	Salix nigra				G5	N4	S4		X	6
Meadow Willow	Salix petiolaris				G5	N5	S5	X	X	5,6
Reddish Willow	Salix x rubens							X	X	5,6
Weeping Willow	Salix x sepulcralis	E			GNA	NNA	SNA		X	6
Sapindales - Maples, Sumacs & Allies										
Aceraceae - Maples										
Manitoba Maple	Acer negundo	E			G5	N5	S5	X	X	3,5,6
Black Maple	Acer nigrum				G5	NNR	S4?		X	6

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Norway Maple	Acer platanoides				GNR	NNA	SNA	X	X	5, 6
Red Maple	Acer rubrum	N			G5	N5	S5	X	X	3,5
Silver Maple	Acer saccharinum				G5	N5	S5	X	X	5,6
Sugar Maple	Acer saccharum	N			G5	N5	S5	X	X	5, 6
Mountain Maple	Acer spicatum				G5	N5	S5		X	6
(Acer rubrum X Acer saccharinum)	Acer x freemanii				GNA	NNA	SNA		X	6
Anacardiaceae - Sumacs										
Smooth Sumac	Rhus glabra				G5	N5	S5		X	6
Staghorn Sumac	Rhus typhina	N			G5	N5	S5	X	X	5,6
Eastern Poison Ivy	Toxicodendron radicans var. radicans	N			GNR	NNR	S5	X	X	5,6
Western Poison Ivy	Toxicodendron radicans var. rydbergii				G5	N5	S5		X	6
Hippocastanaceae - Buckeyes										
Horse Chestnut	Aesculus hippocastanum				GNR	NNA	SNA		X	6
Scrophulariales - Figworts, Bladderworts, Olives & Allies										
Lentibulariaceae - Bladderworts										
Greater Bladderwort	Utricularia vulgaris				G5	N5	S5		X	6
Oleaceae - Olives										
Green-stemmed Forsythia	Forsythia viridissima				GNR	NNA	SNA	X		5
White Ash	Fraxinus americana				G5	N5	S4	X	X	5,6
Black Ash	Fraxinus nigra				G5	N5	S4		X	6
Green Ash	Fraxinus pennsylvanica				G5	N5	S4		X	3,6
European Privet	Ligustrum vulgare				GNR	NNA	SNA	X		5
Common Lilac	Syringa vulgaris	E			GNR	NNA	SNA	X	X	5,6
Scrophulariaceae - Figworts & Snapdragons										
White Turtlehead	Chelone glabra				G5	N5	S5		X	6
Butter-and-eggs	Linaria vulgaris				GNR	NNA	SNA	X	X	5,6
Square-stemmed Monkeyflower	Mimulus ringens				G5	N5	S5		X	6
Common Mullein	Verbascum thapsus	E			GNR	NNA	SNA	X	X	5,6
American Speedwell	Veronica americana				G5	N5	S5		X	6
Common Speedwell	Veronica officinalis				G5	NNR	SNA	X	X	5,6
Solanales - Bindweeds, Nightshades & Allies										
Convolvulaceae - Bindweeds										
American False Bindweed	Calystegia sepium ssp. americana	N			G5T5	N5	S5		X	6
Field Bindweed	Convolvulus arvensis				GNR	NNA	SNA		X	6
Common Dodder	Cuscata gronovii								X	6
Hydrophyllaceae - Waterleafs										
Virginia Waterleaf	Hydrophyllum virginianum				G5	N5	S5		X	6
Polemoniaceae - Phloxes										
Fall Phlox	Phlox paniculata				G5	NNR	SNA		X	6
Solanaceae - Nightshades										
Climbing Nightshade	Solanum dulcamara				GNR	NNA	SNA	X	X	5,6
Theales - St. John's-worts & Waterworts										
Clusiaceae - St. John's-worts										
Common St. John's-wort	Hypericum perforatum				GNR	NNA	SNA	X	X	5,6
Urticales - Mulberries, Elms & Nettles										
Cannabaceae - Hemps										
Marijuana	Cannabis sativa				GNR	NNA	SNA	X		5
Moraceae - Mulberries & Figs										
White Mulberry	Morus alba				GNR	NNA	SNA		X	6
Ulmaceae - Elms										
American Elm	Ulmus americana				G5	N5	S5	X	X	5,6
Siberian Elm	Ulmus pumila				GNR	NNA	SNA	X	X	5,6
Urticaceae - Nettles										
False Nettle	Boehmeria cylindrica				G5	N5	S5		X	6
Wood Nettle	Laportea canadensis				G5	N5	S5		X	6

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Springs Clearweed	Pilea fontana				G5	N4	S4	X	X	5,6
Canada Clearweed	Pilea pumila	N			G5	N5	S5		X	6
European Stinging Nettle	Urtica dioica ssp. dioica	E			G5T5?	NNA	SNA	X		5
Slender Stinging Nettle	Urtica dioica ssp. gracilis				G5T5	N5	S5		X	6
Violales - Violets & Allies										
Cucurbitaceae - Cucumbers										
Wild Mock-cucumber	Echinocystis lobata				G5	N5	S5	X	X	5,6
Violaceae - Pansies & Violets										
Le Conte's Violet	Viola affinis				G5	N4?	S4?		X	6
Dog violet	Viola conspersa							X	X	5,6
Marsh Blue Violet	Viola cucullata				G4G5	N5	S5		X	6
Downy Yellow Violet	Viola pubescens var. pubescens				G5T5	N5	S5	X	X	5,6
Woolly Blue Violet	Viola sororia				G5	N5	S5	X	X	5,6
Johnny-jump-up	Viola tricolor				GNR	NNA	SNA	X		5
Alismatales - Arrowheads & Pondweeds										
Alismataceae - Water-plantains										
Water-plantain	Alisma plantago-aquatica							X	X	5,6
Broad-leaved Arrowhead	Sagittaria latifolia				G5	N5	S5		X	6
Arales - Sweetflags, Arums & Duckweeds										
Araceae - Arums										
Jack-in-the-pulpit	Arisaema triphyllum				G5	N5	S5		X	6
Lemnaceae - Duckweeds										
Lesser Duckweed	Lemna minor				G5	N5	S5	X	X	5,6
Star Duckweed	Lemna trisulca				G5	N5	S5		X	6
Great Duckweed	Spirodela polyrhiza				G5	N5	S5		X	6
Northern Watermeal	Wolffia borealis				G5	N5	S4S5		X	6
Columbia Watermeal	Wolffia columbiana				G5	N4N5	S4S5		X	6
Cyperales - Grasses & Sedges										
Cyperaceae - Sedges										
Water Sedge	Carex aquatilis var. aquatilis				G5T5	N5	S5		X	6
Drooping Woodland Sedge	Carex arctata				G5	N5	S5		X	6
Bebb's Sedge	Carex bebbii				G5	N5	S5	X	X	5,6
Woodland Sedge	Carex blanda				G5	N5	S5		X	6
Fringed Sedge	Carex crinita				G5	N5	S5		X	6
Crested Sedge	Carex cristatella				G5	N5	S5	X	X	5,6
Dewey's Sedge	Carex deweyana				G5	N5	S5	X		5
Graceful Sedge	Carex gracillima				G5	N5	S5		X	6
Limestone Meadow Sedge	Carex granularis				G5	N5	S5		X	6
Hitchcock's Sedge	Carex hitchcockiana				G5	N5	S4S5		X	6
Porcupine Sedge	Carex hystericina				G5	N5	S5		X	6
Inland Sedge	Carex interior				G5	N5	S5		X	6
Lake Sedge	Carex lacustris				G5	N5	S5		X	6
Hop Sedge	Carex lupulina				G5	N5	S5		X	6
Long-stalked Sedge	Carex pedunculata				G5	N5	S5		X	6
Woolly Sedge	Carex pellita				G5	N5	S5		X	6
Cyperus-like Sedge	Carex pseudocyperus				G5	N5	S5		X	6
Eastern Star Sedge	Carex radiata				G5	N5	S5	X	X	5,6
Retrorse Sedge	Carex retrorsa				G5	N5	S5		X	6
Rosy Sedge	Carex rosea				G5	N5	S5		X	6
Spiked Sedge	Carex spicata				GNR	NNA	SNA		X	5
Awl-fruited Sedge	Carex stipata				G5	N5	S5	X	X	5,6
Tussock Sedge	Carex stricta				G5	N5	S5		X	6
Fox Sedge	Carex vulpinoidea				G5	N5	S5	X	X	5,6
Red-stemmed Spikerush	Eleocharis erythropoda	N			G5	N5	S5		X	6
Creeping Spikerush	Eleocharis palustris				G5?	N5	S5		X	6

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Soft-stemmed Bulrush	Schoenoplectus tabernaemontani				G5	N5	S5		X	6
Dark-green Bulrush	Scirpus atrovirens				G5?	N5	S5	X	X	5,6
Cottongrass Bulrush	Scirpus cyperinus				G5	N5	S5	X	X	5,6
Red-tinged Bulrush	Scirpus microcarpus				G5	N5	S5		X	6
Sofstem Bulrush	Scirpus validus							X		5
Poaceae - Grasses										
Redtop	Agrostis gigantea	E			G4G5	NNA	SNA	X	X	5,6
Rough Bentgrass	Agrostis scabra				G5	N5	S5		X	6
Creeping Bentgrass	Agrostis stolonifera	E			G5	N5	SNA	X	X	5,6
Smooth Brome	Bromus inermis	E			G5TNR	NNA	SNA	X	X	5,6
Bluejoint Reedgrass	Calamagrostis canadensis var. canadensis	N			G5T5	N5	S5	X	X	5,6
Orchard Grass	Dactylis glomerata				GNR	NNA	SNA	X	X	5,6
Hairy Crabgrass	Digitaria sanguinalis				G5	NNA	SNA	x	X	5,6
Large Barnyard Grass	Echinochloa crus-galli				GNR	NNA	SNA	X	X	5,6
Creeping Wildrye	Elymus repens	E			GNR	NNA	SNA	X	X	5,6
Virginia Wildrye	Elymus virginicus var. virginicus				G5T5	N5	S5		X	6
Tall Fescue	Festuca arundinacea								X	6
Meadow Fescue	Festuca pratensis							X	X	5,6
Tall Mannagrass	Glyceria grandis				G5	N5	S5		X	6
Fowl Mannagrass	Glyceria striata	N			G5	N5	S5	X	X	5,6
Rice Cutgrass	Leersia oryzoides				G5	N5	S5		X	6
Perennial Ryegrass	Lolium perenne				GNR	NNA	SNA		X	6
Common Panicgrass	Panicum capillare				G5	N5	S5	X		5
Fall Panicgrass	Panicum dichotomiflorum				G5	N5	SNA		X	6
Reed Canary Grass	Phalaris arundinacea var. arundinacea	E			GNR	NNR	S5	X	X	3,5,6
Common Timothy	Phleum pratense	E			GNR	NNA	SNA	X	X	5,6
European Reed	Phragmites australis ssp. australis	E			G5T5	NNA	SNA		X	6
Annual Bluegrass	Poa annua				GNR	NNA	SNA	X	X	5,6
Canada Bluegrass	Poa compressa				GNR	NNA	SNA	X	X	5,6
Fowl Bluegrass	Poa palustris				G5	N5	S5		X	6
Kentucky Bluegrass	Poa pratensis ssp. pratensis	E			G5T5	N5	SNA	X	X	5,6
Spreading Alkaligrass	Puccinellia distans				G5	NNR	SNA		X	6
Purple False Melic	Schizachne purpurascens				G5	N5	S5		X	6
Yellow Foxtail	Setaria glauca							X		5
Yellow Foxtail	Setaria pumila				GNR	NNA	SNA		X	6
Green Foxtail	Setaria viridis				GNR	NNA	SNA	X	X	5,6
Hydrocharitales - Waterweeds										
Hydrocharitaceae - Waterweeds										
Broad Waterweed	Elodea canadensis				G5	N5	S5		X	6
Nuttall's Waterweed	Elodea nuttallii				G5	N3N4	S3		X	6
Juncales - Rushes										
Juncaceae - Rushes										
Toad Rush	Juncus bufonius				G5	N5	S5	X	X	5,6
Dudley's Rush	Juncus dudleyi	N			G5	N5	S5	X	X	5,6
Soft Rush	Juncus effusus ssp. effusus				GNR	NNR	SNA	x	X	5,6
Black-grass Rush	Juncus gerardii				G5	N5	SNA		X	6
Knotted Rush	Juncus nodosus				G5	N5	S5		X	6
Path Rush	Juncus tenuis				G5	N5	S5	X	X	5,6
Torrey's Rush	Juncus torreyi				G5	N5	S5		X	6
Liliales - True Lilies										
Iridaceae - Irises										
Yellow Iris	Iris pseudacorus				GNR	NNA	SNA		X	6
Harlequin Blue Flag	Iris versicolor				G5	N5	S5		X	6
Liliaceae - Lilies										
Wild Leek	Allium tricoccum var. tricoccum				G5	N5	S4		X	6
Garden Asparagus	Asparagus officinalis	E			G5?	NNA	SNA		X	6

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European Lily-of-the-valley	Convallaria majalis				G5	NNA	SNA		X	6
Yellow Trout-lily	Erythronium americanum				G5	N5	S5	X	X	5,6
Orange Daylily	Hemerocallis fulva				GNA	NNA	SNA	X	X	5,6
Yellow Daylily	Hemerocallis lilioasphodelus				GNR	NNA	SNA		X	6
Michigan Lily	Lilium michiganense				G5	N5	S4		X	6
Wild Lily-of-the-valley	Maianthemum canadense ssp. canadense				G5T5	N5	S5	X	X	5,6
False Solomon's-seal	Maianthemum racemosum				G5	N5	S5	X	X	5,6
Star-flowered False Solomon's-seal	Maianthemum stellatum	N			G5	N5	S5		X	6
Hairy Solomon's Seal	Polygonatum pubescens				G5	N5	S5		X	6
Red Trillium	Trillium erectum				G5	N5	S5	X	X	5,6
White Trillium	Trillium grandiflorum				G5	N5	S5		X	6
Pontederiaceae - Pickerel Weeds										
Pickerel Weed	Pontederia cordata				G5	N5	S5		X	6
Smilacaceae - Greenbriers										
Herbaceous Carrionflower	Smilax herbacea				G5	N4N5	S4?		X	6
Najadales - Arrow-grasses, Naiads & Pondweeds										
Najadaceae - Naiads										
Slender Naiad	Najas flexilis				G5	N5	S5		X	6
Potamogetonaceae - Pondweeds										
Curly-leaved Pondweed	Potamogeton crispus				G5	NNA	SNA		X	6
Leafy Pondweed	Potamogeton foliosus				G5	N5	S5		X	6
Floating Pondweed	Potamogeton natans				G5	N5	S5		X	6
Flatstem Pondweed	Potamogeton zosteriformis				G5	N5	S5		X	6
Sago Pondweed	Stuckenia pectinata				G5	N5	S5		X	6
Orchidales - Orchids										
Orchidaceae - Orchids										
Eastern Helleborine	Epipactis helleborine				GNR	NNA	SNA		X	6
Nodding Ladies'-tresses	Spiranthes cernua				G5	N5	S5		X	6
Typhales - Cattails & Burreeds										
Typhaceae - Cattails										
Narrow-leaved Cattail	Typha angustifolia				G5	N5	SNA	X	X	5,6
Broad-leaved Cattail	Typha latifolia	N			G5	N5	S5	X	X	5,6
(Typha angustifolia X Typha latifolia)	Typha x glauca				GNA	NNR	SNA	X	X	5,6
Pinales - Conifers										
Cupressaceae - Junipers & Cedars										
Eastern Red Cedar	Juniperus virginiana	N			G5	N5	S5		X	6
Eastern White Cedar	Thuja occidentalis	N			G5	N5	S5	X	X	3,5,6
Pinaceae - Spruces, Pines, Larches & Firs										
Balsam Fir	Abies balsamea				G5	N5	S5		X	6
American Larch	Larix laricina				G5	N5	S5		X	6
Norway Spruce	Picea abies				G5	NNA	SNA	X	X	5,6
White Spruce	Picea glauca				G5	N5	S5	X	X	3,5,6
Black Spruce	Picea mariana				G5	N5	S5		X	6
Blue Spruce	Picea pungens				G5	NNA	SNA	X		5
Black Pine	Pinus nigra				GNR	NNA	SNA		X	6
Red Pine	Pinus resinosa				G5	N5	S5		X	6
Eastern White Pine	Pinus strobus				G5	N5	S5	X	X	3,5,6
Scots Pine	Pinus sylvestris				GNR	NNA	SNA	X	X	5,6
Eastern Hemlock	Tsuga canadensis				G5	N5	S5		X	6
Taxales - Yews										
Taxaceae - Yews										
Canadian Yew	Taxus canadensis				G5	N5	S4		X	6
Filicales - True Ferns										
Dennstaedtiaceae - Bracken Ferns										
Bracken Fern	Pteridium aquilinum				G5	N5	S5	X		5

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Dryopteridaceae - Wood Ferns										
Northeastern Lady Fern	Athyrium filix-femina var. angustum				G5T5	N5	S5	X	X	5,6
Bulblet Fern	Cystopteris bulbifera				G5	N5	S5		X	6
Spinulose Wood Fern	Dryopteris carthusiana				G5	N5	S5	X	X	5,6
Crested Wood Fern	Dryopteris cristata				G5	N5	S5		X	6
Marginal Wood Fern	Dryopteris marginalis				G5	N5	S5		X	6
Common Oak Fern	Gymnocarpium dryopteris				G5	N5	S5		X	6
Ostrich Fern	Matteuccia struthiopteris	N			G5	N5	S5		X	6
Sensitive Fern	Onoclea sensibilis	N			G5	N5	S5	X	X	5,6
Osmundaceae - Royal Ferns										
Royal Fern	Osmunda regalis				G5	N5	S5		X	6
Cinnamon Fern	Osmundastrum cinnamomeum				G5	N5	S5		X	6
Thelypteridaceae - Marsh Ferns										
Northern Beech Fern	Phegopteris connectilis				G5	N5	S5		X	6
Marsh Fern	Thelypteris palustris				G5	N5	S5	X	X	5,6
Equisetales - Horsetails										
Equisetaceae - Horsetails										
Field Horsetail	Equisetum arvense	N			G5	N5	S5	X	X	5,6
Water Horsetail	Equisetum fluviatile				G5	N5	S5		X	6
Common Scouring-rush	Equisetum hyemale				G5	N5	S5		X	6
Meadow Horsetail	Equisetum pratense				G5	N5	S5		X	6
Variegated Horsetail	Equisetum variegatum				G5	N5	S5		X	6

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Galliformes - Grouse, Quail & Allies									
Phasianidae - Partridge, Grouse & Turkeys									
Ring-necked Pheasant	*Phasianus colchicus*			G5	NNA	SNA	X		4
Ruffed Grouse	*Bonasa umbellus*			G5	N5	S4	X		4
Wild Turkey	*Meleagris gallopavo*			G5	N5	S5		X	6
Anseriformes - Ducks, Geese & Swans									
Anatidae - Ducks, Geese & Swans									
Canada Goose	*Branta canadensis*			G5	N5B,N5N	S5	X	X	4, 5,6
Trumpeter Swan	*Cygnus buccinator*	NAR	NAR	G4	N4B,N5N	S4	X	X	4,6
Wood Duck	*Aix sponsa*			G5	N5B,N5N	S5	X	X	4,6
American Black Duck	*Anas rubripes*			G5	N5B,N5N	S4		X	6
Mallard	*Anas platyrhynchos*			G5	N5B,N5N	S5	X	X	4,5,6
Blue-winged Teal	*Anas discors*			G5	N5B	S4	X		4
Green-winged Teal	*Anas crecca*			G5	N5B,N5N	S4	X		4
Lesser Scaup	*Aythya affinis*			G5	N5B,N5N	S4		X	6
Hooded Merganser	*Lophodytes cucullatus*			G5	N5B	S5B,S5N	X		4
Common Merganser	*Mergus merganser*			G5	N5B,N5N	S5B,S5N	X		4
Gaviiformes - Loons									
Gaviidae - Loons									
Common Loon	*Gavia immer*	NAR	NAR	G5	N5B,N5N	S5B,S5N		X	6
Podicipediformes - Grebes									
Podicipedidae - Grebes									
Pied-billed Grebe	*Podilymbus podiceps*			G5	N5B	S4B,S4N	X		4
Pelecaniformes - Pelicans, Herons, Ibises & Allies									
Ardeidae - Herons & Bitterns									
American Bittern	*Botaurus lentiginosus*			G4	N5B,N3N	S4B	X		4
Great Blue Heron	*Ardea herodias*			G5	N5B	S4	X	X	4, 5,6
Green Heron	*Butorides virescens*			G5	N4B	S4B	X	X	4, 5,6
Black-crowned Night-heron	*Nycticorax nycticorax*			G5	N4N5B	S3B,S3N		X	6
Yellow-crowned Night-heron	*Nyctanassa violacea*			G5	NNA	SNA		X	6
Accipitriformes - Hawks, Kites, Eagles & Allies									
Cathartidae - New World Vultures									
Turkey Vulture	*Cathartes aura*			G5	N5B	S5B	X	X	4, 5,6
Pandionidae - Osprey									
Osprey	*Pandion haliaetus*			G5	N5B	S5B	X	X	4,6
Accipitridae - Hawks, Kites & Eagles									
Northern Harrier	*Circus cyaneus*	NAR	NAR	G5	N5B,N4N	S4B	X		4, 5
Cooper's Hawk	*Accipiter cooperii*	NAR	NAR	G5	N5B,N4N	S4	X	X	4,6
Red-shouldered Hawk	*Buteo lineatus*	NAR	NAR	G5	N4B	S4B	X		4
Broad-winged Hawk	*Buteo platypterus*			G5	N5B	S5B	X		4
Red-tailed Hawk	*Buteo jamaicensis*	NAR	NAR	G5	N5B	S5	X	X	4, 5,6
Gruiformes - Cranes & Rails									
Rallidae - Rails, Gallinules & Coots									
Virginia Rail	*Rallus limicola*			G5	N5B	S5B	X	X	4,6
Sora	*Porzana carolina*			G5	N5B	S4B	X	X	4,6
American Coot	*Fulica americana*	NAR	NAR	G5	N5B	S4B	X		4
Charadriiformes - Plovers, Sandpipers & Allies									
Charadriidae - Plovers									
Black-bellied Plover	*Pluvialis squatarola*			G5	N3B	S4N		X	6
Killdeer	*Charadrius vociferus*			G5	N5B	S5B,S5N	X	X	4, 5,6
Scolopacidae - Sandpipers & Phalaropes									
Spotted Sandpiper	*Actitis macularius*			G5	N5B	S5	X	X	4,6
Least Sandpiper	*Calidris minutilla*			G5	N5B	S4B,S5N		X	6

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Wilson's Snipe	*Gallinago delicata*			G5	N5B	S5B	X		4
American Woodcock	*Scolopax minor*			G5	N5B	S4B	X	X	4,6
Laridae - Gulls, Terns & Skimmers									
Ring-billed Gull	*Larus delawarensis*			G5	N5B,N5N	S5B,S4N	X	X	5,6
Columbiformes - Pigeons & Doves									
Columbidae - Pigeons & Doves									
Rock Pigeon	*Columba livia*			G5	NNA	SNA	X	X	4,6
Mourning Dove	*Zenaida macroura*			G5	N5	S5	X	X	4,5,6
Cuculiformes - Cuckoos & Anis									
Cuculidae - Cuckoos & Anis									
Black-billed Cuckoo	*Coccyzus erythropthalmus*			G5	N5B	S5B	X	X	3,4,6
Strigiformes - Owls									
Strigidae - Typical Owls									
Eastern Screech-Owl	*Megascops asio*	NAR	NAR	G5	N4N5	S4	X	X	4,6
Great Horned Owl	*Bubo virginianus*			G5	N5	S4	X	X	4,6
Barred Owl	*Strix varia*			G5	N5	S5	X		4
Long-eared Owl	*Asio otus*			G5	N5B,N5N	S4	X		4
Apodiformes - Swifts & Hummingbirds									
Apodidae - Swifts									
Chimney Swift	*Chaetura pelagica*	THR	THR	G5	N4B	S4B,S4N	X	X	4,6
Trochilidae - Hummingbirds									
Ruby-throated Hummingbird	*Archilochus colubris*			G5	N5B	S5B	X	X	4,6
Coraciiformes - Kingfishers & Allies									
Alcedinidae - Kingfishers									
Belted Kingfisher	*Megaceryle alcyon*			G5	N5B	S4B	X	X	4,6
Piciformes - Woodpeckers									
Picidae - Woodpeckers									
Yellow-bellied Sapsucker	*Sphyrapicus varius*			G5	N5B	S5B	X		4
Downy Woodpecker	*Picoides pubescens*			G5	N5	S5	X	X	4,6
Hairy Woodpecker	*Picoides villosus*			G5	N5	S5	X	X	4,6
Northern Flicker	*Colaptes auratus*			G5	N5	S4B	X	X	4,5,6
Pileated Woodpecker	*Dryocopus pileatus*			G5	N5	S5	X	X	4,6
Falconiformes - Caracaras & Falcons									
Falconidae - Caracaras & Falcons									
American Kestrel	*Falco sparverius*			G5	N5B	S4	X		4, 5
Passeriformes - Perching Birds									
Tyrannidae - Tyrant Flycatchers									
Eastern Wood-pewee	*Contopus virens*	SC	SC	G5	N4N5B	S4B	X	X	3,4,6
Alder Flycatcher	*Empidonax alnorum*			G5	N5B	S5B	X	X	4,6
Willow Flycatcher	*Empidonax traillii*			G5	N5B	S5B	X	X	4,6
Least Flycatcher	*Empidonax minimus*			G5	N5B	S4B	X		4
Eastern Phoebe	*Sayornis phoebe*			G5	N5B	S5B	X	X	4,5,6
Great Crested Flycatcher	*Myiarchus crinitus*			G5	N5B	S4B	X	X	4,6
Eastern Kingbird	*Tyrannus tyrannus*			G5	N5B	S4B	X	X	4,5,6
Vireonidae - Vireos									
Warbling Vireo	*Vireo gilvus*			G5	N5B	S5B	X	X	4,6
Red-eyed Vireo	*Vireo olivaceus*			G5	N5B	S5B	X	X	4,5,6
Corvidae - Crows & Jays									
Blue Jay	*Cyanocitta cristata*			G5	N5	S5	X	X	4,5,6
American Crow	*Corvus brachyrhynchos*			G5	N5B,N5N	S5B	X	X	4,5,6
Common Raven	*Corvus corax*			G5	N5	S5		X	6
Bombycillidae - Waxwings									
Cedar Waxwing	*Bombycilla cedrorum*			G5	N5	S5B	X		4,5,6

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Paridae - Chickadees & Titmice									
Black-capped Chickadee	*Poecile atricapillus*			G5	N5	S5	X	X	4,5,6
Alaudidae - Larks									
Horned Lark	*Eremophila alpestris*			G5	N5B,N5N	S5B	X	X	4,6
Hirundinidae - Swallows									
Purple Martin	*Progne subis*			G5	N5B	S4B	X		4
Tree Swallow	*Tachycineta bicolor*			G5	N5B	S4B	X	X	4,5,6
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*			G5	N5B	S4B	X	X	4,6
Bank Swallow	*Riparia riparia*	THR	THR	G5	N5B	S4B	X	X	4,6
Cliff Swallow	*Petrochelidon pyrrhonota*			G5	N5B	S4B		X	4,6
Barn Swallow	*Hirundo rustica*	THR	THR	G5	N4N5B	S4B	X	X	3,4,5,6
Regulidae - Kinglets									
Golden-crowned Kinglet	*Regulus satrapa*			G5	N5	S5B	X	X	4,6
Sittidae - Nuthatches									
Red-breasted Nuthatch	*Sitta canadensis*			G5	N5	S5	X	X	4,6
White-breasted Nuthatch	*Sitta carolinensis*			G5	N5	S5	X	X	4,6
Troglodytidae - Wrens									
House Wren	*Troglodytes aedon*			G5	N5B	S5B	X	X	4, 5,6
Winter Wren	*Troglodytes hiemalis*			G5	N5B	S5B	X	X	4,6
Sedge Wren	*Cistothorus platensis*	NAR	NAR	G5	N5B	S4B	X		4
Marsh Wren	*Cistothorus palustris*			G5	N5B	S4B	X		4
Polioptilidae - Gnatcatchers									
Blue-gray Gnatcatcher	*Polioptila caerulea*			G5	N4B	S4B	X	X	4,6
Certhidae - Creepers									
Brown Creeper	*Certhia americana*			G5	N5	S5B	X		4
Mimidae - Mockingbirds & Thrashers									
Gray Catbird	*Dumetella carolinensis*			G5	N5B	S4B	X	X	4, 5,6
Northern Mockingbird	*Mimus polyglottos*			G5	N4	S4	X	X	4,6
Brown Thrasher	*Toxostoma rufum*			G5	N5B	S4B	X		4,6
Sturnidae - Starlings									
European Starling	*Sturnus vulgaris*			G5	NNA	SNA	X	X	4, 5,6
Turdidae - Thrushes									
Eastern Bluebird	*Sialia sialis*	NAR	NAR	G5	N5B	S5B	X		4
Veery	*Catharus fuscescens*			G5	N5B	S4B	X	X	4,6
Hermit Thrush	*Catharus guttatus*			G5	N5B	S5B	X		4
Wood Thrush	*Hylocichla mustelina*	THR	SC	G4	N4B	S4B	X	X	4,6
American Robin	*Turdus migratorius*			G5	N5B,N5N	S5B	X	X	4,5,6
Passeridae - Old World Sparrows									
House Sparrow	*Passer domesticus*			G5	NNA	SNA	X	X	4,5,6
Motacillidae - Pipits									
American Pipit	*Anthus rubescens*			G5	N5B	S4		X	6
Fringillidae - Finches									
Purple Finch	*Haemorhous purpureus*			G5	N5B,N5N	S4B	X	X	4,6
House Finch	*Haemorhous mexicanus*			G5	N5	SNA	X	X	4,6
Pine Siskin	*Spinus pinus*			G5	N5	S4B		X	6
American Goldfinch	*Spinus tristis*			G5	N5B,N5N	S5B	X	X	4,5,6
Evening Grosbeak	*Coccothraustes vespertinus*	SC	SC	G5	N5	S4B	X		4
Parulidae - Wood-Warblers									
Ovenbird	*Seiurus aurocapilla*			G5	N5B	S4B	X	X	4,6
Northern Waterthrush	*Parkesia noveboracensis*			G5	N5B	S5B	X	X	4,6
Blue-winged Warbler	*Vermivora cyanoptera*			G5	N4B	S4B	X		4
Black-and-white Warbler	*Mniotilta varia*			G5	N5B	S5B	X	X	4,6
Tennessee Warbler	*Oreothlypis peregrina*			G5	N5B	S5B		X	6

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Nashville Warbler	*Oreothlypis ruficapilla*			G5	N5B	S5B	X		4
Mourning Warbler	*Geothlypis philadelphia*			G5	N5B	S4B	X	X	4,6
Common Yellowthroat	*Geothlypis trichas*			G5	N5B	S5B	X	X	4,5,6
American Redstart	*Setophaga ruticilla*			G5	N5B	S5B	X	X	4,6
Magnolia Warbler	*Setophaga magnolia*			G5	N5B	S5B	X		4
Blackburnian Warbler	*Setophaga fusca*			G5	N5B	S5B	X		4
Yellow Warbler	*Setophaga petechia*			G5	N5B	S5B	X	X	4,6
Chestnut-sided Warbler	*Setophaga pensylvanica*			G5	N5B	S5B	X		4
Black-throated Blue Warbler	*Setophaga caerulescens*			G5	N5B	S5B	X		4
Pine Warbler	*Setophaga pinus*			G5	N5B	S5B	X	X	4,6
Yellow-rumped Warbler	*Setophaga coronata*			G5	N5B	S5B	X		4
Yellow Warbler	*Setophaga petechia*						X		4, 5
Black-throated Green Warbler	*Setophaga virens*			G5	N5B	S5B	X	X	4,6
Canada Warbler	*Cardellina canadensis*	THR	SC	G5	N5B	S4B	X		4
Wilson's Warbler	*Cardellina pusilla*			G5	N5B	S4B		X	6
Icteridae - Blackbirds									
Bobolink	*Dolichonyx oryzivorus*	THR	THR	G5	N4N5B	S4B	X	X	4,6
Red-winged Blackbird	*Agelaius phoeniceus*			G5	N5B,N5N	S4	X	X	3,4,5,6
Eastern Meadowlark	*Sturnella magna*	THR	THR	G5	N4B	S4B	X	X	4,6
Common Grackle	*Quiscalus quiscula*			G5	N5B	S5B	X	X	4, 5,6
Brown-headed Cowbird	*Molothrus ater*			G5	N5B	S4B	X	X	4,5,6
Orchard Oriole	*Icterus spurius*			G5	N4N5B	S4B		X	6
Baltimore Oriole	*Icterus galbula*			G5	N5B	S4B	X	X	4,6
Emberizidae - Sparrows									
Eastern Towhee	*Pipilo erythrophthalmus*			G5	N4N5B	S4B	X		4
Chipping Sparrow	*Spizella passerina*			G5	N5B	S5B	X	X	4,5,6
Clay-colored Sparrow	*Spizella pallida*			G5	N5B	S4B	X		4
Field Sparrow	*Spizella pusilla*			G5	N4B	S4B	X	X	4,6
Vesper Sparrow	*Pooecetes gramineus*			G5	N5B	S4B	X	X	4,6
Savannah Sparrow	*Passerculus sandwichensis*			G5	N5B	S4B	X	X	4,6
Song Sparrow	*Melospiza melodia*			G5	N5B,N5N	S5B	X	X	4,5,6
Swamp Sparrow	*Melospiza georgiana*			G5	N5B	S5B	X	X	4,6
White-throated Sparrow	*Zonotrichia albicollis*			G5	N5B	S5B	X		4
Dark-eyed Junco	*Junco hyemalis*			G5	N5B,N5N	S5B		X	6
Cardinalidae - Cardinals & Allies									
Northern Cardinal	*Cardinalis cardinalis*			G5	N5	S5	X	X	4,5,6
Rose-breasted Grosbeak	*Pheucticus ludovicianus*			G5	N5B	S4B	X	X	4,5,6
Indigo Bunting	*Passerina cyanea*			G5	N5B	S4B	X	X	4,6
Scarlet Tanager	*Piranga olivacea*			G5	N5B	S4B	X		4
Western Tanager	*Piranga ludoviciana*			G5	N5B	SNA			

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Anura - Frogs and Toads										
Bufonidae - Toads										
American Toad	*Anaxyrus americanus*				G5	N5	S5	X	X	1,5,6
Hylidae - Tree Frogs & Allies										
Gray Treefrog	*Hyla versicolor*				G5	N5	S5		X	1
Spring Peeper	*Pseudacris crucifer*				G5	N5	S5		X	1,6
Ranidae - True Frogs										
American Bullfrog	*Lithobates catesbeianus*				G5	N5	S4		X	1,6
Green Frog	*Lithobates clamitans*				G5	N5	S5		X	1,3,6
Northern Leopard Frog	*Lithobates pipiens*		NAR	NAR	G5	N5	S5	X	X	1,5
Wood Frog	*Lithobates sylvaticus*				G5	N5	S5		X	1
Caudata - Salamanders and Newts										
Ambystomatidae - Mole Salamanders										
Spotted Salamander	*Ambystoma maculatum*				G5	N5	S4		X	1
Plethodontidae - Lungless Salamanders										
Eastern Red-backed Salamander	*Plethodon cinereus*				G5	N5	S5		X	1,6
Salamandridae - True Salamanders and Newts										
Red-spotted Newt	*Notophthalmus viridescens viridescens*				G5T5	N5	S5		X	1,6

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Lepidoptera - Butterflies							
Hesperiidae							
Least Skipper	*Ancyloxypha numitor*					X	2
Arctic Skipper	*Carterocephalus palaemon*					X	2
Wild Indigo Duskywing	*Erynnis baptisiae*					X	2
Juvenal's Duskywing	*Erynnis juvenalis*					X	2
Dun Skipper	*Euphyes vestris*					X	2
Northern Cloudywing	*Thorybes pylades*					X	2
European Skipper	*Thymelicus lineola*					X	2
Hobomok Skipper	*Poanes hobomok*					X	2
Peck's Skipper	*Polites peckius*					X	2
Northern Broken-Dash	*Wallengrenia egeremet*					X	2
Lycaenidae							
Azure sp	*Celastrina sp.*					X	2
Northern Azure	*Celastrina lucia*					X	2
Summer Azure	*Celastrina neglecta*					X	2
Eastern Pine Elfin	*Callophrys niphon*					X	2
Eastern Tailed Blue	*Cupido comyntas*					X	2
Silvery Blue	*Glaucopsyche lygdamus*					X	2
American Copper	*Lycaena phlaeas*					X	2
Acadian Hairstreak	*Satyrium acadica*					X	2
Banded Hairstreak	*Satyrium calanus*					X	2
Striped Hairstreak	*Satyrium liparops*					X	2
Nymphalidae							
Milbert's Tortoiseshell	*Aglais milberti*					X	2
Meadow Fritillary	*Boloria bellona*					X	2
Common Wood-Nymph	*Cercyonis pegala*					X	2
Common Ringlet	*Coenonympha tullia*					X	2
Monarch	*Danaus plexippus*		SC	SC	X	X	2.5
Northern Pearly-Eye	*Lethe anthedon*					X	2
Appalachian Brown	*Lethe appalachia*					X	2
Viceroy	*Limenitis archippus*					X	2
White Admiral	*Limenitis arthemis arthemis*					X	2
Red-spotted Purple	*Limenitis arthemis astyanax*					X	2
Little Wood-Satyr	*Megisto cymela*					X	2
Mourning Cloak	*Nymphalis antiopa*					X	2
Pearl Crescent	*Phyciodes tharos*					X	2
Northern Crescent	Phyciodes cocyta					X	2
Eastern Comma	Polygonia comma					X	2
Gray Comma	Polygonia progne					X	2
Red Admiral	Vanessa atalanta					X	2
Painted Lady	Vanessa cardui					X	2
American Lady	Vanessa virginiensis					X	2
Papilionidae							
Black Swallowtail	*Papilio polyxenes*				X	X	2.5
Tiger Swallowtail	*Papilio glaucus*				X	X	2.5
Pieridae							
Orange Sulphur	*Colias eurytheme*				X	X	2.5
Clouded Sulphur	*Colias philodice*				X	X	2.5
Mustard White	*Pieris oleracea*						
Cabbage White	*Pieris rapae*				X	X	2.5

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Petromyzontiformes - Lampreys										
Petromyzontidae - Lampreys										
Northern Brook Lamprey	*Ichthyomyzon fossor*		SC	SC	G4	N3	S3		X	6
American Brook Lamprey	*Lethenteron appendix*				G4	N3N4	S3	X	X	6,7
Sea Lamprey	*Petromyzon marinus*				G5	N5	SNA		X	6
Cypriniformes - Carps, Minnows & Allies										
Cyprinidae - Carps & True Minnows										
Central Stoneroller	*Campostoma anomalum*		NAR	NAR	G5	N4	S4	X		7
Goldfish	*Carassius auratus*				G5	NNA	SNA	X	X	6,7
Northern Redbelly Dace	*Chrosomus eos*				G5	N5	S5	X	X	6,7
Finescale Dace	*Chrosomus neogaeus*				G5	N5	S5	X	X	6,7
Redside Dace	*Clinostomus elongatus*		END	END	G3G4	N2	S2	X	X	6,7
Common Carp	*Cyprinus carpio*				G5	NNA	SNA	X	X	6,7
Brassy Minnow	*Hybognathus hankinsoni*				G5	N5	S5	X	X	6,7
Common Shiner	*Luxilus cornutus*				G5	N5	S5	X	X	6,7
Hornyhead Chub	*Nocomis biguttatus*		NAR	NAR	G5	N4	S4	X		7
Emerald Shiner	*Notropis atherinoides*				G5	N5	S5	X	X	6,7
Spottail Shiner	*Notropis hudsonius*				G5	N5	S5		X	6
Bluntnose Minnow	*Pimephales notatus*		NAR	NAR	G5	N5	S5	X	X	6,7
Fathead Minnow	*Pimephales promelas*				G5	N5	S5	X	X	6,7
Blacknose Dace	*Rhinichthys atratulus*				G5	N5	S5	X	X	6,7
Longnose Dace	*Rhinichthys cataractae*				G5	N5	S5	X	X	6,7
Creek Chub	*Semotilus atromaculatus*				G5	N5	S5	X	X	6,7
Catostomidae - Suckers										
White Sucker	*Catostomus commersonii*				G5	N5	S5	X	X	6,7
Siluriformes - Catfishes										
Ictaluridae - Bullhead Catfishes										
Yellow Bullhead	*Ameiurus natalis*				G5	N4	S4	X		7
Brown Bullhead	*Ameiurus nebulosus*				G5	N5	S5	X	X	6,7
Stonecat	*Noturus flavus*				G5	N5	S4	X	X	6,7
Salmoniformes - Salmons, Trouts & Chars										
Salmonidae - Salmons, Trouts & Chars										
Rainbow Trout	*Oncorhynchus mykiss*				G5	N5	SNA	X	X	6,7
Brown Trout	*Salmo trutta*				G5	NNA	SNA		X	6
Brook Trout	*Salvelinus fontinalis fontinalis*				G5T5	N5	S5		X	6
Esociformes - Pikes & Mudminnows										
Esocidae - Pikes										
Northern Pike	*Esox lucius*				G5	N5	S5	X		7
Cyprinodontiformes - Killifishes & Allies										
Fundulidae - Topminnows & Killifishes										
Banded Killifish	*Fundulus diaphanus*		NAR	NAR	G5	N5	S5	X		7
Gasterosteiformes - Sticklebacks & Allies										
Gasterosteidae - Sticklebacks										
Brook Stickleback	*Culaea inconstans*				G5	N5	S5		X	6,7
Scorpaeniformes - Scorpionfishes & Sculpins										
Cottidae - Sculpins										
Mottled Sculpin	*Cottus bairdii*				G5	N5	S5		X	6

Common Name	*Scientific Name*	Origin	SARA	ESA	G Rank	N Rank	S Rank	Historical Observations	Recent Observations	Data Sources
Perciformes - Perches, Basses & Allies										
Centrarchidae - Sunfishes										
Rock Bass	*Ambloplites rupestris*				G5	N5	S5	X	X	6,7
Pumpkinseed	*Lepomis gibbosus*				G5	N5	S5	X	X	6,7
Bluegill	*Lepomis macrochirus*				G5	N5	S5	X	X	6,7
Smallmouth Bass	*Micropterus dolomieu*				G5	N5	S5	X	X	6,7
Largemouth Bass	*Micropterus salmoides*				G5	N5	S5	X	X	6,7
Black Crappie	*Pomoxis nigromaculatus*				G5	N4N5	S4	X	X	6,7
Percidae - Perches & Darters										
Rainbow Darter	*Etheostoma caeruleum*				G5	N4	S4	X	X	6,7
Iowa Darter	*Etheostoma exile*				G5	N5	S5		X	6
Johnny Darter	*Etheostoma nigrum*				G5	N5	S5	X	X	6,7
Yellow Perch	*Perca flavescens*				G5	N5	S5	X		7

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Didelphimorphia - Opossums										
Rodentia - Rodents										
Sciuridae - Squirrels & Chipmunks										
Woodchuck	*Marmota monax*				G5	N5	S5	X	X	5,6
Eastern Gray Squirrel	*Sciurus carolinensis*				G5	N5	S5	X	X	5,6
Eastern Chipmunk	*Tamias striatus*				G5	N5	S5	X	X	5,6
Red Squirrel	*Tamiasciurus hudsonicus*				G5	N5	S5	X	X	5,6
Castoridae - Beavers										
Beaver	*Castor canadensis*				G5	N5	S5		X	6
Cricetidae - Voles, Lemmings & New World Mice										
Meadow Vole	*Microtus pennsylvanicus*				G5	N5	S5	X		5
Muridae - Rats & Mice										
House Mouse	*Mus musculus*				G5	NNA	SNA	X		5
Lagomorpha - Hares & Rabbits										
Leporidae - Hares & Rabbits										
Eastern Cottontail	*Sylvilagus floridanus*				G5	N5	S5	X	X	3, 5
Carnivora - Carnivores										
Canidae - Dogs										
Coyote	*Canis latrans*				G5	N5	S5		X	3,6
Red Fox	*Vulpes vulpes*				G5	N5	S5	X	X	5,6
Mephitidae - Skunks										
Striped Skunk	*Mephitis mephitis*				G5	N5	S5	X		5
Procyonidae - Raccoons										
Northern Raccoon	*Procyon lotor*				G5	N5	S5	X	X	5,6

#	Year	Source
1	1978-2019	Herp Atlas https://www.ontarionature.org/dynamic-maps/dynamic-maps/
2	2018	Ontario Butterfly Atlas
3	2019	Cima+ ELC Study
4	2001-2005	OBBA
5	2008	Background Natural Environmental Report - OPA 149 Highway 404 North Secondary Plan Area
6	2017	Ministry of Natural Resources and Forestry, Aurora District. 2017. Provincially Significant Bruce and Berczy Creek W Complex Evaluation Report.
7	Pre 2000-2010	TRCA Draft Rouge River Watersed Fisheries Management Plan

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