



TOWN OF WHITCHURCH-STOUFFVILLE

WATER AND WASTEWATER MASTER PLAN

APPENDIX A

Desktop Natural Environment Report





BASELINE NATURAL FEATURES ASSESSMENT REPORT
TOWN OF WHITCHURCH-STOUFFVILLE
WATER AND WASTEWATER MASTER PLAN
WHITECHURCH-STOUFFVILLE, ONTARIO

Prepared for:
GM BLUEPLAN ENGINEERING LTD.

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March 2023
Guelph, Ontario

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BASELINE NATURAL FEATURES ASSESSMENT REPORT
TOWN OF WHITCHURCH STOUFFVILLE WATER AND WASTEWATER MASTER PLAN
WHITCHURCH-STOUFFVILLE, ONTARIO

Prepared for GM Blueplan Engineering Ltd., March 2023

Kelsey Reich Environmental Technologist	reviewed by Peter De Carvalho, M.Sc., E.I.T. Restoration Specialist, EIT
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1 INTRODUCTION

GM BluePlan Engineering Ltd. retained Matrix Solutions Inc. to prepare a baseline natural features assessment report to support the Town of Whitchurch-Stouffville (the Town) Water & Wastewater Master Plan (WWMP). This report includes a high-level review and analysis of landscape constraints within the Town. Alternatives to providing water and wastewater servicing will need to consider the key environmental features that are entwined throughout the Town, which reinforces the Town's quality of life.

1.1 Purpose of the Master Plan

The purpose of the master plan is to define and determine the water and wastewater infrastructure requirements needed to support the population and employment growth forecasts to year 2051 for the Town. The WWMP will provide the guidance needed to enhance the reliability, efficiency, and capability of the Town's water and wastewater infrastructure to service existing and future residents and businesses. The WWMP will also identify preferred servicing strategies and system improvements for water distribution and wastewater conveyance and the associated costs. With significant population growth forecasted in the Town to the year 2051, a long-term servicing strategy to address the Town's existing and future servicing needs is required in areas of proposed expansion of all communities within the Town and beyond the urban boundary that addresses the identified constraints to the systems.

1.2 Study Area

The study area (Figure 1) encompasses the entire Town, located within a central portion of the Regional Municipality of York (York Region). It is bounded by Davis Drive (Highway 31) to the north, York Durham Line (Highway 30) to the east, and Highway 404 to the west. The southern boundary is generally located North of Nineteenth Avenue. Smaller settlements within the study area boundary include Ballantrae, Musselman Lake, Gormley, Preston Lake, Vandorf, and Bloomington.

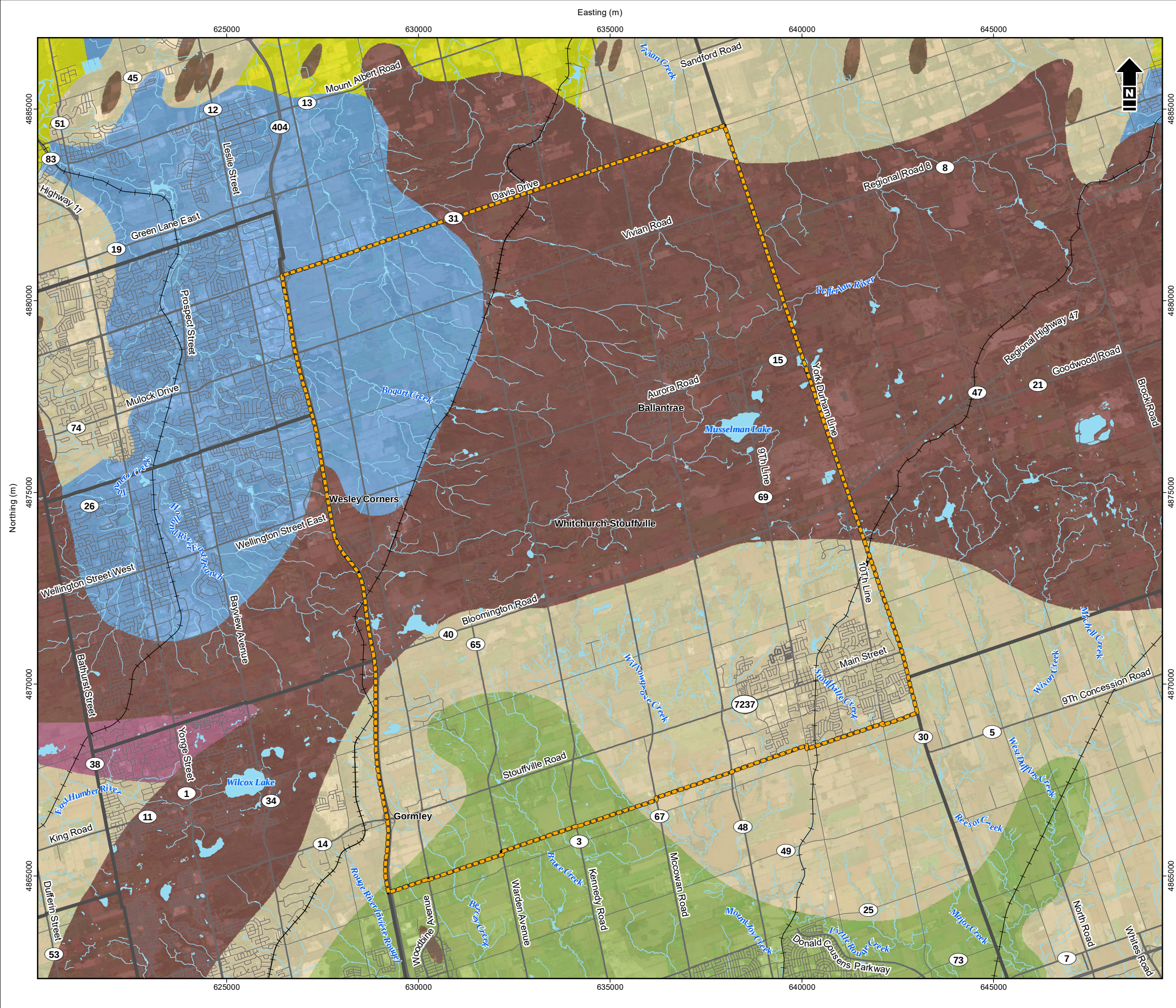
Approximately 80% of the Town is situated within the Oak Ridges Moraine (ORM) physiographic region. This region contains several natural heritage features, including core natural lands and linkages associated with the Rouge River tributaries to the south, the East Holland River to the east, and the Black River tributaries to the northwest. Kettle lakes and Areas of Natural and Scientific Interest (ANSI) are located within the central portions of the Town, along with several wetlands. The areas north of Vandorf Sideroad, particularly between Kennedy Road and York Durham Line, contain vast amounts of forested areas associated with protected landform features (ORM Landform Conservation Areas).

1.3 Physiography

The Town physiography is primarily characterized by kame moraines to the north and drumlinized till plains to the south, with clay plains in the northwest corner and bevelled till plains near the southwest corner of the study area (Figure 2). Kame moraines are large, isolated hills deposited by glaciers that

consist of sand and gravel (Chapman and Putnam 1984). Chapman and Putnam (1984) define tills plains as large flat or gently sloping areas of land on which glacial till has been deposited from a melted glacier. Morphology of tills plains are generally influenced by underlying bedrock topography. Drumlinized till plains, as described previously, include the presence of drumlins overlying the till. Clay plains are flat deposits of clay that formed after the retreat of glaciers, while bevelled till plains are deposits that have been reworked then over-ridden and flattened by subsequent glacial events (Chapman and Putnam 1984).

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- Study Area
 - Local Municipal Boundary
 - Water Body
 - Watercourse
 - Highway
 - Road
 - Railway
- Physiography of Southern Ontario (OGS MRD 228)**
- Clay Plains
 - Sand Plains
 - Bevelled Till Plains
 - Drumlins
 - Till Plains (Drumlinized)
 - Kame Moraines
 - Till Moraines

Reference: Contains information licensed under the Open Government Licence – Ontario, Chapman, L.J. and Putnam, D.F. 2007. Physiography of southern Ontario, Ontario Geological Survey, Miscellaneous Release—Data 228. Produced by Matrix Solutions Inc., under Licence with the Ontario Ministry of Northern Development and Mines © Queen's Printer of Ontario, Imagery (2019) Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

1:100,000 Kilometers
1 0 1 2
NAD 1983 UTM Zone 17N



GM BluePlan Engineering Ltd.
Natural Heritage Report

Physiography

Date: March 2022	Project: 34616	Submitter: K. Reich	Reviewer: P. De Carvalho
Disclaimer: The information contained herein may be compiled from numerous third party materials that are subject to periodic change without prior notification. While every effort has been made by Matrix Solutions Inc. to ensure the accuracy of the information presented at the time of publication, Matrix Solutions Inc. assumes no liability for any errors, omissions, or inaccuracies in the third party material.			Figure 2

2 POLICY CONTEXT

The policy context provides guidance on the significance and sensitivity of natural heritage features at the federal, provincial, regional and local levels (Table 1).

TABLE 1 Applicable Federal, Provincial, and Municipal Policies

Acts and Regulations	Summary of Contents
Federal Acts and Regulations	
<i>Species at Risk Act</i> (2002)	Incorporates a number of prohibitions to protect individuals of listed threatened, endangered, or extirpated SAR, as designated by COSEWIC. Per Section 34, Section 58, and Section 61, these prohibitions apply to aquatic species and migratory birds protected by the MBCA on all lands, and any other listed wildlife species when on federal lands or any lands if recommended by the Minister of the Environment to the Governor in Council. Applicability to Project: While SARA applies to species on federal land, it also applies to SAR migratory birds under the MBCA listed on Schedule 1 where critical habitat has been identified and fish, anywhere they occur. Therefore, SARA only applies to SAR migratory birds, fish, and mussels for this project. Any impacts to these species protected under SARA may require further consultation. However, should the migratory bird species also be listed under the ESA and provides equal or greater protection, the ESA take precedence.
<i>Fisheries Act</i> (1985, revised in 2019)	The <i>Fisheries Act</i> outlines the framework for the management and regulation of fisheries and the conservation and protection of fish and fish habitat within the fishing zones of Canada, all waters in the territorial sea of Canada, and all internal waters of Canada. The most recent revision to the <i>Fisheries Act</i> restricts activities that cause “death of fish, other than by fishing” as well as the “harmful alteration, disruption, or destruction of fish habitat” (Government of Canada 2019) and the release of substances that are known or suspected to be deleterious to fish or fish habitat. Applicability to Project: There are several watercourses within the study area with known fish and fish habitat. If the preferred solutions have potential to impact any watercourse the <i>Fisheries Act</i> will apply to this project. A DFO request for review will be required for activities that have potential to harm, disrupt, or cause the destruction of fish habitat, as well as cause death to fish. Any activities impacting watercourses with known SAR will also require a request for review from DFO.
<i>Migratory Birds Convention Act</i> (1994)	General prohibitions protect migratory birds, their nests, and eggs and prohibit the deposit of harmful substances in waters and areas frequented by them. Applicability to Project: The MBCA applies to the entire study area. Any tree removals would need to be completed outside of the breeding bird season (April 1 to August 30) to avoid disturbing active nests of migratory birds protected under the MBCA.

Acts and Regulations	Summary of Contents
Provincial Acts and Regulations	
<i>Provincial Policy Statement, 2020</i>	The PPS provides policy direction on provincial matters of interest related to land use planning and development. It sets the policy framework for regulating development and use of land and is issued under the authority of Section 3 of the <i>Planning Act</i>. Section 2.1 of the PPS outlines policies that provide legislative protection for the natural environment. These policies include the exclusion of development and site alteration within PSWs, habitat of endangered or threatened species, fish habitat, as well as within SWH, significant woodlands, significant valleylands, ANSIs or adjacent lands “...unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions” (MMAH 2020). The <i>Natural Heritage Reference Manual</i> was developed to provide technical guidance for implementing the natural heritage policies of the PPS. Applicability to Project: A number of natural heritage features are found within the study area and include, but are not limited to, significant woodlands, ANSIs, fish habitat, significant wildlife habitat, and significant habitat of endangered and threatened species.
<i>Endangered Species Act (2007)</i>	Provides for the conservation and protection of species in Ontario classified under the ESA. Species listed as endangered or threatened are afforded legal protection from harm and harassment under the ESA. The ESA also prohibits damage or destruction of habitat of endangered or threatened species. Habitat protection for a species can be general or subject to the specific provisions of a habitat regulation as set out in O. Reg. 832/21 under the ESA. General habitat protection is provided to all threatened and endangered species. Species-specific habitat protection is only afforded to those species for which a habitat regulation has been prepared and passed into law as a regulation of the ESA. Applicability to Project: The ESA applies to all SAR species within provincial lands protected under the ESA. Any impacts to these species or habitats protected under the ESA would require a permit. The study area may contain habitat for SAR species. Refer to Section 4 for a list of potential SAR species.
<i>Conservation Authorities Act (2006)</i>	Empowers conservation authorities to regulate activities in natural and hazardous areas (i.e., streams, floodplains, wetlands, areas in and near rivers, slopes and lake shoreline) through the Development, Interference with Wetlands, and Alterations to Shorelines and Watercourse Regulation. Applicability to Project: A portion of the study area is located within both the LSRCA (regulated under O. Reg. 179/06) and TRCA (regulated under O. Reg. 166/06). Any works within the regulatory limit may require a permit.

Acts and Regulations	Summary of Contents
<i>Lake Simcoe Protection Act</i> (2008)	Protects and directs ecological restoration of the Lake Simcoe watershed. “Activities that may adversely affect the ecological health of the Lake Simcoe watershed” are regulated or prohibited. This applies to “areas of land or water adjacent or close to the shoreline of Lake Simcoe or any other lake in the Lake Simcoe watershed; areas of land or water within, adjacent or close to a permanent or intermittent tributary of Lake Simcoe; or areas of land or water within, adjacent or close to wetlands (Government of Ontario 2021).” Applicability to Project: Approximately 60% of the study area is covered by this act. Development must adhere to the policies of this plan.
<i>Greenbelt Plan</i> (2017)	Provides policies for the protection of natural heritage features by directing future urban growth and development planning within the “Golden Horseshoe” area. Lands within the Greenbelt Plan area are divided into Protected Countryside, Urban River Valleys, NEP Area, and Oak Ridges Moraine Area. These areas are provided protection, which includes (MMA 2017a): • <i>Protects against the loss and fragmentation of the agricultural land base and supports agriculture as the predominant land use;</i> • <i>Gives permanent protection to the natural heritage and water resource systems that sustain ecological and human health and that form the environmental framework around which major urbanization in south-central Ontario will be organized;</i> • <i>Provides for a diverse range of economic and social activities associated with rural communities, agriculture, tourism, recreation and resource uses; and</i> • <i>Builds resilience to and mitigates climate change.</i> Applicability to Project: Much of the northern portion of the study area has been designated as Protected Countryside (which may include a natural heritage system) or ORM area. Policies under this plan are applicable.
Oak Ridges Moraine Conservation Plan (2002)	The objectives within this plan are to protect “the ecological and hydrological integrity of the Oak Ridges Moraine (ORM) Area”. “Only land and resource uses that maintain, improve or restore the ecological and hydrological functions of the ORM Area are permitted;”. The plan includes four land use designations, (Countryside Areas, Natural Core Areas, Natural Linkage Areas, Rural Settlement and Settlement Areas) refer to section 3.1 for additional details of each (MAH 2002). Applicability to Project: Eighty percent of the study area is included within the ORM boundary including each land use designation. Policies under this plan are applicable.
Municipal Acts and Regulations	
Regional Municipality of York Official Plan (2019)	Policies in Chapter 2 of the Regional Municipality of York Official Plan (York Region 2019) identify key natural heritage and key hydrologic features that are to be protected and enhanced through the control of new development and site alteration. Development and site alteration is prohibited within the Regional Greenlands System and that development and site alteration applications within 120 metres of the Regional Greenlands System shall be accompanied by an environmental impact study. The Greenlands System within the Region is presented on Maps 3 and 4 of the Official Plan. Applicability to Project: The study area contains areas within the Regional Greenlands system subject to the policies outlined in the Regional Official Plan.

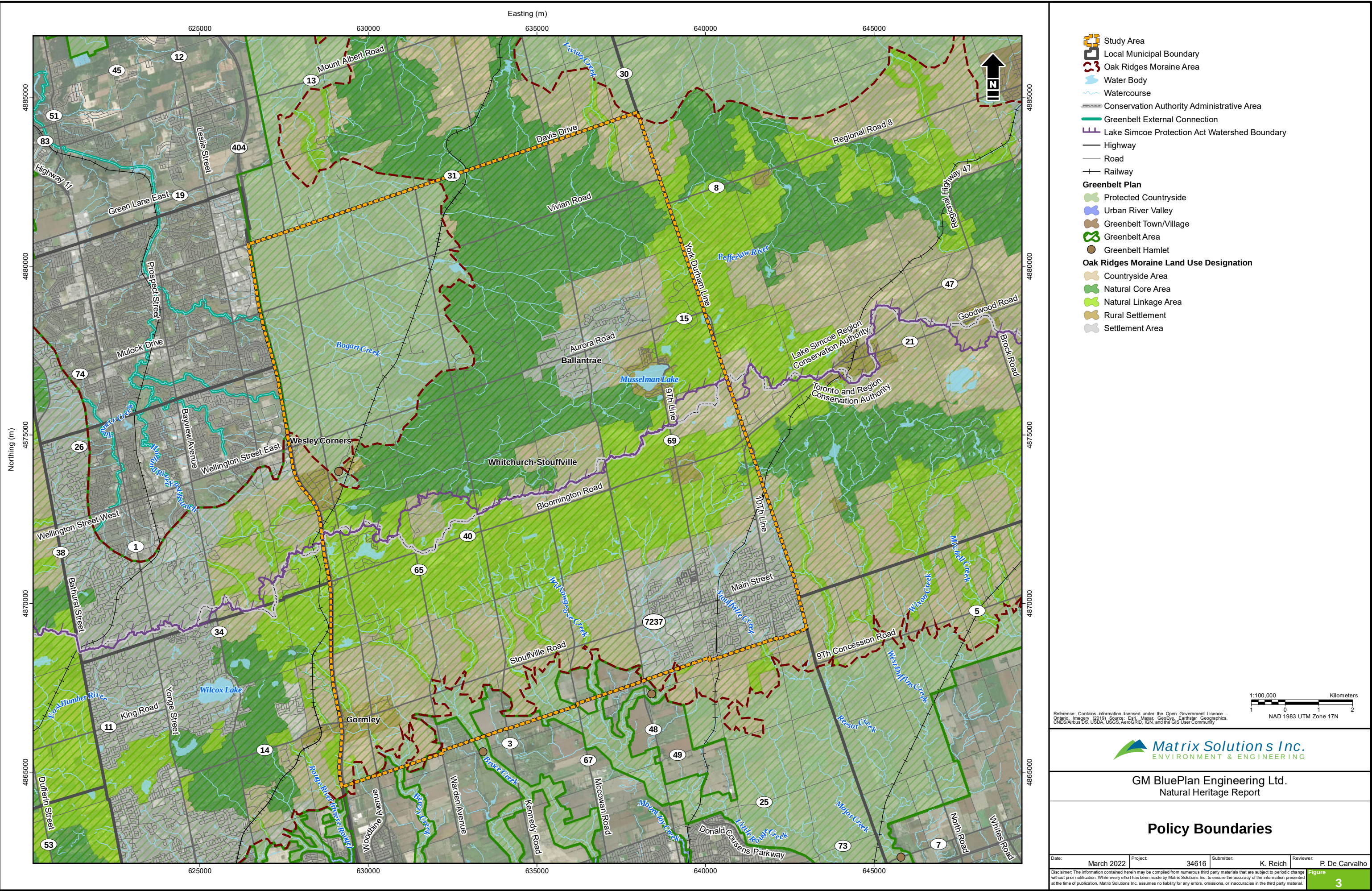
Acts and Regulations	Summary of Contents
Town of Whitchurch-Stouffville Official Plan	Policies outlined in Section 3 Environment Conservation strategy, of the Town of Whitchurch-Stouffville Official Plan, provide direction for the preservation and enhancement of the natural environment within the Town and establishes the towns Greenlands System while acknowledging its location within the ORM and the RPNMA. Natural Heritage features located within the ORM and RPNMA will adhere to the policies of their respective plans. The town's Greenland System is presented on Schedule A Greenlands System. Applicability to Project: The study area encompasses the entire Town of Whitchurch-Stouffville including areas located within the Greenlands System, ORM and the RPNMA.

Notes:

ANSI - areas of natural and scientific interest
COSEWIC - Committee on the Status of Endangered Wildlife in Canada
DFO - Fisheries and Oceans Canada
EPA - Environmental Policy Area
ESA - *Endangered Species Act*
LSRCA - Lake Simcoe Regional Conservation Authority
MBCA - *Migratory Birds Convention Act*
NEP - *Niagara Escarpment Plan*
O. Reg. - Ontario Regulation
ORM - Oak Ridges Moraine
PSW - Provincially Significant Wetland
RPNMA - Rouge Park North Management Plan Study Area
SAR - species at risk
SARA - *Species at Risk Act*
SWH - significant wildlife habitat
TRCA - Toronto and Region Conservation Authority

All policy boundaries can be seen on Figure 3.

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3 EXISTING CONDITIONS

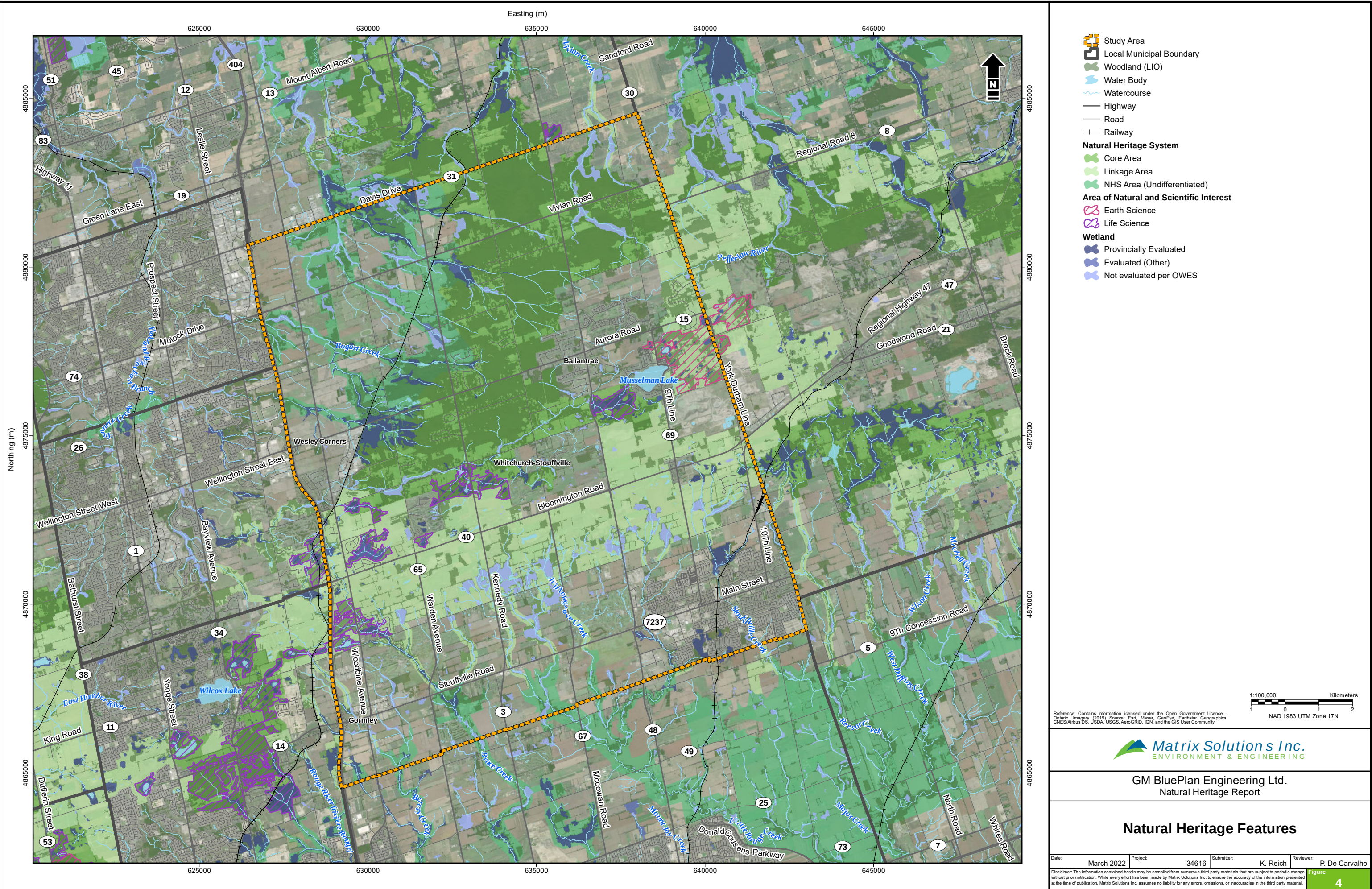
The study area contains large, forested blocks and riparian corridors, as well as an extensive array of natural habitats that support numerous species at risk (SAR), including Redside Dace (*Clinostomus elongatus*), grassland birds such as Bobolink (*Dolichonyx oryzivorus*) and Eastern Meadowlark (*Sturnella magna*), and other species such as Barn Swallow (*Hirundo rustica*), and Eastern Wood Pewee (*Contopus virens*; see Section 4 for more information on SAR). The predominant landscape features that serve as major natural heritage constraints are shown in Figures 3 and 4. The following sections provide a description of the existing natural environment within the study area.

3.1 Methods

The following natural heritage feature descriptions are based on a review of existing information from multiple sources including the latest up to date natural heritage constraint information. Sources include York Region and the Town GIS, as well as online provincial databases, and GIS information available from Toronto Region Conservation Authority (TRCA) and Lake Simcoe Region Conservation Authority (LSRCA). A summary list of database sources includes the following:

- York Region GIS database
- official plans and secondary plans for upper and lower tier municipalities
- natural heritage system studies for upper and lower tier municipalities
- the Ontario Ministry of the Environment, Conservation and Parks (MECP) Natural Resource Values Information System (NRVIS) mapping
- databases prepared by conservation authorities
- Lands Information Ontario reports and maps
- Wetland Evaluation Data Records and maps prepared by MECP
- Environmentally Sensitive/Significant Areas studies prepared by conservation authorities and municipalities
- other relevant sources of background information from available consulting studies

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3.2 Designated Natural Areas

Designated natural areas are identified by relevant agencies, and municipalities through legislation, policies, or management plans, and are known to have distinct or significant value added to an area. These areas may contain a variety of ecological, recreational, and/or aesthetic features and functions that are important and warrant preservation. Examples of these types of areas include the ORM; Lake Simcoe Protection Plan Area, National and Provincial Parks; Provincially Significant Wetlands (PSWs) and Locally Significant Wetlands (LSWs); designated heritage rivers; Environmentally Sensitive Areas; Environmentally Sensitive Policy Areas (ESPA); Provincially Significant ANSI; conservation authority parks/open space lands; stewardship lands; and land trust areas. The following sections present the identified natural areas located within the study area as per reviewed background documents

3.2.1 Oak Ridges Moraine

Eighty percent of the study area is located within the ORM (Figure 3). Designations found within the study area include:

- **Countryside Area:** these areas provide an agricultural transition, rural transition, and buffer between the other three designations. “Prime agricultural areas as identified in the Agricultural System referred to in the Growth Plan for the Greater Golden Horseshoe and the Greenbelt Plan, as well as natural features are protected. Uses typically allowed in agricultural and other rural areas are allowed here to support agriculture and the rural economy. Existing public service facilities in Countryside Areas should be maintained and adapted to meet the needs of the community, where feasible” (MMA 2017b).
- **Natural Core Area:** these are lands with a high concentration of key natural heritage features. “Only existing uses, agricultural uses and very restricted new resource management, low intensity recreational, home businesses, and infrastructure uses are allowed in these areas” (MMA 2017b).
- **Natural Linkage Area:** These areas are mainly along rivers and streams, connecting natural and open space linkages between Natural Core Areas. The only uses allowed are the same as Natural Core Areas with some aggregate resource operations (MMA 2017b)
- **Rural Settlement and Settlement Areas:** Include a range of existing communities where urban uses and development as outlined in the official plans are allowed (MMA 2017b)

3.2.2 Key Hydrological Features

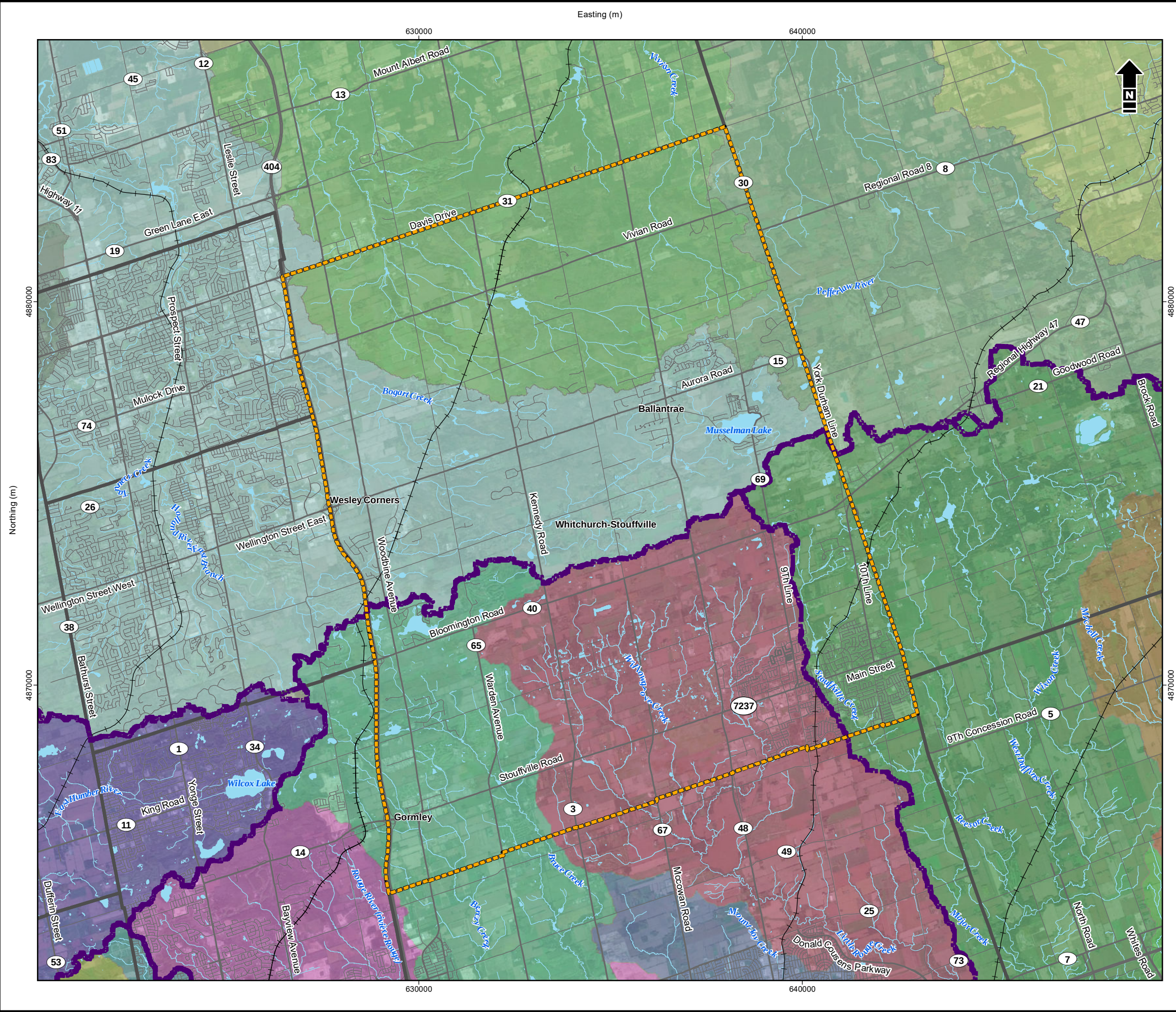
The study area is comprised of three watersheds further divided into six subwatersheds (Figure 5). The following presents a brief description of each watershed and subwatershed within the study area.

- **Rouge River Watershed:** located in the southern portion of the study area, this watershed starts in the ORM and flows south to Lake Ontario. It covers an area of approximately 33,300 ha. Two subwatersheds, Little Rouge and Main Rouge, are within the study area which also include the major tributaries (TRCA 2013).
 - ✦ Little Rouge Subwatershed: the headwaters of this subwatershed flow through the Town. The *Greenbelt Plan* identifies a protected corridor for the Little Rouge River (TRCA 2007)
 - ✦ Main Rouge Subwatershed: headwaters for this subwatershed begin in the south slope of the ORM (TRCA 2007).

- **Lake Simcoe Watershed:** located in the northern portion of the study area this watershed surrounds Lake Simcoe. Three subwatersheds, East Holland River, Black River, and Pefferlaw River, are within the study area (LSRGA 2018).
 - ✦ East Holland Subwatershed: located in a central portion of the study area, this subwatershed has headwaters in the ORM flowing into Lake Simcoe's Cook's Bay. It drains a total area of approximately 24,700 ha (LSRCA 2010a).
 - ✦ Black River Subwatershed: this is located in the northern portion of the study area. The headwaters originate in the ORM and drain into Lake Simcoe. The total area this subwatershed occupies is approximately 37,536 ha (LSRCA 2010b).
 - ✦ Pefferlaw Brook Subwatershed: a small portion of the northeastern border of the study area is within this subwatershed. Like the previously mentioned subwatersheds, the headwaters start in the ORM and flow into Lake Simcoe. It has a total approximate area of 42,500 ha (LSRCA 2012).

- **Duffins Creek Watershed:** a small portion of this watershed is included in the southeastern border of the study area. Headwaters begin in the ORM and flow into Lake Ontario. The total area of this watershed is approximately 28,700 ha. Only one subwatershed, West Duffins Creek, is within the study area boundary (LSRCA 2013).
 - ✦ West Duffins Creek Subwatershed: the headwaters are located in the ORM. Significant surface and groundwater takings for the Town comes from this subwatershed. (TRCA 2013)

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- Study Area
- Watershed
- Subwatershed (TRCA)**
- East Duffins Creek
 - East Humber
 - Ganatsekiagon Creek
 - German Mills Creek
 - Little Rouge
 - Lower Rouge
 - Main Rouge
 - Upper East Don
 - Upper/Beaver
 - Urfe Creek
 - West Duffins Creek
- Subwatershed (LSRCA)**
- Black River
 - East Holland
 - Maskinonge River
 - Pefferlaw Brook
 - Uxbridge Brook
 - West Holland

Reference: Contains information licensed under the Open Government Licence – Ontario. Imagery (2019) Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



GM BluePlan Engineering Ltd.
Natural Heritage Report

Watersheds and Subwatersheds

Date: March 2022 Project: 34616 Submitter: K. Reich Reviewer: P. De Carvalho

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3.2.3 Woodlands

Approximately 6,414 ha of the study area consists of woodlands as identified by the official plans, ORM Conservation Plan. and/or the Ministry of Northern Development, Mines, Natural Resources and Forestry (NDMNRF). Woodland designations that are within the study area but outside of the ORM boundary are defined by the Town in the official plan as one of the following:

- Major Woodland Area: these are continuous blocks of forest that cover several hundreds of hectares and consist of relatively mature mixed and deciduous forests integrated with conifer plantations.
- Tableland Woodlot Area: these are woodlot features that “are generally greater than 4 ha in size and vary in composition from conifer plantation to mature mixed and deciduous stands of trees” (Town of Whitchurch-Stouffville 2020). It is recognized that they may include a lower level of diversity compared to Major Woodland Areas and woodland blocks within the ORM.

Woodlands that are located within the ORM are included in either the ORM Natural Core Area or Natural Linkage Area. York Region has mapped woodlands and regional forests in Map 5 of the official plan, which includes areas located within the ORM boundary (York Region 2019). For the purposes of this report all woodlands have been designated as NDMNRF Woodlands or OP Woodlands (Figure 4).

3.2.4 Greenbelt Plan

A portion of the northwestern corner of the study area is subject to the *Greenbelt Plan* (Figure 3). This includes protected countryside, natural heritage system designations, and ORM area

- Protected Countryside: this includes an agricultural system, natural system and a series of settlement areas (MMA 2017a).
- Natural Heritage System: this is “an overlay on top of the prime agricultural area, including specialty crop areas, and rural lands designations contained in official plans” (MMA 2017a).
- ORM Area: applies to lands within the ORM, in which case the ORM Conservation Plan should be referred to.

3.2.5 Significant Wetlands

Wetlands include areas that are either seasonally or permanently flooded by shallow water, or areas where the water table is close enough to the surface to provide enough water to support the formation of hydric soils. Wetlands can therefore be defined by the dominance of hydrophilic or water tolerant plants (MNRF 2014). Wetlands may be classified as significant at either the local or provincial level using the Ontario Wetland Evaluation System (OWES), which assigns point values to a wetland based on biological, social, hydrological, and special features components. An evaluated wetland may be classified as a PSW, a LSW, or not significant. There are 12 different wetlands and wetlands complexes that have

been evaluated within the study area. More than approximately 757 ha of wetlands are currently unevaluated (MNR 2019). All mapped wetlands are included on Figure 4. There is one LSW complex:

- Black River Wetland Complex: this wetland is approximately 10 ha and consists primarily of swamp wetland type with a dominant vegetation form of trees and tall shrubs as well as a marsh type with a dominant vegetation form of narrow-leaved emergents.

Provincially significant wetlands, which are protected under the *Planning Act* and the *Provincial Policy Statement, 2020* are listed in Table 2

TABLE 2 Provincially Significant Wetlands (Ontario Wetland Evaluation System Standards)

Wetland Name	Type	Dominant Vegetation Forms Present	Approximate Total Area (ha)
Black River Headwater Wetland Complex	Marsh Open Water Swamp	Trees ⁽¹⁾ Dead Shrubs Free-floating Plants Groundcover (Herbs) Narrow-leaved Emergents Robust Emergents Submergent Plants Tall Shrubs	125
Bogart Creek Wetland Complex	Fen Marsh Open Water Swamp	Trees ⁽¹⁾ Free-floating Plants Groundcover (Herbs) Low Shrubs Narrow-leaved Emergents Robust Emergents Submergent Plants Tall Shrubs	213
Bruce & Berczy Creek Wetland Complex	Marsh Swamp	Groundcover (Herbs) Trees Narrow-leaved Emergents ⁽¹⁾ Robust Emergents	20
East Musselman Wetland Complex	Marsh Open Water Swamp	Broad-leaved Emergents Free-floating Plants Groundcover (Herbs) Trees Narrow-leaved Emergents Robust Emergents Submergent Plants Tall Shrubs ⁽¹⁾	36
Goodwood/Glasgow Wetland Complex	Marsh Open Water Swamp	Trees Robust Emergents ⁽¹⁾ Submergent Plants Tall Shrubs	11

Wetland Name	Type	Dominant Vegetation Forms Present	Approximate Total Area (ha)
Little Rouge Creek at Stouffville Wetland Complex	Marsh Open Water Swamp	Trees ⁽¹⁾ Groundcover (Herbs) Narrow-leaved Emergents Robust Emergents Tall Shrubs Unvegetated	49
Musselman Lake Wetland	Bog Marsh Open Water Swamp	Trees ⁽¹⁾ Groundcover (Herbs) Low Shrubs Narrow-leaved Emergents Robust Emergents Submergent Plants Tall Shrubs	48
Rouge River Headwater Wetland Complex	Swamp	Groundcover (Herbs)	3
Stouffville Marsh	Marsh Open Water Swamp	Trees ⁽¹⁾ Free-floating Plants Groundcover (Herbs) Narrow-leaved Emergents Robust Emergents Submergent Plants Tall Shrubs	No data.
Vandorf Wetland Complex	Bog Marsh Open Water Swamp	Trees ⁽¹⁾ Robust Emergents ⁽¹⁾ Submergent Plants ⁽¹⁾ Tall Shrubs	65
White Rose - Preston Lake Wetland Complex	Bog Marsh Open Water Swamp	Trees ⁽¹⁾ Groundcover (Herbs) Narrow-leaved Emergents Robust Emergents Submergent Plants Tall Shrubs	115

(1) denotes most dominant vegetation type

3.2.6 Areas of Natural and Scientific Interest

ANSIs are features that have been identified as having life science or earth science values related to protection, scientific study or education (Figure 4). These features include areas of land and water containing natural landscapes. Five different ANSIs are located within the study area:

- Musselman Lake Kettle Complex (Provincial Earth Science): approximately 360 ha, it is located along the eastern Whitchurch-Stouffville boundary, south of Aurora Road (Highway 15; MNRF 2021).

- Musselman Lake Kettles (Provincial Life Science): this ANSI partially overlaps with the Musselman Lake Kettle Complex. It has a land cover of approximately 173 ha (MNRF 2021).
- Vandorf Kettles (Provincial Life Science): with a land cover of approximately 296 ha, this ANSI is located between Vandor Sideroad to the north and Highway 40 to the south between Highway 67 and beyond the study area boundary to Highway 12 (MNRF 2021).
- Simeon Lakes (Regional Life Science): this ANSI covers approximately 132 ha located on both sides of Highway 404 within Highway 40 to the north and Bethesda Road to the South. (MNRF 2021).
- Bruce's Mill Conservation Area (Provincial Life Science): this ANSI is approximately 35 ha. It is located south of Highway 14 between Highway 3 to the east and Highway 65 to the west (MNRF 2021).

3.2.7 Environmentally Sensitive Areas

Environmentally Significant Areas, or Significant Environmental Areas, as defined by the Town have been mapped in Schedule A of the official plan (Town of Whitchurch-Stouffville 2020). York Region has also mapped Environmentally Significant Areas on Map 3 of the official plan (York Region 2019). There are five Environmentally Significant Areas in order from largest to smallest:

- Simeon Lake Area: Woodlands and wetlands east of Highway 404, to the North and South of Bethesda Road.
- Portion of Musselman Lake Wetland: east of Highway 48 and North of Vandorf Sideroad.
- Portion of East Musselman Wetland Complex: located on both sides of Ninth Line, south of Aurora Road.
- Portion of Vivian Creek: located south of Vivian Road and east of Highway 48.
- Portion of Mount Albert Creek: small tail of an unevaluated wetland along a railway on the north border of the study area

Each feature is located within the ORM and are considered key natural heritage features. Environmentally Significant Areas, according to the York Region Official Plan (York Region 2019) are key natural heritage features that are subject to the same levels of protection as defined in the ORM Conservation Plan and the Greenbelt Plan for life science ANSIs. The TRCA has also designated Environmentally Significant Areas within their jurisdiction as part of the terrestrial natural heritage systems approach (TRCA 2007).

4 SPECIES AT RISK

A desktop review was conducted referencing NHIC, iNaturalist, the Ontario Breeding Bird Atlas, the Butterfly Atlas of Ontario), the Ontario Mammal Atlas, and the Ontario Reptile and Amphibian Atlas to identify records for SAR and species of conservation concern (SCC) within the study area. For the purposes of this screening species identified as SAR species as endangered or threatened under the *Endangered Species Act* (ESA) are considered SAR. Species listed as special concern under the ESA and those listed as endangered, threatened, and special concern under the *Species at Risk Act* (SARA) are considered SCC unless the ESA ranking provides additional protections

A full list of all species found within the desktop review are listed in Appendix B. The desktop review identified 22 SAR and 12 SCC as having potential to occur in the study area. This included one amphibian, 18 birds, one fish, three insects, five mammals, two plants, and four reptiles. For a detailed list of these species along with their habitat requirements, see Appendix C. All the species identified below will require consideration during future phases of the Towns WWMP.

TABLE 3 Species at Risk and Species of Conservation Concern List

Common Name	Scientific Name	ESA Status	SARA Status
Amphibians			
Jefferson Salamander	<i>Ambystoma jeffersonianum</i>	END	END
Birds			
Acadian Flycatcher	<i>Empidonax virens</i>	END	END
Bald Eagle	<i>Haliaeetus leucocephalus</i>	SC	No Status
Bank Swallow	<i>Riparia riparia</i>	THR	THR
Barn Swallow	<i>Hirundo rustica</i>	THR	THR
Bobolink	<i>Dolichonyx oryzivorus</i>	THR	THR
Canada Warbler	<i>Cardellina canadensis</i>	SC	THR
Cerulean Warbler	<i>Setophaga cerulea</i>	THR	END
Chimney Swift	<i>Chaetura pelagica</i>	THR	THR
Common Nighthawk	<i>Chordeiles minor</i>	SC	THR
Eastern Meadowlark	<i>Sturnella magna</i>	THR	THR
Eastern Wood-pewee	<i>Contopus virens</i>	SC	SC
Evening Grosbeak	<i>Coccothraustes vespertinus</i>	SC	SC
Golden Eagle	<i>Aquila chrysaetos</i>	END	No Status
Golden-winged Warbler	<i>Vermivora chrysoptera</i>	SC	THR
Grasshopper Sparrow	<i>Ammodramus savannarum</i>	SC	SC
Least Bittern	<i>Ixobrychus exilis</i>	THR	THR
Red-headed Woodpecker	<i>Melanerpes erythrocephalus</i>	END	THR
Wood Thrush	<i>Hylocichla ustulata</i>	SC	THR
Fish			
Redside Dace	<i>Clinostomus elongatus</i>	END	END

Common Name	Scientific Name	ESA Status	SARA Status
Insects			
Gypsy Cuckoo Bumble Bee	<i>Bombus bohemicus</i>	END	END
Monarch	<i>Danaus plexippus</i>	SC	SC
Transverse Lady Beetle	<i>Coccinella transversoguttata</i>	END	No Status
Mammals			
Eastern Small-footed Myotis	<i>Myotis leibii</i>	END	N/A
Gray Fox	<i>Urocyon cinereoargenteus</i>	THR	THR
Little Brown Myotis	<i>Myotis lucifugus</i>	END	END
Northern Myotis	<i>Myotis septentrionalis</i>	END	END
Tri-colored Bat	<i>Perimyotis subflavus</i>	END	END
Plants			
Black Ash	<i>Fraxinus nigra</i>	END	No Status
Butternut	<i>Juglans cinerea</i>	END	END
Reptiles			
Blanding's Turtle	<i>Emydoidea blandingii</i>	THR	THR
Eastern Milksnake	<i>Lampropeltis triangulum</i>	No Status	SC
Northern Map Turtle	<i>Graptemys geographica</i>	SC	SC
Snapping Turtle	<i>Chelydra serpentina</i>	SC	SC

ESA - *Endangered Species Act*

SARA - *Species at Risk Act*

END - endangered

THR - threatened

SC - special concern

5 CONCLUSIONS AND NEXT STEPS

The study area only has a few small areas that do not contain existing natural heritage designations; therefore, servicing strategies will need to be consider locations and servicing route alternatives that minimize impact to the natural environment. Accordingly, locations of proposed water and/or wastewater infrastructure will need to be carefully evaluated in relation to environmental features and recommended mitigation measures will need to be developed to avoid or minimize impacts during and post construction.

5.1 General Constraints

The following constraints have been identified through the review of background information and should be considered when evaluating the list of strategy alternatives:

- The study area is located within the ORM and Greenbelt for which polices under these plans are applicable.
- The study area contains several designated natural heritage features including:

- ✦ 11 PSWs
 - ✦ 1 Regionally Significant Wetland
 - ✦ several headwater watercourses
 - ✦ several Regionally Significant Woodlands
 - ✦ 5 ANSIs
 - ✦ 5 Environmentally Significant Areas
- The study area includes the potential for 22 SAR and 12 SCC.
 - The study area may also contain species which are regionally or locally rare.

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APPENDIX A

Species List Tables

TABLE A1 Bird Species

Species		Conservation Rank				Source		
Scientific Name	Common Name	Provincial (S-RANK)	Provincial (ESA)	National (COSEWIC)	National (SARA)	NHIC	OBBA	iNaturalist
Accipitridae	Hawks, Kites, Eagles & Allies							
<i>Accipiter cooperii</i>	Cooper's Hawk	S4					x	x
<i>Accipiter gentilis</i>	Northern Goshawk	S4					x	x
<i>Accipiter striatus</i>	Sharp-shinned Hawk	S5					x	
<i>Aquila chrysaetos</i>	Golden Eagle	S2B	END					x
<i>Buteo jamaicensis</i>	Red-tailed Hawk	S5					x	x
<i>Buteo lineatus</i>	Red-shouldered Hawk	S4B			SC		x	x
<i>Buteo platypterus</i>	Broad-winged Hawk	S5B					x	x
<i>Circus cyaneus</i>	Northern Harrier	S4B					x	x
<i>Haliaeetus leucocephalus</i>	Bald Eagle	S2N/S4B	SC					x
Alaudidae	Larks							
<i>Eremophila alpestris</i>	Horned Lark	S5B					x	x
Alcedinidae	Kingfishers							
<i>Megasceryle alcyon</i>	Belted Kingfisher	S4B/S5B					x	x
Apodidae	Swifts							
<i>Chaetura pelagica</i>	Chimney Swift	S4B/S4N	THR	THR	THR		x	x
Anatidae	Ducks, Geese & Swans							
<i>Aix sponsa</i>	Wood Duck	S5					x	x
<i>Anas crecca</i>	Green-winged Teal	S4					x	
<i>Anas discors</i>	Blue-winged Teal	S4					x	
<i>Anas platyrhynchos</i>	Mallard	S5					x	x
<i>Anas rubripes</i>	American Black Duck	S4					x	
<i>Aythya marila</i>	Great Scaup	S4						x
<i>Branta canadensis</i>	Canada Goose	S5					x	x
<i>Bucephala albeola</i>	Bufflehead	S4						x
<i>Bucephala clangula</i>	Common Goldeneye	S5						x
<i>Cygnus buccinator</i>	Trumpeter Swan	S4					x	x
<i>Cygnus olor</i>	Mute Swan	SNA					x	
<i>Lophodytes cucullatus</i>	Hooded Merganser	S5B, S5N					x	x
<i>Melanitta fusca</i>	White-winged Scoter	S4B/S4N						x
<i>Oxyura jamaicensis</i>	Ruddy Duck	S4B/S4N						x
<i>Aythya affinis</i>	Lesser Scaup	S4						x
<i>Aythya collaris</i>	Ring-necked Duck	S5						x
<i>Mergus merganser</i>	Common Merganser	S5B, S5N						x
Ardeidae	Herons and Bitterns							
<i>Ardea alba</i>	Great Egret	S2B						x
<i>Ardea herodias</i>	Great Blue Heron	S4					x	x
<i>Botaurus lentiginosus</i>	American Bittern	S4B					x	
<i>Butorides virescens</i>	Green Heron	S4B					x	x
<i>Ixobrychus exilis</i>	Least Bittern	S4B	THR	THR	THR	x	x	
Bombycillidae	Waxwings							
<i>Bombycilla cedrorum</i>	Cedar Waxwing	S5B					x	x
<i>Bombycilla garrulus</i>	Bohemian Waxwing	SNA						x
Calcariidae	Longspurs & Snow Buntings							
<i>Plectrophenax nivalis</i>	Snow Bunting	SNA						x
Caprimulgidae	Nightjars							
<i>Chordeiles minor</i>	Common Nighthawk	S4B	SC	SC	THR		x	
Cardinalidae	Cardinals, Grosbeaks & Allies							
<i>Cardinalis cardinalis</i>	Northern Cardinal	S5					x	x
<i>Passerina cyanea</i>	Indigo Bunting	S4B					x	x
<i>Pheucticus ludovicianus</i>	Rose-breasted Grosbeak	S4B					x	x
<i>Piranga olivacea</i>	Scarlet Tanager	S4B					x	x
Cathartidae	Vultures							
<i>Cathartes aura</i>	Turkey Vulture	S5B					x	x
Certhiidae	Creepers							
<i>Certhia americana</i>	Brown Creeper	S5B					x	x
Charadriidae	Plovers							
<i>Charadrius vociferus</i>	Killdeer	S5B/S5N					x	x
Columbidae	Pigeons & Doves							
<i>Columba livia</i>	Rock Pigeon	SNA					x	x
<i>Zenaidura macroura</i>	Mourning Dove	S5					x	x
Corvidae	Crows & Jays							
<i>Corvus brachyrhynchos</i>	American Crow	S5B/S4N					x	x
<i>Corvus corax</i>	Common Raven	S5					x	
<i>Cyanocitta cristata</i>	Blue Jay	S5					x	x

Scientific Name	Common Name	Provincial (S-RANK)	Provincial (ESA)	National (COSEWIC)	National (SARA)	NHIC	OBBA	iNaturalist
Cuculidae	Cuckoo & Anis							
<i>Coccyzus americanus</i>	Yellow-billed Cuckoo	S4B					x	
<i>Coccyzus erythrophthalmus</i>	Black-billed Cuckoo	S5B					x	x
Emberizidae	New World Sparrows & Allies							
<i>Ammodramus savannarum</i>	Grasshopper Sparrow	S4B	SC	SC			x	
<i>Junco hyemalis</i>	Dark-eyed Junco	S5B						x
<i>Melospiza georgiana</i>	Swamp Sparrow	S5B					x	x
<i>Melospiza lincolni</i>	Lincoln's Sparrow	S5B					x	
<i>Melospiza melodia</i>	Song Sparrow	S5B/S4N					x	x
<i>Passerculus sandwichensis</i>	Savannah Sparrow	S4B					x	
<i>Pipilo erythrophthalmus</i>	Eastern Towhee	S4B					x	x
<i>Poocetes gramineus</i>	Vesper Sparrow	S4B					x	x
<i>Spizella arborea</i>	American Tree Sparrow	S4B						x
<i>Spizella pallida</i>	Clay-colored Sparrow	S4B					x	x
<i>Spizella passerina</i>	Chipping Sparrow	S5B/S4N					x	x
<i>Zonotrichia albicollis</i>	White-throated Sparrow	S5B					x	x
<i>Zonotrichia leucophrys</i>	White-crowned Sparrow	S4B						x
<i>Spizella pusilla</i>	Field Sparrow	S4B					x	
Falconidae	Carcaras & Falcons							
<i>Falco sparverius</i>	American Kestrel	S4					x	
Fringillidae	Finches & Allies							
<i>Acanthis flammea</i>	Common Redpoll	S4B						x
<i>Acanthis hornemanni</i>	Hoary Redpoll	SNA						x
<i>Coccothraustes vespertinus</i>	Evening Grosbeak	S4B	SC	SC	SC		x	
<i>Haemorhous mexicanus</i>	House Finch	SNA					x	x
<i>Haemorhous purpureus</i>	Purple Finch	S4B					x	x
<i>Loxia curvirostra</i>	Red Crossbill	S4B						x
<i>Loxia leucoptera</i>	White-winged Crossbill	S5B					x	x
<i>Pinicola enucleator</i>	Pine Grosbeak	S4B						x
<i>Spinus pinus</i>	Pine Siskin	S4B					x	x
<i>Spinus tritis</i>	American Goldfinch	S5B/S4N					x	x
Gaviidae	Loons							
<i>Gavia immer</i>	Common Loon	S5B,S5N						x
Hirundinidae	Swallows							
<i>Hirundo rustica</i>	Barn Swallow	S4B	THR	THR	THR	x	x	x
<i>Petrochelidon pyrrhonota</i>	Cliff Swallow	S4B					x	
<i>Progne subis</i>	Purple Martin	S3/S4B					x	
<i>Riparia riparia</i>	Bank Swallow	S4B	THR	THR	THR		x	x
<i>Stelgidopteryx serripennis</i>	Northern Rough-winged Swallow	S4B					x	x
<i>Tachycineta bicolor</i>	Tree Swallow	S4B					x	x
Icteridae	New World Blackbird							
<i>Agelaius phoeniceus</i>	Red-winged Blackbird	S4/S5					x	x
<i>Dolichonyx oryzivorus</i>	Bobolink	S4B	THR	THR	THR	x	x	
<i>Icterus galbula</i>	Baltimore Oriole	S4B					x	x
<i>Icterus spurius</i>	Orchard Oriole	S4B					x	
<i>Molothrus ater</i>	Brown-headed Cowbird	S4B					x	x
<i>Quiscalus quiscula</i>	Common Grackle	S5B/S4N					x	x
<i>Sturnella magna</i>	Eastern Meadowlark	S4B	THR	THR	THR	x	x	x
Laridae	Gulls, Terns & Skimmers							
<i>Hydroprogne caspia</i>	Caspian Tern	S3B						x
<i>Larus delawarensis</i>	Ring-billed Gull	S5B/S4N						x
Mimidae	Mockingbirds, Thrashers & Allies							
<i>Dumetella carolinensis</i>	Gray Catbird	S4B					x	
<i>Mimus polyglottos</i>	Northern Mockingbird	S4					x	x
<i>Toxostoma rufum</i>	Brown Thrasher	S4B					x	x
Pandionidae	Osprey							
<i>Pandion haliaetus</i>	Osprey	S5B					x	x
Paridae	Chickadees and Titmice							
<i>Poecile atricapillus</i>	Black-capped Chickadee	S5					x	x
Parulidae	Wood Warblers							
<i>Cardellina canadensis</i>	Canada Warbler	S4B	SC	THR	SC	x	x	x
<i>Geothlypis philadelphia</i>	Mourning Warbler	S4B					x	x
<i>Geothlypis trichas</i>	Common Yellowthroat	S5B					x	
<i>Mniotilta varia</i>	Black-and-white Warbler	S5B					x	x
<i>Oreothlypis ruficapilla</i>	Nashville Warbler	S5B					x	x
<i>Parkesia noveboracensis</i>	Northern Waterthrush	S5B					x	
<i>Seiurus aurocapilla</i>	Ovenbird	S4B					x	x

Scientific Name	Common Name	Provincial (S-RANK)	Provincial (ESA)	National (COSEWIC)	National (SARA)	NHIC	OBBA	iNaturalist
<i>Setophaga caerulescens</i>	Black-throated Blue Warbler	S5B					x	x
<i>Setophaga castanea</i>	Bay-breasted Warbler	S5B						x
<i>Setophaga cerulea</i>	Cerulean Warbler	S3B	THR	END	END		x	
<i>Setophaga coronata</i>	Yellow Rumped Warbler	S5B						x
<i>Setophaga fusca</i>	Blackburnian Warbler	S5B					x	x
<i>Setophaga magnolia</i>	Magnolia Warbler	S5B					x	
<i>Setophaga pensylvanica</i>	Chestnut-sided warbler	S5B					x	x
<i>Setophaga petechai</i>	Yellow Warbler	S5B					x	x
<i>Setophaga pinus</i>	Pine Warbler	S5B					x	x
<i>Setophaga ruticilla</i>	American Redstart	S5B					x	x
<i>Setophaga virens</i>	Black-throated Green Warbler	S5B					x	x
<i>Vermivora chrysoptera</i>	Golden-winged Warbler	S4B	SC	THR	THR	x	x	x
<i>Vermivora cyanoptera</i>	Blue-winged Warbler	S4B					x	
Passeridae	Sparrows							
<i>Passer domesticus</i>	House Sparrow	SNA					x	x
Phalacrocoracidae	Cormorants							
<i>Phalacrocorax auritus</i>	Double-crested Cormorant	S5B						x
Phasianidae	Partridges, Grouse, Turkeys							
<i>Meleagris gallopavo</i>	Wild Turkey	S5					x	x
<i>Phasianus colchicus</i>	Ring-necked Pheasant	SNA					x	x
<i>Bonasa umbellus</i>	Ruffed Grouse	S4					x	x
Picidae	Woodpeckers							
<i>Colaptes auratus</i>	Northern Flicker	S4B					x	x
<i>Dryocopus pileatus</i>	Pileated Woodpecker	S5					x	x
<i>Leuconotopicus villosus</i>	Hairy Woodpecker	S5					x	x
<i>Melanerpes carolinus</i>	Red-bellied Woodpecker	S4						x
<i>Melanerpes erythrocephalus</i>	Red-headed Woodpecker	S4B	END	END	END		x	
<i>Picoides pubescens</i>	Downy Woodpecker	S5					x	x
<i>Sphyrapicus varius</i>	Yellow-bellied Sapsucker	S5B					x	x
Podicipedidae	Grebes							
<i>Podiceps grisegena</i>	Red-necked Grebe	S3B/S4N						x
<i>Podilymbus podiceps</i>	Pied-billed Grebe	S4B,S4N					x	x
Poliophtidae	Gnatcatchers							
<i>Poliophtila caerulea</i>	Blue-gray Gnatcatcher	S4B					x	
Rallidae	Rallies, Gallinules & Coots							
<i>Fulica americana</i>	American Coot	S4B					x	x
<i>Gallinula chloropus</i>	Common Gallinule	S4B					x	
<i>Porzana carolina</i>	Sora	S4B					x	
<i>Rallus limicola</i>	Virginia Rail	S5B					x	x
Regulidae	Kinglets							
<i>Regulus calendula</i>	Ruby-crowned Kinglet	S4B					x	x
<i>Regulus satrapa</i>	Golden-crowned Kinglet	S5B					x	x
Scolopacidae	Sandpipers, Phalaropes & Allies							
<i>Actitis macularius</i>	Spotted Sandpiper	S5					x	x
<i>Bartramia longicauda</i>	Upland Sandpiper	S4B					x	
<i>Calidris pugnax</i>	Ruff	SNA					x	x
<i>Scolopax minor</i>	American Woodcock	S4B					x	x
Sittidae	Nuthatches							
<i>Sitta canadensis</i>	Red-breasted Nuthatch	S5					x	x
<i>Sitta carolinensis</i>	White-breasted Nuthatch	S5					x	x
Stercorariidae	Skuas							
<i>Aegolius acadicus</i>	Northern Saw-whet Owl	S4						x
<i>Asio otus</i>	Long-eared Owl	S4					x	
<i>Bubo scanidiacus</i>	Snowy Owl	SNA						x
<i>Bubo virginianus</i>	Great Horned Owl	S5					x	x
<i>Strix varia</i>	Barred Owl	S5					x	x
Sturnidae	Starlings							
<i>Sturnus vulgaris</i>	European Starling	SNA					x	x
Trochilidae	Hummingbirds							
<i>Archilochus colubris</i>	Ruby-throated Hummingbird	S5B					x	x
Troglodytidae	Wrens							
<i>Cistothorus palustris</i>	Marsh Wren	S4B					x	
<i>Cistothorus platensis</i>	Sedge Wren	S4B					x	
<i>Thyrothorus ludovicianus</i>	Carolina Wren	S4						x
<i>Troglodytes aedon</i>	House Wren	S5B					x	x
<i>Troglodytes hiemalis</i>	Winter Wren	S5B					x	x
Turdidae	Thrushes							

Scientific Name	Common Name	Provincial (S-RANK)	Provincial (ESA)	National (COSEWIC)	National (SARA)	NHIC	OBBA	iNaturalist
<i>Catharus fuscescens</i>	Veery	S4B					x	x
<i>Catharus guttatus</i>	Hermit Thrush	S5B					x	x
<i>Catharus minimus</i>	Gray-cheeked Thrush	S4B						x
<i>Hylocichla mustelina</i>	Wood Thrush	S4B	SC	THR	THR	x	x	x
<i>Sialia sialis</i>	Eastern Bluebird	S5B					x	x
<i>Turdus migratorius</i>	American Robin	S5B					x	x
Tyrannidae	Tyrant Flycatchers							
<i>Contopus virens</i>	Eastern Wood-pewee	S4B	SC	SC	SC	x	x	x
<i>Empidonax alnorum</i>	Alder Flycatcher	S5B					x	x
<i>Empidonax minimus</i>	Least Flycatcher	S4B					x	
<i>Empidonax traillii</i>	Willow Flycatcher	S5B					x	x
<i>Empidonax virescens</i>	Acadian Flycatcher	S2S3B	END	END	END		x	
<i>Myiarchus crinitus</i>	Great Crested Flycatcher	S4B					x	x
<i>Sayornis phoebe</i>	Eastern Phoebe	S5B/S4N					x	x
<i>Tyrannus tyrannus</i>	Eastern Kingbird	S4B					x	x
Vireonidae	Vireos							
<i>Vireo gilvus</i>	Warbling Vireo	S5B					x	x
<i>Vireo olivaceus</i>	Red-eyed Vireo	S5B					x	x
<i>Vireo solitarius</i>	Blue-headed Vireo	S5B					x	x
<i>Vireo flavifrons</i>	Yellow-throated Vireo	S4B					x	
Total:						8	143	138

TABLE A2 Fish Species

Species Name		Conservation Rank				Source		
Scientific Name	Common Name	S-RANK	ESA	COSEWIC	SARA	NHIC	iNaturalist	DFO
Cypriniformes								
<i>Clinostomus elongatus</i>	Redside Dace	S2	END	END	END	x	x	x
<i>Pimephales promelas</i>	Fathead Minnow	S5					x	
<i>Rhinichthys cataractae</i>	Longnose Dace	S5					x	
<i>Semotilus atromaculatus</i>	Creek Chub	S5					x	
<i>Catostomus commersonii</i>	White Sucker	S5					x	
Perciformes								
<i>Lepomis gibbosus</i>	Pumpkinseed	S5					x	
<i>Micropterus salmoides</i>	Largemouth Bass	S5					x	
Salmoniformes								
<i>Salmo trutta</i>	Brown Trout	SNA					x	
<i>Salvelinus fontinalis fontinalis</i>	Brook Trout	S5					x	
Scorpaeniformes								
<i>Cottus bairdii</i>	Mottled Sculpin	S5					x	
TOTAL:						1	10	1

Legend

SRANK

S1 Critically Imperiled
 S2 Imperiled
 S3 Vulnerable
 S4 Apparently Secure
 S5 Secure
 SU Unrankable
 SNA Unranked
 SX Presumed Extirpated
 SH Possibly Extirpated
 S#? Rank Uncertain

COSEWIC

NAR Not at Risk
 SC Special Concern
 T Threatened
 E Endangered
 XT Extirpated
 DD Data Deficient

COSSARO

NAR Not at Risk
 SC Special Concern
 THR Threatened
 END Endangered
 EXP Extirpated
 DD Data Deficient

SARA Schedule

Schedule 1 Officially protected under SARA
 Schedule 2 Threatened/Endangered; may be reassessed for consideration for inclusion to Schedule 1
 Schedule 3 Special concern; may be reassessed for consideration for inclusion to Schedule 1

Legend

SRANK

S1 Critically Imperiled
 S2 Imperiled
 S3 Vulnerable
 S4 Apparently Secure
 S5 Secure
 SU Unrankable
 SNA Unranked
 SX Presumed Extirpated
 SH Possibly Extirpated
 S#? Rank Uncertain

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 DD Data Deficient

SARA Schedule

Schedule 1 Officially protected under SARA
 Schedule 2 Threatened/Endangered; may be reassessed for consideration for inclusion to Schedule 1
 Schedule 3 Special concern; may be reassessed for consideration for inclusion to Schedule 1

TABLE A3 Reptile and Amphibian Species

Species		Conservation Rank				Source		
Scientific Name	Common Name	Provincial (S-RANK)	Provincial (ESA)	National (COSEWIC)	National (SARA)	NHIC	ORAA	iNaturalist
Cryptodeira	Turtles							
<i>Chelydra serpentina</i>	Snapping Turtle	S3	SC	SC	SC	x	x	x
<i>Chrysemys picta marginata</i>	Midland Painted Turtle	S4				x	x	x
<i>Emydoidea blandingii</i>	Blanding's Turtle	S3	THR	END	THR	x	x	
<i>Graptemys geographica</i>	Northern Map Turtle	S3	SC	SC	SC		x	
<i>Trachemys scripta</i>	Pond Slider	SNA						x
<i>Trachemys scripta elegans</i>	Red-eared Slider	SNA					x	x
Squamata	Snakes							
<i>Lampropeltis triangulum</i>	Milksnake	S4		SC	SC	x	x	x
<i>Ophedrys vernalis</i>	Smooth Greensnake	S4					x	
<i>Storeria dekayi</i>	DeKay's Brownsnake	S5					x	
<i>Storeria occipitomaculata</i>	Red-bellied snake	S5					x	x
<i>Thamnophis sirtalis sirtalis</i>	Eastern Gartersnake	S5					x	x
Caudata	Salamanders							
<i>Ambystoma hybrid</i>	Jefferson X Blue-spotted Salamander	S2/S4				x		
<i>Ambystoma hybrid pop. 1</i>	Jefferson X Blue-spotted Salamander, Jefferson genome dominates	S2				x		
<i>Ambystoma jeffersonianum</i>	Jefferson Salamander	S2	END	END	END	x		
<i>Ambystoma laterale</i>	Blue-spotted Salamander	S4					x	x
<i>Ambystoma maculatum</i>	Spotted Salamander	S4					x	x
<i>Notophthalmus viridescens viridescens</i>	Red-spotted Newt	S5					x	
<i>Plethodon cinereus</i>	Eastern Red-backed Salamander	S5					x	
Anura	Frogs and Toads							
<i>Anaxyrus americanus</i>	American Toad	S5					x	x
<i>Hyla versicolor</i>	Gray Treefrog	S5					x	x
<i>Lithobates catesbeianus</i>	American Bullfrog	S4					x	x
<i>Lithobates clamitans</i>	Green Frog	S5					x	x
<i>Lithobates palustris</i>	Pickerel Frog	S4					x	
<i>Lithobates pipiens</i>	Northern Leopard Frog	S5					x	x
<i>Lithobates sylvaticus</i>	Wood Frog	S5					x	x
<i>Pseudacris crucifer</i>	Spring Peeper	S5					x	x
Total:						7	22	16

Legend

SRANK

S1 Critically Imperiled
 S2 Imperiled
 S3 Vulnerable
 S4 Apparently Secure
 S5 Secure
 SU Unrankable
 SNA Unranked
 SX Presumed Extirpated
 SH Possibly Extirpated
 S#? Rank Uncertain

COSEWIC

NAR Not at Risk
 SC Special Concern
 T Threatened
 E Endangered
 XT Extirpated
 DD Data Deficient

COSSARO

NAR Not at Risk
 SC Special Concern
 THR Threatened
 END Endangered
 EXP Extirpated
 DD Data Deficient

SARA Schedule

Schedule 1 Officially protected under SARA
 Schedule 2 Threatened/Endangered; may be reassessed for consideration for inclusion to Schedule 1
 Schedule 3 Special concern; may be reassessed for consideration for inclusion to Schedule 1

TABLE A4 Insect Species

Species Name		Conservation Ranking				Source		
Scientific Name	Common Name	S-RANK	ESA	COSEWIC	SARA	NHIC	Ontario Butterfly Atlas	iNaturalist
Coleoptera	Beetles							
<i>Cicindela sexguttata</i>	Tiger Beetle	S5						x
<i>Carabus nemoralis</i>	European Ground Beetle	SNA						x
<i>Molochus bimaculatus</i>	Longhorned Beetle	SNR						x
<i>Monochamus scutellatus</i>	Longhorned Beetle	SNR						x
<i>Tetraopes tetrophthalmus</i>	Longhorned Beetle	SNR						x
<i>Acalymma vittatum</i>	Leaf Beetle	SNR						x
<i>Cerotoma trifurcata</i>	Leaf Beetle	SNR						x
<i>Zygogramma suturalis</i>	Leaf Beetle	SNR						x
<i>Coccinella septempunctata</i>	Seven-spotted Ladybird Beetle	SNA						x
<i>Coccinella transversoguttata</i>	Transverse Lady Beetle	SH	END	SC	SC	x		
<i>Coleomegilla maculata</i>	Spotted Ladybird Beetle	S5						x
<i>Cycloneda munda</i>	Immaculate Ladybird Beetle	SNR						x
<i>Anthrenus scrophulariae</i>	Dermestid Beetle	SNA						x
<i>Geotrupes splendidus</i>	Scarab Beetle	SNR						x
<i>Ellychnia corrusca</i>	Glowworm	SNR						x
<i>Glischrochilus fuscatus</i>	Sap Beetle	SNR						x
<i>Dichelonyx linearis</i>	Scarab Beetle	SNR						x
<i>Euphoria inda</i>	Scarab Beetle	SNR						x
<i>Onthophagus orpheus</i>	Scarab Beetle	SNR						x
<i>Popillia japonica</i>	Scarab Beetle	SNA						x
<i>Necrophila americana</i>	Carrion Beetle	S5						x
Diptera	Flies							
<i>Xenox tigrinus</i>	Tiger Bee Fly	S3S4						x
Homoptera	Sucking Insects							
Hymenoptera	Sawflies, Wasps, Bees, and Ants							
<i>Andrena nubecula</i>	Cloudy-winged Miner Bee	S3S4						x
<i>Bombus bohemicus</i>	Gypsy Cuckoo Bumble Bee	S1S2	END	END	END	x		
<i>Bombus impatiens</i>	Common Eastern Bumble Bee	S5						x
<i>Bombus borealis</i>	Northern Amber Bumble Bee	S5						x
<i>Apis mellifera</i>	European Honey Bee	SNA						x
<i>Camponotus pennsylvanicus</i>	Eastern Black Carpenter Ant	S5						x
<i>Prenolepis imparis</i>	Winter Ant	S4						x
Lepidoptera	Butterflies							
<i>Hymenia perspectalis</i>	Spotted Beet Webworm Moth	SNR						x
<i>Spoladea recurvalis</i>	Hawaiian Beet Webworm Moth	SNR						x
<i>Catocala piatrix</i>	The Penitent	S4					x	
<i>Catocala relictata</i>	White Underwing Moth	S5					x	
<i>Cisseps fulvicollis</i>	Yellow-collared Scape Moth	SNR					x	x
<i>Hypena abalienalis</i>	White-lined Bomolocha	SNR						x
<i>Ctenucha virginica</i>	Virginia Ctenucha Moth	S5					x	x
<i>Cynia tenera</i>	Delicate Cynia	S4					x	
<i>Dasychira vagans</i>	Variable Tussock Moth	SNR						x
<i>Estigmene acrea</i>	Salt Marsh Moth	S5					x	
<i>Euchaetes egle</i>	Milkweed Tussock Moth	S4?					x	x
<i>Halysidota tessellaris</i>	Banded Tussock Moth	S5					x	x
<i>Haploa confusa</i>	Confused Haploa	S5					x	x
<i>Haploa contigua</i>	The Neighbor	SNR					x	x
<i>Hyphantria cunea</i>	Fall Webworm Moth	S5					x	x
<i>Idia americalis</i>	American Idia	SNR						x
<i>Lophocampa caryae</i>	Hickory Tussock Moth	SNR					x	
<i>Lophocampa maculata</i>	Spotted Tussock Moth	S4					x	x
<i>Lymantria dispar</i>	Gypsy Moth	SNA						x
<i>Orgyia definita</i>	Definite Tussock Moth	SNR						x
<i>Orgyia leucostigma</i>	White-marked Tussock Moth	S5						x
<i>Parallelia bistriaris</i>	Maple Looper Moth	SNR						x
<i>Phragmatobia fuliginosa</i>	Ruby Tiger Moth	S4?					x	
<i>Hypena scabra</i>	Green Cloverworm Moth	SNR						x
<i>Pyrrharctia isabella</i>	Isabella Tiger Moth	S5					x	x
<i>Spilosoma virginica</i>	Virginian Tiger Moth	S5					x	
<i>Zale horrida</i>	Horrid Zale	SNR						x
<i>Campaea perlata</i>	Pale Beauty Moth	S5						x
<i>Cepphis armataria</i>	Scallop Moth	SNR						x

Scientific Name	Common Name	S-RANK	ESA	COSEWIC	SARA	NHIC	Ontario Butterfly Atlas	iNaturalist
Eufidonia notataria	Powder Moth	SNR						x
Eutrapela clemataria	Curve-toothed Geometer	SNR						x
Lambdina fiscellaria	Hemlock Looper Moth	S5						x
Mesoleuca ruficollata	White-ribbed Carpet	SNR						x
Nematocampa resistaria	Horned Spanworm Moth	SNR						x
Phigalia titea	The Half-wing	SNR						x
Macaria minorata	Minor Angle	SNR						x
Trichodezia albivittata	White-striped Black	SNR						x
Xanthorhoe ferrugata	Red Twin-spot	SNR						x
Thymelicus lineola	European Skipper	SNA					x	
Hesperia leonardus	Leonard's Skipper	S4					x	
Epargyreus clarus	Silver-spotted Skipper	S4					x	
Erynnis icelus	Dreamy Duskywing	S5					x	
Erynnis juvenalis	Juvenal's Duskywing	S5					x	x
Erynnis baptisiae	Wild Indigo Duskywing	S4					x	x
Carterocephalus palaemon	Arctic Skipper	S5					x	
Ancyloxypha numitor	Least Skipper	S5					x	
Hesperia sassacus	Indian Skipper	S4					x	
Polites peckius	Peck's Skipper	S5					x	
Polites themistocles	Tawny-edged Skipper	S5					x	
Polites origenes	Crossline Skipper	S4					x	
Polites mystic	Long Dash Skipper	S5					x	
Wallengrenia egeremet	Northern Broken-Dash	S5					x	
Pompeius verna	Little Glassywing	S4					x	
Anatrytone logan	Delaware Skipper	S4					x	
Poanes massasoit	Mulberry Wing	S4					x	
Poanes hobomok	Hobomok Skipper	S5					x	
Poanes viator	Broad-winged Skipper	S4					x	
Euphyes dion	Dion Skipper	S4					x	
Euphyes vestris	Dun Skipper	S5					x	x
Malacosoma americana	Eastern Tent Caterpillar Moth	S5					x	x
Lycaena phlaeas	American Copper	S5					x	x
Lycaena hyllus	Bronze Copper	S5					x	
Lycaena epixanthe	Bog Copper	S4S5					x	
Satyrus acadica	Acadian Hairstreak	S4					x	
Satyrus calanus	Banded Hairstreak	S4					x	
Satyrus liparops	Striped Hairstreak	S5					x	x
Satyrus titus	Coral Hairstreak	S5					x	
Callophrys niphon	Eastern Pine Elfin	S5					x	x
Cupido comyntas	Eastern Tailed Blue	S5					x	
Glaucopsyche lygdamus	Silvery Blue	S5					x	
Celastrina neglecta	Summer Azure	S5					x	
Celastrina lucia	Northern Spring Azure	S5					x	x
Acronicta americana	American Dagger Moth	S5						x
Acronicta lepusculina	Cottonwood Dagger Moth	S4S5						x
Agrotis ipsilon	Ipsilon Dart	S5						x
Amphipyra pyramidoides	Copper Underwing	SNR						x
Autographa precationis	Common Looper Moth	S5						x
Charadra deridens	The Laugher	S4?						x
Cucullia convexipennis	Brown-bordered Cucullia	S4						x
Feltia herilis	Master's Dart Moth	S5						x
Feltia jaculifera	Dingy Cutworm Moth	S5						x
Noctua pronuba	Large Yellow Underwing Moth	SNA						x
Orthodes majuscula	Rustic Quaker	SNR						x
Orthosia rubescens	Ruby Quaker	SNR						x
Mythimna unipuncta	Armyworm Moth	S4						x
Schinia florida	Primrose Moth	SNR						x
Sunira bicolorago	Bicolored Sallow Moth	S5						x
Datana integerrima	Walnut Caterpillar Moth	SNR					x	
Phyciodes cocyta	Northern Crescent	S5					x	x
Euphydryas phaeton	Baltimore Checkerspot	S4					x	
Polygonia interrogationis	Question Mark	S5					x	x
Polygonia comma	Eastern Comma	S5					x	x
Polygonia progne	Gray Comma	S5					x	x
Speyeria cybele	Great Spangled Fritillary	S5					x	x
Speyeria aphrodite	Aphrodite Fritillary	S5					x	

Scientific Name	Common Name	S-RANK	ESA	COSEWIC	SARA	NHIC	Ontario Butterfly Atlas	iNaturalist
Speyeria atlantis	Atlantis Fritillary	S5					x	
Boloria selene	Silver-bordered Fritillary	S5					x	
Boloria bellona	Meadow Fritillary	S5					x	
Phyciodes tharos	Pearl Crescent	S4					x	x
Nymphalis l-album	Compton Tortoiseshell	S5					x	
Nymphalis antiopa	Mourning Cloak	S5					x	x
Aglais milberti	Milbert's Tortoiseshell	S5					x	
Vanessa virginiensis	American Lady	S5					x	x
Vanessa cardui	Painted Lady	S5					x	x
Vanessa atalanta	Red Admiral	S5					x	x
Junonia coenia	Common Buckeye	SNA					x	
Limenitis arthemis astyanax	Red-spotted Purple	S5					x	
Limenitis archippus	Viceroy	S5					x	
Lethe antheodon	Northern Pearly-Eye	S5					x	x
Lethe eurydice	Eyed Brown	S5					x	
Megisto cymela	Little Wood-Satyr	S5					x	x
Coenonympha tullia	Common Ringlet	S5					x	
Cercyonis pegala	Common Wood-Nymph	S5					x	
Danaus plexippus	Monarch	S2N,S4B	SC	END	SC		x	x
Limenitis arthemis arthemis	White Admiral	S5					x	x
Battus philenor	Pipevine Swallowtail	SNA					x	
Papilio polyxenes	Black Swallowtail	S5					x	x
Papilio cresphontes	Giant Swallowtail	S4					x	
Papilio glaucus	Eastern Tiger Swallowtail	S5					x	x
Papilio canadensis	Canadian Tiger Swallowtail	S5					x	x
Pieris oleracea	Mustard White	S4					x	x
Pieris rapae	Cabbage White	SNA					x	x
Colias philodice	Clouded Sulphur	S5					x	x
Colias eurytheme	Orange Sulphur	S5					x	
Pyrisitia lisa	Little Yellow	SNA					x	
Dryocampa rubicunda	Rosy Maple Moth	S5					x	x
Antheraea polyphemus	Polyphemus Moth	S5					x	x
Actias luna	Luna Moth	S4						x
Hyalophora cecropia	Cecropia Moth	S5					x	
Melittia cucurbitae	Squash Vine Borer Moth	SNR						x
Pennisetia marginatum	Raspberry Crown Borer Moth	SNR						x
Paonias excaecata	Blinded Sphinx	S5						x
Hemaris thysbe	Hummingbird Clearwing	S5					x	x
Darapsa myron	Hog Sphinx	SU					x	
Pachysphinx modesta	Big Poplar Sphinx	S5					x	x
Sphinx kalmiae	Laurel Sphinx	S5					x	
Hemaris diffinis	Snowberry Clearwing Moth	S4S5					x	x
Thyris maculata	Spotted Thyris	SNR						x
Mantodea	Mantises							
Mantis religiosa	Praying Mantis	SNA						x
Odonata	Damselflies and Dragonflies							
Aeshna umbrosa	Shadow Darner	S5						x
Anax junius	Green Darner	S5						x
Calopteryx maculata	Ebony Jewelwing	S5						x
Enallagma geminatum	Skimming Bluet	S4						x
Enallagma vesperum	Vesper Bluet	S4						x
Ischnura verticalis	Eastern Forktail	S5						x
Cordulia shurtleffii	American Emerald	S5						x
Epithea canis	Beaverpond Baskettail	S5						x
Epithea cynosura	Common Baskettail	S5						x
Celithemis eponina	Halloween Pennant	S4						x
Leucorrhinia intacta	Dot-tailed Whiteface	S5						x
Libellula luctuosa	Widow Skimmer	S5						x
Libellula pulchella	Twelve-spotted Skimmer	S5						x
Plathemis lydia	Common Whitetail	S5						x
Ladona julia	Chalk-fronted Corporal	S5						x
Pachydiplax longipennis	Blue Dasher	S5						x
Perithemis tenera	Eastern Amberwing	S4						x
Sympetrum vicinum	Autumn Meadowhawk	S5						x
Orthoptera	related insects							
Melanoplus bivittatus	Two-striped Grasshopper	S5						x

Scientific Name	Common Name	S-RANK	ESA	COSEWIC	SARA	NHIC	Ontario Butterfly Atlas	iNaturalist
<i>Spharagemon bolli</i>	Boll's Grasshopper	S4						x
<i>Chortophaga viridifasciata</i>	Green-striped Grasshopper	S4						x
<i>Dissosteira carolina</i>	Carolina Grasshopper	S4S5						x
<i>Gryllus pennsylvanicus</i>	Fall Field Cricket	S5						x
Phasmatodea	Stick Insects							
<i>Diapheromera femorata</i>	Northern Walkingstick	S4						x
TOTAL:						2	96	136

TABLE A5 Mammal Species

Species Name		Conservation Ranking				Source	
Scientific Name	Common Name	S-RANK	ESA	COSEWIC	SARA	Mammal Atlas	iNaturalist
Artiodactyla	Deer and Bison						
<i>Odocoileus virginianus</i>	White-tailed Deer	S5				x	x
Carnivora	Carnivores						
<i>Canis latrans</i>	Coyote	S5				x	x
<i>Lontra canadensis</i>	North American River Otter	S5				x	x
<i>Lynx rufus</i>	Bobcat	S4				x	
<i>Martes americana</i>	American Marten	S5				x	
<i>Mephitis mephitis</i>	Striped Skunk	S5				x	x
<i>Mustela frenata</i>	Long-tailed Weasel	S4				x	
<i>Mustela nivalis</i>	Least Weasel	SU				x	
<i>Neovison vison</i>	American Mink	S4				x	x
<i>Procyon lotor</i>	Northern Raccoon	S5				x	x
<i>Urocyon cinereoargenteus</i>	Gray Fox	S1	THR	THR	THR	x	
<i>Ursus americanus</i>	American Black Bear	S5				x	
<i>Vulpes vulpes</i>	Red Fox	S5				x	x
Chiroptera	Bats						
<i>Eptesicus fuscus</i>	Big Brown Bat	S4				x	
<i>Lasionycteris noctivagans</i>	Silver-haired Bat	S4				x	
<i>Lasiurus borealis</i>	Red Bat	S4				x	
<i>Lasiurus cinereus</i>	Hoary Bat	S4				x	
<i>Myotis leibii</i>	Eastern Small-footed Myotis	S2/S3	END			x	
<i>Myotis lucifugus</i>	Little Brown Myotis	S4	END	END	END	x	
<i>Myotis septentrionalis</i>	Northern Myotis	S3	END	END	END	x	
<i>Perimyotis subflavus</i>	Tricolored Bat	S3	END	END	END	x	
Didelphimorphia	Opposums						
<i>Didelphis virginiana</i>	Virginia Opossum	S4					x
Lagomorpha	Rabbits and Hares						
<i>Sylvilagus floridanus</i>	Eastern Cottontail	S5				x	x
<i>Lepus americanus</i>	Snowshoe Hare	S5				x	
Rodentia	Rodents						
<i>Castor canadensis</i>	Beaver	S5				x	x
<i>Erethizon dorsatum</i>	Porcupine	S5				x	x
<i>Glaucomys sabrinus</i>	Northern Flying Squirrel	S5				x	
<i>Glaucomys volans</i>	Southern Flying Squirrel	S4				x	
<i>Marmota monax</i>	Woodchuck	S5				x	x
<i>Microtus pennsylvanicus</i>	Meadow Vole	S5				x	
<i>Mus musculus</i>	House Mouse	SNA				x	
<i>Myodes gapperi</i>	Southern Red-backed Vole	S5				x	
<i>Napaeozapus insignis</i>	Woodland Jumping Mouse	S5				x	x
<i>Ondatra zibethicus</i>	Muskrat	S5				x	x
<i>Peromyscus leucopus</i>	White-footed Mouse	S5				x	
<i>Peromyscus maniculatus</i>	Deer Mouse	S5				x	
<i>Rattus norvegicus</i>	Norway Rat	SNA					x
<i>Sciurus carolinensis</i>	Grey Squirrel	S5				x	x
<i>Synaptomys cooperi</i>	Southern Bog Lemming	S4				x	
<i>Tamias striatus</i>	Eastern Chipmunk	S5				x	x
<i>Tamiasciurus hudsonicus</i>	Red Squirrel	S5				x	x
<i>Zapus hudsonius</i>	Meadow Jumping Mouse	S5				x	
Soricomorpha							
<i>Blarina brevicauda</i>	Northern Short-tailed Shrew	S5				x	x
<i>Condylura cristata</i>	Star-nosed Mole	S5				x	

Scientific Name	Common Name	S-RANK	ESA	COSEWIC	SARA	Mammal Atlas	iNaturalist
<i>Parascalops breweri</i>	Hairy-tailed Mole	S4				x	x
<i>Sorex cinereus</i>	Masked Shrew	S5				x	
<i>Sorex hoyi</i>	Pygmy Shrew	S4				x	
TOTAL:						45	20

Legend

SRANK

S1 Critically Imperiled
 S2 Imperiled
 S3 Vulnerable
 S4 Apparently Secure
 S5 Secure
 SU Unrankable
 SNA Unranked
 SX Presumed Extirpated
 SH Possibly Extirpated
 S#? Rank Uncertain

COSEWIC

NAR Not at Risk
 SC Special Concern
 T Threatened
 E Endangered
 XT Extirpated
 DD Data Deficient

COSSARO

NAR Not at Risk
 SC Special Concern
 THR Threatened
 END Endangered
 EXP Extirpated
 DD Data Deficient

SARA Schedule

Schedule 1 Officially protected under SARA
 Schedule 2 Threatened/Endangered; may be reassessed for consideration for inclusion to Schedule 1
 Schedule 3 Special concern; may be reassessed for consideration for inclusion to Schedule 1

TABLE A6 Mollusc Species

Species		Conservation Rank				Source
Scientific Name	Common Name	Provincial (S-RANK)	Provincial (ESA)	National (COSEWIC)	National (SARA)	iNaturalist
Unionidae						
<i>Pyganodon grandis</i>	Giant Floater	S5				x
Viviparidae						
<i>Cipangopaludina chinensis</i>	Chinese Mysterysnail	SNA				x
Helicidae						
<i>Cepaea nemoralis</i>	Grovesnail	SNA				x
Limacidae						
<i>Deroceras reticulatum</i>	Gray Fieldslug	SNA				x
Zonitidae						
<i>Oxychilus draparnaudi</i>	Dark-bodied Glass-snail	SNA				x
<i>Zonitoides arboreus</i>	Quick Gloss	S5				x
TOTAL:						6

TABLE A7 Vegetation Species

Species Name		Indexes				Rankings					Sources	
Scientific Name	Common Name	Coefficient of Conservatism	Wetness Index	Weediness Index	Invasive Species of Ontario	Provincial Rank (S-Rank)	Provincial (ESA)	National (COSEWIC)	National (SARA)	Global Rank (G-Rank)	NHIC	iNaturalist
PTERIDOPHYTES	FERNS & ALLIES											
Azollaceae	Floating Fern Family											
<i>Azolla cristata</i>	Eastern Mosquito Fern	5	-5			S1S2				G5	x	
Dennstaedtiaceae	Bracken Fern Family											
<i>Pteridium aquilinum</i>	Bracken Fern	2	3			S5				G5		x
Dryopteridaceae	Wood Fern Family											
<i>Athyrium filix-femina</i>	Northwestern Lady Fern		0			SU				G5T5		x
<i>Athyrium filix-femina</i> var. <i>angustum</i>	Northeastern Lady Fern	4	0			S5				G5T5		x
<i>Cystopteris bulbifera</i>	Bulblet Fern	5	-3			S5				G5		x
<i>Dryopteris intermedia</i>	Evergreen Wood Fern	5	0			S5				G5		x
<i>Dryopteris marginalis</i>	Marginal Wood Fern	5	3			S5				G5		x
<i>Gymnocarpium dryopteris</i>	Western Oak Fern	7	3			S5				G5		x
<i>Matteuccia struthiopteris</i>	Ostrich Fern	5	0			S5				G5		x
<i>Onoclea sensibilis</i>	Sensitive Fern	4	-3			S5				G5		x
Equisetaceae	Horsetail Family											
<i>Equisetum arvense</i>	Field Horsetail	0	0			S5				G5		x
<i>Equisetum hyemale</i>	Common Scouring-rush	2	0			S5				G5T5		x
<i>Equisetum scirpoides</i>	Dwarf Scouring-rush	7	0			S5				G5		x
Lycopodiaceae	Clubmoss Family											
<i>Lycopodium dendroideum</i>	Tree Groundpine	7	3			S5				G5		x
Pteridaceae	Maidenhair Fern Family											
<i>Adiantum pedatum</i>	Northern Maidenhair Fern	7	3			S5				G5		x
GYMNOSPERMS	CONIFERS											
Cupressaceae	Cedar Family											
<i>Thuja occidentalis</i>	Eastern White Cedar	4	-3			S5				G5		x
Pinaceae	Pine Family											
<i>Abies balsamea</i>	Balsam Fir	5	-3			S5				G5		x
<i>Larix decidua</i>	European Larch		5	-1		SNA				G5		x
<i>Larix laricina</i>	Tamarack	7	-3			S5				G5		x
<i>Picea glauca</i>	White Spruce	6	3			S5				G5		x
<i>Pinus resinosa</i>	Red Pine	8	3			S5				G5		x
<i>Pinus strobus</i>	Eastern White Pine	4	3			S5				G5		x
<i>Tsuga canadensis</i>	Eastern Hemlock	7	3			S5				G5		x
Taxaceae	Yew Family											
<i>Taxus canadensis</i>	Canada Yew	7	3			S4				G5		x
DICOTYLEDONS	DICOTS											
Aceraceae	Maple Family											
<i>Acer negundo</i>	Manitoba Maple	0	0		1	S5				G5		x
<i>Acer saccharinum</i>	Silver Maple	5	-3			S5				G5		x
<i>Acer saccharum</i>	Sugar Maple	4	3			S5				G5		x
<i>Acer X freemanii</i>	Freeman's Maple	6	-5			SNA				GNA		x
Anacardiaceae	Sumac or Cashew Family											
<i>Rhus aromatica</i>	Fragrant Sumac	8	5			S4				G5		x
<i>Toxicodendron rydbergii</i>	Western Poison-ivy	2	0			S5				G-T5		x
<i>Rhus typhina</i>	Staghorn Sumac	1	3			S5				G5		x
Apiaceae	Carrot or Parsley Family											
<i>Daucus carota</i>	Wild Carrot		5	-2		SNA				GNR		x
<i>Osmorhiza claytonii</i>	Woolly Sweet-cicely	5	0			S5				G5		x
Apocynaceae	Dogbane Family											
<i>Apocynum androsaemifolium</i>	Spreading Dogbane	3	5			S5				G5		x
Araliaceae	Ginseng Family											
<i>Aralia nudicaulis</i>	Wild Sarsaparilla	4	3			S5				G5		x
Aristolochiaceae	Duchman's-pipe Family											
<i>Asarum canadense</i>	Wild Ginger	6	5			S5				G5		x
Asclepiadaceae	Milkweed Family											
<i>Asclepias incarnata</i>	Swamp Milkweed	6	-5			S5				G5		x
<i>Asclepias syriaca</i>	Common Milkweed	0	5			S5				G5		x
<i>Vincetoxicum rossicum</i>	European Swallow-wort		5	-3	1	SNA				GNR		x
Asteraceae	Composite or Aster Family											
<i>Achillea millefolium</i>	Common Yarrow		3	-1		SE				G5		x
<i>Symphyotrichum cordifolium</i>	Heart-leaved Aster	5	5			S5				G5		x
<i>Eurybia macrophylla</i>	Large-leaved Aster	5	5			S5				G5		x
<i>Symphyotrichum novae-angliae</i>	New England Aster	2	-3			S5				G5		x
<i>Symphyotrichum oolentangiense</i>	Sky Blue Aster	9	5			S4				G5		x
<i>Symphyotrichum puniceum</i>	Purple-stemmed Aster	6	-5			S5				G5		x
<i>Doellingeria umbellata</i>	Flat-top White Aster	6	-3			S5				G5		x
<i>Leucanthemum vulgare</i>	Ox-eye Daisy		5	-1		SNA				GNR		x
<i>Cichorium intybus</i>	Chicory		5	-1		SNA				GNR		x
<i>Cirsium arvense</i>	Canada Thistle		3	-1	1	SNA				GNR		x
<i>Ageratina altissima</i> var. <i>altissima</i>	White Snakeroot	5	3			S5				G5T5		x
<i>Pilosella aurantiacum</i>	Orange Hawkweed		5	-2	3	SNA				GNR		x
<i>Lactuca biennis</i>	Tall Blue Lettuce	6	0			S5				G5		x
<i>Mycelis muralis</i>	Wall Lettuce		5	-1		SNA				GNR		x
<i>Rudbeckia hirta</i>	Black-eyed Susan	0	3			S5				G5		x
<i>Solidago canadensis</i>	Canada Goldenrod	1	3			S5				G5		x
<i>Solidago flexicaulis</i>	Zig-zag Goldenrod	6	3			S5				G5		x
<i>Solidago lepidota</i>	Canada Goldenrod	1	3			S4?				G5		x
<i>Taraxacum officinale</i>	Common Dandelion		3	-2		SNA				G5		x

<i>Tussilago farfara</i>	Coltsfoot		3	-2		SNA					GNR		x
<i>Xanthium strumarium</i>	Rough Cocklebur	2	0			S5					G5		x
Balsaminaceae	Touch-me-not Family												
<i>Impatiens capensis</i>	Jewelweed	4	-3			S5					G5		x
Berberidaceae	Barberry Family												
<i>Caulophyllum thalictroides</i>	Giant Blue Cohosh	6	5			S4S5					G4G5		x
<i>Podophyllum peltatum</i>	May-apple	5	3			S5					G5		x
Betulaceae	Birch Family												
<i>Betula papyrifera</i>	Paper Birch	2	2			S5					G5		x
Boraginaceae	Borage Family												
<i>Echium vulgare</i>	Viper's Bugloss		5	-2		SNA					GNR		x
<i>Mertensia virginica</i>	Virginia Bluebells	9	-3			S3					G5		x
Brassicaceae	Mustard Family												
<i>Alliaria petiolata</i>	Garlic Mustard		0	-3	1	SNA					GNR		x
<i>Turritis glabra</i>	Tower Mustard	4	5			S5					G5		x
<i>Barbarea vulgaris</i>	Garden Yellowrocket		0	-1	3	SNA					GNR		x
<i>Cardamine diphylla</i>	Crinkleroot	7	5			S5					G5		x
<i>Hesperis matronalis</i>	Dame's Rocket		5	-3	1	SNA					G4G5		x
<i>Lunaria annua</i>	Annual Honesty		5	-1		SNA					GNR		x
Caprifoliaceae	Honeysuckle Family												
<i>Diervilla lonicera</i>	Northern Bush Honeysuckle	5	5			S5					G5		x
<i>Sambucus racemosa</i>	Red Elderberry	5	2		4	S5					G5		x
<i>Viburnum acerifolium</i>	Maple-leaved Viburnum	6	5			S5					G5		x
<i>Viburnum lantana</i>	Wayfaring-tree		5	-1		SNA					GNR		x
<i>Viburnum opulus</i>	European Cranberrybush		0	-1		SNA					G5		x
Caryophyllaceae	Pink Family												
<i>Saponaria officinalis</i>	Bouncing-bet		3	-3	3	SNA					GNR		x
<i>Silene latifolia</i>	Bladder Campion		5	-2		SNA					GNR		x
Cornaceae	Dogwood Family												
<i>Cornus alternifolia</i>	Alternate-leaved Dogwood	6	5			S5					G5		x
<i>Cornus sericea</i>	Red-osier Dogwood	2	-3			S5					G5		x
Cucurbitaceae	Gourd Family												
<i>Echinocystis lobata</i>	Wild Cucumber	3	-2			S5					G5		x
Droseraceae	Sundew Family												
<i>Drosera rotundifolia</i>	Round-leaved Sundew	7	-5			S5					G5		x
Fabaceae	Pea Family												
<i>Lotus corniculatus</i>	Bird's-foot Trefoil		1	-2	2	SNA					GNR		x
<i>Trifolium hybridum</i>	Alsike Clover		1	-1		SNA					GNR		x
<i>Trifolium pratense</i>	Red Clover		2	-2	4	SNA					GNR		x
<i>Trifolium repens</i>	White Clover		2	-1	4	SNA					GNR		x
Fagaceae	Beech Family												
<i>Fagus grandifolia</i>	American Beech	6	3			S4					G5		x
<i>Quercus rubra</i>	Red Oak	6	3			S5					G5		x
Fumariaceae	Fumitory Family												
<i>Dicentra canadensis</i>	Squirrel-corn	7	5			S5					G5		x
<i>Dicentra cucullaria</i>	Dutchman's-breeches	6	5			S5					G5		x
Geraniaceae	Geranium Family												
<i>Geranium robertianum</i>	Herb-robert		5	-2		S5					G5		x
Guttiferae	St. John's-wort Family												
<i>Hypericum ascyron</i>	Great St. John's-wort	6	-1			S3					G4	x	
Hydrophyllaceae	Water-leaf Family												
<i>Hydrophyllum virginianum</i>	Virginia Water-leaf	6	-2			S5					G5		x
Juglandaceae	Walnut Family												
<i>Carya ovata</i>	Shagbark Hickory	6	3			S5					G5		x
<i>Juglans cinerea</i>	Butternut	6	2			S2?	END	END	END		G4	x	
<i>Juglans X bixbyi</i>	Bixby's Walnut					SNA					GRA		x
Lamiaceae	Mint Family												
<i>Glechoma hederacea</i>	Ground Ivy		5	-2	4	SNA					GNR		x
<i>Scutellaria galericulata</i>	Marsh Skullcap	6	-5			S5					G5		x
Lythraceae	Loosestrife Family												
<i>Lythrum salicaria</i>	Purple Loosestrife		-5	-3	1	SNA					G5		x
Monotropaceae	Indian Pipe Family												
<i>Monotropa uniflora</i>	Indian-pipe	6	3			S5					G5		x
Nymphaeaceae	Water-lily Family												
<i>Nuphar variegata</i>	Variegated Pond-lily	4	-5			S5					G5		x
<i>Nymphaea odorata</i>	American White Water-lily					S5?					G5		x
Oleaceae	Olive Family												
<i>Fraxinus nigra</i>	Black Ash	7	-4			S4	END				G5	x	
Onagraceae	Evening-primrose Family												
<i>Circaea canadensis</i>	Canada Enchanter's Nightshade	3	3			S5					G5		x
<i>Epilobium coloratum</i>	Purple-veined Willow-herb	3	-5			S5					G5		x
Papaveraceae	Poppy Family												
<i>Chelidonium majus</i>	Celandine		5	-3		SNA					GNR		x
<i>Sanguinaria canadensis</i>	Bloodroot	5	4			S5					G5		x
Phrymaceae	Lopseed Family												
<i>Phryma leptostachya</i>	American Lopseed	6	5			S4S5					G5		x
Plantaginaceae	Plantain Family												
<i>Plantago rugelii</i>	Rugel's Plantain	1	0			S5					G5		x
Polygonaceae	Smartweed Family												
<i>Persicaria amphibia</i>	Water Knotweed	5	-5			S5?					G5		x
<i>Rumex acetosella</i>	Sheep Sorrel		0	-2	3	SNA					GNR		x
<i>Rumex crispus</i>	Curly-leaf Dock		-1	-2		SNA					GNR		x
Portulacaceae	Purslane Family												
<i>Claytonia caroliniana</i>	Carolina Spring Beauty	7	3			S5					G5		x
Primulaceae	Primrose Family												

<i>Anagallis arvensis</i>	Scarlet Pimpernel		4	-1		SNA				GNR		x
<i>Lysimachia nummularia</i>	Creeping Jenny		-4	-3	2	SNA				GNR		x
Pyrolaceae	Wintergreen Family											
<i>Chimaphila umbellata</i>	Common Pipsissewa	8	5			S5				G5		x
<i>Pyrola elliptica</i>	Waxflower Shinleaf	5	5			S5				G5		x
Ranunculaceae	Buttercup Family											
<i>Actaea pachypoda</i>	White Baneberry	6	5			S5				G5		x
<i>Actaea rubra</i>	Red Baneberry	5	5			S5				G5		x
<i>Anemone acutiloba</i>	Sharp-lobed Hepatica	6	5			S5				G5		x
<i>Anemone cylindrica</i>	Candle Anemone	7	5			S4				G5		x
<i>Aquilegia canadensis</i>	Wild Columbine	5	1			S5				G5		x
<i>Caltha palustris</i>	Yellow Marsh-marigold	5	-5			S5				G5		x
<i>Clematis virginiana</i>	Virginia Virgin's-bower	3	0			S5				G5		x
<i>Ranunculus abortivus</i>	Littleleaf Buttercup	2	-2			S5				G5		x
<i>Ranunculus acris</i>	Tall Buttercup		-2	-2		SNA				G5		x
<i>Ranunculus recurvatus</i>	Hooked Buttercup	4	-3			S5				G5		x
<i>Thalictrum dioicum</i>	Early Meadow-rue	5	2			S5				G5		x
Rhamnaceae	Buckthorn Family											
<i>Rhamnus cathartica</i>	Common Buckthorn		3	-3	1	SNA				GNR		x
Rosaceae	Rose Family											
<i>Crataegus magniflora</i>	Shining-branch Hawthorn	4	5			S3				G3G5	x	
<i>Fragaria vesca</i>	Woodland Strawberry	4	3			S5				G5T5		x
<i>Geum rivale</i>	Purple Avens	7	-5			S5				G5		x
<i>Comarum palustre</i>	Marsh Cinquefoil	7	-5			S5				G5		x
<i>Prunus avium</i>	Sweet Cherry		5	-2	4	SNA				GNR		x
<i>Prunus virginiana</i>	Choke Cherry	2	1			S5				G5		x
<i>Rosa rugosa</i>	Rugosa Rose		3	-1		SNA				GNR		x
<i>Rubus odoratus</i>	Purple Flowering Raspberry	3	5			S5				G5		x
<i>Sorbus americana</i>	American Mountain-ash	8	-1			S5				G5		x
<i>Sorbus aucuparia</i>	European Mountain-ash		5	-2	4	SNA				G5		x
<i>Spiraea alba</i>	White Meadow-sweet	3	-4			S5				G5		x
Rubiaceae	Madder Family											
<i>Cephalanthus occidentalis</i>	Eastern Buttonbush	7	-5			S5				G5		x
<i>Galium lanceolatum</i>	Spear Wild Licorice	8	5			S5				G5		x
<i>Galium triflorum</i>	Fragrant Bedstraw	4	2			S5				G5		x
<i>Mitchella repens</i>	Creeping Partridge-berry	6	2			S5				G5		x
Salicaceae	Willow Family											
<i>Populus grandidentata</i>	Large-tooth Aspen	5	3			S5				G5		x
<i>Populus tremuloides</i>	Trembling Aspen	2	0			S5				G5		x
<i>Salix discolor</i>	Pussy Willow	3	-3			S5				G5		x
Sarraceniacae	Pitcher-plant Family											
<i>Sarracenia purpurea</i>	Purple Pitcher-plant	10	-5			S5				G5		x
Saxifragaceae	Saxifrage Family											
<i>Chrysosplenium americanum</i>	American Golden Saxifrage	8	-5			S4				G5		x
<i>Mitella diphylla</i>	Two-leaved Bishop's Cap	5	2			S5				G5		x
<i>Tiarella cordifolia</i>	Heartleaf Foamflower	6	1			S5				G5		x
Scrophulariaceae	Figwort Family											
<i>Linaria vulgaris</i>	Butter-and-eggs		5	-1	4	SNA				GNR		x
<i>Penstemon digitalis</i>	Foxglove Beard-tongue	6	1			SNA				G5		x
<i>Verbascum thapsus</i>	Common Mullein		5	-2		SNA				GNR		x
Thymelaeaceae	Mezereum Family											
<i>Dirca palustris</i>	Eastern Leatherwood	7	0			S4				G4		x
Tiliaceae	Linden Family											
<i>Tilia americana</i>	American Basswood	4	3			S5				G5		x
Violaceae	Violet Family											
<i>Viola pubescens</i>	Downy Yellow Violet	5	4			S5				G5		x
Vitaceae	Grape Family											
<i>Parthenocissus quinquefolia</i>	Virginia Creeper	6	1			S4?				G5		x
<i>Vitis riparia</i>	Riverbank Grape	0	-2			S5				G5		x
MONOCOTYLEDONS	MONOCOTS											
Araceae	Arum Family											
<i>Arisaema triphyllum</i>	Jack-in-the-pulpit	5	-2			S5				G5		x
<i>Symplocarpus foetidus</i>	Skunk Cabbage	7	-5			S5				G5		x
Cyperaceae	Sedge Family											
<i>Carex albursina</i>	White Bear Sedge	7	5			S5				G5		x
<i>Carex backii</i>	Back's Sedge	8	5			S4S5				G4		x
<i>Carex cephalophora</i>	Oval-leaf Sedge	5	3			S5				G5		x
<i>Carex communis</i>	Fibrous Rooted Sedge	6	5			S5				G5		x
<i>Carex deweyana</i>	Dewey's Sedge	6	4			S5				G5		x
<i>Carex hitchcockiana</i>	Hitchcock's Sedge	6	5			S5				G5		x
<i>Carex intumescens</i>	Greater Bladder Sedge	6	-4			S5				G5		x
<i>Carex laxiflora</i>	Broad Loose-flowered Sedge	5	0			S5				G5		x
<i>Carex leptoneura</i>	Nerveless Woodland Sedge	5	0			S4				G4		x
<i>Carex peckii</i>	Peck's Sedge	6	5			S5				G5		x
<i>Carex pedunculata</i>	Long-stalked Sedge	5	5			S5				G5		x
<i>Carex pensylvanica</i>	Pennsylvania Sedge	5	5			S5				G5		x
<i>Carex radiata</i>	Eastern Star Sedge	4	5			S4				G4		x
<i>Carex rosea</i>	Rosy Sedge	5	5			S5				G5		x
<i>Carex scabrata</i>	Eastern Rough Sedge	8	-5			S5				G5		x
<i>Carex sparganioides</i>	Burreed Sedge	5	0			S5				G5		x
<i>Carex sprengei</i>	Sprengel's Sedge	6	0			S5				G5		x
<i>Cyperus fuscus</i>	Brown Flatsedge		-5	-1		SNA				GNR		x
Hydrocharitaceae	Frog's-bit Family											
<i>Elodea canadensis</i>	Canadian Waterweed	4	-5			S5				G5		x
<i>Elodea nuttallii</i>	Nuttall's Waterweed	8	-5			S3				G5	x	

Iridaceae	Iris Family											
<i>Iris pseudacorus</i>	Yellow Iris		-5	-2	4	SNA				GNR		x
Lemnaceae	Duckweed Family											
<i>Lemna minor</i>	Lesser Duckweed	2	-5			S5				G5		x
<i>Spirodela polyrrhiza</i>	Common Duckweed	4	-5			S5				G5		x
Liliaceae	Lily Family											
<i>Clintonia borealis</i>	Bluebead Lily	7	-1			S5				G5		x
<i>Convallaria majalis</i>	European Lily-of-the-valley		5	-2	3	SNA				G5		x
<i>Erythronium americanum</i>	Yellow Trout-lily	5	5			S5				G5		x
<i>Hemerocallis fulva</i>	Orange Day-lily		5	-3		SNA				GNA		x
<i>Maianthemum canadense</i>	Canada Mayflower	5	0			S5				G5		x
<i>Maianthemum racemosum</i>	Large False Solomon's Seal	4	3			S5				G5		x
<i>Maianthemum stellatum</i>	Starry False Solomon's Seal	6	1			S5				G5		x
<i>Medeola virginiana</i>	Indian Cucumber-root	7	5			S5				G5		x
<i>Polygonatum pubescens</i>	Hairy Solomon's Seal	5	5			S5				G5		x
<i>Scilla siberica</i>	Siberian Squill		5	-1	2	SNA				GNR		x
<i>Streptopus lanceolatus</i>	Rose Twisted-stalk	7	0			S5?				G5T5		x
<i>Trillium erectum</i>	Red Trillium	6	1			S5				G5		x
<i>Trillium grandiflorum</i>	White Trillium	5	5			S5				G5		x
<i>Uvularia grandiflora</i>	Large-flowered Bellwort	6	5			S5				G5		x
Orchidaceae	Orchid Family											
<i>Calopogon tuberosus</i>	Tuberous Grass Pink	9	-5			S4S5				G5		x
<i>Corallorhiza striata</i>	Hooded Coral-root	7	4			S4				G5		x
<i>Epipactis helleborine</i>	Broadleaf Helleborine		5	-2		SNA				GNR		x
Poaceae	Grass Family											
<i>Festuca subverticillata</i>	Nodding Fescue	6	2			S4				G5		x
<i>Milium effusum</i>	Wood Millet	8	4			S4S5				G5		x
<i>Poa alsodes</i>	Grove Blue Grass	7	-2			S4				G4G5		x
<i>Poa annua</i>	Annual Blue Grass		1	-2		SNA				GNR		x
<i>Schizachne purpurascens</i>	Purple False Melic	6	3			S5				G5		x
Potamogetonaceae	Pondweed Family											
<i>Potamogeton crispus</i>	Curly-leaved Pondweed		-5	-3	1	SNA				G5		x
Sparganiaceae	Bur-reed Family											
<i>Sparganium eurycarpum</i>	Broad-fruited Bur-reed	3	-5			S5				G5		x
Typhaceae	Cattail Family											
<i>Typha latifolia</i>	Broad-leaved Cattail	3	-5			S5				G5		x
TOTAL:											6	204

APPENDIX B
Species at Risk and
Species of Conservation Concern Table

TABLE B1 Species At Risk and Species of Conservation Concern

Taxonomy	Species	ESA Status	SARA Status	COSEWIC Status	Preferred Habitat ^{1, 2}	Known Species Range ^{1, 2}	Source Identifying Species Record
Amphibians	Jefferson Salamander <i>Ambystoma jeffersonianum</i>	END	END Schedule 1	END	- Mature deciduous or mixed upland forest containing, or adjacent to, breeding ponds. - Terrestrial habitat must include small mammal burrows or rock fissures for over-wintering below the frost line. - Breeding ponds are normally ephemeral or vernal woodland pools that dry in late summer. - FOD where permanent or temporary ponds or pools are present	- Most commonly found within the Niagara Escarpment and Carolinian forest regions.	NHIC
Birds	Acadian Flycatcher <i>Empidonax virescens</i>	END	END Schedule 1	END	- Large, mature, undisturbed forests, usually 40 ha or greater. - Preferably near forest centres; nests usually built 100+ m from the forest edge, hanging over water (swamps and ravines with maple and beech trees). - Primarily found in forested ravines near Lake Erie shoreline. - SWD, FOD communities that are mature, have a closed canopy, and are of sufficient size	- Occurs in low numbers in the Carolinian area of Southern Ontario.	OBBA
Birds	Bald Eagle <i>Haliaeetus leucocephalus</i>	SC	No Status	Not at Risk	- Wide variety of habitats near major lakes or rivers. - Tall trees (ie, pine or poplar) typically used for nesting. - Diet consists of fish and dead animals (ie, white-tailed deer). - FOC, FOM, FOD, SWC, SWM and SWD	- Can be found across Ontario, from US border north to Lake of the Woods.	iNaturalist
Birds	Bank Swallow <i>Riparia riparia</i>	THR	THR Schedule 1	THR	- Requires vertical faces in sand or silt deposits; river and lake banks, active/inactive sand and gravel pits, road cuts, soil stockpiles. - Breeding sites are located close to aerial foraging areas such as grasslands, meadows, pastures, and cropland. - Large wetlands used for nocturnal roost sites during post-breeding, migration and wintering periods.	- Common across southern Ontario, especially along Lake Erie and Lake Ontario shorelines and the Saugeen River. - Sparse populations scattered across northern Ontario.	OBBA, iNaturalist
Birds	Barn Swallow <i>Hirundo rustica</i>	THR	THR Schedule 1	THR	- Cup-shaped mud nests are built on human-made structures such as open barns, under bridges, and in culverts. - Preferably constructed on rough-cut wood surfaces with right angles. - Foraging habitat includes grassy fields, pastures, cropland, lake and river shorelines, cottage areas and farmyards, islands, wetlands, and tundra. - TPO, CIUM1, MAM, MAS, OAO, SAS1, SAM1, and SAE1 adjacent to suitable nesting structures	- From southern Ontario north to Hudson Bay.	NHIC, OBBA, iNaturalist
Birds	Bobolink <i>Dolichonyx oryzivorus</i>	THR	THR Schedule 1	THR	- Hayfields, pastures, wet prairie, graminoid peatlands, abandoned farm fields dominated by tall grasses, no-till cropland, small-grain fields, restored surface mining sites. - Small nests are often built on the ground in dense grasses. - Typically not abundant in short-grass prairie, alfalfa, or in row crop monocultures (corn, soybean, wheat). - TPO, TPS, CIUM1	- Southern Ontario north to James Bay.	NHIC, OBBA
Birds	Canada Warbler <i>Cardellina canadensis</i>	SC	THR Schedule 1	THR	- Deciduous or coniferous forests with well-developed, dense shrub layer; commonly wet or in riparian areas. - May also include stands regenerating after natural disturbances (ie, logging). - FOC3, FOC4, FOM6, FOM7, FOM8, FOD6, FOD7, FOD8, FOD9, SWC, SWM and SWD	- All of Ontario.	NHIC, OBBA, iNaturalist
Birds	Cerulean Warbler <i>Setophaga cerulea</i>	THR	END Schedule 1	END	- Mature deciduous forests with large, tall trees and an open understory. - Both wet bottomland forests and upland areas. - FOD and SWD that are mature and contain an open understory	- Southern Lake Huron to Western Lake Ontario, and Georgian Bay to the Ottawa River.	OBBA
Birds	Chimney Swift <i>Chaetura pelagica</i>	THR	THR Schedule 1	THR	- Historically included hollow trees. - More commonly found in and around urban settlements, including chimneys and other manmade structures. - Typically close to water. - TPO, CIUM1, MAM, MAS, OAO, SAS1, SAM1, SAE1 adjacent to suitable nesting habitat	- Southern Ontario north to Timmins.	OBBA, iNaturalist
Birds	Common Nighthawk <i>Chordeiles minor</i>	SC	THR Schedule 1	SC	- Open areas with little to no ground vegetation; logged or burned areas, rock barrens, peat bogs, lakeshores, dunes, beaches, and mine tailings. - Less commonly found in cultivated fields, orchards, mine tailings, and along gravel roads and railways. - Nesting habitat is typically open and vegetation free; may include grasslands, pastures, marshes, and riverbanks. - May also include mixed and coniferous forests. - FOC, FOM, FOD, SWC, SWM and SWD	- All of Ontario except for coastal regions of James Bay and Hudson Bay.	OBBA
Birds	Eastern Meadowlark <i>Sturnella magna</i>	THR	THR Schedule 1	THR	- Moderately tall grasslands; prairies, savannahs, pastures and hayfields, alfalfa fields, weedy borders of croplands, roadsides, orchards, airports, overgrown fields. - Small trees, shrubs, or fence posts used as elevated song perches. - TPO, TPS, CIUM1, CIUS, and MAM2	- Southern Ontario north to Timmins, as well as Lake of the Woods area.	NHIC, OBBA, iNaturalist
Birds	Eastern Wood-pewee <i>Contopus virens</i>	SC	SC Schedule 1	SC	- Mid-canopy layer of forest clearings, edges of deciduous and mixed forests, early successional clearings. - FOC, FOM, FOD, SWD, SWM and CIUW	- Southern Ontario north to Sudbury.	NHIC, OBBA, iNaturalist
Birds	Evening Grosbeak <i>Coccothraustes vespertinus</i>	SC	SC Schedule 1	SC	- Open, mature mixed-wood forests dominated by fir, white spruce, and/or trembling aspen. - Attracted to ornamental trees and bird feeders. - FOC and FOM	- Southern Ontario north to Lake Nipigon.	OBBA
Birds	Golden Eagle <i>Aquila chrysaetos</i>	END	No Status	Not At Risk	- Remote, undisturbed areas that include steep cliffs, ledges, riverbanks, or large trees. - Hunting is done near open areas such as bog or tundra. - During migration, may be spotted along the shores of Lake Ontario and Lake Erie. - May winter in southern Ontario, often near deer wintering areas	- All of Ontario.	iNaturalist
Birds	Golden-winged Warbler <i>Vermivora chrysoptera</i>	SC	THR Schedule 1	THR	- Areas with young shrubs surrounded by mature, spread out forests; field edges, hydro or utility right of ways, logged areas, dry uplands, swamp forests, marshes, beaver ponds, burned-out or intermittently cultivated areas. - Nests often placed near clusters of herbaceous plants and low bushes.	- Southern Ontario north to Sudbury.	NHIC, OBBA, iNaturalist

Taxonomy	Species	ESA Status	SARA Status	COSEWIC Status	Preferred Habitat ^{1, 2}	Known Species Range ^{1, 2}	Source Identifying Species Record
Birds	Grasshopper Sparrow <i>Ammodramus savannarum</i> Grasshopper Sparrow (pratensis subspecies; Eastern Grasshopper Sparrow) <i>Ammodramus savannarum pratensis</i>	SC	SC Schedule 1	SC	- Open grassland habitats, usually 5 ha or greater with well-drained, sandy soil; hayfields, pasture, alvars, prairies, grain crops (ie, barley). - Preferably sparsely vegetated areas. - Nests are woven from grasses into a small, cup-like shape.	- Southern Ontario north to North Bay.	OBBA
Birds	Least Bittern <i>Ixobrychus exilis</i>	THR	THR Schedule 1	THR	- Marshes with emergent vegetation surrounded by open water; prefers cattail marshes with a mix of open pools and channels. - Nests are built above marsh water in stands of dense vegetation. - MAS2-1, MAS3-1, SA and OAO.	- From Collingwood to Kingston as well as small pockets near Cornwall.	NHIC, OBBA
Birds	Red-headed Woodpecker <i>Melanerpes erythrocephalus</i>	END	THR Schedule 1	END	- Woodlands and woodland edges, including oak and beech forests, grasslands, orchards, riparian forests, beaver ponds, burns, parks, golf courses, and cemeteries. - Dead trees used for nesting and perching. - TPS, TPW, CIW, FOD1, FOD2, FOD4-1, FOD6, FOD7, and FOD9, that are open with an abundance of dead trees. - Mature deciduous and mixed forests; moist stands of trees with well-developed undergrowth.	- Woodland Caribou Provincial Park southeast to Cornwall.	OBBA
Birds	Wood Thrush <i>Hylocichla mustelina</i>	SC	THR Schedule 1	THR	- Tall trees are used for singing perches. - Nests are built in live saplings, trees, or shrubs, especially sugar maple or American beech. - Preferably large forest mosaics. - FOD and FOM greater than 1 ha.	- Southern Ontario north to Hearst.	NHIC, OBBA, iNaturalist
Fish	Redside Dace <i>Clinostomus elongatus</i>	END	END Schedule 1	END	- Clear pools and slow-moving sections of streams and headwaters with rocky, sandy, or gravel bottoms. - OAO, SA stream communities with gravel substrates and overhanging grasses and shrubs.	- Select tributaries of Lake Huron, streams flowing into western Lake Ontario, the Holland River (Lake Simcoe), and Irvine Creek (Lake Erie).	NHIC, iNaturalist, DFO
Insects	Gypsy Cuckoo Bumble Bee <i>Bombus bohemicus</i>	END	END Schedule 1	END	- Diverse habitats; open meadows, agricultural areas and urban areas, boreal forest, and woodlands.	- Restricted to Pinery Provincial Park. - Historically occurred throughout Ontario.	NHIC
Insects	Monarch <i>Danaus plexippus</i>	SC	SC Schedule 1	END	- Open or disturbed habitats such as roadsides, fields, wetlands, prairies, and open forests. - Trees along the north shore of the Great Lakes are used for roosting before migrating across open water. - Caterpillars are confined to meadows and open areas where milkweed grows. - AL, TP, and CUM where milkweed is present.	- South of 50° of latitude.	OBA, iNaturalist
Insects	Transverse Lady Beetle <i>Coccinella transversoguttata</i>	END	No Status	SC	- Diverse variety of habitats including agricultural area, suburban gardens, parks, coniferous forests, prairie grasslands, meadows, and riparian areas.	- Historically found from southern Ontario north to Attawapiskat.	NHIC
Mammals	Eastern Small-footed Myotis (Eastern Small-footed Bat) <i>Myotis leibii</i>	END	N/A	N/A	- Summer habitat includes rock outcrops, in buildings, under bridges, or in caves, mines or hollow trees. - Roosting locations are typically changed every night. - Winter hibernacula occurs in caves or mines, typically drier and colder than sites selected by other bats.	- South of Georgian Bay to Lake Erie and east to the Pembroke area, the Bruce Peninsula, the Espanola area, and Lake Superior Provincial Park.	Mammal Atlas
Mammals	Gray Fox <i>Urocyon cinereoargenteus</i>	THR	THR Schedule 1	THR	- Deciduous forests and marshes. - Dens are usually found in dense shrubs, close to a water source, or in rocky areas, hollow trees, or underground burrows dug by other animals.	- West of Lake Superior in the Rainy River District. - Pelee Island.	Mammal Atlas
Mammals	Little Brown Myotis (Little Brown Bat) <i>Myotis lucifugus</i>	END	END Schedule 1	END	- Large-diameter trees, attics, abandoned buildings, and barns often used for summer colonies. - Foraging occurs over water, along waterways, and forest edges, while open areas such as clearcuts or fields are typically avoided. - Hibernacula used in winter include mines and caves that are humid and remain above freezing.	- All across Ontario; concentrated in southern Ontario.	Mammal Atlas
Mammals	Northern Myotis (Northern Long-eared Bat) <i>Myotis septentrionalis</i>	END	END Schedule 1	END	- Typically within the boreal forest, under loose bark or in the cavities of trees. - Foraging occurs over water, along waterways, and forest edges, while open areas such as clearcuts or fields are typically avoided. - Overwintering occurs in cold and humid sites such as caves or mines. - FOC, FOM, FOD, SWC, SWM, and SWD where suitable roosting (i.e. cavity trees and trees with loose bark) habitat is available.	- Forested areas in southern Ontario, to the north shore of Lake Superior and occasionally as far north as Moosonee, and west to Lake Nipigon.	Mammal Atlas
Mammals	Tri-colored Bat <i>Perimyotis subflavus</i>	END	END Schedule 1	END	- Day roost and maternity colonies are formed in older forests with large-diameter trees, barns, or other structures. - Foraging occurs over water or along streams in a forest. - Winter hibernacula include caves and mines.	- Southern Ontario north to Sudbury.	Mammal Atlas
Plants	Black Ash <i>Fraxinus nigra</i>	END	No Status	THR	- Commonly in mixed deciduous-conifer or conifer dominated swamps, with poorly drained soil pH of 4.4 to 8.2; Frequently in very wet, seasonally flooded, habitats including floodplain forests, basins, seepage and lacustrine swamp forests, shoreline forest margins, fens and bogs. - Moderately shade-tolerant.	- Northern limit in western Ontario near 53°N with a Southern limit in southwestern Virginia.	NHIC
Plants	Butternut <i>Juglans cinerea</i>	END	END Schedule 1	END	- Deciduous forests with moist, well-drained soil of pH 5.5 to 8; commonly found along streams. - Often grows alone in sunny openings and near forest edges. - FOD and mature hedgerows.	- South of Pembroke to Port Elgin.	NHIC
Reptiles	Blanding's Turtle (Great Lakes / St. Lawrence population) <i>Emydoidea blandingii</i>	THR	THR Schedule 1	END	- Shallow, nutrient-rich habitats; typically large wetlands and shallow lakes with lots of water plants. - Nesting occurs in sand, organic soil, gravel, cobblestone, and soil-filled crevices of rock outcrops. - Overwintering occurs in pools about 1 metre in depth. - SWT2, SWT3, SWD, SWM, MAS2, SAS1, SAM1, where open water is present.	- Southern Ontario north to Sudbury, with isolated reports as far north as Timmins.	NHIC, ORAA
Reptiles	Eastern Milksnake <i>Lampropeltis triangulum</i>	No Status	SC Schedule 1	SC	- Open habitats adjacent to areas with relatively high forest cover; rocky outcrops, meadows, barns, sheds, and rural houses. - BL, TA, AL, RB, TP, CUM, FOC, FOM, and FOD.	- Southwest Ontario to Lake Nipissing.	NHIC, ORAA, iNaturalist

Taxonomy	Species	ESA Status	SARA Status	COSEWIC Status	Preferred Habitat ^{1, 2}	Known Species Range ^{1, 2}	Source Identifying Species Record
Reptiles	Northern Map Turtle <i>Graptemys geographica</i>	SC	SC Schedule 1	SC	- Both lakes and rivers, preferably with slow-moving currents, muddy bottoms, high-quality water, and abundant vegetation. - Habitat must contain suitable basking sites such as rocks and deadheads. - Hibernation occurs at the bottom of deep, slow-moving sections of river. - OAO, SA with emergent rocks and fallen trees.	- Southern Ontario, primarily on the shores of Georgian Bay, Lake St. Clair, Lake Erie, and Lake Ontario, and along larger rivers including the Thames, Grand, and Ottawa. - Has also been recorded on Manitoulin Island and north of Timmins.	ORAA
Reptiles	Snapping Turtle <i>Chelydra serpentina</i>	SC	SC Schedule 1	SC	- Shallow wetland habitats with slow-moving water and soft bottoms; ponds, sloughs, shallow bays, river edges, or slow streams. - Nesting occurs on sandy or gravel banks or man-made structures such as roads, dams, and aggregate pits. - Overwintering occurs underwater, underneath logs, sticks, or overhanging banks, deep in mud in marshy areas, or underneath floating mats of vegetation. - OAO, SA near gravelly or sandy areas.	- Primarily southern Ontario north to Timmins; also found near Thunder Bay and Kenora.	NHIC, ORAA, iNaturalist

Glossary	
EXP	ESA - Extirpated - a species that no longer exists in the wild in Ontario but still occurs elsewhere. SARA - Extirpated - a wildlife species that no longer exists in the wild in Canada, but exists elsewhere in the wild.
END	ESA - Endangered - a species facing imminent extinction or extirpation in Ontario which is a candidate for regulation under Ontario's Endangered Species Act. SARA - Endangered - a wildlife species that is facing imminent extirpation or extinction.
THR	ESA - Threatened - a species that is at risk of becoming endangered in Ontario if limiting factors are not reversed. SARA - Threatened - a wildlife species that is likely to become endangered if nothing is done to reverse the factors leading to its extirpation or extinction.
SC	ESA - Special Concern (formerly Vulnerable) - a species with characteristics that make it sensitive to human activities or natural events. SARA - Special Concern - a wildlife species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.
OMNR	Ontario Ministry of Natural Resources
ESA	Endangered Species Act
SARA	Species at Risk Act (Federal)
Schedule 1	The official list of species that are classified as extirpated, endangered, threatened, and of special concern.
Schedule 2	Species listed in Schedule 2 are species that had been designated as endangered or threatened, and have yet to be re-assessed by COSEWIC using revised criteria. Once these species have been re-assessed, they may be considered for inclusion in Schedule 1.
Schedule 3	Species listed in Schedule 3 are species that had been designated as special concern, and have yet to be re-assessed by COSEWIC using revised criteria. Once these species have been re-assessed, they may be considered for inclusion in Schedule 1.
COSEWIC	Committee on the Status of Endangered Wildlife in Canada - a committee of experts that assesses and designates which wild species are in some danger of disappearing from Canada.
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