CITY OF BRANTFORD

MOHAWK LAKE DISTRICT PLANNING STUDY

ENVIRONMENTAL IMPACT STUDY

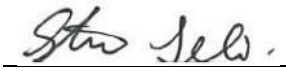
Prepared for: **City of Brantford**

Prepared By: **WSP Canada Group Limited**

July 2020

SIGNATURES

Prepared by



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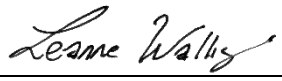

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APPENDICES

1 INTRODUCTION

1.1 BACKGROUND

The City of Brantford has initiated a planning study for the Mohawk Lake District Area: The Mohawk Lake District Planning Study (MLDPS). This study has been identified as a key objective of the 2014 – 2018 City of Brantford Strategic Plan. The City has retained a consulting team led by WSP Canada Group Limited (WSP) to undertake the study.

The purpose of the study is to provide a comprehensive land use structure and policy framework to guide future development and revitalization of the study area. The Mohawk Lake District represents a unique opportunity for the City to shape a vibrant community within an established urban neighbourhood. The study area is made up of diverse land uses, amenities and cultural heritage features and presents many opportunities for redevelopment and improvement of recreational areas. The study will result in three key deliverables:

- A District Plan report, which outlines the vision, goals, objectives and provides a cohesive concept plan for the study area as well as a strategy for implementation and phasing of development / improvements;
- A series of technical studies to support the District Plan; and
- Implementing planning documents, which are anticipated to include Design Guidelines, an Official Plan Amendment and a Zoning By-law Amendment.

The Environmental Impact Study (EIS) documented herein, is one of the technical studies that has been completed in support of the District Plan.

1.2 SITE AND STUDY OVERVIEW

The Mohawk Lake District Area (the “study area”), shown on **Figure 1** in **Appendix A** and, is in southeast Brantford, Ontario, between Eagle Place and East Ward neighbourhoods. The lands within the study area are adjacent to Mohawk Canal / Mohawk Lake, and include the following key features / land uses: the Alfred Watts hydro generating station ruins to the east; Mohawk Park north of the Mohawk Canal / Lake; Kanata Village and the City's Water and Wastewater Treatment Plant to the south; and the Greenwich Mohawk Brownfield site and existing developed areas to the west. In addition, sections of the Trans Canada Trail extend through the study area and adjacent lands. The study area supports multiple land use designations including Residential, Downtown Urban Growth Centre, General Employment and *Core Natural Areas*, as designated in the City of Brantford Official Plan (2018 Office Consolidation).

Adjacent lands include: the City's Municipal Landfill Facility to the south / east; two large parcels of land that are part of the Six Nations of the Grand River Territory; urban developed areas to the west and north; and the Grand River and valleylands to the south.

The purpose of the EIS is to document natural heritage features and functions within the study area to provide input to land uses and policy guidance for the Mohawk Lake District Planning Study. The site-specific natural heritage study components are based primarily on the Data Gap analysis presented in the. Mohawk Lake District Plan Background Report (WSP January 2018), in consideration of any other relevant information, including input provided by review agencies. This EIS is intended as input to the development of a District Plan and implementation of Official Plan policy. It is noted that more detailed Environmental Impact Studies will likely be required in support of future development applications or recommended works (e.g., trails).

1.3 STUDY APPROACH & SCOPE OF WORK

1.3.1 DESKTOP AND BACKGROUND DATA REVIEW

Relevant agencies were contacted and background material was collected and reviewed.

Specifically, the following sources of information were reviewed:

- Topographic mapping (OBM, NTS);
- Aerial photography;
- Natural Heritage Information Centre (NHIC) data (Significant Areas and Species at Risk);
- Species at Risk range maps and habitat descriptions;
- Species at Risk Regional Lists (MNRF);
- Land Information Ontario (LIO) feature and base mapping;
- GRCA GRIN mapping (regulation, wetlands, watercourses);
- Ontario Breeding Bird Atlas;
- Ontario Reptile and Amphibian Atlas;
- Ontario Butterfly Atlas;
- Relevant municipal and provincial policy documents and legislation; and
- Past reports for adjacent properties.

Background and other data sources are listed in the References section of this report.

1.3.2 AGENCY CONSULTATION

As part of the natural environment review and assessment, the following agency consultation has occurred:

- **Project Initiation Meeting**. October 30, 2017, a meeting was held with the City of Brantford to discuss the study approach for the Mohawk Lake District Plan study. That pre-consultation meeting provided guidance for preparation of the Terms of Reference.
- **Release of Mohawk Lake District Plan Background Report (WSP)**. January 2018, following the circulation of a Draft to the City of Brantford.
- **Terms of Reference Teleconference**. February 21, 2018, to solicit input to the EIS TOR. Attendees: representatives from the City of Brantford, GRCA, and WSP.
- **Terms of Reference Circulation and Review**. April 2018, a Terms of Reference (TOR) was prepared by the project team and circulated to the City of Brantford and GRCA. It outlined the planning context and detailed the scope of work (background data collection, agency liaison, field survey program, data review and EIS report structure).
- **Terms of Reference Approval**. July 2018, the Terms of Reference was approved, and incorporated comments received from GRCA.
- **MNRF Consultation**. Guelph District MNRF (Graham Buck, Management Biologist) was contacted to request information any available natural heritage information pertinent to the study area. Information was received on December 21, 2017.
- **GRCA Consultation.** GRCA (Tony Zammit, Watershed Ecologist) was contacted to request information any available natural heritage information pertinent to the study area. Information was received on November 24, 2017.

The Terms of Reference and records of agency correspondence have been included in **Appendix B**.

1.3.3 FIELD SURVEYS

Field surveys completed as part of this study are listed below. Detailed descriptions of the field survey methodologies and results are provided in Section 3.0, with a field survey chronology included in **Appendix C**. Data analysis and evaluation has included preparation of species inventories, habitat assessments, evaluations of significance and sensitivity using relevant guidelines and policy, as described in various areas of the current report.

- Vegetation and Flora:
    - Ecological Land Classification (ELC) mapping and community description; and
    - Botanical inventory (2 season survey).

- Wildlife:
    - Avifaunal surveys (breeding birds);
    - Species-at-risk (SAR) Habitat assessment (conducted during all field visits);
    - *Significant Wildlife Habitat* assessment (conducted during all field visits); and
    - Other incidental wildlife observations (conducted during all field visits).

2 POLICY FRAMEWORK

2.1 FEDERAL

2.1.1 FISHERIES ACT, 1985

The Canadian Fisheries Act provides provisions for the protection of fish and fish habitat. In 2015, the Government of Canada initiated updates to the Fisheries Act, included in Bill C-68, which came into effect on August 28, 2019. Fish and fish habitat protection provisions of the Fisheries Act are detailed on the Fish and fish habitat policy protection statement, August 2019[1] on Fisheries and Oceans Canada (DFO)'s website. Specifically, these provisions state:

Section 34.4 (1): *"No person shall carry on any work, undertaking or activity, other than fishing that results in the death of fish."*, and

Section 35 (1): *"No person shall carry on any work, undertaking or activity that results in harmful alteration, disruption or destruction of fish habitat."*

Proponents that plan to undertake activities in or near water have the potential to negatively affect fisheries, and as such, are responsible for avoiding, mitigating, and possibly offsetting potential negative effects. Avoidance is achieved by undertaking measures which avoid the potential for the project to cause the death of fish or otherwise alter, disrupt or destroy fish habitat. These measures include project design considerations, location of activity, and timing of works. Mitigation is implemented by following best practices such as those described in the 'Measures to protect fish and fish habitat on DFO's Projects Near Water Web page[2].

Any negative residual impacts to fish and fish habitat that remain following the implementation of avoidance and mitigation measures, is considered to have the potential to negatively effect the fishery. The potential for negative effects must be reviewed by DFO under the Fisheries Act. If DFO determines that negative effects are likely a result of the project works, then a Fisheries Act Authorization (FAA) will be required.

2.1.2 MIGRATORY BIRDS CONVENTION ACT (MBCA) 1994

The Migratory Birds Convention Act, MBCA (1994) and Migratory Birds Regulations, MBR (2014) protect most species of migratory birds anywhere they are found in Canada, including surrounding ocean waters,

[1] https://www.dfo-mpo.gc.ca/pnw-ppe/policy-politique-eng.html

[2] https://www.dfo-mpo.gc.ca/pnw-ppe/measures-mesures-eng.html

regardless of ownership. General prohibitions under the MBCA and MBR protect migratory birds, their nests and eggs and prohibit the deposit of harmful substances in waters / areas frequented by them.

The MBR includes an additional prohibition against incidental take, defined by Environmental Canada as:

"The inadvertent harming, killing, disturbance or destruction of migratory birds, nests and eggs."

Environment Canada implements policies and guidelines to protect migratory birds, their eggs and their nests. There is guidance on the Environment Canada website to minimize the risk of incidental take effects on migratory birds, achieve compliance with the law and maintain sustainable populations of migratory birds. Compliance with the MBCA and MBR is best achieved through a due diligence approach, which identifies potential risk, based on a site-specific analysis in consideration of the Avoidance Guidelines and Best Management Practices information on the Environment Canada website.

Works with potential MBCA implications may occur as a result of future development within the study area if vegetation or buildings / structures are removed, potentially removing nests of migratory birds. Compliance with the MBCA can be achieved using the due diligence approach outlined in Section 6.

2.1.3 SPECIES AT RISK ACT (SARA)

The federal Species at Risk Act (SARA) includes a number of prohibitions to protect individuals of listed Species at Risk, including:

- No person shall kill, harm, harass, capture or take an individual of a Threatened, Endangered or Extirpated species.
- No person shall possess, collect, buy, sell or trade an individual of a Threatened, Endangered or Extirpated species, or any part or derivative of such an individual.
- No person shall damage or destroy the residence of one or more individuals of a Threatened or Endangered species, or of an Extirpated species if a recovery strategy has recommended the reintroduction of the species into the wild in Canada.

These prohibitions apply on federal lands throughout Canada, but they are only applicable to private lands for aquatic and migratory birds which are protected by the MBCA and also listed as Endangered, Threatened, or Extirpated under Schedule 1 of SARA. However, the Governor in Council may, by order, apply these prohibitions to non-federal lands if the Minister of the Environment is of the opinion that the laws of a province do not effectively protect a listed species or the residences of a listed species.

On the recommendation of the Minister of the Environment, the Minister of Fisheries and Oceans or the Minister of Canadian Heritage, the Governor in Council may also apply these prohibitions on federal lands to species that are not protected under SARA but are designated Endangered or Threatened by a provincial or territorial minister.

SARA also includes provisions to protect critical habitat; these are complex and vary according to the species in question and the location of the critical habitat. SARA's provisions also permit the Minister of the Environment, the Minister of Fisheries and Oceans and the Minister of Canadian Heritage broad discretionary powers to implement (or not) prohibitions to protect critical habitat. Generally, critical habitat protection applies to Threatened, Endangered and Extirpated species.

2.2 PROVINCIAL

2.2.1 ENDANGERED SPECIES ACT (ESA), 2007

Species designated as *Threatened or Endangered* by the Committee on the Status of Species at Risk in Ontario (COSSARO), otherwise known as Species at Risk in Ontario (SARO), and their habitats (e.g. areas essential for breeding, rearing, feeding, hibernation and migration) are automatically afforded legal protection under the Endangered Species Act (ESA) (Government of Ontario 2007).

ESA Subsection 9(1) states that:

"No person shall,

(a) kill, harm, harass, capture or take a living member of a species that is listed on the Species at Risk in Ontario List as an extirpated, endangered or threatened species;

(b) possess, transport, collect, buy, sell, lease, trade or offer to buy, sell, lease or trade,

> *(i) a living or dead member of a species that is listed on the Species at Risk in Ontario List as an extirpated, endangered or threatened species,*
>
> *(ii) any part of a living or dead member of a species referred to in subclause (i),*
>
> *(iii) anything derived from a living or dead member of a species referred to in subclause (i); or*

(c) sell, lease, trade or offer to sell, lease or trade anything that the person represents to be a thing described in subclause (b) (i), (ii) or (iii).

Clause 10(1) (a) of the ESA states that:

"No person shall damage or destroy the habitat of a species that is listed on the Species at Risk in Ontario list as an endangered or threatened species"

The ESA also calls for the development of species-specific Recovery Strategies and Habitat Regulations. Unlike the general habitat of a species, regulated habitat may include areas that are currently unoccupied by the species. These areas are commonly referred to as "recovery habitat."

In order to balance social and economic considerations with protection and recovery goals, the ESA also enables the MNRF[3] to issue permits or enter into agreements with proponents in order to authorize activities that would otherwise be prohibited by subsections 9(1) or 10(1) of the Act provided the legal requirements of the Act are met.

2.2.2 PROVINCIAL POLICY STATEMENT (PPS), 2014

The Provincial Policy Statement (PPS, 2014) was issued under Section 3 of the Planning Act; the current PPS came into effect April 30, 2014. The PPS provides policy direction on land use planning and development matters that are of provincial interest which protect the natural environment as well as public health and safety. Per the PPS, development and site alteration shall not be permitted in:

- Significant wetlands in Ecoregions 5E, 6E, and 7E1; and
- Significant coastal wetlands.

Unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions, development and site alteration shall not be permitted in:

- Significant wetlands in the Canadian Shield north of Ecoregions 5E, 6E and 7E1;
- Significant woodlands in Ecoregions 6E and 7E;
- Significant valleylands in Ecoregions 6E and 7E; — Significant wildlife habitat (SWH);
- Significant areas of natural and scientific interest;
- Fish habitat (except in accordance with provincial and federal requirements);
- Habitat of endangered species and threatened species (except in accordance with provincial or federal requirements); and
- Adjacent lands to any of the natural features listed above.

Technical guidance for the implementing the natural heritage policies of the PPS is found within the second edition of the Natural Heritage Reference Manual (MNRF, 2010). This manual recommends the approach and technical criteria for protecting natural heritage features and areas in Ontario.

Such natural features are present within the study area, as identified in the Official Plans; they are described in the following sections.

[3] The ESA has been administered by the Ministry of Environment, Conservation and Parks (MECP) since April 1, 2019.

2.3 MUNICIPAL

2.3.1 CITY OF BRANTFORD OFFICIAL PLAN (2008)

The in-force City of Brantford Official Plan (2008; 2018 Office Consolidation) establishes policies to help protect and enhance Brantford's natural heritage resources. Natural heritage policies and delineations include the following:

- *Environmental Protection Policy Areas*;
- *Environmental Control Policy Areas*;
- *Adjacent Lands*;
- *Wetlands*; and
- *Mineral Resource Areas*.

Areas subject to the in-force City of Brantford Official Plan are present within the study area and described in Section 3.

2.3.2 CITY OF BRANTFORD DRAFT OFFICIAL PLAN (2016)

At the time of MLDPS preparation, the City of Brantford was in the process of preparing a new City of Brantford Official Plan through an Official Plan Review process. The new plan is intended to continue to address the changing needs of the community, recognize the new municipal boundary and conform to updated provincial policy. Updates to the *Natural Heritage System* included in the Draft Official Plan have been considered herein as described below and in the following sections.

The City of Brantford recognized the important contribution of natural heritage features and has developed a *Natural Heritage System* (NHS) approach to protecting natural heritage features and their associated ecological and hydrological functions. The NHS approach recognizes the interdependence of natural features and functions and seeks to maintain connections among natural features, so that their existing ecological and hydrological functions are maintained or enhanced. The NHS is intended to:

- Protect the health and water quality of the Grand River Watershed;
- Conserve biodiversity;
- Protect all significant natural heritage features and their associated functions; and
- Protect surface and underground water resources.

The *Natural Heritage System* is comprised of two components:

- The *Core Natural Areas* Designation, which comprises the environmental features and associated buffers that the City shall protect and conserve; and
- The *Adjacent Lands* Overlay Designation which is based on an approximate 120 m setback from the boundary of the *Core Natural Areas* and is intended to act as a trigger for the completion of an Environmental Impact Study.

An Environmental Impact Study may be required, in accordance with the policies of the Official Plan to:

- Identify and evaluate the potential effects of a proposed development, redevelopment or site alteration on the Natural Heritage System;
- Recommend means of preventing, minimizing or mitigating impacts as well as opportunities for enhancing or restoring the quality and connectivity of the elements comprising the Natural Heritage System; and
- Identify and evaluate the presence and significance of elements of the Natural Heritage System and/or interpret the boundaries of the Natural Heritage System, where appropriate.

Designated natural areas subject to the City of Brantford Draft Official Plan are described in Section 3.

2.3.3 GRAND RIVER CONSERVATION AUTHORITY (GRCA) REGULATIONS AND POLICIES

The Grand River Conservation Authority (GRCA) regulates development and/or interference with wetlands in accordance with Ontario Regulation 150/06 made under the Conservation Authorities Act. The regulation applies to areas that are river or stream valleys, wetlands and other areas where development could interfere with the hydrologic function of a wetland.

The Policies for the Administration of the Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulation (GRCA 2015) document provides further direction on the implementation of Ontario Regulation 150/06 and has been considered in the completion of this EIS.

3 EXISTING CONDITIONS

3.1 PRESENT LAND USE

The study area consists of a diverse composition of distinctive areas and land uses including:

- Greenwich Mohawk Brownfield
    - A 20.7 hectare brownfield site that was remediated in 2016, which includes both privately and City owned properties.
- Mohawk Lake and Mohawk Canal
    - These are key elements of the natural heritage system that also provide stormwater management functions for the surrounding area.
- Mohawk Park
    - Located in the north / central portion of the study area.
- Industrial Uses
    - Includes Ingenia Polymers (as well as the existing rail line), a scrap yard, warehousing and pulp and paper. These are concentrated in the central portion of the study area, east of the Greenwich Mohawk Brownfield.
- Municipal Uses
    - The City's principal Water and Waste Water Treatment Facility is located within the study area.
- Other Uses
    - Strip of single detached residential houses on the south side of Greenwich Street;
    - Kanata Village cultural site at 440 Mohawk Street;
    - Cluster of commercial and institutional uses within the west portion of the study area including: the Brantford Food Bank, Brantford Pollution Control Office and Laboratory, religious institution, commercial school, veterinary clinic and automobile repair shop; and
    - Small cluster of commercial uses within the east end of the study area including: the Brant County SPCA, private facility operated by Waste Management and a municipal office.

Figure 1 in **Appendix A** depicts the location of the study area, as well as some of the existing land uses.

3.2 PHYSIOGRAPHY, DRAINAGE & SOILS

This section contains information summarized from the Mohawk Lake Characterization Study MLCS (Draft, Aquafor Beech 2018).

The surficial geology of the Brantford area is a complex mix of glaciofluvial and glaciolacustrine deposits, reworked by the present-day Grand River. According to the Physiographic Regions of Southern Ontario (Chapman and Putnam, 2007), the study area is classified as sand plain.

Areas south of and including Mohawk Lake and canal are underlain by modern alluvial sediments of the Grand River, comprised of unsubdivided sand, silt, gravel, clay and muck. The lake and canal represent a divide between the glaciolacustrine to the south and older alluvial deposits to the north. The study area is located in the Grand River – Lower North Subwatershed.

3.3 NATURAL HERITAGE FEATURES & DESIGNATIONS

Background and secondary source information was used to identify features known to occur within the study area that have been identified as *significant* natural heritage features or *hazard lands* at a provincial or municipal level. A summary of designated features is provided below:

- **Provincially Significant Wetlands** (PSW): None is present within the study area.
- **Significant Woodlands**: All woodlands greater than 4.0 ha in size within the City of Brantford are identified as *Significant Woodlands*. Several are present within the study area: in Mohawk Park; in areas immediately south of Mohawk Lake; and west of the Grand River in the easternmost portion of the study area.
- **Significant Wildlife Habitat** (SWH): One area of SWH was identified in the City of Brantford Official Plan Review, Natural Heritage Strategy (Plan B Natural Heritage, et al., 2014): a rare plant community. The rare plant community, *Dry Oak – Hickory Deciduous Forest* (FOD2-2, S3S4) is located in the western portion of Mohawk Park, west of the access road and park facilities, extending along the valley slope in the south portion of Mohawk Park. Additional *Candidate* and *Confirmed* SWH types are summarized in Section 3.5.3, based on additional surveys / analysis completed for the current EIS and in consideration of the results presented in the MLCS.
- **Areas of Natural and Scientific Interest** (ANSI): None is present within the study area.
- **Fish Habitat**: Mohawk Lake and Canal directly support a cool – warmwater fish community.

- **Species at Risk**: Habitat for Species at Risk (SAR) is known to be present within the City of Brantford, and as such could be present in the natural areas within the study area depending on habitat availability and quality. MNRF provided the following information relevant to the study area:
    - Blanding's Turtle – Kanata Village. In accordance with the Blanding's Turtle General Habitat Description (MNRF 2013), the following habitat categories are present within the study area: Category 1 habitat (the pond plus 30 meters); Category 2 habitats (Mohawk Lake and wetlands plus 30 meters); Category 3 habitats (the areas between the wetlands and open water features located 500 meters apart).
    - Additional information pertaining to SAR is presented in Section 3.7.
- **In-force City of Brantford Official Plan (2018 Office Consolidation).** Under the in-force Official Plan (2008), the following Natural Heritage policy and designation areas are identified and shown on **Figure 2** in **Appendix A**:
    - *Environmental Protection Policy Areas* (EPPAs)
        - None is present in the Study Area (per Schedule 3-1)
    - *Environmental Control Policy Areas* (ECPAs)
        - ECPAs are identified north and south of Mohawk Lake (per Schedule 3-1)
    - Adjacent Lands - lands within 50m of an EPPA
        - None is present in the Study Area (per Schedule 3-1)
    - Wetlands
        - There is one evaluated, non-provincially significant wetland within the Study Area: the Mohawk Lake and Oxbow Wetland Complex. This includes wetland areas parallel to the north side of Mohawk Canal west of Mohawk Lake and within woodlands south of Mohawk Lake (per Schedule 3-3 and GRCA mapping)
        - Note that GRCA online mapping shows additional / larger wetland blocks. Figure 3 presented herein reflects the results of ground-truthing surveys conducted as part of this EIS study, with wetland polygons identified by ELC vegetation community designations.
    - Mineral Resource Areas
        - None is present in the Study Area (per Schedule 3-2)

- **City of Brantford Draft Official Plan (2016), Waterfront Master Plan and Natural Heritage Strategy:**

    - **Core Natural Areas**: These features are generally consistent with the Designated Natural Features present within the study area, described above. *Core Natural Areas* in the study area include woodlands, the rare plant community noted above and an evaluated, non-provincially significant wetland. These features contribute to the *Natural Heritage System* identified in the Draft City of Brantford Official Plan (2016).

    - **Significant Valleylands**: The study area is within Grand River valley, which is designated as a significant valley, as identified in the City of Brantford Natural Heritage Strategy (Plan B Natural Heritage, 2014).

    - **Linkages**: A linkage corridor which likely provides some wildlife movement opportunities exists within the study area, running along Mohawk Lake and Mohawk Canal from its confluence with the Grand River to the eastern edge of the Greenwich Mohawk Brownfield Site, as identified in the City of Brantford Natural Heritage Strategy (Plan B Natural Heritage, 2014).

- **Areas Regulated by Grand River Conservation Authority**: Portions of the study area are regulated by GRCA under Ontario Regulation 150/06. The entirety of the study area south and east of Mohawk Lake falls within the regulated areas as do portions of Mohawk Park adjacent to Mohawk Lake. The area identified as regulated lands by GRCA are not static and are subject to revision.

3.4 VEGETATION & FLORA

Vegetation surveys of the study area were completed on May 29 and July 3, 2018.

3.4.1 APPROACH

The scope of the field surveys included:

- Delineating and classifying vegetation communities using the Ecological Land Classification System for Southern Ontario, ELC (Lee et al., 1998). Vegetation communities are described in Table 1 and delineated on **Figure 3** in **Appendix A**.

- Evaluating the sensitivity and significance of vegetation communities, with guidance from the Natural Heritage Information Centre (NHIC) (vegetation community rarity ranks).

- Completing a two-season botanical inventory and compiling a vascular plant list, included in **Appendix D**.

- Evaluating significance and sensitivity of flora recorded during the field review, using the NHIC website (updated periodically), and regional rarity rankings for Brant County (Oldham, 2017).
- Preliminary delineation of the limits of wetlands present on the subject property according to the Ontario Wetland Evaluation System (OWES) protocols.
- General notes were taken on community health and site disturbance and representative photos were taken.

3.4.2 RESULTS - FLORA

In total, 155 vascular plant species were recorded during the WSP field review, with an additional 5 specimens identified to the genus level. A list of all species recorded is provided in **Appendix D**. Summary statistics for these species are provided below.

- Of the 155 species recorded, 69 (43%) are non-native species, many of which are typical of old field and disturbed areas. These species are generally widespread and abundant in the cultural habitats of the study area.
- Of the 86 native species recorded, all are considered 'apparently secure, uncommon but not rare' (S4) to 'secure, common and widespread' in Ontario (S5).
- No species are federal or provincial Species at Risk (SAR) subject to the provisions of the ESA or SARA.
- Twp species are considered rare in Brant County (Oldham, 2017):
    - Handsome Sedge (*Carex formosa*) – Unit 1a;
    - Tamarack (*Larix laricina*) – Unit 1c; and

The Tamarack is a planted specimen within Mohawk Park. Handsome Sedge is naturally-occurring within Mohawk Park. Locations of these species are shown on **Figure 3** in **Appendix A**.

- Five species are considered uncommon in Brant County (Oldham, 2017):
    - Pubescent Sedge (*Carex hirtifolia*) – Unit 1a;
    - Common Hackberry (*Celtis occidentalis*) – Unit 1a;
    - Canada Moonseed (*Menispermum canadense*) – Unit 1a;
    - Balsam Poplar (*Populus balsamifera*) – Unit 2c and
    - American Bladdernut (*Staphylea trifolia*) – Unit 1a.

The Pubescent Sedge, Canada Moonseed and American Bladdernut are all naturally-occurring within Mohawk Park. The Balsam Poplar is naturally-occurring within the forest vegetation communities on the south side of Mohawk Lake. Common Hackberry is naturally-occurring within Mohawk Park, and the forest vegetation communities on the south side of Mohawk Lake. A very large (>100 cm diameter at breast height) naturally-occurring Common Hackberry is growing on the Kanata Village property, on the north side of the Hamilton-Brantford Rail Trail, approximately 10m north of Mohawk St.

- Of the 87 naturally occurring native species recorded for which *Coefficient of Conservatism* (CC) values are provided, the majority of the CC values range from 0 to 6, with the majority between 2 and 4 (i.e., "tolerant" to "moderately conservative"). Six naturally occurring "conservative" (typically associated with a plant community in an advanced successional stage that has undergone minor disturbance) species were recorded:
    - Common Hackberry (CC=8) – Unit 1a, Unit 2b/c;
    - Canada Horsebalm (CC=8) – Unit 1a;
    - Canada Moonseed (CC=7) – Unit 1a;
    - American Bladdernut (CC=7) – Unit 1a; and
    - Eastern Skunk Cabbage (CC=7) – Unit 1a.

3.4.3 RESULTS – VEGETATION COMMUNITIES

The study area is located in an urban environment, with the vegetation communities showing typical evidence of cultural influence and disturbance. The least disturbed vegetation community is a *Dry-Fresh Oak-Hickory Deciduous Forest* (FOD2-2) within Mohawk Park. While much of the forest understory has been removed and is maintained as groomed parkland, the intact portions (along the western and southern edge of the park) are high-quality. Most of the regionally rare and uncommon species recorded during this study (which also tend to be species requiring minimal disturbance, i.e. high CC value) are located here.

The remained vegetated portions of the study area are primarily early successional habitats, with some small wetland patches. The Greenwich Mohawk Brownfield site underwent remediation between approximately 2013 and 2016. Much of the original pavement remains, with sparse vegetation growing in cracks, and in unpaved areas. Along Mohawk Canal is a cultural woodland consisting of a sparse assemblage of trees and shrubs. Along the Trans Canada Trail, and along the Grand River valley slope, are young forests comprised primarily of Poplars, Black Walnut (*Juglans nigra*), Manitoba Maple (*Acer negundo*) and Common Buckthorn (*Rhamnus cathartica*).

On the Kanata Village property there is a large cattail marsh with a small pond inclusion.

Vegetation communities are shown on **Figure 3** in **Appendix A** and described in Table 1.

Four Vegetation Community Types were classified within the study area:

- Forest:
    - FOD2-2 Dry-Fresh Oak-Hickory Deciduous Forest; and
    - FOD Deciduous Forest.
- Marsh:
    - MAS2-1 Cattail Mineral Shallow Marsh.
- Cultural:
    - CUW1 Mineral Cultural Woodland.

One of these communities is ranked as S3S4 (meaning that it ranks between ‘rare to uncommon’ and ‘apparently secure’) (per NHIC, 2018):

    - FOD2-2 Dry-Fresh Oak-Hickory Deciduous Forest.

Table 1: Vegetation Community Descriptions

Unit	ELC Vegetation Type	Layer	Component Species (most abundant / notable only)	Rare Species and Additional Attributes
1 a-c	**Deciduous Forest (Mohawk Park)** **FOD2-2** Dry-Fresh Oak-Hickory Deciduous Forest	**Canopy / Sub-canopy**	White Oak (*Quercus alba*), Red Oak (*Quercus rubra*), Shagbark Hickory (*Carya ovata*) and Black Cherry (*Prunus serotina*) dominate the canopy. Common Buckthorn (*Rhamnus cathartica*), White Ash (*Fraxinus americana*), Shagbark Hickory, and Gray Dogwood (*Cornus racemosa*) dominate the sub-canopy.	Species of Conservation Concern: • Handsome Sedge – Regionally rare • Pubescent Sedge – Regionally uncommon • Common Hackberry – Regionally uncommon • Canada Moonseed – Regionally uncommon • American Bladdernut – Regionally uncommon • Canada Moonseed – Regionally uncommon Age: Mature Disturbance: Much of the forest understory has been removed and is being maintained as parkland (labelled as 'parkland', see Figure 1 in **Appendix A**), trails, recreational use, noise, exotic species.
		Understory	Common Buckthorn, Gray Dogwood, and White Ash dominate the understory	
		Ground	Common Buckthorn, Gray Dogwood, Wild Grape (*Vitis riparia*), and Pennsylvania Sedge (*Carex pensylvanica*) dominate the ground layer.	
2 a-d	**Deciduous Forest** **FOD** Deciduous Forest	**Canopy / Sub-canopy**	This vegetation community is variable. Dominant canopy species are Eastern Cottonwood (*Populus deltoides ssp. deltoides*), Black Walnut (*Juglans nigra*), and Manitoba Maple (*Acer negundo*). These species alternate in dominance, with some areas dominated by Eastern Cottonwood, some by Black Walnut, and some by Manitoba Maple respectively. In addition, soil moisture varies from Dry – Fresh to Fresh – Moist. Common Buckthorn is dominant in the sub-canopy, with occasional Manitoba Maple (*Acer negundo*) and White Ash.	Species of Conservation Concern: • Common Hackberry – Regionally uncommon • Balsam Poplar – Regionally uncommon Age: Young Disturbance: Trails, recreational use, noise, exotic species, dumping.
		Understory	Common Buckthorn forms a dense understory.	
		Ground	Creeper (*Parthenocissus sp.*), Common Buckthorn, Canada Goldenrod (*Solidago canadensis ssp. canadensis*) and Climbing Poison Ivy (*Toxicodendron radicans ssp. radicans*) dominate.	
3	**Marsh** **MAS2-1** Cattail Mineral Shallow Marsh	**Understory**	Broad-leaved Cattail (*Typha latifolia*) is dominant, with occasional European Reed (*Phragmites australis ssp. australis*)	Disturbance: Fluctuating water level, exotic species. Note: a small pond inclusion is present.
		Ground	N/A	
4	**Disturbed Brownfield** Industrial – Greenwich Mohawk Brownfield	**Canopy / Sub-canopy**	Sparse Manitoba Maple and Eastern Cottonwood in the canopy and sub-canopy.	Species of Conservation Concern: • None Age: Pioneer Disturbance: Previous industrial site that recently underwent brownfield remediation. Dumping, fill, pavement, noise, exotic species.
		Understory	White Sweet Clover (*Melilotus albus*) dominant, with abundant Chicory (*Cichorium intybus*), Queen Anne's Lace (*Daucus carota*) and Canada Bluegrass (*Poa compressa*)	
		Ground	Black Medick (*Medicago lupulina*), English Plantain (*Plantago lanceolata*), Bladder Campion (*Silene vulgaris*), and Butter and Eggs (*Linaria vulgaris*)	
5 a-g	**Woodland** **CUW1** Mineral Cultural Woodland	**Canopy / Sub-canopy**	Black Walnut, Manitoba Maple, White Mulberry and White Ash dominate the canopy and sub-canopy.	Species of Conservation Concern: • None recorded Age: Pioneer Disturbance: Dumping, fill, noise, recreational use, exotic species.
		Understory	Black Walnut seedlings dominate.	
		Ground	Canada Bluegrass dominates.	

3.5 WILDLIFE

3.5.1 GENERAL WILDLIFE INVENTORY & HABITAT ASSESSMENT

APPROACH

In addition to the targeted breeding bird surveys described in the following section, a general wildlife survey and habitat assessment was undertaken during all field surveys, as follows:

- Recording all direct wildlife observations and wildlife signs (including browse, track / trails, animal scat, bird nesting activity, tree cavities, burrows and vocalizations) and identifying potential wildlife usage and habitat functions associated with vegetation communities;
- Assessing SAR habitat availability;
- Inspecting structures for evidence of use by nesting migratory birds; and
- Assessing potential for *Significant Wildlife Habitat* (SWH) features within the study area.

RESULTS

In addition to breeding bird survey results described in corresponding sections below, evidence of the following mammal, herptile and invertebrate species was recorded:

- Mammals:
    - Eastern Chipmunk (*Tamias striatus*);
    - Eastern Cottontail (*Sylvilagus floridanus*);
    - Gray Squirrel (*Sciurus carolinensis*); and
    - Raccoon (*Procyon lotor*).
- Herptiles :
    - American Toad (*Anaxyrus americanus*);
    - Green Frog (*Lithobates clamitans*); and
    - Midland Painted Turtle (*Chrysemys picta marginata*).
- Invertebrates:
    - Banded Hairstreak (*Satyrium calanus*);

- Blue-fronted Dancer (*Argia apicalis*);
- Cabbage White (*Pieris rapae*);
- Common Green Darner (*Anax junius*);
- Common Wood-Nymph (*Cercyonis pegala*);
- Eastern Comma (*Polygonia comma*);
- Least Skipper (*Ancyloxypha numitor*);
- Little Wood-Satyr (*Megisto cymela*);
- Monarch (*Danaus plexippus*);
- Twelve-spotted Skimmer (*Libellula pulchella*);
- Viceroy (*Limenitis archippus*); and
- Gypsy Moth (*Lymantria dispar*).

3.5.2 AVIFAUNA

APPROACH

Two breeding bird surveys were undertaken by qualified, experienced staff, using protocols consistent with the Ontario Breeding Bird Atlas (OBBA) on June 18 and July 5, 2018. These were targeted early morning surveys within the southern Ontario bird breeding period (generally May 24 to July 10), conducted under appropriate weather conditions (i.e., low wind and no precipitation).

Where Permission to Enter (PTE) was granted prior to field investigations, habitats within the study area were thoroughly surveyed using walking transects with frequent listening / observation stops at random locations. During field surveys, species abundance and level of breeding evidence were recorded for all avifauna observed. Level of breeding evidence was determined using the OBBA methodology and terminology (Cadman et.al., 2007; Bird Studies Canada, 2001).

The study area was subdivided into three broad Wildlife Survey Units (WSU) as shown on **Figure 3** in **Appendix A**):

- WSU 1 – south side of Mohawk Lake and Canal, east portion of study area;
- WSU 2 – Greenwich Mohawk Brownfield and west portion of study area;
- WSU 3 – Mohawk Park.

RESULTS

In total, 56 avifauna species were recorded during the breeding bird surveys and supplemental observations made during additional field visits. A full list of species is provided, by date, in **Appendix E**. Breeding evidence ('Possible', 'Probable' or 'Confirmed' according to OBBA standards) was recorded for 51 species. Four species were 'Observed' with no breeding evidence (foraging or flying over study area, with no suitable nesting habitat present): Chimney Swift (*Chaetura pelagica*), Common Raven (*Corvus corax*); Ring-billed Gull (*Larus delawarensis*); and Turkey Vulture (*Cathartes aura*).

One additional (of the 56 total) species was observed during additional field visits outside of the accepted southern Ontario bird breeding period (generally May 24 to July 10): Red-bellied Woodpecker (*Melanerpes carolinus*).

The avifauna species recorded with breeding evidence are expected given the habitats present, which include deciduous forest, wetland and various cultural communities. Most species recorded are generally disturbance tolerant and common in southern Ontario (e.g., American Goldfinch (*Spinus tristis*), American Robin (*Turdus migratorius*), Blue Jay (*Cyanocitta cristata*), Song Sparrow (*Melospiza melodia*)). Some species typically associated with interior or larger forest habitats which may be more sensitive to disturbance were also recorded (e.g., American Redstart (*Setophaga ruticilla*) and Northern Flicker (*Colaptes auratus*)). The more sensitive species are associated with the forested habitat.

Avifaunal Species of Conservation of Concern

For the purposes of this report, Species of Conservation Concern include federally and provincially designated SAR, globally rare / uncommon (G-rank G1 to G3) species, provincially rare / uncommon (S-rank S1 to S3).

- Four species are designated as SAR in Ontario (COSSARO) and / or Canada (COSEWIC):
    - Barn Swallow (*Hirundo rustica* – Threatened, COSSARO and COSEWIC) – Recorded with 'Confirmed' breeding evidence, with eight individuals observed in WSU 1. This species was confirmed nesting under the Mohawk Street bridge over Mohawk Canal at the east end of the study area.
    - Chimney Swift (Threatened, COSSARO and COSEWIC) – Recorded with 'Observed' breeding evidence, with eight individuals flying over the Greenwich Mohawk Brownfield and adjacent houses in WSU 2.
    - Eastern Wood-pewee (*Contopus virens* – Special Concern, COSSARO and COSEWIC) – Recorded with 'Probable' breeding evidence in WSU 3 (within Mohawk Park).
    - Wood Thrush (Special Concern, COSSARO and Threatened, COSEWIC) – Recorded with 'Possible' breeding evidence; one singing male recorded in WSU 3 (within Mohawk Park).
- MBCA. 44 species are subject to provisions of the Migratory Birds Convention Act (1994);

‘Area Sensitive’ species listed in the Significant Wildlife Habitat Technical Guide (MNR 2000)

- Five are listed as ‘Area Sensitive’ by MNRF:
    - American Redstart;
    - Blue-gray Gnatcatcher (*Polioptila caerulea*);
    - Hairy Woodpecker (*Picoides villosus*);
    - Least Flycatcher (*Empidonax minimus*); and
    - White-breasted Nuthatch (*Sitta carolinensis*).

3.5.3 SIGNIFICANT WILDLIFE HABITAT

Significant Wildlife Habitat (SWH) is identified by MNRF or other relevant planning authorities. As outlined in their Significant Wildlife Habitat Technical Guide (OMNR 2000), SWH is broadly categorized as:

- Seasonal concentration areas (i.e., conifer forests for deer wintering);
- Rare vegetation communities or specialized habitats for wildlife;
- Habitats of species of conservation concern, excluding the habitats of endangered and threatened species;
- Animal movement corridors.

A preliminary review of potential SWH in the study area was undertaken based on evaluation criteria in the Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E (MNRF 2015), using available secondary sources of information and field data collected as part of current and previous studies, specifically the MLCS. A summary of candidate and confirmed SWH criteria is presented in Table 2, and the confirmed SWH types identified below are presented on **Figure 4** in **Appendix A**.

Table 2: Preliminary Evaluation of Significant Wildlife Habitat

Criterion	Assessment	Future Survey Requirement	Location
Seasonal Concentration of Animals			
Bat Maternity Colonies	**Candidate**	Leaf-off and acoustic surveys may be required if future development will remove trees associated with CUW and FOD communities. MECP should be contacted to confirm need as part of detailed EIS studies.	Forested (FOD) and treed habitats within study area. Mainly concentrated in eastern portion of study area.
Turtle Wintering Area	**Candidate**	Turtle emergence surveys may be required if development will remove / directly impact identified turtle habitat. Need for surveys to be confirmed via agency consultation during development of Terms of Reference for individual EIS studies.	Snapping Turtle, Midland Painted Turtle and Blanding's Turtle known from the general area. Suitable habitat is present in Kanata Village and Mohawk Lake and Canal.
Rare Vegetation Communities or Specialized Habitat for Wildlife			
Rare Vegetation Communities	**Confirmed**	May be required if development (i.e., trails are proposed within Mohawk Park).	Dry Oak – Hickory Deciduous Forest (FOD2-2, S3S4) within Mohawk Park.
Bald Eagle and Osprey Nesting, Foraging and Perching Habitat	**Candidate**	Not required. The proposed redevelopment concept is unlikely to impact foraging and perching habitat, and no SWH nesting habitat was recorded in the study area.	Forested (FOD) and treed habitats directly adjacent to Mohawk Lake and Canal.
Turtle Nesting Area	**Candidate**	Need for surveys to be confirmed via agency consultation during development of Terms of Reference for individual EIS studies.	Snapping Turtle, Midland Painted Turtle and Blanding's Turtle known from the general area. Potential nesting in suitable habitat (slopes, shorelines, roadsides and upland areas with exposed sandy soils near Kanata Village and Mohawk Lake and Canal.
Amphibian Breeding Habitat (Woodland)	**Candidate**	Amphibian calling surveys using MMP protocol may be required if development will occur adjacent to forested / wetland habitats. Need for surveys to be confirmed via agency consultation during development of Terms of Reference for individual EIS studies.	Mohawk Lake and Canal and any wetland habitat
Amphibian Breeding Habitat (Wetland)	**Confirmed (single American Bullfrog recorded in Mohawk Lake); Candidate through remainder of study area**	Amphibian calling surveys using MMP protocol may be required if development will occur adjacent to wetland / aquatic habitats. Need for surveys to be confirmed via agency consultation during development of Terms of Reference for individual EIS studies.	Mohawk Lake and Canal and any wetland habitat
Habitat for Species of Conservation Concern (not including Endangered or Threatened Species)			
Terrestrial Crayfish	**Candidate**	Not required.	Wet meadow and edges of MAS2-1 habitat. This habitat is not included within or immediately adjacent to the proposed conceptual redevelopment area.
Special Concern and Rare Wildlife Species	**Confirmed** • **Eastern Wood-pewee (SC)** • **Wood Thrush (SC)** • **Monarch (SC)** • **Snapping Turtle (SC)**	Need for surveys to be confirmed via agency consultation during development of Terms of Reference for individual EIS studies.	• Eastern Wood-pewee recorded in Forested (FOD) habitats; • Wood Thrush recorded in Mohawk Park; • Monarch butterfly observed foraging in Greenwich Mohawk Brownfield; • Mohawk Lake is known to provide habitat for Snapping Turtle.

The SWH types presented in Table 2 have been identified as having the potential to occur within / immediately adjacent to the study area and should be more thoroughly evaluated during EIS studies at later development stages. The need for targeted surveys to screen for each of the aforementioned SWH types will need to be determined through the development of Terms of Reference for EIS studies as part of individual development applications. The need for targeted surveys will be based on the proposed works and development envelope / degree of encroachment into the locations identified in Table 2.

3.6 AQUATIC RESOURCES

WSP did not conduct field surveys focusing on aquatic habitat within the study area as there is abundant background information relating to aquatic habitat within the study area. Furthermore, during the preparation of the MLDPS, the City was undertaking the MLCS. The methods and findings of the MLCS have been summarized below as they relate to the fisheries and aquatic habitat within the study area.

3.6.1 APPROACH

Fish Community Surveys

Fish community surveys within Mohawk Lake were conducted using four minnow traps and a fyke net over five days between September 9 and September 21, 2018. The fyke net was set at various locations within the lake and canal and the minnow traps were set around the edges of the lake at various locations.

Aquatic Habitat Assessment

Aquatic habitat was assessed using Section 4: Module 2 of the Ontario Stream Assessment Protocol (OSAP) for Point-Transect Sampling for Channel Structure, Substrate and Bank Conditions. Information collected included parameters such as channel morphology measurements, undercut banks and instream cover opportunities, point source impacts, flow regime characteristics, substrate, critical habitats and riparian cover and shading.

3.6.2 RESULTS

Fish Community

Eight (8) species were recorded during fish community sampling conducted as part of the MLCS in 2018:

- Black Crappie (*Poxomis nigromaculatus*);
- Rock Bass (*Ambloplites rupestris*);
- Largemouth Bass (*Micropterus salmoides*);
- Pumpkinseed (*Lepomis gibbosus*);

- Bluegill (*Lepomis macrochirus*);
- Creek Chub (*Semotilus atromaculatus*);
- Bluntnose Minnow (*Pimephales notatus*); and
- White Sucker (*Catostomus commersonii*)

No aquatic SCC were recorded. The species recorded in the MLCS represent a diverse cool – warmwater assemblage of common, tolerant species.

Aquatic Habitat

Aquatic habitat within the study area is confined to the Mohawk Lake and Canal, which can be partitioned into three areas: the canal upstream of Mohawk Lake (western portion of study area, from Mohawk Park westerly to the western end of the study area); Mohawk Lake (immediately south of Mohawk Park); and the canal between Mohawk Lake and the Grand River (eastern portion of study area, east of Mohawk Lake). Water flows from west to east, from the urbanized area adjacent to Shallow Creek Park, to the canal's confluence with the Grand River at the Alfred Watts Hydroelectric Ruins.

Upstream Canal

The canal upstream of Mohawk Lake (western portion of the study area) is uniform, with an average wetted width of 13 m and average wetted depth of 0.32 m. Morphology consists of a long run with a very deep pool at the upstream end of the study area. Instream cover was low and consists of instream vegetation, boulders and large woody debris. Substrates consisted of sand, gravel, cobble and boulder.

Mohawk Lake

Mohawk Lake has a wetted width of approximately 223 m and a wetted depth of 3.5 m, with a sediment depth of roughly 2.4 m. Given the width of the lake, instream cover is limited to the littoral zone where fallen trees and overhanging vegetation dominate. The littoral zone contains coarse substrates including gravel and cobble extending roughly 1 m offshore, with silt dominated the remainder of the lake.

Canal Between Mohawk Lake and Grand River

The canal located in the east portion of the study area has an average wetted width of approximately 24.5 m and an average wetted depth of 1 m. Similar to the lake habitat, the sediment depth is roughly 2.4 m in this area and is dominate by silt. Instream cover is mainly confined to the littoral zone where fallen trees and overhanging vegetation dominate. A substantial barrier to fish movement is located at the downstream end of the study area, consisting of a top-draw damn.

3.7 SPECIES AT RISK

The NHIC database, MNRF Guelph District and GRCA were consulted for information on local SAR, defined herein as species that are "designated" by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and / or listed under the *Species at Risk Act* (SARA) and species "designated" by the Committee on the Status of Species at Risk in Ontario (COSSARO), including those Endangered, Threatened and Special Concern species listed and regulated under Ontario's Endangered Species Act (ESA) 2007.

Through a background review and agency consultation, 47 SAR were identified has having potential to be present within the study area and surrounding landscape. A SAR habitat suitability evaluation was completed and included in **Appendix F**. The assessment focused on the 'reasonable likelihood of presence in the study area' based on the 'key habitats used by species' (based on MNRF provided definitions or MNRF website habitat descriptions). Considering findings of surveys, habitat suitability and proposed concept, the 'likelihood and magnitude of impacts to species or habitats' was assessed.

For many of the SAR listed in the SAR Screening Table, no suitable habitat is present within the study area, or only a small amount / marginally suitable habitat is present and the likelihood of occurrence is low. The following 12 species were identified as having a moderate to high likelihood of being present (five of which were recorded during field investigations):

- Blanding's Turtle[4] (*Emydoidea blandingii* – Threatened, COSEWIC and COSSARO) – Confirmed via agency consultation (MNRF Guelph District). Based on the Blanding's Turtle habitat description (MNRF, 2013), Category 1 habitat is located within wetland habitat on the Kanata Village property, Category 2 habitat in located in and immediately adjacent to Mohawk Lake and Canal, Category 3 habitat extends 220 m from Category 2 habitat. Blanding's Turtle habitat in the study area has been mapped on **Figure 4** in **Appendix A**.

- Bald Eagle (*Haliaeetus leucocephalus* – Special Concern, COSSARO): Suitable foraging habitat in Mohawk Lake and Canal, as well as Grand River. Perching / nesting opportunities in large trees adjacent to waterbodies.

- Barn Swallow (Threatened, COSEWIC and COSSARO): 'Confirmed' breeding evidence, with eight individuals recorded in WSU 1. This species was observed nesting under the Mohawk Street bridge over Mohawk Canal at the east end of the study area, shown on **Figure 3** in **Appendix A**.

- Chimney Swift (Threatened, COSEWIC and COSSARO): Potentially suitable breeding habitat is present throughout the local landscape (chimneys associated with both residential and commercial buildings); eight individuals were recorded foraging over Greenwich Mohawk Brownfield site.

[4] Habitat as defined in the General Habitat for the Blanding's Turtle (MNRF 2013).

- Eastern Wood-pewee (Special Concern, COSEWIC and COSSARO): Potentially suitable breeding habitat is present in the forested areas within the study area; single individual recorded with 'Possible' breeding evidence in WSU 1 and two individuals recorded with 'Probable' breeding evidence in WSU 3.

- Little Brown Myotis (*Myotis lucifugus* – Endangered COSEWIC and COSSARO): Potential to occur in forested habitat in eastern portion of study area, potential foraging habitat over open areas.

- Northern Myotis (*Myotis septentrionalis* – Endangered COSEWIC and COSSARO): Potential to occur in forested habitat in eastern portion of study area, potential foraging habitat over open areas.

- Monarch (Endangered COSEWIC, Special Concern COSSARO): Likely to pass through and / or forage within study area, potential breeding habitat wherever Milkweed or other wildflowers are present; one adult observed foraging at Greenwich Mohawk Brownfield site. No larvae observed.

- Northern Map Turtle (*Graptemys geographica* – Special Concern COSEWIC and COSSARO): Suitable habitat present within Mohawk Lake and Canal.

- Red-headed Woodpecker (*Melanerpes erythrocephalus* – Special Concern COSSARO, Endangered COSEWIC): Suitable habitat present in open treed areas, predominantly located in eastern portion of study area, outside of proposed development concept.

- Snapping Turtle (*Chelydra serpentina* – Special Concern, COSEWIC and COSSARO): Suitable habitat present within Mohawk Lake and Canal, confirmed by MNRF. Reported by the caretaker to use the wetland habitat (marsh) on Kanata Village property.

- Wood Thrush (Special Concern COSSARO, Threatened COSEWIC): Potentially suitable breeding habitat is present within forested habitat in eastern portion of study area; male individual recorded during the breeding window within Mohawk Park

For each SAR species recorded or identified as potentially using habitats within and immediately adjacent to the study area, the likelihood and magnitude of impacts was identified as 'low'. A large portion of the study area is highly disturbed and contains no unique or specialized habitat features that would support SAR.

Notwithstanding the conclusions of this preliminary SAR screening, it is recommended that relevant agencies (i.e., DFO, MECP) be contacted prior to development taking place to confirm SAR presence / identify potential study requirements related to SAR.

4 CONCEPTUAL DEVELOPMENT PROPOSAL

4.1 OVERVIEW

The MLDPS is to provide a comprehensive land use structure and policy framework to guide future development and revitalization in the study area. One of its key deliverables is a demonstration plan, derived from a preferred concept plan, which serves as the basis for the vision, goals and objectives to be developed in the District Plan report. The preferred demonstration plan was considered and reviewed herein and will serve as the basis of the implementing planning documents such as Design Guidelines, an Official Plan Amendment and Zoning By-law Amendment. Specifically, the preferred plan focuses on a concept for the largest developable area within the study area, the Greenwich Mohawk Brownfield site.

4.2 PREFERRED PLAN

The preferred plan for the Greenwich Mohawk Brownfield site was developed and informed by the results of public engagement sessions, online survey as well as comments from City staff and the technical team. It has also been informed by best practices in planning and urban design. The preferred plan focuses on the redevelopment of the Greenwich Mohawk Brownfield site and already developed areas surrounding Mohawk Canal at the westernmost end of the study area (west of the Greenwich Mohawk Brownfield site). The draft demonstration plan has been included in **Figure 5** in **Appendix A**. Potential alterations to existing trails, creation of new trails, realignment of Greenwich Street and the creation of new park areas has also been identified in the high-level concept plan, located in areas immediately adjacent to, and east of Mohawk Lake. The high-level concept plan has been included in **Figure 6** in **Appendix A** and includes the following:

- A variety of land use types that encourage activity within and connectivity to existing land uses;
- The provision of “Main Street” type mixed uses with at-grade commercial / retail uses and residential or office institutional uses above;
- Added transitional institutional mixed uses on north side of rail to address concern for more community facilities;
- Additional institutional block can provide complimentary / ancillary uses to the large open space / event space while buffering potential noise from events to the proposed “Main Street” and mixed-use residential uses;
- An enhanced Promenade boulevard along Greenwich Street and an enhanced streetscape along Mohawk Street; and,
- Multiple internal trail connections and their connection to surrounding existing trails and links to surrounding cultural amenities / facilities.

5 OPPORTUNITIES AND CONSTRAINTS

This section presents the sensitive terrestrial and aquatic features and associated constraints identified in the existing conditions. These features may be impacted depending on the details of future development proposals and associated construction, and future activities may require the use of timing windows or other measures to mitigation impacts.

- **Natural Heritage System:** The NHS includes all natural features within the study area including woodlands, wetlands, hazard lands associated with Mohawk Lake and Canal (*Core Natural Areas*) and adjacent lands (i.e., within 120 metres). Development within *Core Natural Areas* or *Adjacent Lands* will require the completion of an EIS.

- **Mohawk Lake and Canal:** Extensive historical records of fish surveys as well as results of the field investigations completed as part of the MLCS indicate that the Mohawk Lake and Canal support a diverse assemblage of common, tolerant cool / warmwater species. This habitat is protected under the Fisheries Act.

- **Endangered and Threatened species and habitat:** Species-at-risk occur or could potentially occur within or adjacent to the study area, as discussed in Section 3.7. Additional field surveys as part of future site-specific EIS studies will inform potential impacts and mitigation measures.

- **Significant Wildlife Habitat (SWH):** Development within 120 m of *Significant Wildlife Habitat* is prohibited unless it has been demonstrated that there will be no negative impacts on the features or their ecological functions. The following nine Candidate and Confirmed SWH types have been identified based on background information and results of field investigations: Confirmed Rare Vegetation Communities; Confirmed Wetland Amphibian Breeding Habitat (identified in MLCS); Confirmed Special Concern and Rare Wildlife Species habitat; Candidate Bat Maternity Colony habitat; Candidate Turtle Wintering Areas; Candidate Bald Eagle and Osprey Nesting Foraging and Perching Habitat; Candidate Turtle Nesting Areas; Candidate Woodland Amphibian Breeding Habitat; and Candidate Terrestrial Crayfish Habitat.

- **Nesting Migratory Birds:** Migratory birds, nests and eggs are protected under the Migratory Birds Convention Act (MBCA; 1994). If removals of nesting habitat during the nesting period are required, nest searches may be required to ensure compliance under the MBCA. This applies to vegetation, as well as buildings and other structures.

6 PRELIMINARY IMPACT ASSESSMENT AND MITIGATION

This section outlines a preliminary assessment of impacts that may occur within the study area as a result of the preferred demonstration plan. It is anticipated that this preliminary impact assessment would be updated as part of future EIS studies supporting individual development applications.

6.1 VEGETATION

6.1.1 VEGETATION IMPACTS

Direct Impacts

Minor edge impacts to portions of Cultural Woodland habitat may occur in Open Space areas with proposed trail enhancements (e.g., in the northwest section of the study area along Greenwich Street), and at proposed bridge structure improvement areas over the canal.

Implementation of the concept plan would not result in the loss of provincially, regionally, or locally unique habitat types. While there is one provincially uncommon / rare vegetation community, *Dry-Fresh Oak-Hickory Deciduous Forest* (FOD2-2, S-rank S3S4), it will be retained within Mohawk Park. Existing trails within this rare community type may be enhanced, which would likely cause minor impacts along the trail edges. In addition, no major removals are proposed in the most sensitive areas (i.e. MAS2-1, FOD2-2 and FOD communities); therefore, there is no anticipated impact to / loss of overall botanical or vegetation community diversity from the broader landscape, based on the proposed concept plan. However, there may be minor forest edge removals for the re-alignment of Greenwich Street, for trail enhancement / maintenance, and in areas of waterfront-related enhancement areas, such as lookout points along the Grand River and additional recreational opportunities north of Mohawk Lake. Anticipated impacts to vegetation can be mitigated through the implementation of measures outlined in Section 6.1.2.

No impacts to plant SAR or provincially rare vegetation species are anticipated based on the concept plan. Regionally rare and uncommon species were recorded in Mohawk Park (vegetation unit 1a-c) and within the deciduous forest communities south of Mohawk Lake (unit 2 b-c); however, these species are not anticipated to be directly impacted based on the concept plan. In addition, a large naturally-occurring Common Hackberry tree (>100 cm DBH) is present on the Kanata Village property, on the north side of the Hamilton-Brantford Rail Trail (vegetation unit 2c), approximately 10 m north of Mohawk St, which is anticipated to be retained.

Based on the proposed concept plan, no direct impact to wetland habitat is anticipated. Wetland, in the form of cattail marsh (MAS2-1; unit 3), is located to the west of the existing Hamilton-Brantford Rail Trail;

however, no trail works are proposed along this trail near the wetland and therefore no impacts are anticipated.

The proposed concept plan does not substantively increase fragmentation of sensitive natural features (e.g. high CC or wetland) or reduce connectivity. All intensive development (e.g., commercial or institutional uses) is proposed in highly disturbed areas with little vegetation, and less intensive development (e.g. trail enhancement and lookout points) located within higher quality features will not have significant direct impacts on connectivity, based on the small area of disturbance.

Indirect Impacts

There is potential for indirect impacts to vegetation as the result of construction, changes in adjacent land use, changes to hydrology and occupancy related activities. Indirect impacts may include edge effects, construction-related impacts, hydrogeology changes, and occupancy-related impacts.

If vegetation removal is required along woodland edges for trail or road re-alignment work, edge effects to may include vegetation dieback and species composition changes from increased sunlight (sunscald, drought), and the introduction of exotic/invasive species. However, these wooded areas already show evidence of edge impacts and contain moderate levels of invasive species encroachment under current conditions, so the magnitude of potential impacts is small.

Construction effects may include damage to vegetation outside of the work zone, sedimentation, spills of contaminants, root pruning, damage to tree limbs, and soil compaction.

Hydrogeology effects may include changes to surface water volume/flow direction, changes to groundwater volume/flow direction, and reduced infiltration. These changes may impact hydrologically-connected features (e.g., wetlands, aquatic features, other vegetation communities).

Occupancy effects may include the introduction of exotic/invasive species (e.g. garden escapes), informal trail creation, vandalism, dumping of yard waste and other items, and contaminated road runoff. Again, given the urban context and long anthropogenic land use history, many of these effects are already present to varying degrees across the study area.

6.1.2 VEGETATION MITIGATION

Impacts to vegetation can be mitigated by implementation of the following:

- Avoidance of development in / disturbance to significant and sensitive areas, particularly Mohawk Park and near the cattail marsh (Unit 3) west of the Hamilton-Brantford Rail Trial
- Development setbacks from aquatic, wetland and woodland limits;
- Buffer management within the setback areas which may include ecological enhancement, maintenance of hydrological inputs to receiving areas (e.g. wetlands and watercourses), and restricted access;

- An Erosion & Sediment Control (ESC) Plan which may include the location of fencing, berms and diversion swales, as well as topsoil stockpile areas, treatment / seeding of exposed soils, and a regular site inspection and maintenance schedule;
- A Tree Preservation Plan to identify trees to be retained and protected, trees to be removed, and tree compensation planting areas, where required;
- A Stormwater Management Strategy to control post-development flows and treat stormwater runoff;
- Maintenance of hydrogeological inputs to receiving areas; and
- Temporary vegetation protection fencing to prevent damage to retained natural areas (which may be combined with ESC fencing and wildlife exclusion fencing).

6.2 WILDLIFE

6.2.1 WILDLIFE IMPACTS

Specific impacts to wildlife and wildlife habitat will need to be confirmed or updated / refined through additional studies when individual development applications occur within the study area. In general, direct and indirect impacts to wildlife habitat are anticipated to be mainly confined to the study area, and specifically to the Greenwich Mohawk Brownfield site, consistent with the impacts to vegetation described in Section 6.1.1. A preliminary list of potential impacts to wildlife include:

- Minor direct impacts to culturally influenced vegetation may occur – as described in Section 6.1.1.
- Removal / damage to migratory birds and their nests during any vegetation clearing or grubbing required for future development, depending on the timing of works.
- Harm to wildlife moving through construction zones or developed areas as there is potential for snakes, small mammals etc. to move through the study area.
- Fatal bird strikes due to collisions with windows.

Most wildlife species that occur or potentially occur within the study area are common, tolerant species. Sensitive wildlife habitat features (i.e., SAR and SAR habitat in FOD communities in the eastern portion of the study area, candidate or confirmed SWH, wetland and aquatic habitat) are not anticipated to be directly impacted by the preferred concept plan, as it focuses on the redevelopment of an already disturbed brownfield area and urbanized areas in the western portion of the study area. The more sensitive wildlife habitat features in the study area are located to the east of the Greenwich Mohawk Brownfield site and will not be directly impacted by the main redevelopment concept. Approximately 20.7 ha of highly disturbed, sparsely distributed pioneer vegetation associated with the brownfield redevelopment will be removed,

however this habitat is not sensitive or specialized and its removal is unlikely to impact overall faunal diversity within the study area and local landscape.

One area of confirmed SWH is located within the Greenwich Mohawk Brownfield site. This SWH has been identified due to the presence of foraging habitat for Monarch. The individual observed by WSP in 2018 was likely moving through the study area as opposed to using habitat within the study area for more sensitive life cycle functions (i.e., reproduction). No concentrations of Milkweed (larvae host plant) were observed and foraging habitat is present throughout the local landscape. As such, impacts to Monarch habitat within the study area are anticipated to be negligible.

Minor encroachment / impact may occur within more sensitive habitat features (i.e., Mohawk Park and forested habitat east of Mohawk Lake) associated with future trail enhancement / development, the Greenwich Street realignment, park creation, waterfront-related enhancement areas (i.e., lookout points); however, these impacts are anticipated to be localized and minor in nature.

Specific impacts, and mitigation measures associated with future trail works and park creation will be identified during detailed EIS studies, prior to development or land use changes occurring. Anticipated impacts to wildlife can generally be managed through the implementation of mitigation measures outlined below.

6.2.2 WILDLIFE MITIGATION

In general, the mitigation measures outlined in Section 6.1.2 for vegetation will also protect the associated wildlife habitat functions. However, it is also necessary to ensure the protection of breeding birds and wildlife in general that may nest or otherwise use areas where development is proposed.

Nesting migratory birds are protected under the Migratory Birds Convention Act (MBCA, 1994). Compliance with the MBCA can be achieved using the following due diligence approach:

- Proponent awareness of the MBCA, potential for nesting in the area, and potential for impacts to migratory birds, nests and eggs. Areas outside of the development envelope provide suitable habitat for nesting of forest and generalist species.
- Implementation of the following avoidance and mitigation measures, where possible:
    - Avoiding works (i.e., vegetation / potential nesting habitat removal) within the “Regional Nesting Period” for the majority of species in this area (i.e., extending from early April to late August, as identified on the Environment Canada website by “nesting zone” C[5])
    - Avoiding works in sensitive locations

[5] http://www.ec.gc.ca/paom-itmb/default.asp?lang=En&n=4F39A78F-1#_01_6.

- Minimizing area of vegetation removals
- Implementing post-construction habitat creation / restoration
- Recommending Best Management Practices (BMPs) during construction to minimize potential indirect impacts to vegetation / potential nesting habitat outside of the direct footprint.

For the protection of wildlife in general, the Contract Administrator should ensure that:

- Any wildlife incidentally encountered during construction will not be knowingly harmed and will be allowed to move away from the construction area on its own if possible;
- In the event that an animal encountered during construction does not move from the construction zone, or is injured, the Contract Administrator will be notified.
- Wildlife salvage and relocation be completed where aquatic habitats are filled / removed / altered during construction.

In addition, it is recommended that buildings within the study consider incorporating bird friendly design measures to reduce the risk of fatal bird strikes.

Refinement of mitigation measures will occur through site specific studies at the development stage, and proper implementation of the mitigation measures will help ensure that potential impacts on wildlife and wildlife habitat are minimized.

6.3 SPECIES AT RISK

As discussed in Section 3.7 and detailed in **Appendix F**, 12 SAR have been confirmed, or have potential to occur within or adjacent to the study area.

6.3.1 SAR IMPACTS

At this stage of the project, specific impacts to SAR and SAR habitat cannot be determined. Suitable SAR habitat within the forested habitats, wetland in Kanata Village and Mohawk Lake and Canal are unlikely to be impacted by the proposed Greenwich Mohawk Brownfield redevelopment concept. Potential impacts to SAR and SAR habitat will need to be reviewed and updated as part of future EIS studies completed in support of individual development applications.

Potential impacts to the 12 SAR (Bald Eagle, Barn Swallow, Chimney Swift, Eastern Wood-pewee, Red-headed Woodpecker, Wood Thrush, Blanding's Turtle, Snapping Turtle, Northern Map Turtle, Little Brown Myotis, Northern Myotis and Monarch) are anticipated to be negligible, based on the following:

- Suitable habitat for Bald Eagle, Eastern Wood-pewee, Red-headed Woodpecker, Wood Thrush, Little Brown Myotis and Northern Myotis is predominately confined to forested habitat located in the eastern portion of the study area, in areas east of, and immediately adjacent to Mohawk Lake.
    - These areas are located outside of the proposed Greenwich Mohawk Brownfield redevelopment concept. The redevelopment concept plan is located within already disturbed areas immediately adjacent to existing urban and industrial land uses.
    - Impacts to suitable SAR habitat associated with potential trail development / enhancement in the Mohawk Lake and Park District would likely be localized in nature and would need to be further refined through EIS studies as part of individual development permits / applications.
- No confirmed breeding habitat for Barn Swallow, Chimney Swift or Monarch was recorded within the proposed Greenwich Mohawk Brownfield redevelopment concept area.
    - Barn Swallow nesting was confirmed under the Mohawk Street bridge over Mohawk Canal. This bridge is located at the east end of the study area and will not be impacted or altered as part of the Greenwich Mohawk Brownfield redevelopment.
    - Though no nesting habitat was confirmed within the Greenwich Mohawk Brownfield redevelopment concept, any existing buildings in this area may provide nesting opportunities for Barn Swallow.
    - Currently, the redevelopment concept area provides some suitable foraging habitat for these species, however foraging habitat exists within the surrounding landscape. As foraging habitat is present in the local landscape and no confirmed breeding habitat will be directly impacted by the proposed redevelopment concept, impacts to these species within the study area are anticipated to be negligible.
- Wetland habitat in Kanata Village, Mohawk Lake and Mohawk Canal has been confirmed to support Blanding's Turtle (per MNRF correspondence). Mohawk Lake and Canal has also been confirmed habitat for Snapping Turtle, and provides suitable habitat to support Northern Map Turtle.
    - No components of the proposed redevelopment concept will be located in the areas identified by MNRF as providing habitat for Snapping Turtle or Northern Map Turtle.
    - Regulated habitat for Blanding's Turtle encompasses much of the study area. Category 1 habitat is found within Kanata Village, Category 2 habitat is found within Mohawk Lake and Canal and Category 3 habitat extends 220 m from the Category 2 habitat.
        - Category 1 habitat will not be directly impacted by the proposed redevelopment concept. Minor encroachment into Category 2 habitat may occur along Mohawk

Canal and a large portion of Category 3 habitat encompasses the Greenwich Mohawk Brownfield site.

- Future EIS studies as part of individual development applications will inform specific impacts to SAR turtle habitat and consultation with relevant agencies (i.e., MECP) will inform any SAR permitting requirements that may be necessary as part of future development applications.

6.3.2 SAR MITIGATION

Notwithstanding the summary of potential impacts to SAR habitat above, additional review is recommended during EIS studies as part of future development applications. Review of SAR and SAR habitat potential is recommended to ensure that SAR assessments are current for specific properties under review (including the creation / enhancement of trails) and that any SAR present or potentially present have been addressed (i.e., impact assessment, development of mitigation, ESA authorization, if required). As SAR listings can change over time, it will also be important to confirm whether the status of any species recorded during the study have changed.

Future studies in support of individual development applications should involve consultation with MECP at the outset to confirm SAR survey requirements.

6.4 FISHERIES AND AQUATIC HABITAT

6.4.1 FISHERIES IMPACTS

Provided that no work within water or below the high water mark of Mohawk Lake and Canal is proposed as part of future development activities, the potential impacts associated with the proposed development concept adjacent to Mohawk Lake and Canal are anticipated to be limited to 'during-construction' activities, grading and other indirect impacts typically associated with site development (e.g., erosion and sediment transport, anthropogenic inputs, pollutants, etc.). These indirect or secondary impacts are not likely to contravene the Fisheries Act and can generally be addressed with the implementation of standard construction-related mitigation measures.

6.4.2 FISHERIES MITIGATION

The following standard mitigation measures are being recommended for implementation in order to avoid or minimize potential impacts to fish and fish habitat in Mohawk Lake and Canal during and following construction activities.

Construction Design

- Any temporarily stockpiled soil, debris or other excess materials, and any construction-related materials, should be properly contained (e.g. within silt fencing) in areas separated at least 30 m from Mohawk Lake and Canal. All construction materials, excess materials and debris should be removed and appropriately disposed of following construction.

- All construction-related activities should be controlled to prevent entry of any petroleum products, debris or other potential contaminants/deleterious substances, in addition to sediment as outlined above, to Mohawk Lake and Canal.

Sediment and Erosion Control Measures

- The Contractor should follow the erosion and sediment control measures identified in the contract and prevent / control potential for erosion and sediment caused by their construction methods and operations so as to meet all legislative requirements, to prevent entry of sediments into Mohawk Lake and Canal and its drainage features, and to prevent damage to features and property.

Shoreline / Bank / Vegetation / Stabilization

- The construction access, work areas and associated requirements for removal of riparian vegetation should be minimized to the extent required for the construction activities, and these areas then delineated in the field using properly installed protective silt fencing. All temporarily disturbed areas should be re-stabilized following construction using appropriate means.

Operation and Machinery

- All construction-related activities should be controlled so as to prevent entry of any petroleum products, debris or other potential contaminants/deleterious substances, in addition to sediment as outlined above, to Mohawk Lake and Canal.

- No equipment should be allowed to ford or otherwise enter Mohawk Lake and Canal except as specified in the contract or unless authorized by the appropriate environmental agencies/permits.

7 SUMMARY AND RECOMMENDATIONS

This report documents the natural heritage features and functions within the study area in order to provide input to land uses and policy guidance for the Mohawk Lake District Planning Study. It reviews the available background natural heritage information for the property, field investigation results and identifies constraints to development. A preliminary assessment of potential impacts and identification of associated mitigation measures are also provided; however, this will require review and refinement as part of future EIS studies conducted as part of individual development applications.

Potential impacts associated with the Greenwich Mohawk Brownfield redevelopment concept may include localized removal or disturbance of cultural communities, as well as possible indirect impacts to more sensitive features associated with the Mohawk Lake and Canal, Mohawk Park and locally and regionally rare plant species. Impacts related to the creation of new trails or enhancement of existing trails within forested habitats should be reviewed through EIS studies prior to any work taking place.

Based on the available background information and field survey findings, SAR wildlife are present or have potential to use habitat locally and potentially be impacted by development activity within the study area. However, potential impacts are anticipated to be negligible.

As discussed throughout this report, individual EIS studies associated with future development applications will be required to demonstrate that proposed developments comply with applicable natural heritage policy and legislation (i.e., Official Plans, PPS, ESA, O. Reg. 150/06, etc.). A permit associated with GRCA's O. Reg. 150/06 Development, Interference with Wetlands and Alterations to Shorelines and Watercourses, will likely be required prior to development taking place within the study area. Additionally, future environmental assessment work may require consultation with MECP regarding any outfalls into the Mohawk Lake and Canal and should identify potential impacts to species that have the potential to utilize this habitat.

A series of standard mitigation measures are recommended. These are intended to avoid or minimize impacts to vegetation, wildlife and aquatic habitat, protecting natural features within the study area, and protecting wildlife / wildlife habitat in general. Specific impacts of the proposed developments on SAR and ecological features, as well as mitigation measures, will be refined further through individual environmental impact studies completed as part of individual development applications.

Table 3: Recommendations for Future Work

I.D. #	Constraint / Concern	Mitigation / Protection / Future Work	Concerned Agency
1.0 Reports			
1.1	EIS	EIS studies associated with individual development applications will likely be required to update and refine site specific existing conditions, confirm development limits, assess impacts of the development and develop mitigation and compensation measures to address impacts. The need and scope for future EIS studies will be confirmed with relevant agencies at the outset of individual development applications.	City, MNRF, MECP, GRCA
	EIS	Ecologists to provide input to refine development plans in design stages, including but not limited to: detailing appropriate SWM measures, confirmation of development limits, etc..	City, MNRF, MECP, GRCA
2.0 Vegetation and Wildlife			
2.1	Vegetation and Flora	Refinement and updating of vegetation community classification and botanical inventory is recommended to assess impacts as part of future EIS studies.	City, MECP, GRCA
2.2	Breeding Birds	Refinement and updating of breeding bird use is recommended to assess impacts as part of future EIS studies.	City, MECP, GRCA
3.0 SAR / SWH			
3.1	SAR Screening	Update SAR screening as part of future EIS studies to ensure that any newly listed SAR are considered prior to development taking place and that potential impacts to SAR / SAR habitat are assessed in consideration of the specific proposals	MECP
3.2	SAR Turtles	Consult with MECP to determine if detailed surveys are required for developments adjacent to confirmed SAR turtle habitat.	MECP
3.3	SWH	Consult with MECP to determine if detailed surveys are required for developments adjacent to confirmed SWH turtle habitat.	City, MECP, GRCA
4.0 Aquatics			
4.1	Aquatic Habitat in Mohawk Lake and Canal	No untreated water should be directed to Mohawk Lake or Canal from future development. Any SWM infrastructure that will outlet to Mohawk Lake or Canal should be designed to adhere to GRCA quantity and quality control targets. During-construction, mitigation measures to protect surface water quality should be implemented, including an erosion and sediment control plan, spills management plan, vegetation management plan and typical best-practices. Specific impacts and mitigation measures to be determined during future EIS studies.	City, MNRF/MECP, DFO, GRCA

I.D. #	Constraint / Concern	Mitigation / Protection / Future Work	Concerned Agency
5.0 Enhancement and Restoration Opportunities			
5.1	Enhancement and Restoration of the Existing Natural Heritage System	Consider implementing future restoration efforts within the study area's existing natural heritage system (e.g., invasive species management, improvements to pollinator habitat, native plantings, etc.).	City, GRCA
6.0 Permitting			
6.1	Endangered Species Act	Obtain ESA authorization for any SAR impacted by future development (i.e., Blanding's Turtle). Consultation should occur with MECP prior to development taking place to determine need for surveys / potential permitting.	MECP
6.2	GRCA Permit	For works proposed within GRCA Regulated Areas, obtain a permit from GRCA under O. Reg 150/06	GRCA

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APPENDIX A:
FIGURES

APPENDIX B:
TERMS OF REFERENCE AND AGENCY CORRESPONDENCE

APPENDIX C:
FIELD SURVEY CHRONOLOGY

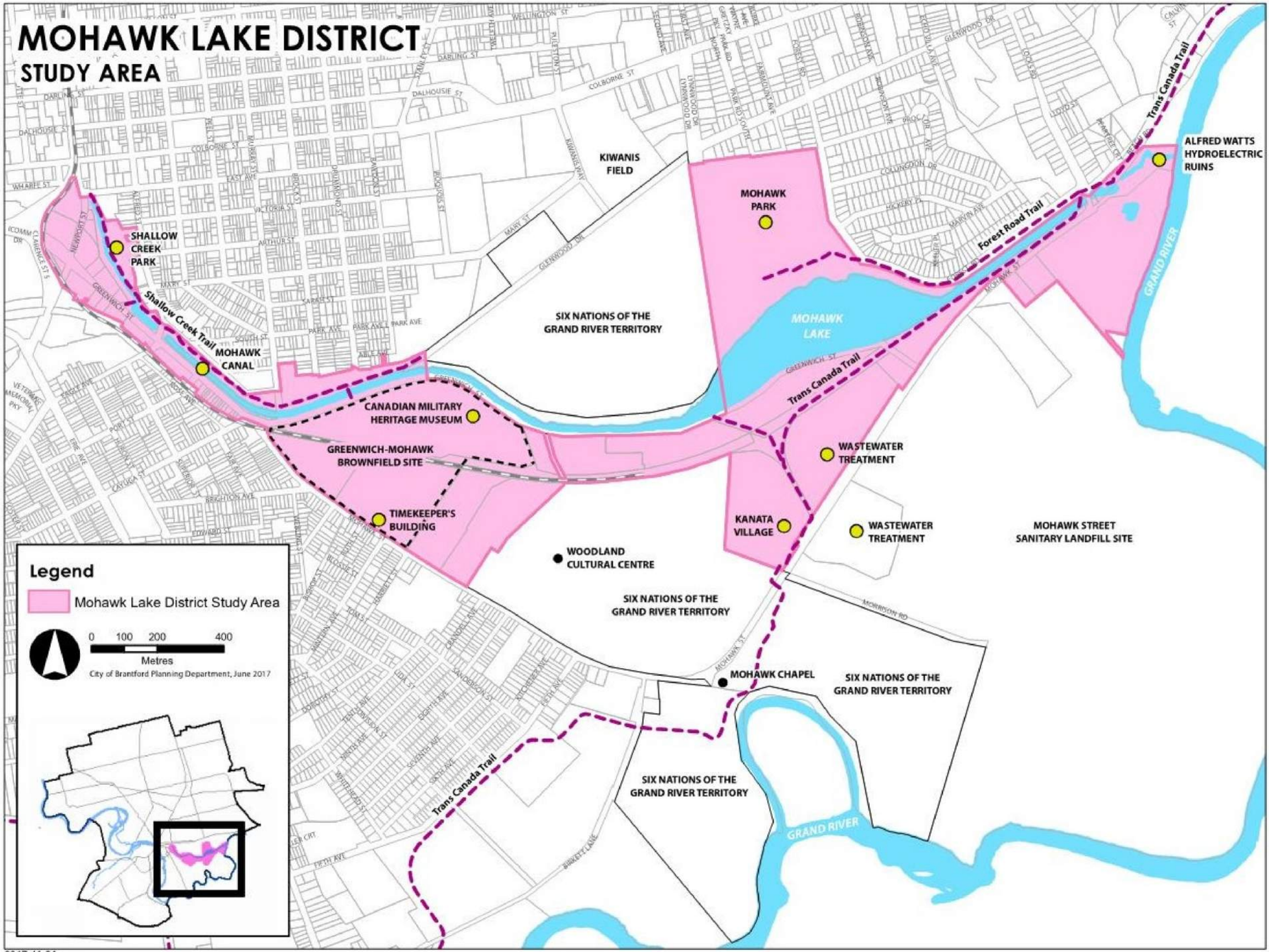
APPENDIX D:
VASCULAR PLANT LIST

APPENDIX E:
BREEDING BIRD SURVEY RESULTS

APPENDIX F:
SPECIES AT RISK SCREENING

APPENDIX A:
FIGURES

MOHAWK LAKE DISTRICT
STUDY AREA



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WSP	MOHAWK LAKE DISTRICT PLANNING STUDY, BRANTFORD Study Area	APPROXIMATE SCALE AS SHOWN	Date: July 2020 Project No: 17M-02119-00 Figure No: 1

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MOHAWK LAKE DISTRICT PLANNING STUDY, BRANTFORD
Official Plan Environmental Desigations

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Date: July 2020
Project No: 17M-02119-00
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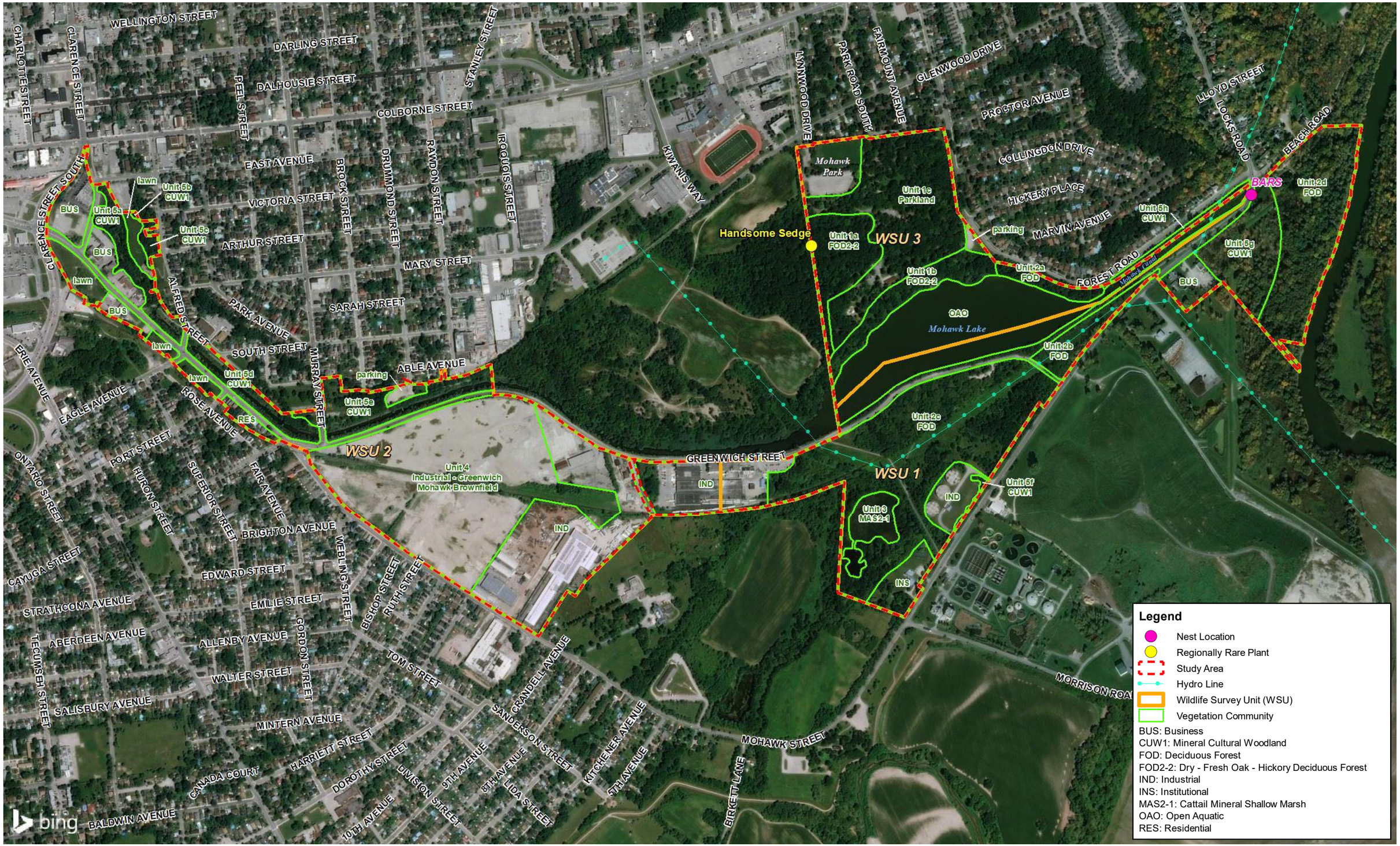

Legend

- Nest Location
- Regionally Rare Plant
- Study Area
- Hydro Line
- Wildlife Survey Unit (WSU)
- Vegetation Community

BUS: Business
CUW1: Mineral Cultural Woodland
FOD: Deciduous Forest
FOD2-2: Dry - Fresh Oak - Hickory Deciduous Forest
IND: Industrial
INS: Institutional
MAS2-1: Cattail Mineral Shallow Marsh
OAO: Open Aquatic
RES: Residential

MOHAWK LAKE DISTRICT PLANNING STUDY, BRANTFORD
Natural Environment Features

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Date: July 2020
Project No: 17M-02119-00
Figure No: 3

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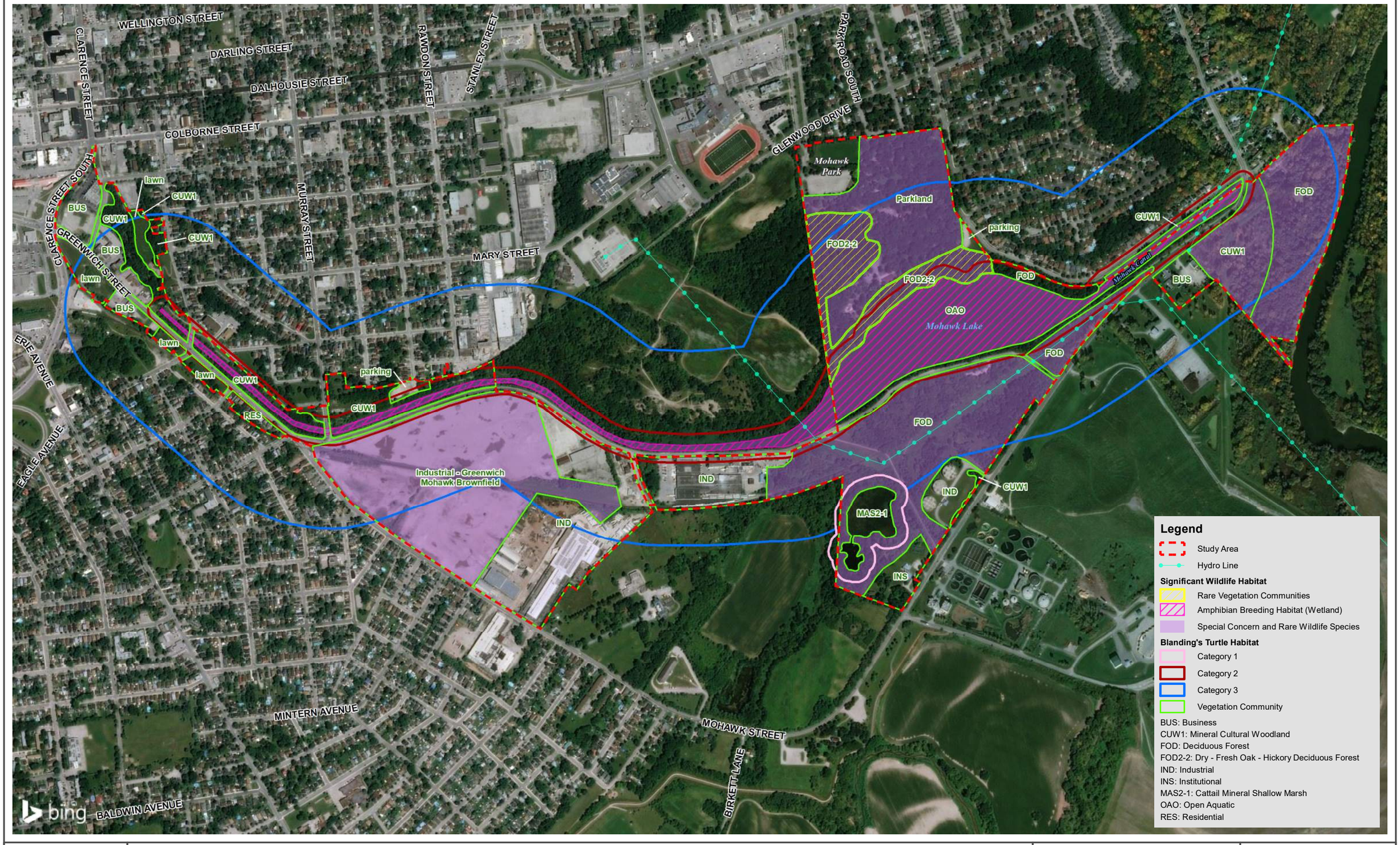

MOHAWK LAKE DISTRICT PLANNING STUDY, BRANTFORD
Ecological Constraints

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Date: July 2020
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MOHAWK LAKE DISTRICT PLAN

City of Brantford

July 2020 - Revised Draft

LEGEND

- Enhanced Mixed Use Gateway
- Mixed Use Corridor
- Mixed Commercial
- Institutional
- Transitional Institutional Mixed Use
- Museum
- Park and Open Space
- Existing Residential
- Study Area Boundary

Scale 1 : 2500
(24 x 36)

19M-00294-00

MOHAWK LAKE DISTRICT, BRANTFORD
Demonstration Plan

APPROXIMATE
SCALE AS SHOWN

Date: July 2020
Project No: 17M-02119-00
Figure No: 5

31 Jul 2020

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MOHAWK LAKE DISTRICT
AREA PLAN

CONNECTIVITY AND RECREATIONAL OPPORTUNITIES

CITY OF BRANTFORD

WSP	MOHAWK LAKE DISTRICT PLANNING STUDY, BRANTFORD Concept Plan	APPROXIMATE SCALE AS SHOWN	Date: July 2020 Project No: 17M-02119-00 Figure No: 6

24 Oct 2019

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APPENDIX B:
TERMS OF REFERENCE AND AGENCY CORRESPONDENCE

MOHAWK LAKE DISTRICT PLANNING STUDY, BRANTFORD

ENVIRONMENTAL IMPACT STUDY – Terms of Reference

1.0 INTRODUCTION AND SITE CONTEXT

WSP Canada Group Limited (WSP) has been retained by the City of Brantford to complete an Environmental Impact Study (EIS) as input to the broader Mohawk Lake District Planning Study, Brantford, Ontario. The Mohawk Lake District Study Area (the "study area"), shown on Figure 1, is in southeast Brantford, between Eagle Place and East Ward neighbourhoods. The lands within the Study Area are adjacent to Mohawk Canal / Mohawk Lake, and include the following key features / land uses: the Alfred Watts hydro generating station ruins to the east; Mohawk Park north of the Mohawk Canal; Kanata Village and the City's Water and Wastewater Treatment Plant to the south; and the Greenwich Mohawk brownfield site and existing developed areas to the west. In addition, sections of the Trans Canada Trail extend through the Study Area and adjacent lands. The Study Area supports multiple land use designations including Residential, Downtown Urban Growth Centre, General Employment and Core Natural Areas, as designated in the City of Brantford *Draft* Official Plan (2016).

Adjacent lands include the City's Municipal Landfill Facility to the south/east; two large parcels of land that are part of the Six Nations of the Grand River Territory; urban developed areas to the west and north; and the Grand River and valleylands to the south.

2.0 RELEVANT STUDIES AND POLICY

The Study Area has received a considerable amount of analysis, through broader studies, and targeted work within the Study Area. In addition, there are a number of databases which house information relevant to the Study Area. The following sources are of relevance to the Study Area:

- City of Brantford Official Plan Review, Environmental Data Report (ESG International Inc.; 2001)
- City of Brantford Waterfront Master Plan (The Planning Partnership et.al., 2010)
- City of Brantford Official Plan Review, Background Paper and Natural Heritage Strategy (Plan B Natural Heritage; February 2014)

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- Mohawk Lake Characterization Study (in process)
- City of Brantford Official Plan (2008)
- City of Brantford Draft Official Plan (2016)
- Ministry of Natural Resources and Forestry (MNRF)
    - Natural Heritage Information Centre (NHIC) database
    - Information provided via email dated December 5, 2017
- Grand River Conservation Authority (GRCA)
    - Gran River Information Network (GRIN)
    - Online mapping information
    - Information provided via email dated November 24, 2017
    - Information provided during teleconference February 21, 2018
- Other databases: ebird; Ontario Breeding Bird Atlas; Ontario Reptile and Amphibian Atlas
- Satellite / air photo imagery

3.0 STUDY ACTIVITIES TO DATE

Key study activities to date are as follows:

- October 30, 2017. Project Initiation Meeting
- Prepare and circulate the Background Report (Prepared by WSP and submitted in Draft to City staff)
- January 2018. Mohawk Lake District Plan Background Report (WSP)
- February 21, 2018. Teleconference with attendees from the City of Brantford, GRCA and WSP to solicit input on the EIS Terms of Reference
- 2018 field surveys as listed in Section 5
- Submission of a Draft TOR in April 2018; incorporation of GRCA comments received (email dated May 2, 2018) in the current TOR

4.0 NATURAL HERITAGE FEATURES & FUNCTIONS

The above-referenced studies, policy documents and other secondary sources of information were considered in the preparation of the Background Report. Key findings related to designated natural heritage features are summarized below.

- **Provincially Significant Wetlands** (PSW): None identified within the study area.
- **Significant Woodlands**: All woodlands greater than 4 ha in size within the City of Brantford are identified as Significant Woodlands. There are a number of these features present within the study area. These features are located in Mohawk Park, as well as areas immediately south of Mohawk Lake and west of the Grand River in the easternmost portion of the study area.
- **Significant Wildlife Habitat** (SWH): One area of SWH was identified through available background information: a rare plant community. The rare plant community is located in the western portion of Mohawk Park, west of the access road and park facilities. One potential SWH area is present in association with Mohawk Lake (for Snapping Turtle). MNRF will be contacted in regard to SWH.
- **Areas of Natural and Scientific Interest** (ANSI): None present within the study area.
- **Fish Habitat**: Mohawk Lake and Canal directly support a diverse warmwater fish community.
- **Species at Risk**: Habitat for Species at Risk (SAR) is known to be present within the City of Brantford, and as such could be present in the natural areas within the study area depending on habitat availability and quality. MNRF provided the following information for two SAR turtle species known from the study area:
    - Snapping Turtle – Mohawk Lake. The lake and any areas used by the species, including for nesting, has the potential to be significant wildlife habitat.
    - Blanding's Turtle – Kanata Village. In accordance with the Blanding's Turtle General Habitat Description (MNRF 2013), the following habitats are present within the study area: Category 1 habitat (the pond plus 30 meters); Category 2 habitats (Mohawk Lake and wetlands plus 30 meters); Category 3 habitats (the connections between the wetlands and open water features located 500 meters apart). MNRF will be contacted in regard to extent of SAR habitat.
- **In-force City of Brantford Official Plan (2008).** Under the in-force Official Plan (2008), the following Natural Heritage policy and designation areas are identified:
    - *Environmental Protection Policy Areas* (EPPAs)
        - None is present in the Study Area (per Schedule 3-1)

- *Environmental Control Policy Areas* (ECPAs)
    - ECPAs are identified north and south of Mohawk Lake (per Schedule 3-1)
- Adjacent Lands - lands within 50m of an EPPA
    - None is present in the Study Area (per Schedule 3-1)
- Wetlands
    - There is one evaluated, non-provincially significant wetland within the Study Area: the Mohawk Lake and Oxbow Wetland Complex. This includes wetland areas parallel to the north side of Mohawk Canal west of Mohawk Lake and within woodlands south of Mohawk Lake (per Schedule 3-3 and GRCA mapping)
- Mineral Resource Areas
    - None is present in the Study Area (per Schedule 3-2)

- **City of Brantford Official Plan, Waterfront Master Plan and Natural Heritage Strategy:**
    - **Core Natural Areas**: These features are generally consistent with the Designated Natural Features present within the study area, described above. *Core Natural Areas* in the study area include woodlands, rare plant community and an evaluated, non-provincially significant wetland. These features contribute to the *Natural Heritage System* identified in the Draft City of Brantford Official Plan (Version 1, July 2016).
    - **Significant Valleylands**: The study area falls within Grand River valley, which is designated as a significant valley, as identified in the City of Brantford Natural Heritage Strategy (Plan B Natural Heritage, 2014).
    - **Linkages**: A linkage / movement corridor exists within the study area, running along Mohawk Lake and Mohawk Canal from its confluence with the Grand River to the eastern edge of the Greenwich-Mohawk Brownfield Site, as identified in the City of Brantford Natural Heritage Strategy (Plan B Natural Heritage, 2014).
    - **Areas Regulated by Grand River Conservation Authority**: Portions of the study area are regulated by GRCA under Ontario Regulation 150/06. These areas are generally consistent with lands identified as floodplain in the City of Brantford Official Plan. The entirety of the study area south and east of Mohawk Lake falls within the regulated areas as do portions of Mohawk Park adjacent to Mohawk Lake. The area identified as regulated lands by GRCA are not static and are subject to revision.

5.0 PROPOSED EIS SCOPE OF WORK

The proposed EIS scope of work is intended to provide sufficient information as input to land uses and policy guidance for the Mohawk Lake District Planning Study. The site specific natural heritage study components are based primarily on the Data Gap analysis presented in the Background Report (January 2018), in consideration of any other relevant information, including input provided by review agencies. This scope is intended to be appropriate to inform the development of a District Plan and implementing Official Plan policy. It is noted that more detailed Environmental Impact Studies may be required in support of development applications or recommended works (e.g., trails). The scope identified herein is also consistent with the proposal submitted by WSP to the City of Brantford. Any additional work program tasks would require additional approved budget.

Although existing secondary source documentation provides a general characterization of the flora and fauna present or potentially present based on habitats, information is not specific to the study area. Hence, floral and faunal inventories are recommended. This work will focus on habitat characterization, floristic inventorying and SAR species searches / habitat assessment.

Given that aquatic information is fairly comprehensive for Mohawk Lake and Canal, aquatic field work for the EIS will focus on documenting any small tributaries or outlets currently not mapped / known in the study area. Fishing / fish community assessments are not recommended.

Existing natural heritage constraints (e.g., designated areas) will be confirmed through field work as part of the EIS. Given that these constraints are unlikely to change and since these areas are unlikely to be proposed for development or land use change, characterization of these areas will be based on reconnaissance level field work in the EIS. Comprehensive and/or specialized field surveys are not proposed for those areas.

The EIS will include the following scope of work:

- **Background Information Update.** A comprehensive background information review was completed as part of the Background Report. Any new information will be considered, along with previous work. In particular, relevant results from the Mohawk Lake Characterization Study (in process; July 2018) will be considered, and we will liaise with representatives to ensure consistency in analysis / presentation of results.
- **Field surveys.** Field surveys are proposed on two dates: one in late May / early June and one in early-mid July. The primary focus is general habitat assessment, with supplemental floral and faunal inventories. Surveys will include the following elements, undertaken during each site visit[1]:

[1] Properties within the study area owned by GRCA will not be directly accessed due to timing of permission.

- Preliminary botanical inventory and vegetation community classification per the Ecological Land Classification (ELC)
- Delineation of wetland boundaries based on current Ontario Wetland Evaluation System (OWES) guidelines and evaluation in accordance with the Policies for the Administration of the Development, Interference to Wetlands and Alterations to Shorelines and Watercourses Regulation, Ontario Regulation 150/06 (GRCA 2015)
- Breeding bird survey per Ontario Breeding Bird Atlas (OBBA) protocol
- General wildlife habitat characterization, with a focus on potential SAR habitat potential. This will include a reconnaissance level survey to assess turtle nesting habitat suitability [2]
- Document any aquatic habitat assessment not mapped on existing databases; record general habitat attributes.

- **Agency Liaison.** If any SAR are encountered during field surveys, MNRF will be consulted for direction on approval requirements, as requested by MNRF.
- **Input to Land Use Concepts.** Based on natural heritage constraints
- **Prepare Draft EIS Report for Agency Review.** Incorporating existing conditions, policy review, impacts and mitigation and recommendations, including recommendations for future studies.
- **Revise and Finalize EIS Report based on Agency Comments.**

[2] Note that turtle nesting surveys recommended by MNRF are not proposed and have not been included herein. These may be identified as a contingency, pending reconnaissance level survey results and client approval.

November 20, 2017

Grand River Conservation Authority (GRCA)
400 Clyde Road, Cambridge Ontario
N1R 5W6

To whom it may concern:

WSP Canada Inc. has been retained by The Corporation of the City of Brantford to conduct the Mohawk Lake District Planning Study in Brantford Ontario. The study area encompasses a diverse composition of distinctive areas and land uses.

The study area generally encompasses Mohawk Park, Mohawk Lake and Canal as well as select properties adjacent to these features. In fulfillment of the tasks associated with the planning study, updated ecological background information is required for the study area (see attached map). As such, we are formally contacting you to request any available natural heritage information pertinent to the study area.

Information we are seeking includes:

Terrestrial

- Wildlife and vegetation species observation records;
- Sensitive wildlife habitat locations (nesting/breeding/hibernation);
- Sensitive avian nesting sites;
- Designated natural features information and mapping;
- ELC community information.

Aquatic

- Fish community composition / fish species observation records;
- Sensitive and/or specialized fish habitat;
- Thermal classifications.

Species at Risk (SAR)

- Locations, observation dates and any other relevant information about SAR – if possible, please provide the UTM's/accuracy codes; and
- Locally rare species lists or species records known within the study area.

If further information is required, please feel free to contact the undersigned. Thank you for your assistance, it is greatly appreciated.

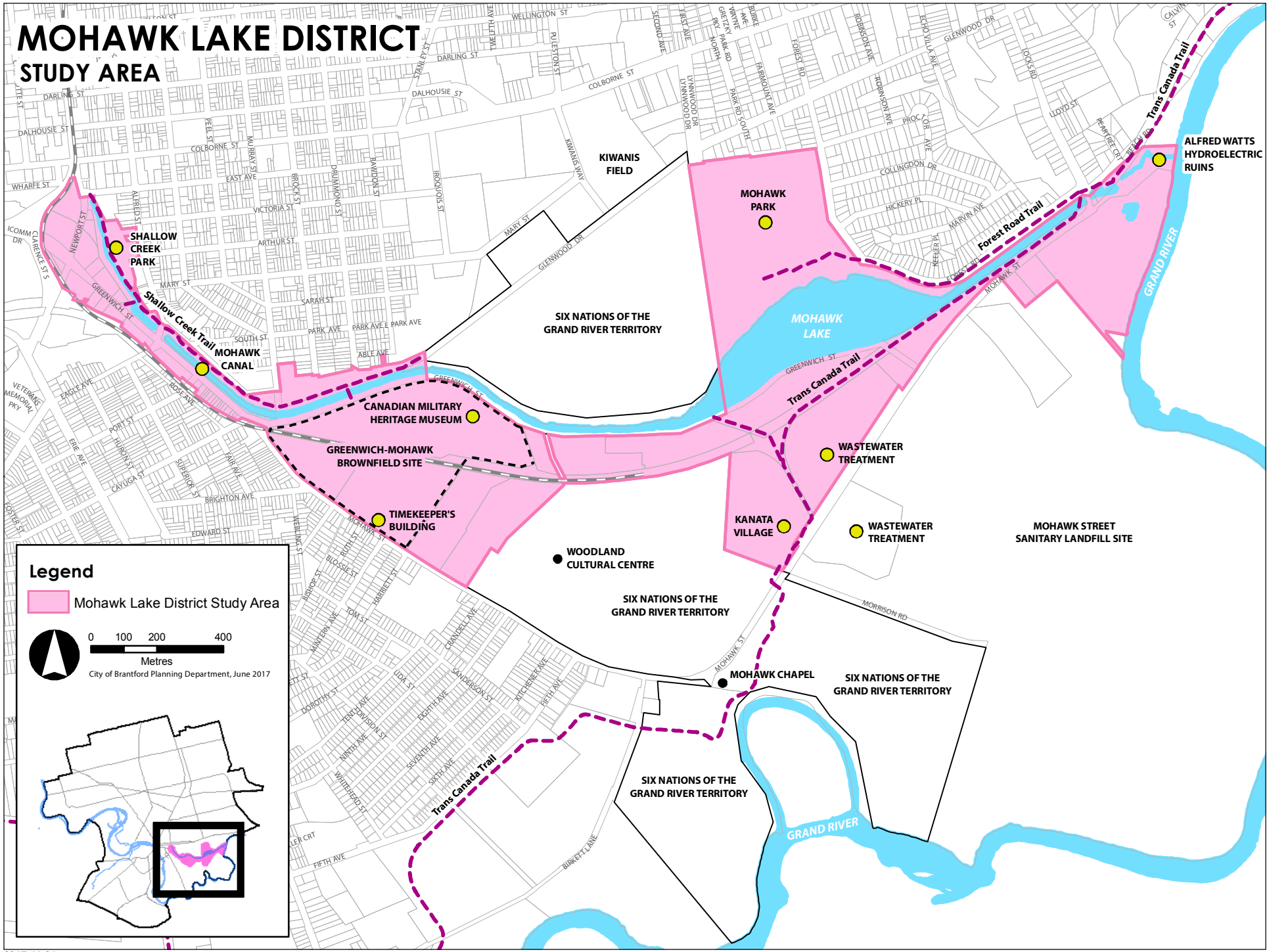
Yours sincerely,

Steven Leslie
Ecologist

582 Lancaster Street West
Kitchener, ON, Canada N2K 1M3

Fax: +1 519 743-8778

wsp.com


MOHAWK LAKE DISTRICT
STUDY AREA
SHALLOW CREEK PARK
Shallow Creek Trail
MOHAWK CANAL
KIWANIS FIELD
SIX NATIONS OF THE GRAND RIVER TERRITORY
MOHAWK PARK
MOHAWK LAKE
Forest Road Trail
Trans Canada Trail
GRAND RIVER
ALFRED WATTS HYDROELECTRIC RUINS
CANADIAN MILITARY HERITAGE MUSEUM
GREENWICH-MOHAWK BROWNFIELD SITE
TIMEKEEPER'S BUILDING
WASTEWATER TREATMENT
KANATA VILLAGE
WOODLAND CULTURAL CENTRE
MOHAWK STREET SANITARY LANDFILL SITE
MOHAWK CHAPEL
Legend
Mohawk Lake District Study Area
0 100 200 400
Metres
City of Brantford Planning Department, June 2017

2017-11-01

Leslie, Steven

From: Tony Zammit <tzammit@grandriver.ca>
Sent: November 24, 2017 2:30 PM
To: Leslie, Steven
Subject: RE: Natural Environment Information Request

Hi Steven,

My apologies for the delay. I wanted to canvass a few other staff in the office before responding.

For starters, I would refer you to the GRCA's online mapping for information on natural heritage features and natural hazards identified by the GRCA.

The GRCA owns land toward the east end of the study area and does have preliminary ELC mapping for this property. If you are interested in obtaining the relevant shape file/SDE layers (i.e. GRCA property limits and ELC vegetation boundaries), please contact Zoë Green (zgreen@grandriver.ca) in our Geomatics Department. If you are interested in conducing field work of your own on this or any other GRCA property, an access permit from the GRCA may be required. Permits are relatively easy to obtain following the completion and submission of a GRCA research application form, which can be downloaded from the following:

https://www.grandriver.ca/en/our-watershed/resources/Documents/ResearchForm.pdf

Christmas Bird Counts have been conducted within and around the City of Brantford the last 3 years, and another one will take place this year. Some of this data may be available through Ebird. I was involved in the past and recall seeing several species of gulls, which likely move between the landfill and the lake. I would not be surprised if the lake and canal attracts large numbers of waterfowl during the winter.

I am also aware of a few anecdotal wildlife records. According to one land owner who also sites on the City's EPAC, beavers, muskrats, and turtles (painted and snapping) are present along the canal (and probably the lake as well). Bats have been observed at dusk (foraging habitat likely present, hibernation sites possible in older buildings) and ospreys have raised young within this area (nest location not known).

I understand the City is also undertaking a Rehabilitation Study for Mohawk lake and the associated channel and that they have compiled several background reports to support a terms of reference for this work. I assume you will have access to those reports.

Hope this helps.

Best,

Tony

Anthony E. Zammit, MES, BSc, BEd | Watershed Ecologist
Grand River Conservation Authority
400 Clyde Road, Box 729, Cambridge, Ontario N1R 5W6
Tel: 519-621-2763 x2246 | Toll Free: 866-900-4722 | Fax: 519-621-4844
tzammit@grandriver.ca | www.grandriver.ca

From: Leslie, Steven [mailto:Steven.Leslie2@wsp.com]
Sent: Monday, November 20, 2017 2:18 PM
To: Tony Zammit
Subject: Natural Environment Information Request

Hello Mr. Zammit,

I am emailing you once again with an information request for a new WSP project that I am helping out with. As per your previous email relating to another project that I contacted you about, I have checked GRCA's online mapping tool and just wanted to send in an information request in case there is any additional information that you or one of your colleagues may be able to provide. If you would be able to respond to the attached information request yourself, or let me know who I should contact that may be able to assist me, it would be greatly appreciated.

Thank you for your time,

Steven Leslie, B.E.S.
Ecologist
Ecology & Environmental Impact Assessment (EIA)

T+ 1 519-904-1798

582 Lancaster Street West
Kitchener, Ontario,
N2K 1M3 Canada

wsp.com

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Guelph District MNRF
Information Request Form

Ontario

Consultant Name:	Steven Leslie
Company Name:	WSP Canada Inc.
Email Address:	steven.leslie2@wsp.com
Phone Number:	519-904-1798
Proponent Name:	The Corporation of the City of Brantford
Project Name:	Mohawk Lake District Planning Study
Property Address:	See attached map
Township/Municipality:	Brantford
Lot & Concession:	N/A

UTM Coordinates: (NAD83)

562410 Easting (X)

4776395 Northing (Y)

Brief Description of Undertaking: Natural heritage background search in order to provide input to a background report, prior to undertaking a scoped EIS in 2018 as part of a comprehensive planning study.

Have you previously contacted someone at MNRF for information on this site? Yes ☐ No ☑

If yes, when and who?

Provide a map of accurate scale to illustrate footprint/study area of the proposed activity in relation to the surrounding landscape (e.g. property boundaries, roads, waterbodies, natural features, towns, and other human landmarks). Use of aerial photography is strongly encouraged. Include scale, north arrow and legend.

ATTACHMENTS – I have attached a:

☐ Picture ☑ Map ☐ Other

REQUEST - I would like to request the following information for the property identified above:
**Requires an appointment and remittance of fees.*

☐ Wetland evaluation and data record *
(please provide name of wetland if known)

☐ ANSI Checksheet *
(please provide name of ANSI if known)

☐ Fish Dot Information *
(fish and other aquatic species found in a particular area of a watercourse)

☑ Provincially Tracked Species/Species at Risk

☑ Other

Any other available natural heritage informa

Please forward the completed form to: esa.guelph@ontario.ca
Or send by mail:
Guelph District, Ministry of Natural Resources and Forestry
1 Stone Road West Guelph, ON N1G 4Y2

Leslie, Steven

From: Buck, Graham (MNRF) <Graham.Buck@ontario.ca>
Sent: December 21, 2017 11:43 AM
To: Leslie, Steven
Subject: Mohawk_Lake_District_Planning_Study_MNRF_Response
Attachments: SAR_Brantford.pdf

Hi Steve,

The following turtle species are known from the study area:

1. Snapping Turtle – Mohawk Lake. The lake and any areas sued by the species, including for nesting, has the potential to be significant wildlife habitat.
2. Blanding's Turtle – Kanata Village. The habitats of this species are protected by the ESA. The habitats of the species in the study area, as per the general habitat description, are as follows: Category 1 habitat: the pond plus 30 meters around the pond is. Category 2 habitats: Mohawk Lake and the wetlands the study area plus 30 meters. Category 3 habitats the connections between the wetlands and open water features located 500 meters apart.

As part of EIS work it will be important to determine if there is any turtle nesting or movements, particularly Blanding's Turtle in the study area. Therefore any areas where conditions are suitable for turtle nesting, including agriculture fields, meadows and areas of exposed soil should be check.

A survey technique which Guelph district staff have endorsed in the past, specific to Blanding's Turtle, is described below. If the intent is to search for other species of nesting turtles (Painted, Snapping etc.) these recommendations may need to be altered.

BLANDING'S TURTLE NESTING SURVEYS:

- Blanding's Turtle nesting typically occurs within 250 metres of a wetland edge. It is important to note that the nearest wetland may not be used by the species for hibernation. Blanding's Turtles often move hundreds of metres away, and up to six kilometres, from overwintering habitats before completing nesting.
- Habitats utilized for nesting are open, sunny and warm, with soils that are typically friable (not compacted) and dominated by fragments of sand and gravel.
- The MNRF recommends that areas suitable for nesting, within two kilometres of a known overwintering pond, be examined for nesting and predated nests.
- Suitable areas for nesting can include muskrat huts, agricultural fields, meadows, soil and mulch piles, gardens and flower beds, compost heaps and sand dunes and beaches.

- Nesting in Ontario can occur any time during a six week period, spanning from late May to early July. However, Blanding's Turtle typically nest in Ontario in June over a three week period.
- Blanding's Turtle nest at the same time or after Painted and Snapping Turtle nesting has begun. Evidence that these more common species are nesting may be used to determine when to initiate targeted surveys for Blanding's Turtle.
- Blanding's Turtle nesting is often associated with warm temperatures (>14 degrees Celsius) and high humidity, including light rain. However, nesting can also occur in cooler temperatures as well.
- Nesting typically occurs in the evening, beginning at 6:00 PM and ending at 10:00 PM. Nesting activity may also extend to midnight on occasion.
- In some instances female Blanding's turtles can take two hours to nest, and can be easily disturbed by people during nesting. Therefore, observations should be made a safe distance to limit potential disturbance.

BLANDING'S TURTLE NEST SURVEYS

- It may be possible to identify the predated nest to species by using the following guidelines:

Species	**Egg Dimensions**	**Number per clutch**
Painted Turtle	ellipsoid in shape; 3.3 cm long and 2.3 cm wide; soft exterior	5-10
Snapping Turtle	Spherical and 28.5-35.5mm in diameter	20-40
Blanding's Turtle	ellipsoid in shape and > 4 cm long, hard exterior	Typically 5-10 occasionally up to 20

- The possession and transport of the egg fragments of Blanding's Turtle requires a Protection and Recovery s.17 2 (b) permit under the Endangered Species Act from the Ministry of Natural Resources and Forestry.

BLANDING'S TURTLE NEST AND NESTING SURVEY EFFORT

In instances where there is potential nesting habitat, the MNRF recommends both nesting and nest surveys be completed. Nesting surveys should take place from 6:00 PM to 10:00 PM during warm (> 14 degrees Celsius) and humid nights. The surveys should commence at the first sign of Painted or Snapping Turtle nesting in the area and continue for three weeks (21 days). If it is not known when Painted Turtle or Snapping Turtle nesting has begun, surveys should begin the last week of May and continue for six weeks. During the six week survey window information on when common turtle nesting activity has begun may become

available. There may be the opportunity to scope the six week survey effort to include this information. This should be done in consultation with the MNRF Guelph District Office.

The MNRF recommends the following table be used as guidance for survey effort:

Painted Turtle and/or Snapping Turtle nesting commenced in the area	**Painted Turtle and/or Snapping Turtle nesting not commenced in the area***
Nesting surveys: 6 visits on suitable nights during a three week period	Nesting surveys: 18 visits on suitable nights during a six week period
Nest surveys: 3 visits during the 3 week period	Nest surveys: 6 visits during the 6 week period

If Blanding's Turtle nesting is observed, the MNRF Guelph District Office (graham.buck@ontario.ca or esa.guelph@ontario.ca) should be contacted as soon as possible for additional guidance.

In addition to turtles Barn Swallow nesting has also be confirmed in the study area.

In addition to the known species at risk described above the area should be screened and survey for other species at risk. A list of SAR that have the potential to occur in the area can be produced by cross-referencing the ecosites described during the habitat inventory with the habitat descriptions of SAR known to occur within the planning area. The list of SAR known to occur in the City of Brantford is attached.

Sincerely,

Graham Buck
Management Biologist
Ministry of Natural Resources and Forestry
Guelph District
1 Stone Road West Guelph ON
N1G 4Y2
519 826 4505
graham.buck@ontario.ca

From: ESA Guelph (MNRF)
Sent: December-05-17 10:26 AM
To: Buck, Graham (MNRF)
Subject: FW: Natural Heritage Information Request

From: Leslie, Steven [mailto:Steven.Leslie2@wsp.com]
Sent: November-15-17 9:42 AM
To: ESA Guelph (MNRF)
Subject: Natural Heritage Information Request

Hello,

Please see attached Natural Heritage Information request and map of the study area for the Mohawk Lake District Planning Study in Brantford. If there are any questions or concerns, please do not hesitate to contact me.

Thank you,

Steven Leslie, B.E.S.
Ecologist
Ecology & Environmental Impact Assessment (EIA)

T+ 1 519-904-1798

582 Lancaster Street West
Kitchener, Ontario,
N2K 1M3 Canada

wsp.com

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APPENDIX C:
FIELD SURVEY CHRONOLOGY

Appendix C. Field Survey Chronology

Date	Staff	Task	Plants	Wildlife		Coverage / Units	Weather Conditions
			ELC / Botanical	Breeding Birds	SAR/SWH/General Wildlife		
May 29, 2018	LW	Ecological Land Classification (ELC), botanical inventory, SAR habitat assessment, significant wildlife habitat (SWH) assessment, incidental wildlife observations	4		4	All	AirTemp Start: 19; AirTemp End: 24; Sky Start: 1, End: 1; Wind Start: 1, End: 1
June 18, 2018	JV	Avifauna surveys (breeding birds), SAR habitat assessment, significant wildlife habitat (SWH) assessment, incidental wildlife observations		3.5	3.5	All	AirTemp Start: 26; AirTemp End: 32; Sky Start: 1, End: 2; Wind Start: 2, End: 2
July 3, 2018	LW	Ecological Land Classification (ELC), botanical inventory, SAR habitat assessment, significant wildlife habitat (SWH) assessment, incidental wildlife observations	4		4	All	AirTemp Start: 21; AirTemp End: 30; Sky Start: 1, End: 1; Wind Start: 2, End: 2
July 5,2018	JV	Avifauna surveys (breeding birds), SAR habitat assessment, significant wildlife habitat (SWH) assessment, incidental wildlife observations		3.5	3.5	All	AirTemp Start: 27; AirTemp End: 31; Sky Start: 1, End: 1; Wind Start: 2, End: 2
Total # field dates	8		**2**	**2**	**4**		
Total # hours	30		**8**	**7**	**15**		

APPENDIX D:
VASCULAR PLANT LIST

Appendix D. Vascular Plant List

SCIENTIFIC NAME	COMMON NAME	FAMILY	CC[1]	CW[1]	G_RANK[3]	S_RANK[4]	COSEWIC[5]	SARA STATUS[6]	SARA SCHEDULE[6]	SARO[7]	BRANT COUNTY (Oldham 2017)[8]	NATIVE STATUS[9]
Acer negundo	Manitoba Maple	Sapindaceae	0	-2	G5	S5					C	N
Acer platanoides	Norway Maple	Sapindaceae	*	5	GNR	SNA					IX	I
Acer rubrum	Red Maple	Sapindaceae	4	0	G5	S5					C	N
Acer saccharum	Sugar Maple	Sapindaceae	4	3	G5	S5					C	N
Acer tataricum	Tatarian Maple	Sapindaceae	*	5	GNR	SNA						I
Ailanthus altissima	Tree-of-heaven	Simaroubaceae	*	5	GNR	SNA						I
Alliaria petiolata	Garlic Mustard	Brassicaceae	*	0	GNR	SNA					IX	I
Ambrosia artemisiifolia	Common Ragweed	Asteraceae	0	3	G5	S5					C	N
Ambrosia trifida	Great Ragweed	Asteraceae	0	-1	G5	S5					C	N
Arctium lappa	Great Burdock	Asteraceae	*	0	GNR	SNA					IX	I
Arisaema triphyllum	Jack-in-the-pulpit	Araceae	5	-2	G5	S5					C	N
Asclepias syriaca	Common Milkweed	Apocynaceae	0	5	G5	S5					C	N
Bidens frondosa	Devil's Beggarticks	Asteraceae	3	-3	G5	S5					C	N
Boehmeria cylindrica	False Nettle	Urticaceae	4	-5	G5	S5					C	N
Bromus inermis	Smooth Brome	Poaceae	*	5	G5TNR	SNA					IX	I
Capsella bursa-pastoris	Common Shepherd's Purse	Brassicaceae	*	1	GNR	SNA					IX	I
Carex formosa	Handsome Sedge	Cyperaceae	6	-2	G4	S4					R	N
Carex gracillima	Graceful Sedge	Cyperaceae	4	3	G5	S5					C	N
Carex grayi	Gray's Sedge	Cyperaceae	8	-4	G4	S4					R	N
Carex hirtifolia	Pubescent Sedge	Cyperaceae	5	5	G5	S4S5					U	N
Carex lupulina	Hop Sedge	Cyperaceae	6	-5	G5	S5					C	N
Carex pensylvanica	Pennsylvania Sedge	Cyperaceae	5	5	G5	S5					C	N
Carex rosea	Rosy Sedge	Cyperaceae	5	5	G5	S5					C	N
Carya ovata	Shagbark Hickory	Juglandaceae	6	3	G5	S5					C	N
Catalpa speciosa	Northern Catalpa	Bignoniaceae	*	3	G4?	SNA					IX	I
Celtis occidentalis	Common Hackberry	Cannabaceae	8	1	G5	S4					U	N
Cerastium fontanum	Common Mouse-ear Chickweed	Caryophyllaceae	*	3	GNR	SNA					IX	I
Chelidonium majus	Greater Celadine	Papaveraceae	*	5	GNR	SNA					IX	I
Cichorium intybus	Wild Chicory	Asteraceae	*	5	GNR	SNA					IX	I
Cicuta maculata var. maculata	Spotted Water-hemlock	Apiaceae	6	-5	G5T5	S5					C	N
Circaea canadensis	Broad-leaved Enchanter's Nightshade	Onagraceae	3	3	G5T5	S5					C	N
Cirsium arvense	Canada Thistle	Asteraceae	*	3	GNR	SNA					IX	I
Cirsium vulgare	Bull Thistle	Asteraceae	*	4	GNR	SNA					IX	I

SCIENTIFIC NAME	COMMON NAME	FAMILY	CC[1]	CW[1]	G_RANK[3]	S_RANK[4]	COSEWIC[5]	SARA STATUS[6]	SARA SCHEDULE[6]	SARO[7]	BRANT COUNTY (Oldham 2017)[8]	NATIVE STATUS[9]
Collinsonia canadensis	Canada Horsebalm	Lamiaceae	8	0	G5	S4					C	N
Convallaria majalis	European Lily-of-the-valley	Asparagaceae	*	5	G5	SNA					IX	I
Convolvulus arvensis	Field Bindweed	Convolvulaceae	*	5	GNR	SNA					IX	I
Cornus racemosa	Grey Dogwood	Cornaceae	2	-2	G5?	S5					C	N
Cornus rugosa	Round-leaved Dogwood	Cornaceae	6	5	G5	S5					C	N
Cornus sericea	Red-osier Dogwood	Cornaceae	2	-3	G5	S5					C	N
Dactylis glomerata	Orchard Grass	Poaceae	*	3	GNR	SNA					IX	I
Daucus carota	Wild Carrot	Apiaceae	*	5	GNR	SNA					IX	I
Diervilla lonicera	Northern Bush-honeysuckle	Caprifoliaceae	5	5	G5	S5					C	N
Dipsacus fullonum	Common Teasel	Caprifoliaceae	*	5	GNR	SNA					IX	I
Dryopteris carthusiana	Spinulose Wood Fern	Dryopteridaceae	5	-2	G5	S5					C	N
Echium vulgare	Common Viper's Bugloss	Boraginaceae	*	5	GNR	SNA					IX	I
Elaeagnus umbellata	Autumn Olive	Elaeagnaceae	*	3	GNR	SNA					IX	I
Epipactis helleborine	Broad-leaved Helleborine	Orchidaceae	*	5	GNR	SNA					IX	I
Equisetum arvense	Field Horsetail	Equisetaceae	0	0	G5	S5					C	N
Erigeron annuus	Annual Fleabane	Asteraceae	0	1	G5	S5					C	N
Erigeron philadelphicus	Philadelphia Fleabane	Asteraceae	1	-3	G5	S5					C	N
Fragaria vesca ssp. americana	American Woodland Strawberry	Rosaceae	4	4	G5T5	S5						N
Fragaria virginiana ssp. virginiana	Wild Strawberry	Rosaceae	2	1	G5T5	SU					C	N
Fraxinus americana	White Ash	Oleaceae	4	3	G5	S4					C	N
Galium aparine	Common Bedstraw	Rubiaceae	4	3	G5	S5					C	N
Galium sp.	Bedstraw sp.	Rubiaceae										
Geranium maculatum	Spotted Geranium	Geraniaceae	6	3	G5	S5					C	N
Geum canadense	Canada Avens	Rosaceae	3	0	G5	S5					C	N
Geum urbanum	Wood Avens	Rosaceae	*	5	G5	SNA					IX	I
Glyceria striata	Fowl Mannagrass	Poaceae	3	-5	G5	S5					C	N
Hesperis matronalis	Dame's Rocket	Brassicaceae	*	5	G4G5	SNA					IX	I
Hydrophyllum virginianum	Virginia Waterleaf	Boraginaceae	6	-2	G5	S5					C	N
Hylodesmum glutinosum	Large Tick-trefoil	Fabaceae	6	5	G5	S4					C	N
Hypericum perforatum	Common St. John's-wort	Hypericaceae	*	5	GNR	SNA					IX	I
Iris pseudacorus	Yellow Iris	Iridaceae	*	-5	GNR	SNA					IX	I
Juglans nigra	Black Walnut	Juglandaceae	5	3	G5	S4?					C	N
Juncus tenuis	Path Rush	Juncaceae	0	0	G5	S5					C	N

SCIENTIFIC NAME	COMMON NAME	FAMILY	CC[1]	CW[1]	G_RANK[3]	S_RANK[4]	COSEWIC[5]	SARA STATUS[6]	SARA SCHEDULE[6]	SARO[7]	BRANT COUNTY (Oldham 2017)[8]	NATIVE STATUS[9]
Larix laricina	Tamarack	Pinaceae	7	-3	G5	S5					R	N
Leersia oryzoides	Rice Cutgrass	Poaceae	3	-5	G5	S5					C	N
Leonurus cardiaca	Common Motherwort	Lamiaceae	*	5	GNR	SNA					IX	I
Leucanthemum vulgare	Oxeye Daisy	Asteraceae	*	5	GNR	SNA					IX	I
Linaria vulgaris	Butter-and-eggs	Plantaginaceae	*	5	GNR	SNA					IX	I
Lonicera tatarica	Tatarian Honeysuckle	Caprifoliaceae	*	3	GNR	SNA					IX	I
Lycopus americanus	American Water-horehound	Lamiaceae	4	-5	G5	S5					C	N
Lythrum salicaria	Purple Loosestrife	Lythraceae	*	-5	G5	SNA					IX	I
Maianthemum racemosum	Large False Solomon's-seal	Asparagaceae	4	3	G5	S5					C	N
Maianthemum stellatum	Star-flowered False Solomon's-seal	Asparagaceae	6	1	G5	S5					C	N
Malus pumila	Common Apple	Rosaceae	*	5	G5	SNA					IX	I
Medicago lupulina	Black Medick	Fabaceae	*	1	GNR	SNA					IX	I
Melilotus albus	White Sweet-clover	Fabaceae	*	3	G5	SNA					IX	I
Menispermum canadense	Canada Moonseed	Menispermaceae	7	0	G5	S4					U	N
Morus alba	White Mulberry	Moraceae	*	0	GNR	SNA					IX	I
Oenothera biennis	Common Evening Primrose	Onagraceae	0	3	G5	S5					X	N
Onoclea sensibilis	Sensitive Fern	Onocleaceae	4	-3	G5	S5					C	N
Ornithogalum umbellatum	Common Star-of-Bethlehem	Asparagaceae	*	1	G3G5	SNA						I
Oxalis stricta	European Wood-sorrel	Oxalidaceae	0	3	G5	S5					C	N
Parthenocissus sp.	Creeper sp.	Vitaceae										
Persicaria maculosa	Spotted Lady's-thumb	Polygonaceae	*	-3	G3G5	SNA					IX	I
Persicaria virginiana	Virginia Smartweed	Polygonaceae	6	0	G5	S4					X	N
Phalaris arundinacea var. arundinacea	Reed Canarygrass	Poaceae	0	-4	GNR	S5					C	N
Phragmites australis ssp. australis	European Reed	Poaceae	*	-4	G5T5	SNA					IC	I
Picea glauca	White Spruce	Pinaceae	6	3	G5	S5					X	N
Picea pungens	Blue Spruce	Pinaceae	*		G5	SNA						I
Pinus nigra	Austrian Pine	Pinaceae	*	-5	GNR	SNA						I
Pinus strobus	Eastern White Pine	Pinaceae	4	3	G5	S5					C	N
Pinus sylvestris	Scots Pine	Pinaceae	*	5	GNR	SNA					IX	I
Plantago lanceolata	English Plantain	Plantaginaceae	*	0	G5	SNA					IX	I
Plantago rugelii	Rugel's Plantain	Plantaginaceae	1	0	G5	S5					C	N
Poa compressa	Canada Bluegrass	Poaceae	0	2	GNR	SNA					IX	I
Poa pratensis ssp. pratensis	Kentucky Bluegrass	Poaceae	0	1	G5T5	SNA					IX	I

SCIENTIFIC NAME	COMMON NAME	FAMILY	CC[1]	CW[1]	G_RANK[3]	S_RANK[4]	COSEWIC[5]	SARA STATUS[6]	SARA SCHEDULE[6]	SARO[7]	BRANT COUNTY (Oldham 2017)[8]	NATIVE STATUS[9]
Podophyllum peltatum	May-apple	Berberidaceae	5	3	G5	S5					C	N
Populus balsamifera	Balsam Poplar	Salicaceae	4	-3	G5	S5					U	N
Populus deltoides ssp. deltoides	Eastern Cottonwood	Salicaceae	4	-1	G5T5	S5					C	N
Potentilla recta	Sulphur Cinquefoil	Rosaceae	*	5	GNR	SNA					IX	I
Prunella vulgaris ssp. lanceolata	Lance-leaved Self-heal	Lamiaceae	5	5	G5T5	S5					C	N
Prunus serotina	Black Cherry	Rosaceae	3	3	G5	S5					C	N
Prunus sp.	Cherry sp.	Rosaceae										
Prunus virginiana	Chokecherry	Rosaceae	2	1	G5	S5						N
Quercus alba	White Oak	Fagaceae	6	3	G5	S5					C	N
Quercus rubra	Northern Red Oak	Fagaceae	6	3	G5	S5					C	N
Ranunculus acris	Common Buttercup	Ranunculaceae	*	-2	G5	SNA					IX	I
Reynoutria japonica	Japanese Knotweed	Polygonaceae	*	3	GNR	SNA					IX	I
Rhamnus cathartica	European Buckthorn	Rhamnaceae	*	3	GNR	SNA					IX	I
Rhus typhina	Staghorn Sumac	Anacardiaceae	1	5	G5	S5					C	N
Ribes americanum	American Black Currant	Grossulariaceae	4	-3	G5	S5					C	N
Robinia pseudoacacia	Black Locust	Fabaceae	*	4	G5	SNA					IX	I
Rosa multiflora	Multiflora Rose	Rosaceae	*	3	GNR	SNA					IX	I
Rubus allegheniensis	Alleghany Blackberry	Rosaceae	2	2	G5	S5					X	N
Rubus idaeus ssp. strigosus	North American Red Raspberry	Rosaceae	0	-2	G5T5	S5					C	N
Rubus occidentalis	Black Raspberry	Rosaceae	2	5	G5	S5					X	N
Rudbeckia hirta	Black-eyed Susan	Asteraceae	0	3	G5	S5					C	N
Rumex crispus	Curly Dock	Polygonaceae	*	-1	GNR	SNA					IX	I
Rumex obtusifolius	Bitter Dock	Polygonaceae	*	-3	GNR	SNA					IX	I
Salix sp.	Willow sp.	Salicaceae										
Sambucus canadensis	Common Elderberry	Caprifoliaceae	5	-2	G5T5	S5					X	N
Silene latifolia	White Campion	Caryophyllaceae	*	5	GNR	SNA						I
Silene vulgaris	Bladder Campion	Caryophyllaceae	*	5	GNR	SNA					IX	I
Smilax herbacea	Herbaceous Carrionflower	Smilacaceae	5	0	G5	S4?					C	N
Solanum dulcamara	Climbing Nightshade	Solanaceae	*	0	GNR	SNA					IX	I
Solanum ptychanthum	Eastern Black Nightshade	Solanaceae	3	5	G5	S5					C	N
Solidago altissima var. altissima	Eastern Tall Goldenrod	Asteraceae	1	3	GNR	S5					C	N
Solidago canadensis var. canadensis	Canada Goldenrod	Asteraceae	1	3	G5T5	S5					C	N
Sonchus arvensis	Field Sow-thistle	Asteraceae	*									I

SCIENTIFIC NAME	COMMON NAME	FAMILY	CC[1]	CW[1]	G_RANK[3]	S_RANK[4]	COSEWIC[5]	SARA STATUS[6]	SARA SCHEDULE[6]	SARO[7]	BRANT COUNTY (Oldham 2017)[8]	NATIVE STATUS[9]
Sorbus aucuparia	European Mountain-ash	Rosaceae	*	5	G5	SNA					IX	I
Staphylea trifolia	American Bladdernut	Staphyleaceae	7	0	G5	S4					U	N
Symphyotrichum cordifolium	Heart-leaved Aster	Asteraceae	5	5	G5	S5					C	N
Symplocarpus foetidus	Eastern Skunk Cabbage	Araceae	7	-5	G5	S5					C	N
Syringa vulgaris	Common Lilac	Oleaceae	*	5	GNR	SNA					IX	I
Tanacetum vulgare	Common Tansy	Asteraceae	*	5	GNR	SNA					IX	I
Taraxacum officinale	Common Dandelion	Asteraceae	*	3	G5	SNA					IX	I
Thalictrum dioicum	Early Meadow-rue	Ranunculaceae	5	2	G5	S5					C	N
Thuja occidentalis	Eastern White Cedar	Cupressaceae	4	-3	G5	S5					C	N
Tilia americana	Basswood	Malvaceae	4	3	G5	S5					C	N
Toxicodendron radicans var. radicans	Eastern Poison Ivy (Climbing)	Anacardiaceae	5	-1	GNR	S5					C	N
Tragopogon dubius	Yellow Goatsbeard	Asteraceae	*	5	GNR	SNA					IX	I
Tragopogon pratensis	Meadow Goatsbeard	Asteraceae	*	5	GNR	SNA					IX	I
Trifolium hybridum	Alsike Clover	Fabaceae	*	1	GNR	SNA						I
Trifolium pratense	Red Clover	Fabaceae	*	2	GNR	SNA					IX	I
Trifolium repens	White Clover	Fabaceae	*	2	GNR	SNA					IX	I
Trillium grandiflorum	White Trillium	Melanthiaceae	5	5	G5	S5					C	N
Typha latifolia	Broad-leaved Cattail	Typhaceae	3	-5	G5	S5					C	N
Ulmus americana	White Elm	Ulmaceae	3	-2	G5	S5					C	N
Ulmus pumila	Siberian Elm	Ulmaceae	*	5	GNR	SNA					IX	I
Urtica dioica ssp. gracilis	Slender Stinging Nettle	Urticaceae	2	-1	G5T5	S5					C	N
Verbascum blattaria	Moth Mullein	Scrophulariaceae	*	4	GNR	SNA					IX	I
Verbascum thapsus	Common Mullein	Scrophulariaceae	*	5	GNR	SNA					IX	I
Verbena urticifolia	White Vervain	Verbenaceae	4	-1	G5	S5					C	N
Veronica arvensis	Corn Speedwell	Plantaginaceae	*	5	GNR	SNA					IX	I
Viburnum opulus ssp. opulus	Cranberry Viburnum	Adoxaceae	*	0	GNR	SNA					IX	I
Viola sp.	Violet sp.	Violaceae										
Vitis riparia	Riverbank Grape	Vitaceae	0	-2	G5	S5					C	N

PLANT LIST LEGEND

Scientific Name, Common Name, and Family
Based on Vascan (Dec. 2017) and NHIC (Dec. 16 2018)

Vascan: http://data.canadensys.net/vascan/search
NHIC: http://www.sse.gov.on.ca/sites/MNR-PublicDocs/EN/ProvincialServices/Ontario_Vascular_Plants.xlsx

[1] Coefficient of Conservatism, Coefficient of Wetness, Weediness, and Physiology/Habit
Oldham, M. J., W. D. Bakowsky and D. A. Sutherland. 1995. Floristic Quality Assessment System for Southern Ontario. Natural Heritage Information Centre, Ministry of Natural Resources. Peterborough, Ontario.
CC and CW values reflect updates by NHIC, current as of Dec. 16, 2018).

CC: Coefficient of Conservatism. Rank of 0 to 10 based on plants degree of fidelity to a range of synecological parameters: (0-3) Taxa found in a variety of plant communities; (4-6) Taxa typically associated with a specific plant community but tolerate moderate disturbance; (7-8) Taxa associated with a plant community in an advanced successional stage that has undergone minor disturbance; (9-10) Taxa with a high fidelity to a narrow range of synecological parameters.
CW: Coefficient of Wetness. Value between 5 and –5. A value of –5 is assigned to Obligate Wetland (OBL) and 5 to Obligate Upland (UPL), with intermediate values assigned to the remaining categories.
Weediness: Assigned to all non-native species and range from -1 (low impact of the species on natural areas) to -3 (high impact of the species on natural areas).
Habit: Physiology/Habit. The growth form of the species (e.g. forb, shrub, tree).

[3] G-Rank (Global)
Global Status from Nature Serve (via NHIC, Dec. 16, 2018)
Nature Serve: http://explorer.natureserve.org/
NHIC: http://www.sse.gov.on.ca/sites/MNR-PublicDocs/EN/ProvincialServices/Ontario_Vascular_Plants.xlsx

Global ranks are assigned by a consensus of the network of Conservation Data Centres (CDCs), scientific experts, and the Nature Conservancy to designate a rarity rank based on the range-wide status of a species, subspecies, or variety.

Global (G) Conservation Status Ranks
G1: Critically Imperiled - At very high risk of extinction or elimination due to very restricted range, very few populations or occurrences, very steep declines, very severe threats, or other factors.
G2: Imperiled - at high risk of extinction or elimination due to restricted range, few populations or occurrences, steep declines, severe threats, or other factors.
G3: Vulnerable - At moderate risk of extinction or elimination due to a fairly restricted range, relatively few populations or occurrences, recent and widespread declines, threats, or other factors.
G4: Apparently Secure - At fairly low risk of extinction or elimination due to an extensive range and/or many populations or occurrences, but with possible cause for some concern as a result of local recent declines, threats, or other factors.
G5: Secure - At very low risk or extinction or elimination due to a very extensive range, abundant populations or occurrences, and little to no concern from declines or threats.
G#G#: Range Rank – A numeric range rank (e.g., G2G3, G1G3) is used to indicate the range of uncertainty about the exact status of a taxon or ecosystem type. Ranges cannot skip more than two ranks (e.g., GU should be used rather than G1G4).
GX: Presumed Extinct - Not located despite intensive searches and virtually no likelihood of rediscovery.
GH: Possibly Extinct - Known from only historical occurrences but still some hope of rediscovery. Examples of evidence include (1) that a species has not been documented in approximately 20-40 years despite some searching and/or some evidence of significant habitat loss or degradation; (2) that a species has been searched for unsuccessfully, but not thoroughly enough to presume that it is extinct or eliminated throughout its range.
GU: Unrankable – Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.
GNR: Unranked – Global rank not yet assessed
GNA: Not Applicable – A conservation status rank is not applicable because the species is not a suitable target for conservation activities. A global conservation status rank may be not applicable for several reasons, related to its relevance as a conservation target. For species, typically the species is a hybrid without conservation value, or of domestic origin. For ecosystems, the type is typically non-native (e.g, many ruderal vegetation types), agricultural (e.g. pasture, orchard) or developed (e.g. lawn, garden, golf course).
?: Inexact Numeric Rank – Denotes inexact numeric rank; this should not be used with any of the Variant Global Conservation Status Ranks or GX or GH.
T#: Infraspecific Taxon (trinomial) - The status of infraspecific taxa (subspecies or varieties) are indicated by a "T-rank" following the species' global rank. Rules for assigning T-ranks follow the same principles outlined above. For example, the global rank of a critically imperiled subspecies of an otherwise widespread and common species would be G5T1. A T subrank cannot imply the subspecies or variety is more abundant than the species, for example, a G1T2 subrank should not occur. A vertebrate animal population (e.g., listed under the U.S. Endangered Species Act or assigned candidate status) may be tracked as an infraspecific taxon and given a T rank; in such cases a Q is used after the T-rank to denote the taxon's informal taxonomic status.
Q: Questionable taxonomy that may reduce conservation priority – Distinctiveness of this entity as a taxon or ecosystem type at the current level is questionable; resolution of this uncertainty may result in change from a species to a subspecies or hybrid, or inclusion of this taxon or type in another taxon or type, with the resulting taxon having a lower priority (numerically higher) conservation status rank. The “Q” modifier is only used at a global level and not at a national or subnational level.
C: Captive or Cultivated Only – Taxon or ecosystem at present is presumed or possibly extinct or eliminated in the wild across their entire native range but is extant in cultivation, in captivity, as a naturalized population (or populations) outside their native range, or as a reintroduced population or ecosystem restoration, not yet established. The “C” modifier is only used at a global level and not at a national or subnational level. Possible ranks are GXC or GHC. This is equivalent to “Extinct” in the Wild (EW) in IUCN’s Red List terminology (IUCN 2001).

[4] S-Ranks (Provincial)
Provincial Status from the NHIC (Dec. 16, 2018)
NHIC: http://www.sse.gov.on.ca/sites/MNR-PublicDocs/EN/ProvincialServices/Ontario_Vascular_Plants.xlsx

Provincial (or Subnational) ranks are used by the Natural Heritage Information Centre (NHIC) to set protection priorities for rare species and natural communities. These ranks are not legal designations. Provincial ranks are assigned in a manner similar to that described for global ranks, but consider only those factors within the political boundaries of Ontario.

Provincial/Sub-national (S) Conservation Status Ranks
S1: Critically Imperiled – At very high risk of extirpation in the jurisdiction due to very restricted range, very few populations or occurrences, very steep declines, severe threats, or other factors.

S2: Imperiled – At high risk of extirpation in the jurisdiction due to restricted range, few populations or occurrences, steep declines, severe threats, or other factors.
S3: Vulnerable – At moderate risk of extirpation in the jurisdiction due to a fairly restricted range, relatively few populations or occurrences, recent and widespread declines, threats, or other factors.
S4: Apparently Secure – At a fairly low risk of extirpation in the jurisdiction due to an extensive range and/or many populations or occurrences, but with possible cause for some concern as a result of local recent declines, threats, or Secure – At very low or no risk of extirpation in the jurisdiction due to a very extensive range, abundant populations or occurrences, with little to no concern from declines or threats.
S#S#: Range Rank – A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species or community. Ranges cannot skip more than one rank (e.g., SU is used rather than S1S4).
SX: Presumed Extirpated – Species or ecosystem is believed to be extirpated from the jurisdiction (province). Not located despite intensive searches of historical sites and other appropriate habitat, and virtually no likelihood that it will be rediscovered. [equivalent to "Regionally Extinct" in IUCN Red List terminology]
SH: Possibly Extirpated (Historical) – Known from only historical records but still some hope of rediscovery. There is evidence that the species or ecosystem may no longer be present in the jurisdiction, but not enough to state this with certainty. Examples of such evidence include (1) that a species has not been documented in approximately 20-40 years despite some searching and/or some evidence of significant habitat loss or degradation; (2) that a species or ecosystem has been searched for unsuccessfully, but not thoroughly enough to presume that it is no longer present in the jurisdiction.
SNR: Unranked – Nation of state/province conservation status not yet assessed.
SU: Unrankable – Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.
SNA: Not Applicable – A conservation status rank is not applicable because the species is not a suitable target for conservation activities (e.g., long distance aerial and aquatic migrants, hybrids without conservation value, and non-native species.
?: Inexact or Uncertain - Denotes inexact or uncertain numeric rank.
T#: Infraspecific Taxon (trinomial) - The status of infraspecific taxa (subspecies or varieties) are indicated by a "T-rank" following the species' global rank. Rules for assigning T-ranks follow the same principles outlined above. For example, the subnational rank of a critically imperiled subspecies of an otherwise widespread and common species would be S5T1. A T subrank cannot imply the subspecies or variety is more abundant than the species, for example, a S1T2 subrank should not occur. A vertebrate animal population may be tracked as an infraspecific taxon and given a T rank; in such cases a Q is used after the T-rank to denote the taxon's informal taxonomic status.

[5] COSEWIC (Committee on the Status of Endangered Wildlife in Canada)
The federal review process is implemented by COSEWIC (Status as of Dec. 2018)

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) is an independent advisory panel to the Minister of Environment and Climate Change Canada that meets twice a year to assess the status of wildlife species at risk of extinction.
https://www.canada.ca/en/environment-climate-change/services/committee-status-endangered-wildlife.html

COSEWIC Conservation Status Ranks
EXT: Extinct – A species that no longer exists.
EXP: Extirpated – A species no longer existing in the wild in Canada, but occurring elsewhere.
END: Endangered – A species facing imminent extirpation or extinction.
THR: Threatened – A species likely to become endangered if limiting factors are not reversed.
SC: Special Concern (formerly vulnerable) – A species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.
NAR: Not At Risk – A species that has been evaluated and found to be not at risk of extinction given the current circumstances.
DD: Data Deficient – Available information is insufficient (a) to resolve a species' eligibility for assessment or (b) to permit an assessment of the species' risk of extinction.

[6] SARA (Species at Risk Act) Status and Schedule
Federal status from the Government of Canada's Species at Risk Public Registry (Status as of Feb. 2018)
http://www.registrelep-sararegistry.gc.ca/

The Act establishes Schedule 1, as the official list of species at risk in Canada. It classifies those species as being either Extirpated, Endangered, Threatened, or a Special Concern. Once listed, the measures to protect and recover a listed species are implemented. However, please note that while Schedule 1 lists species that are extirpated, endangered, threatened and of special concern, the prohibitions do not apply to species of special concern.

SARA Conservation Status Ranks
EXT: Extinct – A species that no longer exists.
EXP: Extirpated – A species that no longer exists in the wild in Canada, but exists elsewhere in the wild.
END: Endangered – A species that is facing imminent extirpation or extinction.
THR: Threatened – A species likely to become endangered if limiting factors are not reversed.
SC: Special Concern – A species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.

[7] SARO (Species at Risk in Ontario)
Provincial status from MNRF (Status as of Dec. 2018)
https://www.ontario.ca/environment-and-energy/species-risk-ontario-list

The provincial review process is implemented by the MNR's Committee on the Status of Species at Risk in Ontario (COSSARO). COSSARO is an independent advisory panel to the Ontario Ministry of Natural Resources and Forestry that assesses the status of species at risk of extinction.

MNRF Conservation Status Ranks
EXP: Extirpated – Extirpated – Lives somewhere in the world, and at one time lived in the wild in Ontario, but no longer lives in the wild in Ontario.
END: Endangered – Lives in the wild in Ontario but is facing imminent extinction or extirpation.
THR: Threatened – Lives in the wild in Ontario, is not endangered, but is likely to become endangered if steps are not taken to address factors threatening it.
SC: Special Concern – Lives in the wild in Ontario, is not endangered or threatened, but may become threatened or endangered due to a combination of biological characteristics and identified threats.

[8] Regional Status

Brant County
Oldham, Michael J. 2017. List of the Vascular Plants of Ontario's Carolinian Zone (Ecoregion 7E). Carolinian Canada and Ontario Ministry of Natural Resources and Forestry. Peterborough, ON. 132 pp.

Rankings are based on "previous lists, personal communications, and the author's knowledge of the Carolinian Zone flora."

Codes are defined as follows:
H: Historic. Native and no known records for at least 30 years.
R: Rare
U: Uncommon
C: Common
X: Present. Native but no status assigned because of lack of information, often due to confusion with similar species.
I: Introduced. A non-native (exotic) species that is established (or was formerly established) outside of cultivation.

[9] Native Status
Based on Vascan (Dec. 2017) and NHIC (Dec. 16, 2018)
Vascan: http://data.canadensys.net/vascan/search
NHIC: http://www.sse.gov.on.ca/sites/MNR-PublicDocs/EN/ProvincialServices/Ontario_Vascular_Plants.xlsx

Codes are defined as follows:
N: Native
I: Introduced

APPENDIX E:
BREEDING BIRD SURVEY RESULTS

Appendix E. Breeding Bird Survey Results

Common Name	Scientific Name	GRANK [1]	SRANK [2]	SARO (ESA) Status [3]	COSEWIC Status [4]	SARA Status [5]	Schedule [5]	MNR Area Sensitive [6]	Protected Under MBCA	Wildife Survey Areas																Overall Site		Comments
										Area 1						Area 2						Area 3							
										18-Jun-18		05-Jul-18		Overall		18-Jun-18		05-Jul-18		Overall		18-Jun-18		05-Jul-18		Overall			
										Number	Highest BE	Number	Highest BE	Highest Abundance	Highest Breeding Status	Number	Highest BE	Number	Highest BE	Highest Abundance	Highest Breeding Status	Number	Highest BE	Number	Highest BE	Highest Abundance	Highest Breeding Status	Total Number	Highest Breeding Status	
Birds																													
American Crow	*Corvus brachyrhynchos*	G5	S5B									3	H	3	POSS							1	H	1	T	1	PROB	4	PROB	
American Goldfinch	*Spinus tristis*	G5	S5B						X	6	H	15	P	15	PROB	4	H			4	POSS	5	H	10	P	10	PROB	29	PROB	
American Redstart	*Setophaga ruticilla*	G5	S5B					X	X	2	S	2	T	2	PROB							3	S	1	T	3	PROB	5	PROB	
American Robin	*Turdus migratorius*	G5	S5B						X	13	CF	8	H	13	CONF	6	S	2	T	6	PROB	7	S	4	T	7	PROB	26	CONF	
Baltimore Oriole	*Icterus galbula*	G5	S4B						X	4	P	3	H	4	PROB							3	S			3	POSS	7	PROB	
Barn Swallow	*Hirundo rustica*	G5	S4B	THR	THR	THR	1		X	8	N	6	AE	8	CONF													8	CONF	
Belted Kingfisher	*Megaceryle alcyon*	G5	S4B																					1	H	1	POSS	1	POSS	
Black-capped Chickadee	*Poecile atricapillus*	G5	S5						X	2	S	1	T	2	PROB									2	H	2	POSS	4	PROB	
Blue Jay	*Cyanocitta cristata*	G5	S5							2	H	6	T	6	PROB							3	H	2	T	3	PROB	9	PROB	
Blue-gray Gnatcatcher	*Polioptila caerulea*	G5	S4B					X	X	2	H	2	T	2	PROB													2	PROB	
Brown-headed Cowbird	*Molothrus ater*	G5	S4B							4	P			4	PROB	5	P			5	PROB	8	P	2	H	8	PROB	17	PROB	
Canada Goose	*Branta canadensis*	G5	S5						X			2	H	2	POSS	2	P	10	X	10	PROB							12	PROB	
Carolina Wren	*Thryothorus ludovicianus*	G5	S4						X			1	S	1	POSS													1	POSS	
Cedar Waxwing	*Bombycilla cedrorum*	G5	S5B						X	10	H	5	T	10	PROB													10	PROB	
Chimney Swift	*Chaetura pelagica*	G5	S4B, S4N	THR	THR	THR	1		X											8	OBS							8	OBS	Recorded incidentally during ELC fieldwork on July 3, 2018
Chipping Sparrow	*Spizella passerina*	G5	S5B						X			4	S	4	POSS			2	S	2	POSS	3	S	5	FY	5	CONF	11	CONF	
Common Grackle	*Quiscalus quiscula*	G5	S5B							2	H	4	P	4	PROB							6	H			6	POSS	10	PROB	
Common Raven	*Corvus corax*	G5	S5									1	X	1	OBS													1	OBS	
Common Yellowthroat	*Geothlypis trichas*	G5	S5B						X	3	S	1	T	3	PROB													3	PROB	
Downy Woodpecker	*Picoides pubescens*	G5	S5						X	2	D	2	A	2	PROB	3	H			3	POSS							5	PROB	
Eastern Bluebird	*Sialia sialis*	G5	S5B	NAR	NAR				X	3	S			3	POSS													3	POSS	
Eastern Kingbird	*Tyrannus tyrannus*	G5	S4B						X	1	H			1	POSS									1	H	1	POSS	2	POSS	
Eastern Wood-pewee	*Contopus virens*	G5	S4B	SC	SC	SC	1		X	1	S			1	POSS							2	S	1	T	2	PROB	3	PROB	
European Starling	*Sturnus vulgaris*	G5	SNA							15	FY	10	P	15	CONF	5	H	10	P	10	PROB	8	H	3	T	8	PROB	33	CONF	
Field Sparrow	*Spizella pusilla*	G5	S4B						X			1	S	1	POSS													1	POSS	
Gray Catbird	*Dumetella carolinensis*	G5	S4B						X	9	S	2	T	9	PROB	2	S			2	POSS							11	PROB	
Great Blue Heron	*Ardea herodias*	G5	S4						X									1	X	1	OBS							1	PROB	
Great Crested Flycatcher	*Myiarchus crinitus*	G5	S4B						X													2	S/H	2	T	2	PROB	2	PROB	
Hairy Woodpecker	*Picoides villosus*	G5	S5					X	X	1	D	1	H	1	PROB													1	PROB	
House Sparrow	*Passer domesticus*	G5	SNA							6	P	6	H	6	PROB	8	P	4	H	8	PROB							14	PROB	
House Wren	*Troglodytes aedon*	G5	S5B						X	5	S	2	T	5	PROB													5	PROB	
Indigo Bunting	*Passerina cyanea*	G5	S4B						X	3	S	3	T	3	PROB									1	S	1	POSS	4	PROB	
Least Flycatcher	*Empidonax minimus*	G5	S4B					X	X			1	S	1	POSS													1	POSS	
Killdeer	*Charadrius vociferus*	G5	S5B,S5N						X							2	H	1	T	2	PROB							2	PROB	
Mallard	*Anas platyrhynchos*	G5	S5						X			2	H	2	POSS													2	POSS	
Mourning Dove	*Zenaida macroura*	G5	S5						X	2	S	5	T	5	PROB			1	H	1	POSS	3	S	3	T	3	PROB	9	PROB	
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*	G5	S4B						X			2	H	2	POSS													2	POSS	
Northern Cardinal	*Cardinalis cardinalis*	G5	S5						X	7	S	3	T	7	PROB	1	S			1	POSS	4	S	1	T	4	PROB	12	PROB	
Northern Flicker	*Colaptes auratus*	G5	S4B						X	2	S			2	POSS									2	H	2	POSS	4	POSS	
Orchard Oriole	*Icterus spurius*	G5	S4B						X	1	S			1	POSS													1	POSS	
Rock Pigeon	*Columba livia*	G5	SNA						X									6	H	6	POSS							6	POSS	
Red-eyed Vireo	*Vireo olivaceus*	G5	S5B						X	1	S			1	POSS							6	S	4	T	6	PROB	7	PROB	
Red-tailed Hawk	*Buteo jamaicensis*	G5	S5	NAR	NAR					2	H	2	P	2	PROB													2	PROB	
Red-winged Blackbird	*Agelaius phoeniceus*	G5	S4							12	P	10	S	12	PROB	5	S			5	POSS							17	PROB	
Ring-billed Gull	*Larus delawarensis*	G5	S5B,SZN						X	2	X	30	X	30	OBS	10	X	35	X	35	OBS							65	OBS	
Rose-breasted Grosbeak	*Pheucticus ludovicianus*	G5	S4B						X	6	S	3	CF	6	CONF							1	S	1	T	1	PROB	7	CONF	
Song Sparrow	*Melospiza melodia*	G5	S5B						X	10	S	5	FY	10	CONF	3	S	2	T	3	PROB	8	S			8	POSS	21	CONF	
Swamp Sparrow	*Melospiza georgiana*	G5	S5B						X			1	S	1	POSS													1	POSS	
Tree Swallow	*Tachycineta bicolor*	G5	S4B						X	2	H			2	PROB			1	H	1	POSS							3	PROB	
Turkey Vulture	*Cathartes aura*	G5	S5B							2	X	4	X	4	OBS			1	X	1	OBS	2	X	1	X	2	OBS	7	OBS	
Warbling Vireo	*Vireo gilvus*	G5	S5B						X	4	S	3	T	4	PROB			1	S	1	POSS	4	S			4	POSS	9	PROB	
White-breasted Nuthatch	*Sitta carolinensis*	G5	S5					X	X															1	H	1	PROB	1	PROB	

Appendix E. Breeding Bird Survey Results

Common Name	Scientific Name	GRANK [1]	SRANK [2]	SARO (ESA) Status [3]	COSEWIC Status [4]	SARA Status [5]	Schedule [5]	MNR Area Sensitive [6]	Protected Under MBCA	Wildife Survey Areas																Comments
										Area 1						Area 2						Area 3						Overall Site		
										18-Jun-18		05-Jul-18		Overall		18-Jun-18		05-Jul-18		Overall		18-Jun-18		05-Jul-18		Overall				
										Number	Highest BE	Number	Highest BE	Highest Abundance	Highest Breeding Status	Number	Highest BE	Number	Highest BE	Highest Abundance	Highest Breeding Status	Number	Highest BE	Number	Highest BE	Highest Abundance	Highest Breeding Status	Total Number	Highest Breeding Status	
Willow Flycatcher	*Empidonax traillii*	G5	S5B,SZN						X			1	S	1	POSS													1	POSS	
Wood Thrush	*Hylocichla mustelina*	G5	S4B	SC	THR	THR	1		X																	1	POSS	1	POSS	Recorded incidentally during ELC fieldwork on July 3, 2018
Yellow Warbler	*Setophaga petechia*	G5	S5B						X	8	S	6	T	8	PROB	1	S			1	POSS	2	S			2	POSS	11	PROB	
Total										47						22						27						55		

WILDLIFE LIST LEGEND

[1]G-Rank (global)
Global ranks are assigned by a consensus of the network of Conservation Data Centres (CDCs), scientific experts, and the Nature Conservancy to designate a rarity rank based on the range-wide status of a species, subspecies, or variety.

G1 Extremely rare - usually 5 or fewer occurrences in the overall range or very few remaining individuals; or because of some factor(s) making it especially vulnerable to Extinction.
G2 Very rare - usually between 5 and 20 occurrences in the overall range or with many individuals in fewer occurrences; or because of some factor(s) making it vulnerable to Extinction.
G3 Rare to uncommon - usually between 20 and 100 occurrences; may have fewer occurrences, but with a large number of individuals in some populations; may be susceptible to large-scale disturbances.
G4 Common - usually more than 100 occurrences; usually not susceptible to immediate threats.
G5 Very common - demonstrably secure under present conditions.

[2]S-Ranks (provincial)
Provincial (or Subnational) ranks are used by the Natural Heritage Information Centre (NHIC) to set protection priorities for rare species and natural communities. These ranks are not legal designations. Provincial ranks are assigned in a manner similar to that described for global ranks, but consider only those factors within the political boundaries of Ontario.

S1 Critically Imperiled - Critically imperiled in the nation or state/province because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the state/province.
S2 Imperiled - Imperiled in the nation or state/province because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the nation or state/province.
S3 Vulnerable - Vulnerable in the nation or state/province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.
S4 Apparently Secure - Uncommon but not rare; some cause for long-term concern due to declines or other factors.
S5 Secure - Common, widespread, and abundant in the nation or state/province.
S#S# Range Rank - A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species or community. Ranges cannot skip more than one rank (e.g., SU is used rather than S1S4).
SAN Non-breeding accidental.
SE Exotic - not believed to be a native component of Ontario's fauna.
SZN Non-breeding migrants/vagrants.
SZB Breeding migrants/vagrants.

[3]SARO (Species at Risk in Ontario) Status
Provincial status from MECP (Status as of Dec. 2018)
https://www.ontario.ca/page/species-risk-ontario

The provincial review process is implemented by the Committee on the Status of Species at Risk in Ontario (COSSARO). COSSARO is an independent advisory panel to the Ontario Ministry of Environment, Conservation and Parks (MECP) that assesses the status of species at risk of extinction.

MECP Conservation Status Ranks
EXT Extinct - A species that no longer exists anywhere in the world.

EXP Extirpated - A species that lives somewhere in the world, lived at one time in the wild in Ontario, but no longer lives in the wild in Ontario.
END Endangered - A species that is facing imminent Extinction or extirpation.
THR Threatened - A species that is likely to become Endangered if steps are not taken to address factors threatening to lead to its Extinction or extirpation.
SC Special Concern – A species that may become Threatened or Endangered because of a combination of biological characteristics and identified threats.

[4]COSEWIC (Committee on the Status of Endangered Wildlife in Canada)
The federal review process is implemented by COSEWIC (Status as of Dec. 2018)

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) is an independent advisory panel to the Minister of Environment and Climate Change Canada that meets twice a year to assess the status of wildlife species at risk of extinction.
https://www.canada.ca/en/environment-climate-change/services/committee-status-endangered-wildlife.html

COSEWIC Conservation Status Ranks
EXT Extinct - A species that no longer exists.
EXP Extirpated - A species no longer existing in the wild in Canada, but occurring elsewhere.
END Endangered - A species facing imminent extirpation or Extinction.
THR Threatened - A species likely to become Endangered if limiting factors are not reversed.
SC Special Concern (formerly vulnerable) - A species that may become a Threatened or an Endangered species because of a combination of biological characteristics and identified threats.
NAR Not At Risk - A species that has been evaluated and found to be not at risk of Extinction given the current circumstances.
DD Data Deficient (formerly Indeterminate) - Available information is insufficient to resolve a species' eligibility for assessment or to permit an assessment of the species' risk of Extinction.

[5]SARA (Species at Risk Act) Status and Schedule
Federal status from the Government of Canada's Species at Risk Public Registry (Status as of Feb. 2018)
https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry.html

The Act establishes Schedule 1, as the official list of wildlife species at risk. It classifies those species as being either Extirpated, Endangered, Threatened, or a Special Concern. Once listed, the measures to protect and recover a listed wildlife species are implemented.

EXT Extinct - A wildlife species that no longer exists.
EXP Extirpated **-** A wildlife species that no longer exists in the wild in Canada, but exists elsewhere in the wild.
END Endangered - A wildlife species that is facing imminent extirpation or Extinction.
THR 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 Special Concern - A wildlife species that may become a Threatened or an Endangered species because of a combination of biological characteristics and identified threats.

Schedule 1: is the official list of species that are classified as Extirpated, Endangered, Threatened and 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.

The Act establishes Schedule 1 as the official list of wildlife species at risk. However, please note that while Schedule 1 lists species that are Extirpated, Endangered, Threatened and Special Concern, the prohibitions do not apply to species of Special Concern.

Species that were designated at risk by COSEWIC prior to October 1999 (Schedule 2 & 3) must be reassessed using revised criteria before they can be considered for addition to Schedule 1 of SARA. After they have been assessed, the Governor in Council may on the recommendation of the Minister, decide on whether or not they should be added to the List of Wildlife Species at Risk.

[6] MNR Area Sensitive Species
Area Sensitivity is defined as species requiring large areas of suitable habitat in order to sustain population numbers

From: Ministry of Natural Resources. 2000. Significant Wildlife Habitat Technical Guide. Fish and Wildlife Branch, Wildlife Section. Science Development and Transfer Branch, Southcentral Science Section. 151pp. + appendices.

Ontario Breeding Bird Atlas - Breeding Evidence Codes

OBSERVED
X Species observed in its breeding season (no breeding evidence).

POSSIBLE
H Species observed in its breeding season in suitable nesting habitat.
S Singing male(s) present, or breeding calls heard, in suitable nesting habitat in breeding season.

PROBABLE
P Pair observed in suitable nesting habitat in nesting season.
T Permanent territory presumed through registration of territorial behaviour (song, etc.) on at least two days, a week or more apart, at the same place.
D Courtship or display, including interaction between a male and a female or two males, including courtship feeding or copulation.
V Visiting probable nest site
A Agitated behaviour or anxiety calls of an adult.
B Brood Patch on adult female or cloacal protuberance on adult male.
N Nest-building or excavation of nest hole.

CONFIRMED
DD Distraction display or injury feigning.
NU Used nest or egg shells found (occupied or laid within the period of the survey).
FY Recently fledged young (nidicolous species) or downy young (nidifugous species), including incapable of sustained flight.
AE Adult leaving or entering nest sites in circumstances indicating occupied nest.
FS Adult carrying fecal sac.
CF Adult carrying food for young.
NE Nest containing eggs.
NY Nest with young seen or heard.

APPENDIX F:
SPECIES AT RISK SCREENING

Appendix F. Species at Risk Screening Table

Species At Risk Designations	
ENDANGERED	
THREATENED	
SPECIAL CONCERN	
EXTIRPATED	

Species	ESA Status[1] and Regional Occurrence	ESA Protection[2]	Source of Record (Date)	Key Habitats Used by Species in Ontario	Reasonable Likelihood of Presence in Study Area	Surveys Undertaken	Results of Field Surveys	Likelihood and Magnitude of Impacts to Species or Habitat
Amphibians								
Jefferson Salamander (Ambystoma jeffersonianum)	END	Species Protection and Habitat Regulation	Herp Atlas (1991)	Inhabit deciduous and mixed deciduous forests with suitable breeding areas which generally consist of ephemeral (temporary) bodies of water that are fed by spring runoff, groundwater, or springs (MNRF Guelph - Waterloo List, 2014)	**Low** - Suitable breeding habitat (i.e. woodlands with vernal pools) may occur occur in forested habitats within study area. Records of Jefferson Salamander occur within 10 km of the study area in 1991.	4 General Wildlife Surveys; 2 SAR Habitat Assessments	Not recorded.	**Low** - Potential habitat located in eastern portion of study area, outside of the proposed Greenwich Mohawk Brownfield redevelopment area.
Birds								
Acadian Flycatcher (Empidonax virescens)	END	Species and General Habitat Protection	eBird (2012); MNRF (2017)	Generally requires large areas of mature, undisturbed forest; avoids the forest edge; often found in well wooded swamps and ravines (MNRF Guelph - Waterloo List, 2014)	**Low** - No suitable breeding habitat (i.e. mature forests > 30 ha) occurs within the study area. One record during breeding season within 10km of the study area in 2012.	2 Breeding Bird Surveys; SAR habitat assessment	Not recorded.	**None** - No suitable breeding habitat present within study area.
Bald Eagle (Haliaeetus leucocephalus)	SC	N/A	eBird (2019); MNRF (2017)	Prefers deciduous and mixed-deciduous forest; and habitat close to water bodies such as lakes and rivers; They roost in super canopy trees such as Pine (MNRF Guelph - Waterloo List, 2014)	**High** - Suitable habitat (i.e. large super canopy trees adjacent to waterbody) and there are multiple records of this species within the study area in January 2019.	2 Breeding Bird Surveys; SAR habitat assessment	Not recorded.	**Low** - Potential habitat unlikely to be impacted by the proposed Greenwich Mohawk Brownfield redevelopment. Foraging habitat unlikely to be impacted, abundant foraging opportunities exists in local landscape.
Bank Swallow (Riparia riparia)	THR	Species and General Habitat Protection	eBird (2019); MNRF (2017)	It nests in a wide variety of naturally and anthropogenically created vertical banks, which often erode and change over time including aggregate pits and the shores of large lakes and rivers (MNRF Guelph Waterloo List, 2014)	**Low** - Several recent records of this species observed within 1km. No suitable nesting habitat within study area, potential foraging habitat over open areas (i.e., fields, waterbodies).	2 Breeding Bird Surveys; SAR habitat assessment	Not recorded.	**Low** - No suitable breeding habitat recorded within study area, foraging habitat abundant in local landscape, unlikely to be impacted by future development.
Barn Swallow (Hirundo rustica)	THR	Species and General Habitat Protection	eBird (2019); MNRF (2017)	prefers farmland; lake/river shorelines; wooded clearings; urban populated areas; rocky cliffs; and wetlands. They nest inside or outside buildings; under bridges and in road culverts; on rock faces and in caves etc. (MNRF Guelph - Waterloo List, 2014)	**High** - Suitable nesting habitat (i.e. buildings, bridges, culverts) occurs within the study area and adults leaving a nest were observed during the breeding bird surveys.	2 Breeding Bird Surveys; SAR habitat assessment	Recorded with "Confirmed" breeding evidence. Eight individuals and nest observed on Mohawk Street bridge over Mohawk Canal.	**Low** - Potential nesting habitat present in buildings, bridges and culverts. Any work involving the removal or alteration or structures may impact suitable breeding habitat. Targeted surveys should be conducted prior to any development taking place. Impacts can be avoided with suitable mitigation measures.
Black Tern (Chlidonias niger)	SC	N/A	eBird (1957)	Generally prefer freshwater marshes and wetlands; nest either on floating material in a marsh or on the ground very close to water (MNRF Guelph - Waterloo List, 2014)	**Low** - No suitable breeding habitat (i.e. marshes) and only historic record within 10km of the study area	2 Breeding Bird Surveys; SAR habitat assessment	Not recorded.	**None** - No suitable breeding habitat present within study area.
Bobolink (Dolichonyx oryzivorus)	THR	Species and General Habitat Protection	eBird (2015); MNRF (2017)	Generally prefers open grasslands and hay fields. In migration and in winter uses freshwater marshes and grasslands (MNRF Guelph - Waterloo List, 2014)	**Low** - No suitable breeding habitat (i.e. grasslands >10ha) and recent records within 10km of the study area.	2 Breeding Bird Surveys; SAR habitat assessment	Not recorded.	**None** - No suitable breeding habitat present within study area.
Canada Warbler (Cardellina canadensis)	SC	N/A	eBird (2018); MNRF (2017)	Generally prefers wet coniferous, deciduous and mixed forest types, with a dense shrub layer. Nests on the ground, on logs or hummocks, and uses dense shrub layer to conceal the nest (MNRF Guelph - Waterloo List, 2014)	**Low** - No suitable breeding habitat and recent records within 10km of the study area.	2 Breeding Bird Surveys; SAR habitat assessment	Not recorded.	**None** - No suitable breeding habitat present within study area.

Appendix F. Species at Risk Screening Table

Species	ESA Status[1] and Regional Occurrence	ESA Protection[2]	Source of Record (Date)	Key Habitats Used by Species in Ontario	Reasonable Likelihood of Presence in Study Area	Surveys Undertaken	Results of Field Surveys	Likelihood and Magnitude of Impacts to Species or Habitat
Cerulean Warbler (Setophaga cerulea)	THR	Species and General Habitat Protection	MNRF (2017)	Generally found in mature deciduous forests with an open understory; also nests in older, second-growth deciduous forests (MNRF Guelph - Waterloo List, 2014)	**None** - No suitable breeding habitat (i.e. deciduous forest >10ha) and no records of species in the area.	2 Breeding Bird Surveys; SAR habitat assessment	Not recorded.	**None** - No suitable breeding habitat present within study area.
Chimney Swift (Chaetura pelagica)	THR	Species and General Habitat Protection	WSP; MNRF (2017)	Historically found in deciduous and coniferous, usually wet forest types, all with a well-developed, dense shrub layer; now most are found in urban areas in large uncapped chimneys (MNRF Guelph - Waterloo List, 2014)	**High** - Suitable breeding habitat (i.e. chimneys) likely occurs in the urban areas and one individual was recorded as incidental during site visit.	2 Breeding Bird Surveys; SAR habitat assessment	Recorded as an incidental observation, eight individuals observed foraging over Greenwich Mohawk Brownfield site.	**Low** - Potential breeding habitat present in buildings with chimneys. Any work involving the removal or alteration or structures may impact suitable breeding habitat. Targeted surveys should be conducted in suitable habitat prior to any development taking place. Impacts can be avoided with suitable mitigation measures.
Common Nighthawk (Chordeiles minor)	SC	N/A	eBird (2016); MNRF (2017)	Generally prefer open, vegetation-free habitats, including dunes, beaches, recently harvested forests, burnt-over areas, logged areas, rocky outcrops, rocky barrens, grasslands, pastures, peat bogs, marshes, lakeshores, and river banks. This species also inhabits mixed and coniferous forests. Can also be found in urban areas (nest on flat roof-tops) (MNRF Guelph - Waterloo List, 2014)	**Low** - No suitable habitat (i.e. open areas). There is a recent record observed within 1km of sudy area.	2 Breeding Bird Surveys; SAR habitat assessment	Not recorded.	**Low** - No suitable breeding habitat recorded within study area, foraging habitat abundant in local landscape, unlikely to be impacted by future development.
Eastern Meadowlark (Sturnella magna)	THR	Species and General Habitat Protection	eBird (2019); MNRF (2017)	Generally prefers grassy pastures, meadows and hay fields. Nests are always on the ground and usually hidden in or under grass clumps (MNRF Guelph - Waterloo List, 2014)	**Low** - No suitable breeding habitat (i.e. grasslands >10ha) and recent records within 10km of the study area.	2 Breeding Bird Surveys; SAR habitat assessment	Not recorded.	**None** - No suitable breeding habitat present within study area.
Eastern Wood-pewee (Contopus virens)	SC	N/A	eBird (2019); MNRF (2017)	Associated with deciduous and mixed forests. Within mature and intermediate age stands it prefers areas with little understory vegetation as well as forest clearings and edges (MNRF Guelph - Waterloo List, 2014)	**High** - Suitable breeding habitat (i.e. deciduous forest) occurs and was recorded as incidental and during breeding bird surveys.	2 Breeding Bird Surveys; SAR habitat assessment	Recorded with "Probable" breeding evidence in Mohawk Park.	**Low** - Suitable habitat located outside of the proposed Greenwich Mohawk Brownfield redevelopment. Impacts from future development in forested areas (i.e.,) trails can be minimized with the implementation of appropriate mitigation measures.
Golden-winged Warbler (Vermivora chrysoptera)	SC	N/A	eBird (2003); MNRF (2017)	Generally prefer areas of early successional vegetation, found primarily on field edges, hydro or utility right-of-ways, or recently logged areas (MNRF Guelph - Waterloo List, 2014)	**Low** - Suitable breeding habitat (i.e. early successional habitat) does not occur and no recent records within 10km.	2 Breeding Bird Surveys; SAR habitat assessment	Not recorded.	**None** - No suitable breeding habitat present within study area.
Louisiana Waterthrush (Parkesia motacilla)	THR	N/A	MNRF (2017)	Generally inhabits mature forests along steeply sloped ravines adjacent to running water. It prefers clear, cold streams and densely wooded swamps (MNRF Guelph - Waterloo List, 2014)	**None** - No suitable breeding habitat (i.e. cold streams) occurs within study area and there are no records in the region.	2 Breeding Bird Surveys; SAR habitat assessment	Not recorded.	**None** - No suitable breeding habitat present within study area.
Northern Bobwhite (Colinus virginianus)	END	Species and General Habitat Protection	eBird (1957); MNRF (2017)	Generally inhabits a variety of edge and grassland type - habitats including non-intensively farmed agricultural lands (MNRF Guelph - Waterloo List, 2014)	**None** - No suitable breeding habitat (i.e. habitat mosaic of croplands, pine-hardwood forests and fields) occurs within the study area and there are no recent records of this species in the region.	2 Breeding Bird Surveys; SAR habitat assessment	Not recorded.	**None** - No suitable breeding habitat present within study area.
Red-headed Woodpecker (Melanerpes erythrocephalus)	SC	N/A	eBird (2017); MNRF (2017)	Generally prefer open oak and beech forests, grasslands, forest edges, orchards, pastures, riparian forests, roadsides, urban parks, golf courses, cemeteries, as well as along beaver ponds and brooks (MNRF Guelph - Waterloo List, 2014)	**Moderate** - Suitable breeding habitat (i.e. open treed habitats) occurs within study area and there are a few records within 10km.	2 Breeding Bird Surveys; SAR habitat assessment	Not recorded.	**Low** - Potential habitat (i.e., forested and open treed habitats) located outside of proposed Greenwich Mohawk Brownfield redevelopment. Impacts from future development (i.e., trails) can be minimized with the implementation of appropriate mitigation measures.

Appendix F. Species at Risk Screening Table

Species	ESA Status[1] and Regional Occurrence	ESA Protection[2]	Source of Record (Date)	Key Habitats Used by Species in Ontario	Reasonable Likelihood of Presence in Study Area	Surveys Undertaken	Results of Field Surveys	Likelihood and Magnitude of Impacts to Species or Habitat
Wood Thrush (Hylocichla mustelina)	SC	N/A	eBird (2019); MNRF (2017)	Nests mainly in second-growth and mature deciduous and mixed forests, with saplings and well-developed understory layers. Prefers large forest mosaics, but may also nest in small forest fragments (MNRF Guelph - Waterloo List, 2014)	**High** - Suitable breeding habitat (i.e. deciduous forest) occurs and species was recorded as incidental.	2 Breeding Bird Surveys; SAR habitat assessment	Recorded with "Possible" breeding evidence in Mohawk Park.	**Low** - Suitable habitat located outside of the proposed Greenwich Mohawk Brownfield redevelopment. Impacts from future development in forested areas (i.e.,) trails can be minimized with the implementation of appropriate mitigation measures.
Yellow-breasted Chat (Icteria virens virens)	END	Species and General Habitat Protection	MNRF (2017)	Generally prefer dense thickets around wood edges, riparian areas, and in overgrown clearings (MNRF Guelph - Waterloo List, 2014)	**None** - No suitable breeding habitat (>4ha thicket) occurs within study area and there are no records in the area.	3 Breeding Bird Surveys; SAR habitat assessment	Not recorded.	**None** - No suitable breeding habitat present within study area.
Fish								
Black Redhorse (Moxostoma duquesnei)	THR	Species and General Habitat Protection	DFO Aquatic SAR Mapping (2019); MNRF (2017)	Generally lives in moderately sized rivers and streams, with generally moderate to fast currents (MNRF Guelph - Waterloo List, 2014)	**Low** - no suitable habitat present within study area. Potentially suitable habitat exists in the Grand River downstream of the study area	Desktop Review	Not recorded.	**Low** - No suitable habitat within study area. Implentation of approriate mitigation measures will limit the potential for indirect impacts in Grand River downstream of the study area.
Eastern Sand Darter - Ontario Population (Ammocrypta pellucida)	END	Species Protection and Habitat Regulation	DFO Aquatic SAR Mapping (2019); MNRF (2017)	Generally prefer sandy-bottomed streams and rivers (MNRF Guelph - Haldimand List, 2015).	**Low** - no suitable habitat present within study area. Potentially suitable habitat exists in the Grand River downstream of the study area	Desktop Review	Not recorded.	**Low** - No suitable habitat within study area. Implentation of approriate mitigation measures will limit the potential for indirect impacts in Grand River downstream of the study area.
Northern Brook Lamprey (Ichthyomyzon fossor)	SC	N/A	MNRF (2017)	Generally inhabits small rivers and clear streams of varying sizes. Adults spawn in gravelly riffles (MNRF Guelph - Waterloo List, 2014)	**Low** - no suitable habitat present within study area. Potentially suitable habitat exists in the Grand River downstream of the study area	Desktop Review	Not recorded.	**Low** - No suitable habitat within study area. Implentation of approriate mitigation measures will limit the potential for indirect impacts in Grand River downstream of the study area.
Silver Shiner (Notropis photogenis)	THR	Species and General Habitat Protection	DFO Aquatic SAR Mapping (2019); MNRF (2017)	Generally prefer moderate to large, deep, relatively clear streams with swift currents, and moderate to high gradients (MNRF Guelph - Waterloo List, 2014)	**Low** - no suitable habitat present within study area. Potentially suitable habitat exists in the Grand River downstream of the study area	Desktop Review	Not recorded.	**Low** - No suitable habitat within study area. Implentation of approriate mitigation measures will limit the potential for indirect impacts in Grand River downstream of the study area.
Insects								
Monarch (Danaus plexippus)	SC	N/A	WSP; MNRF (2017)	Exist primarily wherever milkweed and wildflowers exist; abandoned farmland, along roadsides, and other open spaces (MNRF Guelph - Waterloo List, 2014)	**High** - Likely to pass through and / or forage in cultural meadow, roadsides, or other open areas throughout the study area. Some potential for breeding wherever Milkweed is present in the study area.	4 General Wildlife Surveys; 2 SAR habitat Assessment	Recorded at Greenwich Mohawk Brownfield site, single adult observed foraging.	**Low** - Limited Milkweed (larvae host plant) present within study area. Nectaring plants for adults are abundant in the local landscape.
Rapids Clubtail (Gomphus quadricolor)	END	Species Protection and Habitat Regulation	MNRF (2017)	Clear, cool medium-to-large rivers with gravel shallows and muddy pools (MNRF Species Profile Online 2014).	**Low** - No suitable habitat and no observations.	4 General Wildlife Surveys; 2 SAR habitat Assessment	Not recorded.	**None** - No suitable habitat present within study area.
Rusty-patched Bumble Bee (Bombus affinis)	END	Species and General Habitat Protection	MNRF (2017)	Generally inhabits a range of diverse habitats including mixed farmland, sand dunes, marshes, urban and wooded areas. It usually nests underground in abandoned rodent burrows (MNRF Guelph - Waterloo List, 2014)	**Low** - Potentially suitable habitat is present, however no recent records and species has experienced significant declines in Ontario.	4 General Wildlife Surveys; 2 SAR habitat Assessment	Not recorded.	**Low** - No known records within the study area. Nectaring plants for adults are present within the larger landscape.
Mammals								

Appendix F. Species at Risk Screening Table

Species	ESA Status[1] and Regional Occurrence	ESA Protection[2]	Source of Record (Date)	Key Habitats Used by Species in Ontario	Reasonable Likelihood of Presence in Study Area	Surveys Undertaken	Results of Field Surveys	Likelihood and Magnitude of Impacts to Species or Habitat
American Badger (Southwestern Ontario population) (Taxidea taxus jacksoni)	END	Species Protection and Habitat Regulation	MNRF (2017)	Generally prefer open habitats, whether natural (grasslands) or man-made (agricultural fields, road right-of-ways, golf courses)(MNRF Guelph - Waterloo List, 2014)	**None** - No suitable habitat (i.e. open areas)	4 General Wildlife Surveys; 2 SAR habitat Assessment	Not recorded.	**None** - No suitable habitat present within study area. No individuals or burrows recorded during surveys and unlikely to occur within study area given its rarity and the urban landscape.
Eastern-smalled footed Bat (Myotis leibii)	END	Species Protection and Habitat Regulation	MNRF (2017)	Overwintering habitat: Caves and mines that remain above 0 degrees Celsius. Maternal Roosts: primarily under loose rocks on exposed rock outcrops, crevices and cliffs, and occasionally in buildings, under bridges and highway overpasses and under tree bark (MNRF Guelph - Waterloo List, 2014)	**Low** - Low potential for this species to occur throughout study area as foraging vistant (generally less common than other bat species in Southern Ontario). Potential for roosting in buildings or other structures throughout study area.	4 General Wildlife Surveys; 2 SAR habitat Assessment	Not recorded (acoustic monitoring / exit surveys not completed).	**Low** - Unlikely to be impacted as a foraging vistant. Potential maternity roost habitat in buildings throughout study area. Habitat assessments and targeted surveys at development stage will inform potential for impacts and mitigation measures.
Little Brown Myotis (Myotis lucifugus)	END	Species Protection and Habitat Regulation	MNRF (2017)	Overwintering habitat: Caves and mines that remain above 0 degrees Celsius. Maternal Roosts: primarily under loose rocks on exposed rock outcrops, crevices and cliffs, and occasionally in buildings, under bridges and highway overpasses and under tree bark (MNRF Guelph - Waterloo List, 2014)	**Moderate** - Lilely to occur as a foraging vistant throughout the study area (suitable foraging habitat over open areas and Mohawk Lake); some potential for maternity roost habitat in buildings and trees with cavities / loose bark.	4 General Wildlife Surveys; 2 SAR habitat Assessment	Not recorded (acoustic monitoring / exit surveys not completed).	**Low** - Unlikely to be impacted as a foraging vistant. Unlikely to occur in buildings and most suitable roosting habitat is associated with forested areas located away from the proposed Greenwich Mohawk Brownfield redevelopment concept. Habitat assessments and targeted surveys at development stage will inform potential for impacts and mitigation measures.
Northern Myotis (Myotis septentrionalis)	END	Species Protection and Habitat Regulation	MNRF (2017)	Overwintering habitat: Caves and mines that remain above 0 degrees Celsius. Maternal Roosts: primarily under loose rocks on exposed rock outcrops, crevices and cliffs, and occasionally in buildings, under bridges and highway overpasses and under tree bark (MNRF Guelph - Waterloo List, 2014)	**Moderate** - Lilely to occur as a foraging vistant throughout the study area (suitable foraging habitat over open areas and Mohawk Lake); some potential for maternity roost habitat in buildings and trees with cavities / loose bark.	4 General Wildlife Surveys; 2 SAR habitat Assessment	Not recorded (acoustic monitoring / exit surveys not completed).	**Low** - Unlikely to be impacted as a foraging vistant. May occur in buildings, however, most suitable roosting habitat is associated with forested areas located away from the proposed Greenwich Mohawk Brownfield redevelopment concept. Habitat assessments and targeted surveys at development stage will inform potential for impacts and mitigation measures.
Tri-colored Bat (Perimyotis subflavus)	END	Species Protection and Habitat Regulation	MNRF (2017)	Overwintering habitat: Caves and mines that remain above 0 degrees Celsius. Maternal Roosts: Manmade structures or tree cavities. Foraging over still water, rivers, or in forest gaps (COSEWIC 2013f)	**Low** - Limited potential to occur as a foraging visitant throughout the study area (this species is generally uncommon in southern Ontario); some potential for maternity roost habitat in buildings or trees.	4 General Wildlife Surveys; 2 SAR habitat Assessment	Not recorded (acoustic monitoring / exit surveys not completed).	**Low** - Unlikely to be impacted as a foraging vistant. Potential maternity roost habitat present in forest edges and buildings, however, impacts are unlikley as this species has a localized distribution in Ontario and is unlikely for southwestern Ontario.
Mussels								
Rainbow Mussel (Villosa iris)	SC	Species and General Habitat Protection	DFO Aquatic SAR Mapping (2019); MNRF (2017)	Most abundant in shallow, well- oxygenated reaches of small- to medium-sized rivers and sometimes lakes, on substrates of cobble, gravel, sand and occasionally mud (MNRF Guelph - Wellington List 2015)	**Low** - no suitable habitat present within study area. Potentially suitable habitat exists in the Grand River downstream of the study area	Desktop Review	Not recorded.	**Low** - No suitable habitat within study area. Implentation of approriate mitigation measures will limit the potential for indirect impacts in Grand River downstream of the study area.
Round Pigtoe (Pleurobema sintoxia)	END	Species and General Habitat Protection	DFO Aquatic SAR Mapping (2019); MNRF (2017)	Generally occur in small rivers in areas of moderate flow on substrates of gravel, cobble and boulder. In larger rivers, they are found in mud, sand and gravel at varying depths (MNRF Guelph - Haldimand List, 2015)	**Low** - no suitable habitat present within study area. Potentially suitable habitat exists in the Grand River downstream of the study area	Desktop Review	Not recorded.	**Low** - No suitable habitat within study area. Implentation of approriate mitigation measures will limit the potential for indirect impacts in Grand River downstream of the study area.

Species	ESA Status[1] and Regional Occurrence	ESA Protection[2]	Source of Record (Date)	Key Habitats Used by Species in Ontario	Reasonable Likelihood of Presence in Study Area	Surveys Undertaken	Results of Field Surveys	Likelihood and Magnitude of Impacts to Species or Habitat
Wavy-rayed Lampmussel (Lampsilis fasciola)	THR	Species Protection and Habitat Regulation	DFO Aquatic SAR Mapping (2019); MNRF (2017)	Generally inhabit clear rivers and streams of a variety of sizes, where the water flow is steady and the substrate is stable (MNRF Guelph - Wellington List 2015)	**Low** - no suitable habitat present within study area. Potentially suitable habitat exists in the Grand River downstream of the study area	Desktop Review	Not recorded.	**Low** - No suitable habitat within study area. Implentation of approriate mitigation measures will limit the potential for indirect impacts in Grand River downstream of the study area.
Plants								
American Chestnut (Castanea dentata)	END	Species and General Habitat Protection	MNRF (2017)	Found in deciduous forest communities; this tree prefers arid forests with acid and sandy soils (MNRF Guelph - Brantford List, 2017).	**Moderate** - Suitable habitat may be present in deciduous forest communities within Mohawk Park.	Two season botanical inventory	Not recorded.	**Low** - Suitable habitat located outside of the proposed Greenwich Mohawk Brownfield redevelopment. Impacts from future development in forested areas (i.e.,) trails can be minimized with the implementation of appropriate mitigation measures.
American Columbo (Frasera caroliniensis)	END	Species and General Habitat Protection	MNRF (2017)	Most commonly associated with open deciduous forested slopes, thickets and clearings; grows in a variety of relatively stable habitats as well as on a wide variety of soils (MNRF Guelph - Brantford List, 2017).	**Moderate** - Suitable habitat may be present in deciduous forest communities within Mohawk Park.	Two season botanical inventory	Not recorded.	**Low** - Suitable habitat located outside of the proposed Greenwich Mohawk Brownfield redevelopment. Impacts from future development in forested areas (i.e.,) trails can be minimized with the implementation of appropriate mitigation measures.
Bird's-foot Violet (Viola pedata)	END	Species and General Habitat Protection	MNRF (2017)	Generally grows in open, disturbed, well-drained, sandy sites, and, in Ontario, is found in Black Oak savannah habitats within deciduous forests (MNRF Guelph - Brantford List, 2017).	**None** - No Black Oak savannah habitat within study area. Not recorded during botanical inventory.	Two season botanical inventory	Not recorded.	**None** - No Black Oak savannah habitat within study area. Not recorded during botanical inventory.
Broad Beech Fern (Phegopteris hexagonoptera)	SC	N/A	MNRF (2017)	Generally inhabits shady areas of beech and maple forests where the soil is moist or wet (MNRF Guelph - Brantford List, 2017).	**None** - No Beech and Maple forest habitat within study area. Not recorded during botanical inventory.	Two season botanical inventory	Not recorded.	**None** - No Beech and Maple forest habitat within study area. Not recorded during botanical inventory.
Butternut (Juglans cinerea)	END	Species and General Habitat Protection	iNaturalist (2019)	Generally grows in rich, moist, and well-drained soils often found along streams. It may also be found on well-drained gravel sites, especially those made up of limestone. It is also found, though seldomly, on dry, rocky and sterile soils. In Ontario, the Butternut generally grows alone or in small groups in deciduous forests as well as in hedgerows (MNRF Guelph - Waterloo List, 2014).	**Moderate** - Suitable habitat may be present in deciduous forest communities within Mohawk Park or in woodland along the Mohawk Canal.	Two season botanical inventory	Not recorded.	**Low** - Suitable habitat located outside of the proposed Greenwich Mohawk Brownfield redevelopment. Impacts from future development in forested areas (i.e.,) trails can be minimized with the implementation of appropriate mitigation measures.
Common Hoptree (Ptelea trifoliata)	THR	Species and General Habitat Protection	iNaturalist (2018)	Rare in Canada, though plentiful in the eastern United States. It is only known to occur in southwestern Ontario on the north shore of Lake Erie (MNRF Species Profile Online 2014).	**None** - Study area is not along Lake Erie. Not recorded during botanical inventory.	Two season botanical inventory	Not recorded.	**None** - Study area is not along Lake Erie. Not recorded during botanical inventory.
Eastern Flowering Dogwood (Cornus florida)	END	Species Protection and Habitat Regulation	iNaturalist (2018)	Generally grows in deciduous and mixed forests, in the drier areas of its habitat, although it is occasionally found in slightly moist environments; Also grows around edges and hedgerows (MNRF Guelph - Waterloo List, 2014).	**Low** - Suitable habitat may be present in deciduous forests within the study area. Recent records within 10km of site but not recorded during botanical inventory.	Two season botanical inventory	Not recorded.	**Low** - Suitable habitat located outside of the proposed Greenwich Mohawk Brownfield redevelopment. Impacts from future development in forested areas (i.e.,) trails can be minimized with the implementation of appropriate mitigation measures.
Reptiles								

Species	ESA Status[1] and Regional Occurrence	ESA Protection[2]	Source of Record (Date)	Key Habitats Used by Species in Ontario	Reasonable Likelihood of Presence in Study Area	Surveys Undertaken	Results of Field Surveys	Likelihood and Magnitude of Impacts to Species or Habitat
Blanding's Turtle (Emydoidea blandingii)	THR	Species and General Habitat Protection	Herp Atlas (2011); MNRF (2017)	Generally occur in freshwater lakes, permanent or temporary pools, slow-flowing streams, marshes and swamps. They prefer shallow water that is rich in nutrients, organic soil and dense vegetation. Adults are generally found in open or partially vegetated sites, and juveniles prefer areas that contain thick aquatic vegetation including sphagnum, water lilies and algae. They dig their nest in a variety of loose substrates, including sand, organic soil, gravel and cobblestone. Overwintering occurs in permanent pools that average about one metre in depth, or in slow-flowing streams (MNRF Guelph - Waterloo List, 2014)	**High** - Suitable habitat (i.e. lakes) occurs within the study area and there are recent records at Kanata Village.	4 General Wildlife Surveys; 2 SAR habitat Assessment	Not recorded.	**Low** - Suitable habitat will not be directly impacted by the Greenwich Mohawk Brownfield redevelopment concept, however, further investigation will need to take place when development occurs in order to confirm habitat suitability and provide recommendations for robust mitigation measures.
Eastern Hog-nosed Snake (Heterodon platirhinos)	THR	Species and General Habitat Protection	Herp Atlas (2016); MNRF (2017)	Generally prefer habitats with sandy, well-drained soil and open vegetative cover, such as open woods, brushland, fields, forest edges and disturbed sites. The species is often found near water (MNRF Guelph - Hamilton List, 2013)	**Low** - Limited suitable habitat (i.e. open woodlands) occurs in study area however, recent records observed within 10km.	4 General Wildlife Surveys; 2 SAR habitat Assessment	Not recorded.	**Low** - Limited suitable habitat within study area, more likely to occur in rural areas as opposed to urban habitats. No suitable habitat present within proposed Greenwich Mohawk Brownfield redevelopment area.
Eastern Ribbonsnake (aka. Northern Ribbonsnake) (Thamnophis sauritus septentrionalis)	SC	N/A	MNRF (2017)	Generally occur along the edges of shallow ponds, streams, marshes, swamps, or bogs bordered by dense vegetation that provides cover. Abundant exposure to sunlight is also required, and adjacent upland areas may be used for nesting (MNRF Guelph - Waterloo List, 2014)	**Low** - Limited suitable habitat (i.e. marsh and densely vegetated riparian areas) occurs within study area) No recent records or observations.	4 General Wildlife Surveys; 2 SAR habitat Assessment	Not recorded.	**Low** - Limited suitable habitat within study area. No suitable habitat present within proposed Greenwich Mohawk Brownfield redevelopment area.
Northern Map Turtle (Graptemys geographica)	SC	N/A	Herp Atlas (2018); MNRF (2017)	Generally inhabits both lakes and rivers, showing a preference for slow moving currents, muddy bottoms, and abundant aquatic vegetation. These turtles need suitable basking sites (such as rocks and logs) and exposure to the sun for at least part of the day (MNRF Guelph - Waterloo List, 2014)	**Moderate** - Suitable habitat (i.e. large waterbodies and watercourses) occurs within and immediately adjacent to the study area, however abundant aquatic vegetation is lacking. Recent records present within general area.	4 General Wildlife Surveys; 2 SAR habitat Assessment	Not recorded.	**Low** - Suitable habitat will not be directly impacted by the proposed Greenwich Mohawk Brownfield redevelopment concept. Further study required in support of future development - to confirm habitat suitability and provide recommendations for mitigation measures, as required.
Snapping Turtle (Chelydra serpentina)	SC	N/A	Herp Atlas (2018); MNRF (2017)	Generally inhabit shallow waters where they can hide under the soft mud and leaf litter. Nesting sites usually occur on gravely or sandy areas along streams. Snapping Turtles often take advantage of man-made structures for nest sites, including roads (especially gravel shoulders), dams and aggregate pits (MNRF Guelph - Brantford List, 2017).	**High** - Suitable habitat (i.e. waterbodies and watercourses with permanent water) occurs within and immediately adjacent to the study area. There are recent records at Mohawk Lake.	4 General Wildlife Surveys; 2 SAR habitat Assessment	Not recorded.	**Low** - Suitable habitat will not be directly impacted by the proposed Greenwich Mohawk Brownfield redevelopment concept. Further study required in support of future development - to confirm habitat suitability and provide recommendations for mitigation measures, as required.
Spiny Softshell (Apalone spinifera)	END	Species and General Habitat Protection	MNRF (2017)	Generally prefer marshy creeks, swift-flowing rivers, lakes, impoundments, bays, marshy lagoons, ditches and ponds near rivers (MNRF Guelph - Hamilton List, 2013)	**Low** - Suitable habitat (i.e. large waterbodies and watercourses) occurs within and adjacent to the study area, however this species has a relatively well known and localized distribution in Ontario.	4 General Wildlife Surveys; 2 SAR habitat Assessment	Not recorded.	**Low** - Though suitable habitat is present, this species' localized distribution does not include the study area or the immediate vicinity.