

WESTWOOD VILLAGE, PHASE 2,
TOWNSHIP OF NORTH DUMFRIES, ONTARIO

SCOPED ENVIRONMENTAL IMPACT STUDY (EIS) REPORT

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1.0 INTRODUCTION

1.1 Site and Study Overview

WSP Canada Inc. (WSP), formerly MMM Group Limited (MMM) and Ecoplans Limited (Ecoplans), has been retained by Hallman Construction Limited (HCL) and Gatestone Development Corporation to complete a Scoped Environmental Impact Study (EIS) in support of proposed development of Westwood Village Phase 2 (herein referred to as the Subject Property) in the Township of North Dumfries, Ontario.

To date, WSP has authored or provided natural heritage input to the following reports within the vicinity of the Subject Property:

- Cambridge West Community, Master Environmental Servicing Plan and Community Master Plan. Technical Work Plan (MHBC et.al.; November 2010)
- Cambridge West MESP, Natural Environment Study. Final (Ecoplans; November 2013)
- Cambridge West Collector Road Network Class Environmental Assessment. Technical Memorandum - Natural Heritage. Evaluation of Alternatives (MMM; October 2015)
- Cambridge West Lands - Jefferson Salamander Encounter Response Plan - Revised (WSP/ MMM; December 2016)
- Cambridge West Lands, Hallman Construction Limited & Brian Domm Ltd., Draft Plan of Subdivisions, Cambridge, Ontario. Scoped Environmental Impact Study (MMM Group; December 2016)
- Cambridge West Lands, Hallman Construction Limited & Brian Domm Ltd., Draft Plan of Subdivision, Cambridge, Ontario. Scoped Environmental Impact Study - Addendum 1 (WSP; October 2017)
- Collector Road Network Class Environmental Assessment. Environmental Study Report. Cambridge West, City of Cambridge. Natural Heritage Summary Report (WSP; April 2018)
- Cambridge West Lands, Hallman Construction & Cachet Developments (Cam West) Inc. Tree Management Plan (Cambridge West Lands), Cambridge Ontario (WSP; August 2019)
- Cambridge West Lands, Hallman Construction & Cachet Developments (Cam West) Inc. Tree Management Plan, Realigned Blenheim Road and Related Infrastructure, Cambridge Ontario (WSP; February 2020)



- Cambridge West Lands, Hallman Construction & Cachet Developments (Cam West) Inc. Blenheim Road Re-alignment and Devil's Creek Culvert Replacement Scoped Environmental Impact Study (WSP; May 2020)
- Cambridge West Lands. Biological Monitoring Report: Pre-construction (2014-2015). Prepared for Hallman Construction Limited and Cachet Management (Cam West) Inc. (WSP; May 2021).
- Cambridge West Lands. Biological Monitoring Report: Pre-construction (2019). Prepared for Hallman Construction Limited and Cachet Management (Cam West) Inc. (WSP. May 2021)
- Westwood Village, Cambridge. Biological Monitoring Report: During-construction (2020). Prepared for Hallman Construction Limited and Cachet Management (Cam West) Inc. (WSP; June 2023)
- Westwood Village, Cambridge. Biological Monitoring Report: During-construction (2021). Prepared for Hallman Construction Limited and Cachet Management (Cam West) Inc. (WSP; June 2023)
- Westwood Village, Cambridge. Biological Monitoring Report: During-construction (2022). Prepared for Hallman Construction Limited and Cachet Management (Cam West) Inc. (WSP; January 2024)
- Westwood Village, Cambridge. Biological Monitoring Report: During-construction (2023). Prepared for Hallman Construction Limited and Cachet Management (Cam West) Inc. (WSP; May 2024)
- Westwood Village, Cambridge. Biological Monitoring Report: During-construction (2024). Prepared for Hallman Construction Limited and Cachet Management (Cam West) Inc. (WSP; February 2026)
- Westwood Village – Phase 2 Lands. Biological Monitoring Report: Pre-Construction (2020). Prepared for Hallman Construction Limited and Gatestone Development Corp. (WSP; July 2023)
- Westwood Village – Phase 2 Lands. Biological Monitoring Report: During-Construction (2021). Prepared for Hallman Construction Limited and Gatestone Development Corp. (WSP; July 2023)
- Westwood Village – Phase 2 Lands. Biological Monitoring Report: During-Construction (2022). Prepared for Hallman Construction Limited and Gatestone Development Corp. (WSP; January 2024)
- Westwood Village – Phase 2 Lands. Biological Monitoring Report: During-Construction (2023). Prepared for Hallman Construction Limited and Gatestone Development Corp. (WSP; May 2024)
- Westwood Village – Phase 2 Lands. Biological Monitoring Report: During-Construction (2024). Prepared for Hallman Construction Limited and Gatestone Development Corp. (WSP; in process)



The proposed development addressed herein builds upon the numerous background studies and, in particular, the Cambridge West Master Environmental Servicing Plan (MESP) completed in 2013 (City of Cambridge and Landowner Group 2013) and approved by City Council March 2014.

The purpose of the MESP study was to guide the development of the Cambridge West Community lands by recommending appropriate land uses. The MESP study integrated environmental, servicing, transportation, and land use planning concepts and was based on technical studies in several areas, including natural heritage. The MESP has also guided the development of the Cambridge West Community Plan, submitted to the City of Cambridge as part of an Official Plan Amendment Application on July 24, 2014. Phases 1 and 2 of the Cambridge West Collector Road Network EA were completed as part of the MESP. Phases 1 and 2 of the Cambridge West Collector Road Network EA were completed as part of the MESP. The remaining phases were addressed as part of an integrated approach that coordinated the EA process with an Official Plan Amendment that had the effect of designating the collector roads in the City of Cambridge Official Plan.

WSP staff completed the natural heritage study component of the Cambridge West MESP. Natural heritage input to the MESP included detailed characterization of existing conditions through multi-year (2008 - 2013) field studies and thorough background desktop review of available information. That study also included: an analysis of potential impacts on ecological features and functions from changes to existing land use; identification of mitigation measures to eliminate or reduce those impacts; and recommendations for the protection and enhancement of existing significant natural heritage features and their functions adjacent to the Subject Property. Key recommendations included: implementation of setbacks / buffers where natural features are situated adjacent to proposed development; maintenance of wildlife movement corridors through retained, created or enhanced wildlife movement linkages / corridors; and wildlife habitat enhancement. These recommendations laid the framework for the natural heritage system adopted with the approval of the MESP in 2014. Refer to the Cambridge West MESP for additional details.

The results of the MESP form the basis of information provided in the current scoped EIS. Additional ecological monitoring and targeted field surveys in support of the Collector Road EA were undertaken in 2014 and 2015; results from that work have been integrated with the findings of the MESP to inform this scoped EIS. Further additional surveys to supplement the existing data were completed from 2019 - 2024.

This report summarizes findings of the natural heritage assessment of the Subject Property and adjacent lands, including: a summary of background data collection; results of field surveys to characterize existing ecological conditions; an evaluation of the sensitivity and significance of the natural features within and adjacent to the Subject Property; review and assessment of natural heritage policy; and proposed development details. Impacts on the identified natural features and functions as a result of the proposed development are presented along with recommendations for mitigation measures to eliminate or reduce



the potential impacts. Recommendations for ecological enhancements (e.g., ecological linkages, enhanced buffers, etc.) and biological monitoring are also provided.

This EIS has been prepared in support of five applications:

- An Official Plan Amendment, in the form of a *Special Policy* for the Westwood Village Phase 2 Community. Refer to Policy 2.1.4 of the Township Official Plan and the concurrent Planning Justification Report (MHBC April 2026).
- One zoning by-law amendment that applies to both the HCL and Brian Domm lands.
- Two Plans of Subdivision (one for each parcel of land).

The study team consists of MHBC Planning, Urban Design & Landscape Architecture (planning and project coordination), MTE Consultants Inc. (all engineering including, stormwater management, surface water resource management and hydrogeology), Paradigm Transportation Solutions Limited (transportation) and WSP (natural heritage and fluvial geomorphology).

Note that a previous version of this report was submitted to the Township of North Dumfries in 2021. The current report builds upon the 2021 submission, reflecting changes to the proposed development, updates to technical information and incorporates the results of fieldwork completed as part of biological monitoring since the 2021 submission, as relevant.

1.2 Subject Property

The Subject Property, as shown in Figure 1, is approximately 25.43 ha and located in the Township of North Dumfries, immediately west of the Westwood Village Phase 1 lands. The Subject Property is bounded by the Blair-Bechtel-Cruickston *Environmentally Sensitive Landscape* (ESL) to the west, south and north, and Newman Drive, within the approved Westwood Village Phase 1 lands to the east. Existing land use within the development envelope was under agricultural use (cropland) until preliminary grading and filling was undertaken in 2020. As a condition of GRCA Permit No. 690/19 and the Township of North Dumfries' Pre Servicing Agreement, the pre-graded area was re-established as interim agricultural lands in 2021.

The proposed development includes single and multiple residential / residential housing, mixed-use, a park, and roads. In addition, the development will include the required municipal services (storm, sanitary, sewer) and a stormwater management (SWM) system.

1.3 Study Area

The broader area discussed within the MESP Natural Environment Study (NES) has been referred to within this document as the 'MESP General Study Area'. In this report, the Study Area includes the



Westwood Village Phase 2 development area (the Subject Property), as well as adjacent natural areas (i.e., WSU 2, 3, 4, 6, and 8 on Figure 4) - to ensure the potential for impacts have been considered in context of the local landscape.

Natural features within the Study Area and adjacent lands are clustered in several large blocks; they have several overlapping designations as shown in Figure 1. These features include a diverse mix of aquatic, wetland, and upland habitats. While habitat continuity is generally good within these blocks, intervening agricultural / urban land uses have resulted in a fragmented local ecosystem. The primary natural feature blocks are:

West of Subject Property – Lands are designated as part of the Blair-Bechtel-Cruickston ESL. This ESL includes portions of the Barrie's Lake - Bauman Creek *Provincially Significant Wetland* (PSW), Barrie's Lake *Environmentally Sensitive Policy Area* (ESPA), and the *rare* Charitable Research Reserve ('rare') lands to the north.

East of the Subject Property – A feature referred to as the 'Central Wetland', part of the Barrie's Lake - Bauman Creek PSW, is located east of the Subject Property, within the Westwood Village Phase 1 lands.

All of the large natural areas described above are identified as *Core Environmental Features* (CEFs) in the Cambridge Official Plan (2018) and all have been recommended for retention in the MESP / subsequent studies as part of the *Natural Heritage System*.

For additional details refer to the MESP NES (2013).

2.0 POLICY FRAMEWORK

2.1 Overview

This scoped EIS is being undertaken in accordance with relevant policies and guidelines of the Township of North Dumfries, City of Cambridge, Region of Waterloo, Grand River Conservation Authority (GRCA), Government of Ontario and Government of Canada. The natural heritage policy framework, including designations, guidelines and recommendations at the federal, provincial, regional and municipal level, has informed this study. Key documents include the Provincial Planning Statement (PPS; 2024) and its guidance documents, and Official Plans for the Region, City and Township. A detailed discussion of relevant natural heritage policies and compliance is included in Section 9, with key documents listed in the References.



2.2 Species of Conservation Concern (SCC)

The term “Species of Conservation Concern” (SCC), in this report, includes:

- Species listed by COSEWIC¹, and potentially subject to the provisions of the federal Species at Risk Act (SARA; 2002)
- Species listed by COSSARO² and potentially subject to the provisions of Ontario's Species Conservation Act (SCA; 2025)
- Provincially significant species (NHIC S-rank of S1 to S3 or SH)
- Regionally significant species, per the Checklist of the Waterloo Region's Significant Species List (Regional Municipality of Waterloo 1999) and the List of the Vascular Plants of Ontario's Carolinian Zone (Oldham 2017)
- *Area Sensitive* species listed in the Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E (MNRF 2015)
- Vascular plant species with provincial *Coefficients of Conservatism* (CC)³ of 9 or 10

Prior to undertaking the field survey, a list of SCC with the potential to be present within the general vicinity of the Study Area was generated based on the background resources listed in Section 3.

The potential for plant and wildlife SCC was assessed through a habitat suitability assessment / screening process, as well as through detailed surveys, where warranted (based on species range, records and habitat suitability). See Section 5, 6 and 9 for further details regarding the results of field surveys and the SAR habitat suitability assessment.

3.0 STUDY APPROACH

This report outlines methodology and findings from the Westwood Village Phase 2 ecology fieldwork in 2019 - 2020 and results from field work conducted as part previous studies from 2008 to 2015. In addition, results from biological monitoring from 2021 – 2024 have been considered. In previous reports, listed in

¹ Committee on the Status of Endangered Wildlife In Canada

² Committee on the Status of Species at Risk in Ontario

³ 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 specific plant community but tolerate moderate disturbance; (7-8) Taxa associated with plant communities in advanced successional stages with minor disturbance; (9-10) Taxa with high fidelity to a narrow range of synecological parameters.



Section 1.1, natural environment features and functions were characterized and evaluated using a combination of a review of background information and findings of a multi-season, multi-year (2008 – 2015) field survey program. Detailed results from previous natural heritage surveys are presented in the reports listed in Section 1.1, with key findings included herein.

Surface water quality / quantity and hydrogeological studies were completed as part of the MESP study by MTE Consultants Inc. and LVM Inc. Details are provided in reports titled Cambridge West Master Environmental Servicing Plan – Surface Water Resources and Municipal Servicing Study (MTE Consultants Inc. 2013) and Hydrogeology Study Report - Cambridge West Community Master Environmental Servicing Plan (MESP) Roseville / Blenheim Road, Cambridge, Ontario (LVM Inc. 2013). Updated hydrogeology, stormwater management and functional servicing studies have been completed for the subject property, with relevant information considered herein:

- Westwood Village Community (Phase 2). Brian Domm Subdivision, Hallman Subdivision. Functional Servicing Report (MTE; April 2026a)
- Westwood Village Community (Phase 2). Brian Domm Subdivision, Hallman Subdivision. Preliminary Stormwater Management Report (MTE; April 2026b)
- Cambridge West Community. Westwood Village Phase 2. Brian Domm Subdivision, Hallman Subdivision. Hydrogeological Assessment (MTE; January 2021).
- Westwood Village (Phase 2) Community - Hydrogeological Assessment Report Addendum (MTE; April 2026c).

3.1 Background Review

Natural environment features and functions within the vicinity of the Study Area have been characterized and evaluated using a combination of background information and field surveys, as discussed below. The review of secondary source background information included the following sources:

- Topographic mapping (OBM, NTS), and both historical and current aerial photography
- eBird website – Interactive species range maps
- Environmental reports relevant to the Study Area
- Fisheries and Oceans Canada (DFO) – Aquatic species at risk mapping
- Grand River Conservation Authority (GRCA) – GRIN resource mapping
- iNaturalist website - Interactive species observation and range maps
- Geospatial Ontario database information



- Natural Heritage Information Centre (NHIC) database and mapping
- Ontario Mammal Atlas (Dobbyn 1994)
- Ontario Reptile and Amphibian Atlas (Ontario Nature website)
- Relevant Cambridge Official Plan (2018) policies and guidelines
- Relevant Township of North Dumfries Official Plan (2018) policies and guidelines
- Relevant Studies:
 - MESP Natural Environment Study (NES) Report (Ecoplans 2013)
 - Cambridge West Lands Scoped EIS (MMM 2016)
 - Biological monitoring reports as referenced in Section 1.1.

3.2 Agency Liaison

Agencies engaged for this study include: Region of Waterloo; Township of North Dumfries; City of Cambridge; GRCA; Ministry of Natural Resources and Forestry (MNRF) - Guelph District; Ministry of the Environment, Conservation and Parks (MECP). Extensive agency consultation was undertaken as part of the MESP study with respect to natural heritage issues. As part of this scoped EIS, agencies were circulated a draft Terms of Reference on November 18, 2020, which outlined the proposed scope of work (Appendix A).

This report also incorporates input received at the following agency meetings and liaison:

- October 3, 2019. Pre-consultation Meeting. Attended by staff from Region of Waterloo, Township of North Dumfries, City of Cambridge, GRCA, Energy + Inc., and proponents / study team.
- October 18, 2019. Site meeting to review feature limits previously flagged by WSP. Attended by staff from Region of Waterloo, Township of North Dumfries, City of Cambridge, GRCA, MHBC, and WSP.
- March 9, 2020. Meeting at Township. Attended by staff from Township of North Dumfries and City of Cambridge, as well as proponents / project team
- September 15, 2020. WSP submitted a memo documenting analysis of a small wetland (identified as Vegetation Unit 18 in submitted reports for planning of the Cambridge West community) to MNRF. The memo concluded that the wetland should be removed from the PSW.
- December 14, 2020. Region of Waterloo Ecological and Environmental Advisory Committee (EEAC) meeting to review the EIS Terms of Reference.



- January 18, 2021. Email from MNRF confirming agreement with the WSP September 15, 2020 memo / conclusions, specifically that Vegetation Unit 18 should be removed from the PSW and LIO mapping.

3.3 Field Surveys

An overview of field surveys carried out for this EIS study (2019 to 2020), including supplementary work carried out during previous studies is provided below.

3.3.1 MESP Surveys

A multi-year (2008 – 2013), multi-season ecological field survey program within the Study Area was undertaken as part of the MESP, and as documented in the MESP NES Report (Ecoplans 2013). An overview of fieldwork relevant to the Subject Property, conducted as part of the MESP and subsequent studies, is provided below.

Vegetation

- Vegetation community classification and description
- Botanical inventory
- Natural feature delineation
- Specialized surveys; forest edge assessment, old growth assessment

Wildlife

- Avifaunal surveys (breeding birds, migrant / supplemental, owls, crepuscular birds, marsh birds)
- Herpetofaunal surveys (spring calling amphibians, Ambystomid salamander trapping, road / mortality, 'cover board', turtle basking / nesting)
- Butterflies and Dragonflies (Lepidoptera and Odonata)
- American Badger habitat assessment
- General wildlife
- *Species at Risk* (SAR) screening, surveys and habitat suitability assessment

In total, MESP natural environment field work entailed 1284 person-hours on 171 dates from 2008-2013.

3.3.2 2014 - 2015 Surveys and 2019 - 2020 Surveys

Based on anticipated timing for construction, pre-construction monitoring for Westwood Village Phase 1 was initiated in 2014 - 2015, then resumed in 2019 - 2020; this included coverage of the current Study Area. In addition, pre-construction (2019 and 2020) and during-construction (2021 – 2024) biological



monitoring specific to Westwood Village Phase 2 has been undertaken based on the approved biological monitoring specified in the MESP, the approved biological monitoring program as specified in the EIS for adjacent City lands (WSP 2016) and conditions of approval for Draft Plans of Subdivision 30T-16103 and 30T-16104. Relevant information from all of the above has been considered herein.

Additional monitoring components will be added in the during- and post-construction monitoring phases, once established or installed: wildlife passage monitoring; and buffer integrity / function monitoring. The recommended biological monitoring component for the Subject Property is presented in Section 11. It is consistent with the approved MESP recommendations regarding scope and duration.

For 2019 - 2020 biological surveys, survey station locations in the Study Area were consistent with the MESP study recommendations, with minor modifications (i.e., field fitting where safety concerns regarding water depth were present) and to provide the best overall representation of each vegetation community. Locations of the biological monitoring / survey components are shown on Figure 2.

For a detailed summary of all ecological field surveys undertaken as part of the EIS study (2019 and 2020), MESP and ongoing biological monitoring, see the Field Chronology provided in Appendix B. Field surveys included the following:

Scoped EIS (2021):

- Substantial field effort in 2019 and 2020, consistent with previous MESP surveys - which included the same survey components and coverage / locations (i.e., ELC, botanical inventory, breeding birds, marsh birds, least bittern, migrant waterfowl, spring amphibian breeding, turtle basking)
- In total, this included 259 field person-hours on 41 dates

Monitoring surveys from 2021 to 2024

- Substantial field effort; consistent with MESP / EIS surveys, though refined to address specific elements of monitoring (e.g., vegetation plot / transects at set locations)
- In total, this included 475 field person-hours on 74 dates

4.0 OVERVIEW OF SITE CONDITIONS

An overview of the Study Area and existing natural heritage features is provided in Section 1.0 of this report. The following sections provide additional characterization of the natural features and functions within the Study Area.



4.1 Past & Present Land Use

The Subject Property has been under agricultural production since the early nineteenth century. Feature limits / extent of active agricultural use have varied slightly year to year and over time, but adjacent ‘core’ natural areas in the Study Area are relatively unchanged over the past 50 years.

Within the Study Area, lands are a mix of active agriculture (cropland), urbanizing areas (development ongoing) and natural heritage features, including marsh / open water wetlands (WSU 2, WSU 3, WSU 6 and WSU 8), as well as upland and swamp communities associated with the Blair-Bechtel-Cruickson ESL and *rare* lands (WSU 4).

Coincident with site grading for the adjacent approved subdivisions in Westwood Village Phase 1, some grading related activities were undertaken on the Subject Property from 2020-2022:

- Installation of Erosion & Sediment Control (ESC) fencing at MESP-recommended buffer limits;
- Preliminary site filling and grading, in accordance with GRCA Permit No. 690/19 and the Township’s Pre-Servicing Agreement.
- Installation of the wildlife eco-passage at the Newman Drive crossing. This eco-passage was installed as of April 2023, with connections to temporary wildlife exclusion fencing on the west (Subject Property) and east sides (Westwood Village Phase 1).

4.2 Designated Features

The following designated natural heritage features are found within (or partially within) the Study Area (see Figure 1). Most of these features have multiple / overlapping natural environment designations.

- **PSW’s:** Barrie’s Lake – Bauman Creek PSW
- **GRCA Regulated Areas (O. Reg. 41/24):** watercourses and wetlands.
- **City of Cambridge, Cambridge Official Plan (2018) Natural Heritage System:** Blair-Bechtel - Cruickston ESL; Barrie’s Lake ESPA, CEF’s; Locally Significant Natural Areas (LSNA’s); and fish habitat (Barrie’s Lake).
- **Township of North Dumfries Official Plan (2018) Designated ‘Greenlands Network’ Features:** Blair-Bechtel – Cruickston Creek ESL; Barrie’s Lake ESPA; hazard lands, Supporting Environmental Features (SEF’s), and CEF’s.



4.3 Physiography, Soils & Drainage

This overview considers previous MESP work, field surveys undertaken by WSP and relevant information in the Functional Servicing Report (MTE 2026a), Preliminary SWM Report (MTE 2026b); and Hydrogeological Assessment (MTE; 2021) & associated addendum (MTE 2026c). All descriptions refer to the existing site conditions prior to area grading / filling undertaken on the Subject Property in 2020.

The Study Area includes a mix of active and former agricultural fields (row crops), wetlands and forest, with development underway on adjacent lands to the east. The Subject Property was formerly comprised of agricultural fields (currently area-graded).

The Subject Property is in the Grand River Watershed, within the Cruickston Creek subwatershed. It is important to note that none of subject lands drain to Barrie's Lake under current conditions. No defined watercourses are present on the Subject Property. Diffuse and defined channels associated with Cruickston Creek and Newman Creek are located on adjacent lands to the north. Devil's Creek is located ~950 m to the east, with an intervening subdivision under construction.

As shown on Figure 2.1 (MTE 2026a), the eastern portion of the Subject Property primarily drains to the central wetland on adjacent City lands to the east. That feature does not have a surface outlet and as a result recharges and drains internally. The northern and western portion of the Subject Property drains externally towards the adjacent woodland and wetland areas to the west and north. Both the northern and western portions of the subject lands are currently within the Cruickston Creek subwatershed; however, the MESP recommended that these be redirected to the Grand River via SWMF 2.

There are several PSW wetland features in the study area, outside of the Subject Property (i.e., WSU 2, WSU 3, WSU 6, Barrie's Lake (WSU 8) and Devil's Creek Swamp and Forest ESPA (WSU 1 and WSU 9). All are located outside of lands proposed for development. One small evaluated / non-PSW wetland is present on the Subject Property: Vegetation Unit 18 (Figure 3). There are no defined surface water channel outlets to any of the adjacent wetland areas from the Subject Property; rather surface water is conveyed as sheet flow or in low lying areas to the wetland interface.

The Subject Property is moderately sloped, with a topographic high located near BH13-10 (Figure 7.1 in MTE 2026b). Existing ground surface elevations range between 307.0 m above mean sea level (amsl) near the Wetland 6 boundary to 316.0 m amsl near the boundary between the Domm Township Lands boundary and Hallman Township Lands boundary (Appendix H).

Soils on the subject property range from silt with trace sand and gravel to gravelly sand with trace silt and clay (MTE 2021).



4.4 Hydrogeology

As noted in the Hydrogeological Assessment (MTE 2021) and associated addendum (MTE 2026c), groundwater on the Subject Property follows pre-grading topography, ranging in depth from 1.10 m below ground surface (mbgs) to 6.52 mbgs. The greatest depth to groundwater occurs near the centralized high points at BH13-10. The shallowest depth to groundwater, other than in the mini piezometers that are located adjacent to the wetlands, occurs near the northern wetland/woodlot limit at BH113-10. Groundwater is interpreted to flow north toward the rare 'hogsback' / Cruickston Creek as well as north and east toward the Grand River and Devil's Creek.

Average surface water levels in Wetlands 2, 3, 4 and 5 (Figure 1 in MTE 2026c) ranged between 0.39 m and 0.76 m prior to 2020, with water levels in all four wetlands averaging 0.42 m from 2020 – 2025 (MTE 2026c)

The wetlands are highly dependent on rainfall and groundwater contributions to maintain water levels during the summer. Between 2020 and 2023, average rainfall was lower than previous years, leading to a reduction in water level ranges during that period. The same conditions (i.e., lower average water levels compared to conditions prior to 2020) have been observed in Barrie's Lake. It is expected that as annual rainfall returns to pre-2020 averages, and with the implementation of wetland water balance mitigation measures (e.g., roof water collection systems and at-source infiltration systems) that water levels will return to previous levels.

Wetland water levels follow yearly trends of peaking after winter snowmelt events and decreasing over the summer and fall months. This trend is expected, but can vary depending on the ambient temperature, sun exposure, amount of rainfall, rainfall frequency, and the level of the groundwater table.

For additional detail, refer to the Hydrogeology Study Report (LVM 2013), the Cambridge West Community. Westwood Village Phase 2. Brian Domm Subdivision, Hallman Subdivision. Hydrogeological Assessment (MTE April 2021) and the Westwood Village (Phase 2) Community – Hydrogeological Assessment Report Addendum (MTE April 2026c).

Additional discussion is provided in the 2020 – 2024 biological monitoring reports and in the following monitoring reports prepared by MTE:

- MTE Consultants Inc. 2023. Cambridge West Community – During Development Monitoring Program – Pre-Construction Surface / Groundwater Monitoring Summary (2014 - 2019)
- MTE Consultants Inc. 2023. Westwood Village Community. During-Development Monitoring Program. 2020 Annual During-Construction Surface / Groundwater Monitoring Report.

- MTE Consultants Inc. 2023. Westwood Village Community. During-Development Monitoring Program. 2021 Annual During-Construction Surface / Groundwater Monitoring Report.
- MTE Consultants Inc. 2023. Westwood Village Community. During-Development Monitoring Program. 2022 Annual During-Construction Surface / Groundwater Monitoring Report.
- MTE Consultants Inc. 2024. Westwood Village Community. During-Development Monitoring Program. 2023 Annual During-Construction Surface / Groundwater Monitoring Report.
- MTE Consultants Inc. 2025. Westwood Village Community. During-Development Monitoring Program. 2024 Annual During-Construction Surface / Groundwater Monitoring Report.

5.0 VEGETATION

5.1 Vegetation Community Characterization

5.1.1 *Approach*

Multi-season, multi-year field surveys of vegetation were undertaken between 2008 and 2015 as part of the previous studies, and additional surveys were completed in 2019 and 2020 to update the floristic inventory. Additional information regarding vegetation and flora has been collected through ongoing biological monitoring completed in 2021 and 2024. Natural heritage features within 120 m of the Subject Property have been discussed in this scoped EIS. Vegetation communities have been delineated on an air photo base and refined based on field visits (Figure 3); described using general characteristics, dominant flora, age, exotic / invasive species, size, rare flora, notable features etc.; and classified to 'vegetation type'. Vegetation types we described using the Ecological Land Classification System for Southern Ontario (Lee et.al. 1998). Vegetation community significance has been evaluated using Natural Heritage Resources of Ontario: Vegetation Communities of Southern Ontario (Bakowsky 1996) and vegetation community significance listed on the NHIC website.

5.1.2 *Results*

5.1.2.1 Study Area

The general area is typical of southern Ontario landscapes, consisting of a mix of land uses: urban residential (to the north, east and southeast); agricultural (to the west and south); rural residential / farmstead (several properties along Blenheim Road); and natural (forest / wetland / pond areas within and adjacent to the Study Area).



The natural features within the Study Area are associated with the woodlands and wetlands to the west, the Central wetland on City lands to the east and Barrie's Lake to the south; these are generally coincident with the designated natural heritage features (i.e., PSW, ESPA, ESL). See Figure 1.

Vegetation communities are shown in Figure 3 and described in detail in Table 1, with vascular plant SCC listed in Table 2.

In total, twelve composite Vegetation Units for which detailed studies were conducted are present within the Study Area; some are relatively homogeneous, with or without inclusions; and some are complexes or mosaics of different habitat types. None of the vegetation community types surveyed is considered provincially significant (per Bakowsky 1996 / NHIC).

Based on monitoring completed by WSP from 2021 - 2024, there are no changes to ELC community types or composition / descriptions.

5.1.2.2 Subject Property

Portions of the following vegetation units are present adjacent to the Subject Property: Unit 1A, 1B, 2, 3, 4, 5, 10a, 10b, 11a, 11a, and 12. With the exception of Unit 18 (small wetland), none is within the proposed development envelope. Per the WSP Technical Memo (Sept. 2020; Appendix G) and concurrence by MNRF, this wetland has been reaffirmed as not part of the PSW. Note that this is the same conclusion reached in the MESP. Additional commentary and assessment is provided in Section 9.9, with the conclusion that the wetland meets GRCA policies allowing removal (consistent with the MESP and 2016 EIS for adjacent City lands).

5.2 Botanical Inventory

5.2.1 Approach

As part of previous studies, a multi-season botanical inventory was undertaken within the Study Area on 42 separate dates between 2008 and 2018, as detailed in previous studies listed in Section 1.1. In addition, botanical inventory surveys were complete on 10 separate dates between 2019 and 2020 (Appendix B). The quality of a particular vegetation community can be reflected in its richness of conservative species as indicated by the *Floristic Quality Index* (FQI) number (Oldham et al. 1995). FQI is a measurement of a vegetation community's ecological quality based on its plant species composition. FQI is calculated by weighting the mean *Coefficient of Conservatism* divided by species richness. Generally, 1 to 10 is low quality, 11 to 20 is moderate, 21 to 35 is high quality, and > 35 is exceptional.

Plant species status was evaluated using the Region of Waterloo Listing of Significant Vascular Plants (1999) for regional significance; the NHIC website for provincial rarity ranks (i.e., S-Ranks); the Species At



Risk in Ontario list (MNR) for provincial status designations; and the Canadian Species At Risk list (COSEWIC – current list at the time of report preparation) for national status designations. Additional commentary regarding Species at Risk (SAR) is provided in Section 9 and Appendix E.

5.2.2 Results

Detailed results from previous studies have been submitted separate cover, in the reports listed in Section 1.1. Species lists presented herein are cumulative, and include results from all previous surveys, with the addition of the 2019 to 2024 data. Vascular plant species are listed by Vegetation Unit and provided in Appendix C.

In total, 428 vascular plant species were recorded by WSP within the Study Area (seven identified to genus due to lack of identifiable characteristics).

- Most are native species (317 native species [74%]) and most are common and secure or apparently secure in Ontario (i.e., ranked S5, S4, or SNA).
- Two species designated by COSEWIC as SAR in Canada:
 - **Black Ash** (*Fraxinus nigra*; S4, Threatened)
 - **Butternut** (Endangered)
- Two species afforded protection under the Species Conservation Act (2025):
 - **Butternut** (Endangered)
 - **Black Ash** (Endangered)
- **Provincially Rare Species.** Two species with moderate to high risk of extirpation in Ontario: Butternut (*Juglans cinerea*; S2?); and Northern Pin Oak (*Quercus ellipsoidalis*; S3).
- **Regionally Rare Species.** Twenty-nine species considered significant in the Region of Waterloo⁴. Sixty-five species are considered significant within the Carolinian Zone⁵.
- **Invasive species.** One quarter (26%) of the species recorded are introduced. Of these introduced plant species, five are considered priority invasive species:
 - **European Reed** (*Phragmites australis* ssp. *australis*)

⁴ Regional Municipality of Waterloo, 1999. Revisions to Waterloo Region's Significant Species List: Vascular Plants Component. Report to Planning and Culture Committee PC-99-028.1. Approved by Council June 23, 1999.

⁵ 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.



- **Japanese Barberry** (*Berberis thunbergii*)
- **Garlic Mustard** (*Alliaria petiolata*)
- **Glossy Buckthorn** (*Frangula alnus*)
- **European Buckthorn** (*Rhamnus cathartica*)

No *Species of Conservation Concern* were recorded on the Subject Property; all are within the retained adjacent natural areas.

Based on monitoring completed by WSP in 2021 and 2024 there have been no substantive changes to floristic composition. Variations noted in the during-construction monitoring period are attributed to above average precipitation in late pre-construction (2019), followed by drought conditions in the during-construction period (2021-2022).

5.3 Feature Delineation

Wetland and CEF limits were previously determined in the MESP NES based on the following: spring and summer floristic surveys; ELC habitat classifications; guidance in the Ontario Wetland Evaluation System for Southern Ontario (2013); and guidance in the Region of Waterloo's Greenlands Network Implementation Guidelines, 2nd Draft (2010). Preliminary wetland / CEF delineations by Ecoplans were completed on nine dates in 2010 and 2011, confirmed by City, Region, and GRCA staff during site walks in 2010 and 2011 and subsequent surveyed for inclusion on base plans.

Limits were reviewed in the field based on existing conditions and updated guidelines (e.g., Final Greenlands Network Implementation Guidelines [2016]) in 2019, confirmed with agencies on October 18, 2019, and surveyed for inclusion on base plans. See Figure 5 for the updated surveyed wetland and CEF limits. Feature limits are also accurately shown on the proposed plans of subdivision. Limits have been reviewed through ongoing biological monitoring and no changes to the confirmed limits are proposed.

5.4 General Vegetation Inventory and Analysis

5.4.1 Methodology

A General Vegetation Inventory and Analysis (GVIA) was undertaken in support of the current Draft Plan Application – per the City of Cambridge Tree Management Policy (2002). The four main requirements addressed as part of the GVIA are:

- **Inventory Information.** Inventory information on the vegetation units within the study area is detailed in Section 5.1, Section 5.2 and Table 1.
- **Air Photo.** The Subject Property and Study Area are shown on all figures.



- **Maps.** The Draft Plan is shown on Figure 6.
- **Analytical Report.** Discussed in Sections 5.4.2, 8, and 10.

5.4.2 *GVIA – Results and Recommendations*

GVIA vegetation community assessment and recommendations are provided in Table 1. All vegetation communities within the adjacent natural features are recommended for retention with no further assessment - protect (RFA-P). Vegetation Unit 18 (isolated wetland in the southern portion of the Subject Property) is recommended for removal with no further assessment - remove (NFA-R), consistent with MESP NES, City lands EIS (WSP 2016) recommendations, and based on the updated analysis in Section 9.

Table 1. Vegetation Community Descriptions

UNIT	HABITAT / ELC VEGETATION TYPE	LAYER	DOMINANT SPECIES	DESCRIPTION AND COMMENTS
1a	Upland Fringe	Canopy	Red Oak, Trembling Aspen, Northern Pin Oak, Manitoba Maple, Bur Oak, Black Cherry,	- Area: 2.0 ha 106 spp. recorded (48% native; FQI 14.6) - Age: successional meadow, thicket, young woodland; occasional mid-aged to mature trees - Disturbance: moderate to high overall; higher in cultural meadows; plowing to / within dripline in many areas - Overall botanical quality: Moderate - GVIA Recommendation: NFA-P
	FOD1-4 Dry-Fresh Oak - Hardwood Deciduous Forest	Shrub Layer	Common Buckthorn, Glossy Buckthorn, Chokecherry, Black Raspberry	
	FOD3-1 Dry-Fresh Poplar Deciduous Forest	Ground Layer	Enchanter's Nightshade, Goldenrod spp., Dandelion, Wild Carrot, Smooth Brome, Aster spp.	
1b	Wetland Habitat Complex	Canopy	Occasional larger Willows (White Willow, Meadow Willow, Reddish Willow), Peach-leaved Willow, Freeman's Maple, Manitoba Maple	- Area: 11.7 ha 82 spp. recorded (83% native; FQI 29.7) - Age: mature - Disturbance: low overall – some edge intrusions abutting active farm fields. Sparse European Reed patches along pond edge that have been actively managed since 2017. - Organic soils > 40 cm deep - Overall botanical quality: High - GVIA Recommendation: NFA-P
	SWT3-2 Willow Organic Thicket Swamp	Shrub Layer	Heart-leaved Willow, Bebb's Willow, White Willow, Meadow Willow, Winterberry, Silky Dogwood, Red-osier Dogwood	
	SWT3-7 Winterberry Organic Thicket Swamp	Ground Layer	Spotted Jewel-weed, Fowl Manna Grass, Reed-canary Grass, Cattail spp., Purple Loosestrife, Sedge spp., Rice-cut Grass, Sensitive Fern, Spotted Joe-pye-weed, Purple-stemmed Aster, Panicked Aster, Large Bur-reed	
2	Deciduous Forest	Canopy	Sugar Maple, Red Oak, American Beech, Black Cherry, Red Maple, White Pine, Bur Oak, Large-tooth Aspen and American Basswood	- Area: 1.9 ha 93 spp. Recorded (81% native; FQI 36.0) - Age: mid-aged / sub-mature - Disturbance: moderate – some edge effects, canopy gaps, farm lane at north end; excavated drainage channel; invasive / exotic species; rubbish - Old drainage channel extends from pond at south end to forest / swamp to the north – no surface water connection and no flow conveyance - Overall botanical quality: High - GVIA Recommendation: NFA-P
	FOD5-3 Dry-Fresh Sugar Maple – Oak Deciduous Forest	Shrub Layer	Sugar Maple, American Beech, Black Cherry, White Ash, Ironwood, Blue Beech, Chokecherry, Alternate-leaved Dogwood, Common Buckthorn, Bush Honeysuckle, Riverbank Grape,	
		Ground Layer	Sugar Maple, Red Baneberry, White Baneberry, White Trillium, Evergreen Wood Fern, Wild Leek, Zigzag Goldenrod, Wild Ginger, False Solomon's Seal, Dame's Rocket	
3	Deciduous Forest	Canopy	Sugar Maple, American Beech, Red Oak, Black Cherry, Yellow Birch, White Pine, Bitternut Hickory, Large-tooth Aspen, American Basswood	- Area: 3.4 ha 145 spp. recorded (87% native; FQI 50.9) - Age: mid-aged to mature - Disturbance: low overall – some edge effects; exotic species present - Notable stands of Leatherwood on local knolls between vernal pond and swamp. - Includes upland fringe and inclusions between the swamp and agricultural field to the east /
	FOD5-2 Dry-Fresh Sugar Maple – Beech Deciduous Forest	Shrub Layer	Sugar Maple, American Beech, White Ash, Ironwood, Blue Beech, Chokecherry, Alternate-leaved Dogwood, Common Buckthorn, Smooth Serviceberry, Leatherwood	
	* Partial inventory/habitat assessment (south portion)			



UNIT	HABITAT / ELC VEGETATION TYPE	LAYER	DOMINANT SPECIES	DESCRIPTION AND COMMENTS
		Ground Layer	Sugar Maple, Red Baneberry, Wild Sarsaparilla, White Trillium, Evergreen Wood Fern, Wild Leek, Wild Ginger, False Solomon's Seal, Tall Hairy Agrimony, Yellow Avenas, Garlic Mustard	northeast. - Overall botanical quality: Exceptional - GVIA Recommendation: NFA-P
4	Vernal Pond / Thicket Swamp SAF3-1 Duckweed Floating-leaved Shallow Aquatic SWT3-7 Winterberry Organic Thicket Swamp	Canopy	Partial canopy cover by adjacent forest trees (Sugar Maple, American Beech, Yellow Birch, White Pine).	- Area: 0.4 ha 69 spp. recorded (93% native; FQI 36.5) - Age: mature - Disturbance: low – a few exotic species; limited recent anthropogenic disturbance - Organic soils > 40 cm deep - Overall botanical quality: Exceptional - GVIA Recommendation: NFA-P
		Shrub Layer	Fringe of Winterberry, <i>Salix</i> spp., Blue Beech, Red-osier Dogwood and Glossy Buckthorn	
		Ground Layer	Lesser Duckweed, Spotted Jewel-weed, Fowl Manna Grass, Skunk Cabbage, Marsh Fern, <i>Carex</i> spp., Rice-cut Grass, Sensitive Fern, Crested Shield Fern, Blueflag, Cinnamon Fern,	
5	Swamp SWM6-1 Birch-Conifer Organic Mixed Swamp * Partial inventory /habitat assessment (south portion)	Canopy	Yellow Birch, Black Ash, White Pine, Red Maple, American Larch, Freeman's Maple, Eastern White Cedar, Bur Oak, Trembling Aspen, American Elm	- Area: 7.6 ha 147 spp. recorded (90% native; FQI 51.5) - Age: mature overall - Disturbance: low – limited exotic / invasive species and edge effects. One dense European Reed patch along wetland edge at the southern portion of the woodlot - Part of the 'Hogsback', primarily located on <i>rare</i> lands to the north (Figure 1) - Contains interior forest habitat (5.5 ha) with hummocky and rich organic swamp - Organic soils > 40 cm deep - Overall botanical quality: Exceptional - GVIA Recommendation: NFA-P
		Shrub Layer	Yellow Birch, Red Maple, Eastern White Cedar, American Elm, Blue Beech, Common Elderberry, Spicebush, Glossy Buckthorn	
		Ground Layer	Cinnamon Fern, Sensitive Fern, Marsh Marigold, Spotted Jewel-weed, Fowl Manna Grass, <i>Carex</i> spp., Rice-cut Grass, Rough-leaved Goldenrod, Royal Fern	
10a	Wetland / Pond SAF3-1 Duckweed Floating-leaved Shallow Aquatic MAS3-1 Cattail Organic Shallow Marsh MAM3-3 Reed-canary Grass Organic Meadow Marsh	Canopy	n/a	- Area: 1.6 ha 134 spp. recorded between 10a and 10b (55% native; FQI 20.3) - Age: mature overall, but recent fill / veg removal and hydrological alterations - Disturbance: moderate (locally high). Sparse European Reed patches along pond edge that have been actively managed since 2017. - Organic soils > 40 cm deep - South 'lobe' ploughed through during drier years; also, there have been some alterations to drainage for farming. Flora is more tolerant and variable. - Overall botanical quality: High - GVIA Recommendation: NFA-P
		Shrub Layer	A few scattered willows, Red-osier Dogwood and Common Elderberry.	
		Ground Layer	Cattail spp., Lesser Duckweed, Wild Mint, Reed-canary Grass, Rice-cut Grass, Purple Loosestrife, <i>Carex</i> spp., Spotted Joe-pye-weed	
10b	Upland Fringe CUM1-1 Dry-Moist Old Field Meadow	Canopy	n/a	- Area: 0.3 ha 134 spp. recorded between 10a and 10b (55% native; FQI 20.3) - Width of upland margin varies year to year depending on limits of ploughing.
		Shrub Layer	A few scattered Common Buckthorn and Raspberry spp.	

UNIT	HABITAT / ELC VEGETATION TYPE	LAYER	DOMINANT SPECIES	DESCRIPTION AND COMMENTS
		Ground Layer	Goldenrods, Aster spp., Mullein, Wild Carrot, Smooth Brome, Motherwort, Common Burdock, Velvetleaf, Common Milkweed.	- Age: pioneer / early successional - Disturbance: high – recent / ongoing ploughing, fill and grading - Overall botanical quality: Low – Moderate - GVIA Recommendation: NFA-P
11a	Thicket Swamp SWT3-2 Willow Organic Thicket Swamp	Canopy	n/a	- Area: 2.4 ha 115 spp. recorded between 11a and 11b (78% native; FQI 30.6) - Age: mature - Disturbance: moderate overall, some local infill / dumpling and invasive species - Organic soils > 40 cm deep - Overall botanical quality: Moderate - GVIA Recommendation: NFA-P
		Shrub Layer	A few scattered Common Buckthorn, Raspberry spp.	
		Ground Layer	Goldenrods, Aster spp., Smooth Brome, Common Burdock, Common Milkweed.	
11b	Wetland Mosaic SAF3-1 Duckweed Floating-leaved Shallow Aquatic MAS3-1 Cattail Organic Shallow Marsh MAM3-3 Reed-canary Grass Organic Meadow Marsh Inclusions: CUM1-1 Dry-Moist Old Field Meadow CUW1 Mineral Cultural Woodland	Canopy	Occasional tree willows, Freeman's Maple, Manitoba Maple	- Area: 3.0 ha 115 spp. recorded between 11a and 11b (78% native; FQI 30.6) - Organic soils > 40 cm deep - Narrow bands of cultural meadow / woodland present along portions of the wetland perimeter. - Width of upland and wetland margin varies year to year depending on limits of ploughing. - Age: varies - immature to mature - Disturbance: low to moderate overall, but some areas are ploughed regularly - Overall botanical quality: High - GVIA Recommendation: NFA-P
		Shrub Layer	Heart-leaved Willow, Bebb's Willow, Peach-leaved Willow, Meadow Willow, Winterberry, Silky Dogwood, Red-osier Dogwood	
		Ground Layer	Spotted Jewel-weed, Fowl Manna Grass, Reed-canary Grass, Narrow-leaved Cattail, Purple Loosestrife, <i>Carex</i> spp., Rice-cut Grass, Sensitive Fern, Spotted Joe Pye-weed, Purple-stemmed Aster, Panicked Aster,	
12	Wetland SAF3-1 Duckweed Floating-leaved Shallow Aquatic MAM2-2 Reed-canary Grass Mineral Meadow Marsh	Canopy	Occasional tree willows, Trembling Aspen, Balsam Poplar, Manitoba Maple	- Area: 0.22 ha 29 spp. recorded (48% native; FQI 5.9) - Age: pioneer / early successional - Disturbance: high – regularly plowed through / planted - Anthropogenically disturbed ephemeral pond / wetland area between / abutting two large wetlands. - Wetland limits vary year to year depending on hydrology and limits of ploughing. - Overall botanical quality: Low - GVIA Recommendation: NFA-P
		Shrub Layer	Heart-leaved Willow, Pussy Willow, Sandbar Willow, Bebb's Willow, Peach-leaved Willow, Meadow Willow, Winterberry, Silky Dogwood, Red-osier Dogwood	
		Ground Layer	Reed-canary Grass, Cattail species, Spotted Jewel-weed, Fowl Manna Grass, Purple Loosestrife, <i>Carex</i> spp., Rice-cut Grass, Spotted Joe-pye-weed, Purple-stemmed Aster,	
18	Seasonally wet area ELC not applicable	Canopy	n/a	- Area: 0.07 ha 18 spp. recorded (50% native; FQI 2.4) - Isolated wet depression with wetland vegetation in wet years and ploughed in dry years. As a result, vegetation typically does not mature and no ELC vegetation community type applies. - No surface inlets / outlets – water source is likely surface run-off from field. - Age: pioneer / early successional - Disturbance: high. Limits vary year to year depending on hydrology / ploughing. - Overall botanical quality: Low - GVIA Recommendation: NFA-R
		Shrub Layer	n/a	
		Ground Layer	Yellow Nutgrass, Mustard, Old Witch Panic Grass, Barnyard Grass, Orchard Grass, Broad-leaved Water-plantain.	

Table 2. Vascular Plant SCC Recorded within the Study Area

SCIENTIFIC NAME	COMMON NAME	CC ⁶	G RANK	S RANK	COSEWIC Status	SARO Status	CAROLINIAN ZONE (OLDHAM 2017)	WATERLOO REGION (1999)	UNIT 1A	UNIT 1B	UNIT 2	UNIT 3	UNIT 4	UNIT 5	UNIT 10	UNIT 11	UNIT 12
<i>Acer spicatum</i>	Mountain Maple	6	G5	S5			U							X			
<i>Agrostis scabra</i>	Rough Bentgrass	6	G5	S5			R						X				
<i>Asclepias exaltata</i>	Poke Milkweed	8	G5	S4			R				X	X					
<i>Brachyelytrum erectum</i>	Southern Shorthusk	7	G4G 5	S4			U					X					
<i>Calla palustris</i>	Wild Calla	8	G5	S5			R	W*		X							
<i>Carex atherodes</i>	Wheat Sedge	6	G5	S4			R	W								X	
<i>Carex laevivaginata</i>	Smooth-sheathed Sedge	8	G5	S4			U	W						X			
<i>Carex laxiculmis</i> var. <i>laxiculmis</i>	Spreading Sedge	7	G5T5	S4			C	W				X					
<i>Carex leptoneura</i>	Finely-nerved Sedge	5	G5	S5			U					X					
<i>Carex pseudocyperus</i>	Cyperus-like Sedge	6	G5	S5			U						X			X	
<i>Carex scabrata</i>	Eastern Rough Sedge	8	G5	S5			U	W						X			
<i>Carex sparganioides</i>	Burreed Sedge	5	G5	S4S5			C	W*			X	X					
<i>Carex tuckermanii</i>	Tuckerman's Sedge	7	G5	S5			U	W								X	
<i>Celtis occidentalis</i>	Common Hackberry	8	G5	S4			C	W*			X	X					
<i>Ceratophyllum demersum</i>	Common Hornwort	4	G5	S5			U			X					X		

⁶ Refer to Appendix D for legend

SCIENTIFIC NAME	COMMON NAME	CC ⁶	G RANK	S RANK	COSEWIC Status	SARO Status	CAROLINIAN ZONE (OLDHAM 2017)	WATERLOO REGION (1999)	UNIT 1A	UNIT 1B	UNIT 2	UNIT 3	UNIT 4	UNIT 5	UNIT 10	UNIT 11	UNIT 12
<i>Chrysosplenium americanum</i>	American Golden-saxifrage	8	G5	S4			U						X				
<i>Cinna latifolia</i>	Drooping Woodreed	7	G5	S5			R							X			
<i>Clintonia borealis</i>	Yellow Clintonia	7	G5	S5			U							X			
<i>Comarum palustre</i>	Marsh Cinquefoil	7	G5	S5			R					X					
<i>Cornus canadensis</i>	Bunchberry	7	G5	S5			U							X			
<i>Corylus cornuta</i>	Beaked Hazelnut	5	G5	S5			U							X			
<i>Crataegus coccinea</i> var. <i>pringlei</i>	Pringle's Hawthorn	4	G--T5	S5			U	W*				X					
<i>Dirca palustris</i>	Eastern Leatherwood	7	G4	S4			U					X					
<i>Dryopteris cristata</i>	Crested Wood Fern	7	G5	S5			U						X	X			
<i>Dulichium arundinaceum</i>	Three-way Sedge	7	G5	S5			R						X				
<i>Eleocharis palustris</i>	Common Spikerush	6	G5?	S5			R								X	X	X
<i>Equisetum fluviatile</i>	Water Horsetail	7	G5	S5			U			X							
<i>Equisetum palustre</i>	Marsh Horsetail	10	G5	S5			R	W						X			
<i>Equisetum scirpoides</i>	Dwarf Scouring-rush	7	G5	S5			R					X					
<i>Fragaria vesca</i> ssp. <i>americana</i>	Woodland Strawberry	4	G5T5	S5			U					X			X	X	
<i>Fraxinus nigra</i>	Black Ash	7	G5	S4	THR	END	C			X		X	X	X			
<i>Galium obtusum</i>	Blunt-leaved Bedstraw	6	G5	S4S5			C	W*								X	
<i>Galium palustre</i>	Common Marsh Bedstraw	5	G5	S5			R			X				X		X	
<i>Geum fragarioides</i>	Barren Strawberry	5	G5	S5			U		X			X		X			
<i>Glyceria grandis</i>	Tall Mannagrass	5	G5	S5			U								X		X
<i>Glyceria septentrionalis</i>	Eastern Mannagrass	7	G5	S4			U	W*							X	X	
<i>Gymnocarpium</i>	Common Oak Fern	7	G5	S5			U					X		X			

SCIENTIFIC NAME	COMMON NAME	CC ⁶	G RANK	S RANK	COSEWIC Status	SARO Status	CAROLINIAN ZONE (OLDHAM 2017)	WATERLOO REGION (1999)	UNIT 1A	UNIT 1B	UNIT 2	UNIT 3	UNIT 4	UNIT 5	UNIT 10	UNIT 11	UNIT 12
<i>dryopteris</i>																	
<i>Hackelia virginiana</i>	Virginia Stickseed	5	G5	S5			C	W*	X		X	X		X			
<i>Hylodesmum glutinosum</i>	Large Tick-trefoil	6	G5	S4			U					X					
<i>Juglans cinerea</i>	Butternut	6	G4	S2?	END	END	U					X					
<i>Juglans nigra</i>	Black Walnut	5	G5	S4?			C	W*+	X			X					
<i>Juncus articulatus</i>	Jointed Rush	5	G5	S5			U								X	X	
<i>Juncus canadensis</i>	Canada Rush	6	G5	S5			R	W		X						X	
<i>Larix laricina</i>	Tamarack	7	G5	S5			U							X			
<i>Lemna trisulca</i>	Star Duckweed	6	G5	S5			U			X			X		X	X	
<i>Lepidium virginicum</i>	Poor-man's Peppergrass	0	G5	S5			U								X		
<i>Lonicera hirsuta</i>	Hairy Honeysuckle	7	G5	S5			R	W			X	X					
<i>Lysimachia terrestris</i>	Swamp Yellow Loosestrife	6	G5	S5			R	W						X			
<i>Lysimachia thyrsiflora</i>	Tufted Yellow Loosestrife	7	G5	S5			U								X	X	
<i>Nabalus altissimus</i>	Tall Rattlesnakeroot	5	G5	S5			U					X					
<i>Panax trifolius</i>	Dwarf Ginseng	8	G5	S4			R	W						X			
<i>Panicum flexile</i>	Wiry Panicgrass	8	G5	S4			R								X		
<i>Parthenocissus Quinqu</i>	Virginia Creeper	6	G5	S4?			U	W*	X								
<i>Pedicularis canadensis</i>	Canada Lousewort	7	G5	S5			U				X	X					
<i>Persicaria sagittata</i>	Arrow-leaved Smartweed	5	G5	S4S5			U	W		X							
<i>Pilea fontana</i>	Lesser Clearweed	5	G5	S4			U	W				X	X				
<i>Polygaloides paucifolia</i>	Fringed Milkwort	6	G5	S5			R					X		X			
<i>Populus balsamifera</i>	Balsam Poplar	4	G5	S5			U			X						X	

SCIENTIFIC NAME	COMMON NAME	CC ⁶	G RANK	S RANK	COSEWIC Status	SARO Status	CAROLINIAN ZONE (OLDHAM 2017)	WATERLOO REGION (1999)	UNIT 1A	UNIT 1B	UNIT 2	UNIT 3	UNIT 4	UNIT 5	UNIT 10	UNIT 11	UNIT 12
<i>Populus deltoides</i>	Cottonwood	4	G5	S5			C	W+								X	
<i>Potamogeton zosteriformis</i>	Flat-stemmed Pondweed	5	G5	S5			R			X							
<i>Pyrola elliptica</i>	Shinleaf	5	G5	S5			U					X					
<i>Quercus ellipsoidalis</i>	Northern Pin Oak	9	G5	S3			R	W	X								
<i>Rudbeckia laciniata</i>	Cut-leaved Coneflower	7	G5	S5			U							X			
<i>Rubus hispidus</i>	Bristly Dewberry	6	G5	S4			C	W#		X							
<i>Rumex verticillatus</i>	Swamp Dock	7	G5	S4			U			X							
<i>Salix lucida</i>	Shining Willow	5	G5	S5			U								X	X	
<i>Salix nigra</i>	Black Willow	6	G5	S4			U			X						X	
<i>Spirodela polyrhiza</i>	Great Duckweed	4	G5	S5			U			X					X	X	
<i>Streptopus lanceolatus</i>	Rose Twisted-stalk	7	G5	S5			U							X			
<i>Stuckenia filiformis</i>	Thread-leaved Pondweed	8	G5	S5			R	W*									
<i>Stuckenia pectinata</i>	Sago Pondweed	4	G5	S5			U			X					X	X	
<i>Triosteum aurantiacum</i>	Orange-fruit Horse-gentian	7	G5	S4S5			U				X	X					
<i>Vaccinium angustifolium</i>	Early Lowbush Blueberry	6	G5	S5			C	W*				X	X				
<i>Wolffia borealis</i>	Northern Watermeal	4	G5	S5			U	W*		X					X	X	
<i>Wolffia columbiana</i>	Columbia Watermeal	4	G5	S5			U	W*		X					X	X	
<i>Zanthoxylum americanum</i>	Northern Prickly-ash	3	G5	S5			C	W*			X			X			
Totals					2	0	61	29	5	17	7	25	10	20	15	19	2

6.0 WILDLIFE

Results and discussion for avifauna, herpetofauna, Lepidoptera / Odonata, mammals and wildlife movement are discussed in Sections 6.1 through 6.5. Additional discussion and details regarding SAR and Significant Wildlife Habitat (SWH) are included in Section 9, Appendix E and Appendix F.

6.1 Birds (Avifauna)

6.1.1 Approach

6.1.1.1 MESP Study

As part of field surveys for the MESP study, avifaunal field surveys were completed on 37 dates from 2008 – 2013 (with a total of more than 140 person-hours: Appendix B), incorporating the following components:

- Thirteen **breeding bird surveys** from 2008 - 2011. Undertaken by thoroughly walking random transects⁷ within or along the perimeter of Wildlife Survey Units (WSU's) and recording presence, abundance and level of breeding evidence (using Ontario Breeding Bird Atlas [OBBA] protocols). Additional evidence of breeding activity was recorded during other field surveys within and outside of the breeding window.
- Seventeen **supplemental / migrant bird surveys** from 2008 - 2011. Species and abundance were recorded, by survey unit (same as breeding bird units). In some cases, these observations included evidence of breeding both within and outside of the 'breeding window' for southern Ontario.
- Four **nocturnal Owl surveys** in 2010 and 2011, following the protocols set out in the Ontario Breeding Bird Atlas (OBBA) Standardized Owl Surveys Instruction Manual (March 2002).
- Two **marsh bird monitoring surveys** in June - July 2011. The marsh bird monitoring surveys followed the protocols set out in the Marsh Monitoring Program (MMP) Participant's Handbook for Surveying Marsh Birds (Bird Studies Canada & Environment Canada, Revised 2008), with some minor revisions to study timing and reporting.

⁷ With the exception of wildlife survey unit 8 (Barrie's Lake) and Unit 9 (Devil's Creek floodplain east of rail line), where reconnaissance level / edge surveys were completed

- One **crepuscular bird survey** in July 2010. Crepuscular species are those that are most active during twilight hours, either at dawn or dusk, such as Common Nighthawk and Eastern Whip-poor-will. Suitable habitats (i.e., forest edges, agricultural fields, proximity to bodies of water) were surveyed during favourable conditions (clear, calm conditions with an air temperature of 17°C).

For further details on MESP field survey methodology, refer to the MESP NES report.

6.1.1.2 2014 - 2015 and 2019 - 2020 Surveys

Additional avifaunal surveys were undertaken in 2014 - 2015 and 2019 - 2020 (with a total of 93 person-hours during targeted avifaunal surveys):

- Breeding bird surveys
 - 2014: May 26, June 3 and June 16 (in WSU 2, WSU 3, WSU 4, WSU 6 and WSU 8)
 - 2015: June 2, June 13 (in WSU 2, WSU 3, WSU 6 and WSU 8)
 - 2019: May 31 and June 18 (in WSU 2, WSU 3, WSU 4, WSU 6 and WSU 8 west)
 - 2020: May 27 and June 18 (in WSU 2, WSU 3, WSU 4, WSU 6 and WSU 8 west)
- Marsh bird monitoring
 - 2014: June 6, June 20 and July 4 (in WSU 2, WSU 3, WSU 6 and WSU 8)
 - 2015: May 23, June 2 and June 13 (in WSU 2, WSU 3, WSU 6 and WSU 8)
 - 2019: May 29 and June 27 (in WSU 2, WSU 3, WSU 6 and WSU 8 west)
 - 2020: May 25 and June 17 (in WSU 2, WSU 3, WSU 6 and WSU 8 west)
- Least Bittern Surveys
 - 2014: June 6, June 20 and July 4 (in WSU 2, WSU 3, WSU 6 and WSU 8)
 - 2015: May 23, June 2 and June 13 (in WSU 2, WSU 3, WSU 6 and WSU 8)
 - 2019: May 31, June 18 and June 28 (in WSU 2, WSU 3, WSU 6 and WSU 8 west)
 - 2020: May 27, June 18 and July 6 (in WSU 2, WSU 3, WSU 6 and WSU 8 west)
- Supplemental / migrant bird surveys across the Subject Property and adjacent lands
 - 2014: 5 dates in April and May
 - 2015: 6 dates in May
 - 2019: 3 dates in May
 - 2020: 3 dates in April and May



Methods for each are described in the following sections. Avifaunal surveys were conducted in WSUs as shown in Figure 4.

Note that in addition to the 93 person hours of survey noted above, all surveys listed above were also completed as part of biological monitoring from 2021 – 2024, with the same survey coverage.

Breeding Bird Surveys

Five wildlife survey units (WSU 2, WSU 3, WSU 4, WSU 6 and WSU 8) were surveyed for breeding birds in 2014. Four units were surveyed in 2015 (WSU 4 was to be surveyed as part of future monitoring). All five units were surveyed again in 2019 – 2020 and from 2021 - 2024. In 2014 - 2015, surveys within WSU 8 were undertaken in both the east and west section of Barrie's Lake, whereas in 2019 - 2020, only the west section of WSU 8 was surveyed. These areas were surveyed by walking along the edges of the WSUs and recording presence, abundance and level of breeding evidence using OBBA protocols.

Marsh Bird Surveys

Targeted marsh bird surveys (using call-playback protocols) were undertaken in 2014 – 2015; 2019 – 2020; and 2021 - 2024. The marsh bird monitoring surveys followed the protocols set out in the Marsh Monitoring Program Participant's Handbook for Surveying Marsh Birds (MMP) (Bird Studies Canada & Environment Canada, Revised 2008), with some minor revisions to study timing and reporting.

The following outlines survey methods based on the MMP protocols:

- Marsh birds were surveyed on two or three dates each year: Each station was surveyed for approximately 15 minutes: a five-minute passive (silent) observation period; a five-minute call playback period; and a second five-minute passive observation period. The MMP Broadcast CD was used for playback recordings.
- Surveys were undertaken in weather that was favourable for surveying marsh birds (good visibility, warm temperatures (at least 16°C), no precipitation and little to no wind).

The four survey stations are located within the four large wetland areas (WSU 2, 3, 6 and 8). In 2014 - 2015, surveys were undertaken in both the east and west sections of WSU 8 (Barrie's Lake). In 2019 - 2020 and 2021 - 2024, only the west section of WSU 8 was surveyed. Stations are oriented to maximize sampling area and observation potential. Station locations included the following target habitats: marsh habitat dominated by non-woody emergent plants such as cattails, rushes, reeds, grasses or sedges intermingled with shallow open water.

In addition to species recorded during the multiple breeding bird surveys, the MMP surveys also targeted secretive marsh birds that may otherwise go undetected. These secretive marsh birds, which are considered "focal" species in the MMP, include American Bittern (*Botaurus lentiginosus*); American Coot



(*Fulica americana*); Common Gallinule (*Gallinula galeata*); Least Bittern (*Ixobrychus exilis*); Pied-billed Grebe (*Podilymbus podiceps*); Sora (*Porzana carolina*); Virginia Rail (*Rallus limicola*); and Yellow Rail (*Coturnicops noveboracensis*).

Secondary species (non-focal species which were observed or heard during these targeted surveys) were also recorded.

Least Bittern

Methodology for surveys followed the National Least Bittern Survey Protocol (Environment Canada 2011) The Environment Canada methodology has the following key elements:

- At least 3 surveys; early am timing (30 minutes before sunrise to 10 am);
- Stationary counts at stations at least 250 m apart; not conducted under adverse weather conditions (e.g., rain, fog, extreme heat or winds exceeding 19 km/h);
- 13-minute call response broadcasts at each station, with 5 minutes of passive listening, 5 minutes of call broadcasts and 3 minutes of passive listening;
- Recording numbers, call type, and distance of recorded Least Bitterns; and
- Recording other marsh birds and habitat characteristics.

The survey stations are located within the four major wetland units (WSU 2, 3, 6 and 8). In 2014 - 2015, surveys within WSU 8 were undertaken in both the east and west sections of Barrie's Lake. In 2019 – 2020 and 2021 - 2024, only the west section of WSU 8 was surveyed.

Migrant Waterfowl

Pond and wetland areas (WSU 2, WSU 3, WSU 6 and WSU 8) were surveyed incidentally in conjunction with other spring surveys (i.e., amphibian breeding, turtle basking, other avifaunal surveys). Species presence and abundance were recorded.

6.1.2 Results

Detailed results from the MESP and subsequent studies are provided under separate cover, with key findings discussed herein. Results from the 2019 - 2020 biological surveys are summarized herein, to act as a baseline for future monitoring.

Based on monitoring completed by WSP from 2021 to 2024, there have been no substantive changes to avifaunal composition or abundance. Relevant results have been incorporated into the discussion below, with detailed results for each year provided under separate cover.

Breeding Bird Surveys



Results from 2019 – 2020 and 2021 - 2024 avifaunal surveys were similar to the MESP and 2014 - 2015 survey results, though there were some differences in richness and composition year to year. Refer to Appendix D for MESP; 2014 – 2015; 2019 – 2020; and 2021 - 2024 survey results for WSU 2, WSU 3, WSU 4, WSU 6 and WSU 8.

Within WSUs 2, 3, 4, 6 and 8, there were 60 species recorded in 2020, 66 species recorded in 2019, 58 species recorded in 2015, and 77 species recorded in 2014, relative to the 82 species recorded during the MESP study. Also, fewer species were recorded in each of the WSUs, with the exception of WSU 8 (Barrie's Lake), during the 2019 - 2020 and 2014 - 2015 surveys compared to the MESP study. In general, species richness within each WSU was comparable on an annual basis. It is important to note that there have been no direct disturbances or alterations to retained natural areas. Annual variation in species richness may be due to a number of factors:

- Fewer in-field survey hours relative to the MESP (where many additional field surveys were undertaken, with associated supplemental observations, and a greater total number of breeding bird survey hours were undertaken).
- Different focus for monitoring surveys (i.e., focus on portions of survey units adjacent to the proposed development rather than the entire survey unit). For example, the eastern and western sections of WSU 8 were surveyed in 2014 - 2015, but only the western half was surveyed in 2019 – 2020 and 2021 - 2024.
- General year to year environmental variability affecting habitat for less tolerant species or those with specific hydrologic requirements (e.g., Trumpeter Swan, Common Gallinule, American Coot, Hooded Merganser, American Black Duck, Blue-winged Teal).
- Infrequent observations of less common, less abundant or less easily detected species (e.g., owls, Scarlet Tanager, Veery, Yellow-rumped Warbler, Canada Warbler, Black-billed Cuckoo, Green Heron, Least Bittern).
- Inclusion of edge / open-country birds with woodland / wetland areas in 2014 - 2015 monitoring to provide a more comparable 'site total' relative to the MESP - where open areas were covered as a separate survey unit (e.g., Savannah Sparrow, Mourning Dove, Vesper Sparrow, Turkey Vulture).

In total, 110 bird species have been recorded in the broader MESP General Study Area from 2008 - 2024. Most of these species are considered breeders within this EIS Study Area, with the following possible exceptions:

- Possible migrants: American Coot, Bay-breasted Warbler, Blackpoll Warbler, Black-throated Green Warbler, Canada Warbler, Pine Siskin, Swainson's Thrush and Yellow-rumped Warbler.
- Potential / likely breeders in the local landscape, but with no evidence of nesting and/or no suitable habitat in the Study Area: Bank Swallow, Chimney Swift, Cliff Swallow, Northern Rough-winged Swallow, Osprey, Great Blue Heron and Turkey Vulture.



Of the 110 species recorded in the broader MESP General Study Area across all years, 104 species were confirmed within the EIS Study Area (i.e., WSUs 2, 3, 4, 6 and 8). Of these 110 species, 51 are considered SCC (as described in Section 2.2 above) and 46 species have been recorded within the EIS Study Area (i.e., WSUs 2, 3, 4, 6 and 8), as presented in Tables 3 - 7 and described below:

- Four species designated as Threatened – not subject to the protection provisions of the SCA:
 - **Bank Swallow** (Threatened)
 - Foraging visitants (up to 40 individuals recorded on various dates foraging over wetland / agricultural fields). No suitable nesting habitat is present (typically sand, clay or gravel river bands or steep cliffs) within the development envelope.
 - **Bobolink** (Threatened)
 - Possible breeder. Single singing male recorded on one date (May 21, 2014) in pasture fronting Roseville Road west of 1034 Roseville Road laneway.
 - **Chimney Swift** (Threatened)
 - Foraging visitants (2-4 individuals recorded on various dates foraging over wetland / agricultural fields). No suitable nesting habitat is present within the development envelope.
 - **Least Bittern** (Threatened)
 - Possible and probable breeders. Two individuals recorded in WSU 3 wetland on June 20, 2011, and one individual recorded in WSU 6 wetland on two dates in 2019 (May 31 and June 28).
- Three species designated as *Special Concern* – not subject to the provisions of the SCA:
 - **Barn Swallow**
 - Foraging visitants (up to 40 individuals recorded on various dates foraging over wetland / agricultural fields). Confirmed nesting in a barn at 1034 Roseville Road. No suitable nesting habitat is present within the development envelope.
 - **Canada Warbler**
 - Probable migrants. Two singing males recorded on a single date (May 20, 2009) in WSU 2.
 - **Common Nighthawk**
 - Single individual observed foraging over Barrie's Lake (WSU 8) on one date in 2022.
 - **Eastern Wood-pewee**

- Probable breeders recorded in small numbers (1-4 individuals) on various dates in suitable woodland habitat (WSU 4); also recorded in low numbers along the margins of WSU 3 and WSU 8.
- One provincially rare species: **Trumpeter Swan** (S2S3):
 - Confirmed breeder in WSU 2 and WSU 3 (adults observed with fledged young) and probable breeder in WSU 8 (5 individuals). Recorded on various dates.
- Seven species included on Schedule 1 of SARA:
 - **Bank Swallow** (Threatened). See comments above.
 - **Barn Swallow** (Threatened). See comments above.
 - **Bobolink** (Threatened). See comments above.
 - **Canada Warbler** (Threatened). See comments above.
 - **Chimney Swift** (Threatened). See comments above.
 - **Common Nighthawk** (Special Concern). See comments above.
 - **Eastern Wood-pewee** (Special Concern). See comments above.
 - **Least Bittern** (Threatened). See comments above.
- **Regionally Rare Species.** Forty-one species considered significant in the Region of Waterloo (per Region of Waterloo Report PC-96-021, 1996).
- **Area Sensitive Species.** Six species considered *Area Sensitive* per MNRF (2015a)⁸

Marsh Bird Surveys

Species observed during the 2019 – 2020 surveys, as well as the 2021 – 2024 biological monitoring surveys were consistent with those observed as part of the MESP study and 2014 – 2015 surveys, which include:

- American Coot responded to playback calls in WSU 6 (5 individuals) in 2014;
- Common Gallinule responded to playback calls in WSU 2 (2011, 2019), WSU 3 (2011, 2019, 2020), WSU 6 (2011, 2014, 2015, 2020) and WSU 8 (2011);
- Least Bittern responded to playback calls in WSU 3 in 2011;
- Pied-billed Grebe responded to playback calls in WSU 2 (2011), WSU 3 (2011, 2015, 2019, 2020), WSU 6 (2011, 2019) and WSU 8 (2011, 2014, 2015, 2020, 2024);

⁸ **Ecoregion 6E Area Sensitive Birds** (MNRF 2015a). Area Sensitive species in Ontario are generally defined as species requiring large areas of suitable habitat for long term population survival.



- Sora responded to playback calls in WSU 2 (2014, 2015, 2019), WSU 3 (2011, 2014, 2015, 2019, 2024), WSU 6 (2015, 2022) and WSU 8 (2011, 2023); and
- Virginia Rail responded to playback calls in WSU 2 (2011, 2015, 2024), WSU 3 (2011, 2015, 2019, 2024), WSU 6 (2015) and WSU 8 (2011, 2023, 2024).

Least Bittern

Two Least Bittern were heard calling from suitable habitat (cattail marsh) in WSU 3 in 2011 during MMP surveys as part of the MESP study (possible breeders). No Least Bittern were recorded in 2014 or 2015 from any of the survey stations or WSUs. One Least Bittern was heard calling from suitable habitat (cattail marsh) in WSU 6 on two dates in May and June 2019 (probable breeder). No additional observations were recorded from 2020 – 2024.

Migrant Waterfowl

Migrant waterfowl species were recorded in the wetland / pond areas in 2014 - 2015 and 2019 - 2024 including: American Wigeon; Blue-winged Teal; Bufflehead; Common Gallinule; Double-crested Cormorant; Great Blue Heron; Green-winged Teal; Hooded Merganser; Killdeer; Osprey; Pied-billed Grebe; Ring-necked Duck; Sandhill Crane; Solitary Sandpiper; Sora; Trumpeter Swan; Virginia Rail; Wilson's Snipe; and Wood Duck. Generally, these were low in abundance (<10 individuals) and short-term visitors. Larger numbers (10 – 30 individuals) of common species (e.g., Canada Goose, Mallard) were recorded in ponds and fields on various dates, but not consistently.



Table 3. Avifaunal SCC Recorded in WSU 2⁹

Common Name	Srank	SARO Status	COSEWIC Status	SARA Status	Waterloo Region Significance	Area Sensitive	MESP		Pre-Construction										During-Construction									
							2008-2012		2014		2015		2019		2020		2014-2020		2021		2022		2023		2024		2021-2024	
							Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status
Alder Flycatcher	S5B				W								1	POSS			1	POSS							1	POSS	1	POSS
American Coot	S3B,S4N				W	X	1	POSS																				
American Redstart	S5B				W	X																		2	POSS	2	POSS	
Barn Swallow	S4B	SC	SC	THR			30	CONF	15	OBS	15	OBS	10	OBS	9	OBS	15	OBS	4	OBS	3	OBS	10	OBS	6	OBS	10	OBS
Black-billed Cuckoo	S4S5B				W													1	PROB	1	POSS					1	PROB	
Bobolink	S4B	THR	SC	THR					1	POSS							1	POSS										
Canada Warbler	S5B	SC	SC	THR	W	X	2	POSS																				
Common Gallinule	S3B				W		7	CONF	1	PROB			2	PROB			2	PROB										
Green Heron	S4B				W		1	POSS	1	POSS							1	POSS										
Hairy Woodpecker	S5					X														1	POSS			1	POSS	1	POSS	
Marsh Wren	S4B,S3N				W		2	PROB	2	POSS							2	POSS				1	POSS			1	POSS	
Mourning Warbler	S5B				W								1	POSS			1	POSS										
Orchard Oriole	S4B				W						1	POSS					1	POSS										
Pied-billed Grebe	S4B,S2N				W		1	POSS	1	PROB			1	PROB	1	POSS	1	PROB										
Sandhill Crane	S5B,S3N				W	X														2	POSS					2	POSS	
Savannah Sparrow	S5B,S3N					X	2	POSS																				
Sora	S5B				W		1	POSS	1	POSS					1	POSS	1	POSS					1	POSS		1	POSS	
Virginia Rail	S4S5B				W		2	PROB			1	PROB			1	POSS	1	PROB					2	PROB	1	PROB	2	PROB
Wilson's Snipe	S5B				W				6	POSS							6	POSS										
Wood Duck	S5B,S3N				W*		10	CONF	4	PROB	2	PROB	2	PROB	11	CONF	11	CONF					3	PROB	2	PROB	3	PROB
Yellow-billed Cuckoo	S4B				W										1	POSS	1	POSS										
Yellow-rumped Warbler	S5B,S4N				W		1	POSS																	2	POSS	2	POSS
Total # of breeding species		3	3	3	18	6	12		8		3		5		5		13		1		3		4		6		10	

⁹ Refer to Appendix E for legend



Table 4. Avifaunal SCC Recorded in WSU 3

Common Name	Srank	SARO Status	COSEWIC Status	SARA Status	Waterloo Region Significance	Area Sensitive	MESP		Pre-Construction										During-Construction									
							2008-2012		2014		2015		2019		2020		2014-2020		2021		2022		2023		2024		2021-2024	
							Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status
Alder Flycatcher	S5B				W								2	POSS			2	POSS					1	POSS	1	POSS	1	POSS
American Black Duck	S4				W				2	PRO B							2	PRO B										
American Coot	S3B,S4 N				W	X	2	POSS																				
American Redstart	S5B				W	X	3	PRO B							2	POSS	2	POSS							2	POSS	2	POSS
Barn Swallow	S4B	SC	SC	TH R			10	CON F	10	OBS	15	OBS	1	OBS	1	OBS	15	OBS	1	OBS	3	OBS	8	OBS	4	OBS	8	OBS
Belted Kingfisher	S5B,S4 N				U		1	POSS	1	POSS			1	POSS			1	POSS			1	POSS	1	POSS			1	POSS
Black-billed Cuckoo	S4S5B				W				1	POSS					1	PRO B	1	PRO B			1	PRO B					1	PRO B
Brown Thrasher	S4B				W		1	POSS			1	PRO B					1	PRO B					1	POSS			1	POSS
Chestnut-sided Warbler	S5B				W		1	POSS														2	POSS			2	POSS	
Cliff Swallow	S4S5B				W*		40	CON F																				
Common Gallinule	S3B				W		6	CON F	3	PRO B			1	PRO B	1	PRO B	3	PRO B										
Cooper's Hawk	S4				W	X													1	POSS						1	POSS	
Eastern Wood-pewee	S4B	SC	SC	SC							1	PRO B					1	PRO B										
Green Heron	S4B				W				1	PRO B					1	PRO B	1	PRO B										
Hairy Woodpecker	S5					X	1	POSS													1	POSS					1	POSS
Hooded Merganser	S5				W		4	CON F	1	PRO B			2	PRO B			2	PRO B										
Least Bittern	S4B	TH R	TH R	TH R	CV	X	2	POSS																				
Least Flycatcher	S5B				W	X	1	POSS			1	POSS					1	POSS										
Marsh Wren	S4B,S3 N				W								2	PRO B	1	PRO B	2	PRO B							1	PRO B	1	PRO B
Pied-billed Grebe	S4B,S2 N				W		4	CON F	4	PRO B			1	POSS	5	CON F	5	CON F										
Red-bellied Woodpecker	S5				W						1	POSS					1	POSS										
Ruby-throated Hummingbird	S5B				W*				1	POSS							1	POSS										
Sandhill Crane	S5B,S3 N				W	X	2	PRO B	1	POSS			3	PRO B			3	PRO B	2	POSS			2	PRO B			2	PRO B
Savannah Sparrow	S5B,S3 N					X			4	PRO B							4	PRO B			1	PRO B					1	PRO B
Sora	S5B				W		4	PRO	3	PRO	1	PRO	1	POSS			3	PRO			2	POSS	1	POSS	1	PRO	2	PRO



Common Name	Srank	SARO Status	COSEWIC Status	SARA Status	Waterloo Region Significance	Area Sensitive	MESP		Pre-Construction								During-Construction											
							2008-2012		2014		2015		2019		2020		2014-2020		2021		2022		2023		2024		2021-2024	
							Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status
								B		B		B					1	POSS								B		B
Vesper Sparrow	S4B				W	X			1	POSS							1	POSS										
Virginia Rail	S4S5B				W		5	PRO B	4	PRO B	1	PRO B					4	PRO B			2	PRO B	1	POSS	1	PRO B	2	PRO B
White-breasted Nuthatch	S5					X	1	POSS			1	POSS	1	POSS			1	POSS	2	POSS							2	POSS
Wood Duck	S5B,S3 N				W*		12	CON F	18	CON F	8	CON F	2	PRO B	3	CON F	18	CON F			2	PRO B	14	CON F	1	PRO B	14	CON F
Yellow-billed Cuckoo	S4B				W										1	POSS	1	POSS	1	PRO B							1	PRO B
Yellow-rumped Warbler	S5B,S4 N				W		1	POSS																				
Total # of breeding species		3	3	3	26	10	19		14		8		10		8		23		4		7		8		6		16	



Table 5. Avifaunal SCC Recorded in WSU 4

Common Name	Srank	SARO Status	COSEWIC Status	SARA Status	Waterloo Region Significance	Area Sensitive	MESP		Pre-Construction								During-Construction									
							2008-2012		2014		2019		2020		2014, 2019, 2020		2021		2022		2023		2024		2021-2024	
							Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status
American Redstart	S5B				W	X	1	PROB			1	POSS	1	POSS	1	POSS					3	PROB			3	PROB
Black-billed Cuckoo	S4S5B				W		1	POSS									1	POSS	2	POSS					2	POSS
Eastern Wood-pewee	S4B	SC	SC	SC			4	PROB	2	PROB	1	PROB	1	PROB	2	PROB	1	PROB	2	PROB	3	POSS	4	POSS	4	PROB
Hairy Woodpecker	S5					X	1	POSS	1	POSS					1	POSS			1	POSS			1	POSS	1	POSS
Mourning Warbler	S5B				W								1	POSS	1	POSS										
Northern Mockingbird	S4				W		1	POSS			1	POSS			1	POSS										
Northern Waterthrush	S5B				W				1	POSS					1	POSS					1	POSS			1	POSS
Pied-billed Grebe	S4B,S2N				W		1	POSS																		
Pileated Woodpecker	S5				W	X			1	PROB					1	PROB							1	POSS	1	POSS
Pine Siskin	S5				W						1	POSS			1	POSS										
Pine Warbler	S5B,S3N				W	X	2	POSS	1	PROB	1	POSS			1	PROB			1	POSS			1	POSS	1	POSS
Red-bellied Woodpecker	S5				W		8	PROB	5	PROB	3	PROB	1	PROB	5	PROB	1	POSS	2	PROB	1	POSS	1	POSS	2	PROB
Ruby-throated Hummingbird	S5B				W*															1	POSS			1	POSS	
Savannah Sparrow	S5B,S3N					X			1	POSS					1	POSS										
Scarlet Tanager	S5B				W	X	3	PROB	4	PROB					4	PROB										
Vesper Sparrow	S4B				W	X	2	POSS																		
White-breasted Nuthatch	S5					X	4	CONF			2	POSS	1	PROB	2	PROB	3	POSS	1	POSS	1	POSS	2	POSS	3	POSS
Winter Wren	S5B,S4N				W	X	2	POSS																		
Wood Duck	S5B,S3N				W*		2	PROB					2	POSS	2	POSS										
Yellow-billed Cuckoo	S4B				W												1	PROB							1	PROB
Total # of breeding species		1	1	1	16	9	13		8		7		6		14		5		6		6		6		11	



Table 6. Avifaunal SCC Recorded in WSU 6

Common Name	Srank	SARO Status	COSEWIC Status	SARA Status	Waterloo Region Significance	Area Sensitive	MESP		Pre-Construction										During-Construction									
							2008-2012		2014		2015		2019		2020		2014, 2015, 2019,2020		2021		2022		2023		2024		2021-2024	
							Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status
American Coot	S3B,S4N				W	X	1	POSS	1	PROB							1	PROB										
Common Gallinule	S3B				W		7	CONF	1	PROB	1	POSS	1	PROB	1	POSS	1	PROB										
Green Heron	S4B				W				1	OBS					1	POSS	1	POSS										
Hooded Merganser	S5				W		2	POSS																				
Least Bittern	S4B	THR	THR	THR	CV	X							1	PROB			1	PROB										
Marsh Wren	S4B,S3N				W						1	POSS	3	PROB	1	POSS	3	PROB										
Pied-billed Grebe	S4B,S2N				W		9	CONF	3	PROB							3	PROB										
Sandhill Crane	S5B,S3N				W	X																2	POSS			2	POSS	
Savannah Sparrow	S5B,S3N					X			2	PROB							2	PROB			1	POSS				1	POSS	
Sora	S5B				W		3	POSS	2	PROB	1	POSS					2	PROB			1	POSS				1	POSS	
Vesper Sparrow	S4B				W	X			2	PROB							2	PROB										
Virginia Rail	S4S5B				W				1	POSS			1	PROB			1	PROB			1	POSS	1	POSS			1	POSS
Wood Duck	S5B,S3N				W*		2	PROB																				
Total # of breeding species		1	1	1	12	5	6		7		3		4		3		10		0		3		2		0		4	



Table 7. Avifaunal SCC Recorded in WSU 8

Common Name	Srank	SARO Status	COSEWIC Status	SARA Status	Waterloo Region Significance	Area Sensitive	MESP		Pre-Construction										During-Construction									
							2008-2012		2014		2015		2019		2020		2014, 2015, 2019, 2020		2021		2022		2023		2024		2021-2024	
							Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status
Alder Flycatcher	S5B				W								1	POSS			1	POSS										
American Coot	S3B,S4N				W	X																1	POSS			1	POSS	
American Redstart	S5B				W	X			2	PROB	2	PROB					2	PROB	1	POSS					2	POSS	2	POSS
Barn Swallow	S4B	SC	SC	THR					10	CONF	10	PROB			1	OBS	10	CONF										
Belted Kingfisher	S5B,S4N				U				2	PROB	1	POSS			1	POSS	2	PROB							1	POSS	1	POSS
Black-billed Cuckoo	S4S5B				W													1	POSS							1	POSS	
Brown Thrasher	S4B				W				1	POSS							1	POSS										
Common Gallinule	S3B				W		1	POSS																				
Eastern Wood-pewee	S4B	SC	SC	SC																					1	PROB	1	PROB
Green Heron	S4B				W				1	POSS							1	POSS										
Hairy Woodpecker	S5					X					1	POSS					1	POSS										
Hooded Merganser	S5				W		4	CONF																				
Marsh Wren	S4B,S3N				W								1	POSS	1	POSS	1	POSS										
Orchard Oriole	S4B				W										1	POSS	1	POSS										
Pied-billed Grebe	S4B,S2N				W		5	CONF	7	CONF	4	PROB	6	CONF	2	CONF	7	CONF							5	CONF	5	CONF
Sandhill Crane	S5B,S3N				W	X	3	PROB	1	PROB			3	PROB			3	PROB	2	PROB	5	POSS	2	PROB	2	PROB	5	PROB
Sora	S5B				W																	1	POSS			1	POSS	
Virginia Rail	S4S5B				W		2	PROB														1	POSS	1	POSS	1	POSS	
White-breasted Nuthatch	S5					X	1	POSS					2	POSS			2	POSS	2	POSS					1	POSS	2	POSS
Wood Duck	S5B,S3N				W*		5	CONF	11	CONF	3	CONF					11	CONF	1	PROB	1	OBS			3	PROB	3	PROB
Total # of breeding species		2	2	2	16	5	7		8		6		5		4		13		5		1		4		8		11	

Notes:

American Coot: Recorded in WSU 2/3 on May 20 & 22, 2009; Recorded in Unit 6 on July 9, 2009. Earlier records possible migrants.

Bank Swallow: Foraging visitants. No suitable nesting habitat (typically sand, clay or gravel river banks or steep cliffs) is present in the General Study Area. Local breeding habitat may be present in nearby gravel pits.

Barn Swallow: Foraging visitants. Confirmed breeding of at least 10 pairs within the barns at 200 Blenheim Road (adjacent to WSU2). No suitable nesting habitat is present elsewhere in the General Study Area.

Bobolink: Single singing /displaying male recorded on May 21, 2014 west of the laneway west of WSU 2 (in field adjacent to barn)

Canada Warbler: Recorded on May 20 and May 22, 2009. Likely a late migrant. Typically breeds further north.

Chimney Swift: Nesting habitat not known from / observed in the General Study Area; Chimney Swifts are aerial insectivores typically foraging over water, flying distances from nesting site for food supply.

Cliff Swallow: Nesting habitat not known observed in Study Area (typically cliffs/bluffs/bridges/houses). Fledged young in WSU 3. CLSW's are aerial insectivores typically foraging over water, flying from nesting site for food supply. Nesting occurs on local bridges (e.g. Grand River).

Northern Rough-winged Swallow: Recorded on May 29, 2008; July 9, 2009; June 8, 2010; July 7, 2010; July 26, 2010; May 25, 2011. Nesting habitat not known from/observed in the General Study Area (sandy road banks, steep riparian banks or drainage holes). Fledged young observed in WSU 3. NRWS's are aerial insectivores foraging over water, flying from nesting site for food supply.

Northern Waterthrush: 1 S recorded on July 26, 2010 WSU 4.

Osprey: Foraging visitants. No nests recorded in the General Study Area.

Pine Siskin: Recorded on May 31, 2019. Likely a late migrant. Typically breeds further north.

Swainson's Thrush: Recorded on May 31, 2019. Likely a late migrant. Typically breeds further north.

Yellow-rumped Warbler: Recorded on May 20 and May 22, 2009. Likely a late migrant. Typically breeds further north.

6.2 Reptiles and Amphibians (Herpetofauna)

6.2.1 Approach

6.2.1.1 MESP and Subsequent Studies

Extensive herpetofaunal surveys were undertaken as part of the MESP and subsequent studies over a multi-year period (2008 - 2016). Further detail is provided in the MESP NES, EIS, and 2014 - 2015 monitoring reports under separate cover.

6.2.1.2 2019 - 2024 Surveys

Two types of herpetofaunal survey were undertaken in 2019 - 2020:

- Spring amphibian breeding surveys in WSU 2, WSU 3, WSU 4¹⁰, WSU 6 and WSU 8¹¹. These surveys followed the Marsh Monitoring Program Amphibian Calling Survey Protocol (Bird Studies Canada 2008, revised 2009) and were completed on the following dates:
 - 2019: April 8, May 29, and June 27
 - 2020: April 8, May 25, and June 17
 - 2021: April 12, May 31, and June 28
 - 2022: April 25, May 25, and June 30
 - 2023: April 14, May 11, and June 22
 - 2024: April 10, May 9, and June 28
- Turtle basking surveys in WSU 2, WSU 3, WSU 6, and WSU 8¹². These were carried out according to the Survey Protocol for Blanding's Turtle (*Emydoidea blandingii*) in Ontario (MNRF 2014¹³) on the following dates:
 - 2019: May 5, May 15, May 21, May 31, and June 18

¹⁰ Note: amphibian breeding surveys in WSU 4 were undertaken from 2008-2011 (MESP), then re-initiated for monitoring in 2019 (i.e. it was not surveyed during the 2014 – 2015 surveys).

¹¹ Note: 2014 and 2015, amphibian breeding surveys were conducted only in the East Section of WSU 8 only. In 2019, amphibian breeding surveys were conducted in both the East and West Sections of WSU 8 (with the East Section being surveyed as part of adjacent landowner monitoring).

¹² Note: 2014 and 2015, turtle basking surveys were conducted in both the East and West Sections of WSU 8. In 2019, turtle basking surveys were conducted only in the West Section.

¹³ Note: The survey protocol was updated in August 2015 (MNRF 2015b), however, the approach for basking turtle surveys between the 2014 and 2015 protocols was consistent.



- 2020: April 27, May 16, May 21, June 1, and June 13
- 2021: April 6, April 23, May 12, June 7, and June 16
- 2022: April 12, April 22, April 29, May 5, and May 13
- 2023: April 12, April 27, May 5, May 19, and May 26
- 2024: April 10, April 26, May 7, May 16, and May 24

6.2.2 Results

Detailed results from the MESP and subsequent studies are provided under separate cover, with key findings considered herein. Results from the 2019 – 2020 and 2021 - 2024 biological surveys are summarized herein, to act as a baseline for comparison with during- and post-construction biological monitoring.

Based on monitoring completed by WSP from 2021 to 2024, there have been no substantive changes to herpetofauna composition, though year to year differences have been observed based on varying water levels, as noted above. Relevant results have been incorporated into the discussion below, with detailed results for each year provided under separate cover.

Amphibian Breeding Surveys

Overall, calling anurans showed a high species richness and were observed in relatively high abundance where suitable habitat was present during surveys. Calling was fairly consistent across all survey years in terms of distribution and abundance, though some variation in species composition / abundance was noted among survey years. A summary of survey results from the MESP study (2008 - 2011) compared to 2014 - 2015 surveys and 2019 - 2020 surveys is presented in Appendix D.

The summary presented in Appendix D shows that the results from the 2019 - 2024 spring amphibian calling surveys were generally consistent with the MESP and 2014 - 2015 biological monitoring surveys, noting that two species with limited to no observations in 2019 / 2020 (Western Chorus Frog and American Toad) were previously recorded sporadically and in low abundance (i.e., no trends in their presence / abundance). Moreover, it is important to note that for all but one survey round, there were no alterations to this amphibian breeding habitat or adjacent lands between 2015 and 2020 (i.e., the Subject Property and adjacent City development lands were still 'pre-development' for all surveys except for the 3rd survey in 2020 [June 17, 2020], in which site grading had commenced on adjacent lands prior to this date).

Table 8. Amphibian Calling Surveys – Summary of Results (2019 - 2024)

SPECIES	AMPHIBIAN CALLING STATION & MAXIMUM CALLING CODE									# STNS RECORDED
	AM2	AM3	AM4	AM5	AM6	AM9	AM10	AM11	AM12	
American Toad	3	3	2	2	3			3	1	7
American Bullfrog								1		1
Green Frog	1	1	1	2	1	1		2		7
Gray Treefrog	3	3	3	3	3	3		1	2	8
Northern Leopard Frog	1	1	1	2	2			3	1	7
Spring Peeper	3	3	3	3	3	3	3	3	1	9
Wood Frog	1	2	2	3	1	3	3	1	1	9
Species Richness	6	6	6	6	6	4	2	7	5	

Call Code 1- individual calls can be counted, no overlap; Call Code 2- some calls can be counted, some overlap; Call Code 3- calls continuous and overlapping, individuals not distinguishable

Turtle Basking Surveys

Results from the 2019 – 2020 and 2021 – 2024 turtle basking surveys were generally consistent with the MESP and 2014 - 2015 surveys; however, results for WSU 8 were much lower in 2019 - 2024 compared to 2014 - 2015 given that the lake was surveyed from only one location in 2019 - 2024, compared to two locations in 2014- 2015. In general, abundance has varied between locations, with each location showing relatively higher abundances in some years and lower in others, typically in a consistent manner (i.e., years with high abundance in one location, usually had high abundance in other locations. Overall, there has been no consistent / substantive differences across the survey years (2008 - 2024).

From 2019 - 2024, two turtle species were observed during turtle basking surveys (and incidentally during other surveys), with similar distribution and abundances to those recorded in previous survey years:

- Midland Painted Turtle: widespread and abundant within WSUs 2, 3, 6 and 8.
- Snapping Turtle: widespread in low abundances within WSUs 2, 3, 6 and 8.

No Blanding's Turtles have been observed during any field surveys.



Table 9. Turtle Basking Survey Summary Results (2019 - 2024)

Feature ID	2019		2020		2021		2022		2023		2024	
	MPTU	SNTU	MPTU	SNTU	MPTU	SNTU	MPTU	SNTU	MPTU	SNTU	MPTU	SNTU
Pond 2 (WSU 6)	13	2	48	0	83	8	1	1	1	1	2	0
Pond 3 (WSU 2)	4	1	13	0	43	3	11	2	3	0	14	0
Pond 4/5 (WSU 3)	37	2	93	1	63	6	4	1	10	2	16	1
Barrie's Lake (WSU 8)	37	1	17	1	54	0	26	1	51	0	47	0

* Maximum count for a single survey, not cumulative.

Incidental Turtle Observations

- Agricultural Field adjacent to WSU 3: One nesting Snapping Turtle and several Snapping Turtle nest sites were observed on June 18, 2019, in the agricultural field adjacent to WSU 3 (within 15-20m of the wetland edge).
- Agricultural Field adjacent to WSU 4: On June 18, 2019, one Snapping Turtle was observed wandering in the agricultural field within 50 m of WSU 4 in search of a nest site; one Snapping Turtle nest site was also observed in the agricultural field adjacent to WSU 4 (within 5 m of the woodland edge).
- Roseville Road adjacent to WSU 8 (West Section): On May 5, 2019, two road-killed Midland Painted Turtles were observed on Roseville Road.
- No incidental observations of turtle nesting evidence or turtle road mortality were observed in 2020.
- In most survey years since 2020, incidental observations of one to several turtles have been recorded, typically via evidence of turtles crossing or nesting along Roseville Road between WSU 2 and WSU 8 or evidence of nesting in agricultural fields adjacent to WSU 2, WSU 3 and WSU 6 (prior to development of the Phase 1 lands).

6.2.3 Summary of Herpetofaunal Survey Results

The following summarizes key herpetofaunal survey results, including MESP surveys (2008 - 2011) and biological surveys in 2014- 2015 and 2019 - 2024:

- Based on 2008 - 2009 and 2016 survey results, MNRF concluded that Jefferson Salamanders (JESA) were not present within the MESP General Study Area (MNRF 2010; 2016). None has been recorded during surveys from 2008 – 2024.
- Spring Amphibian Breeding.
 - Calling anurans have been recorded in varying (low to high) abundance across the Study Area where suitable habitat was present in the MESP and subsequent monitoring periods.
 - Amphibian calling has been fairly consistent in terms of distribution and abundance, though some variation in species composition / abundance is evident between survey years in both the larger open water - marsh systems and smaller ephemeral features.
 - It should be noted that water levels in each of the wetlands were extremely low in 2021 due to limited rainfall and it is likely that the reduced amphibian calling distribution and abundances recorded at most stations in 2021 were likely a result of the unusually dry

conditions. However, wetland water levels increased in 2023 and 2024; for most stations, 2022, 2023 and 2024, results again showed higher diversity (including some species with higher abundances) relative to previous during-construction monitoring results and greater consistency with pre-construction results.

- For most species, particularly those recorded with greater frequency and/or in higher abundance (e.g., Gray Treefrog, Spring Peeper and Green Frog), results have been consistent between years - though some had lower abundance in later survey years, particularly during the drier years from 2020 to 2022. Other species have been recorded less frequently and in varying abundance (e.g., Bullfrog, Chorus Frog and Wood Frog) and were absent in some or many years. Though there is no trend evident for those less frequently recorded species, lower abundance and/or absence in some years may relate to lower water levels or compressed breeding periods outside of survey windows (e.g., for Wood Frog, Chorus Frog and Bullfrog).
- Turtle Basking.
 - In total, two species of turtle have been recorded: Midland Painted Turtle and Snapping Turtle. Each has been recorded in varying abundance in each survey year at each survey location.
 - Abundance has varied between locations, with each location showing relatively higher abundances in some years and lower in others, typically in a consistent manner (i.e., years with high abundance in one location usually had high abundance in other locations).
 - Abundance has varied within locations between years, both within the pre-construction period (2011, 2014/15 and 2019) and between periods, though there is no consistent / substantive difference between the during-construction results and pre-construction / MESP.

Though results have varied somewhat year-to-year for both anuran breeding and turtle basking surveys, it is important to note that there were no direct alterations to herpetofaunal breeding habitat throughout the survey years as the result of development related activities. The variability is primarily due to varying water levels in the surveyed wetland / pond areas.

6.3 Insects (Lepidoptera and Odonata)

6.3.1 Approach

Targeted Lepidoptera (butterflies, moths, skippers) and Odonata (dragonflies and damselflies) field surveys were completed as part of the MESP study on 11 dates in late spring through fall, from 2009 –



2011. Supplemental observations were recorded during other wildlife surveys undertaken as part of the MESP study and during 2014 – 2015; 2019 – 2020; and 2021 - 2024 fieldwork.

6.3.2 *Results*

In total, 34 species of Lepidoptera species and 51 Odonata species were recorded as part of the MESP study. A list of species is provided in Appendix D. Additional survey results are provided in the MESP NES report. Results from 2014 – 2015; 2019 – 2020; and 2021 - 2024 were generally similar to MESP results. No 'new' notable observations were recorded.

Of the total 85 Lepidoptera and Odonata species recorded across all years, 10 are SCC:

- One federally designated SAR
 - Monarch (Special Concern)
- One provincially designated SAR
 - Monarch (Special Concern)
- Eight Provincially Rare Species
 - Giant Swallowtail (S3)
 - Amber-winged Spreadwing (S3)
 - Harlequin Darner (S3)
 - Painted Skimmer (S2)
 - Spatterdock Darner (S1)
 - Swamp Darner (S2S3)
 - Tawny Emperor (S2S3)
 - Unicorn Clubtail (S2S3)
- Seven species which could be considered locally uncommon

Table 10. Odonata and Lepidoptera SCC Recorded in WSU 2, 3, 4, 6, and 8 (2008 – 2024)

COMMON NAME	G-RANK ¹	S-RANK ²	SARO ³	COSEWIC ⁴	SARA STATUS ⁵	SARA SCHEDULE ⁵	LOCALLY UNCOMMON ⁶	WSU 2	WSU 3	WSU 4	WSU 6	WSU 8
LEPIDOPTERA												
Columbine Duskywing	G4	S4					X		X	X		
Common Sootywing	G5	S3S4							X	X		
Giant Swallowtail	G5	S3								X		
Spicebush Swallowtail	G5	S4					X					
American Snout	G5	SZB					X			X		
Tawny Emperor	G5	S2S3								X		
Monarch	G4	S4	SC	END	SC	1		X	X	X	X	X
ODONATA												
American Emerald	G5	S5					X	X				X
Variable Darner	G5	S5					X	X				
Spatterdock Darner	G3G4	S1										X
Unicorn Clubtail	G5	S2S3										X
Swamp Darner	G5	S2S3								X		
Harlequin Darner	G5	S3								X		
Chalk-fronted Corporal	G5	S5					X		X			X
Amber-winged Spreadwing	G4	S3							X			
Frosted Whiteface	G5	S5					X		X	X		X
Painted Skimmer	G5	S2					X		X			
Slaty Skimmer	G5	S4					X		X			
Band-winged Meadowhawk	G5	S4					X			X		
Carolina Saddlebags	G5	SZB					X		X	X		X
Total = 20			1	1	1	1	11	2	8	10	1	7

6.4 Mammals

6.4.1 Approach

6.4.1.1 MESP Study

Mammal surveys were undertaken as part of the MESP study over a multi-year period (2008 - 2011).



Mammals were surveyed using three approaches: 1) 'general' wildlife surveys, including winter visits; 2) incidental observations during other field surveys; and 3) targeted surveys for American Badger (*Taxidea taxus*), a species that is listed as *Endangered* both provincially and federally.

Additional details are provided in the MESP NES report.

6.4.1.2 2014 - 2015 and Collector Road Network EA Surveys

General

Incidental observations of mammals were recorded during 2014 - 2015 fieldwork, and fieldwork conducted as part of the Collector Road Network EA, where noted.

Bats

A habitat assessment was completed for potential hibernacula and maternal roosting habitat, via walking transects through potentially suitable habitat in the Study Area on three dates: June 13, 2015; November 25, 2015; and May 16, 2017.

Those surveys focused on treed areas (both woodland and individual trees / clusters) adjacent to the Subject Property. Survey findings were assessed against criteria specified in the "Maternal Roost Surveys (Forests / Woodlands)" section of the Technical Note, Species at Risk (SAR) Bats (MNRF 2015).

6.4.1.3 2019 – 2020 and 2021 - 2024 Surveys

General

Incidental observations of mammals were recorded during 2019 - 2020 and 2021 - 2024 fieldwork, where noted.

6.4.2 Results

General

The Study Area provides habitat for large and small mammals. In total, seven mammal species were detected in the General Study Area during the 2008 - 2011 MESP: Eastern Chipmunk (*Tamias striatus*); Raccoon (*Procyon lotor*); Deer Mouse (*Peromyscus maniculatus*); White-footed Mouse (*Peromyscus leucopus*); Meadow Vole (*Microtus pennsylvanicus*); Shrew (unknown species); and White-tailed Deer (*Odocoileus virginianus*).



During the 2014 - 2015 and 2019 - 2020 surveys, seven additional species were recorded in the Study Area based on visual observations of individuals or evidence such as tracks, scat, etc., including: American Mink (*Mustela vison*); Bat (unknown species); Beaver (*Castor canadensis*); Coyote (*Canis latrans*); Grey Squirrel (*Sciurus carolinensis*); Muskrat (*Ondatra zibethicus*); and Red Fox (*Vulpes vulpes*).

Furthermore, although not confirmed within the Study Area, the treed ecosites (forest / swamp), wetlands and edge habitats within the local landscape provide suitable habitat opportunities for a variety of other mammals including Groundhog (*Marmota monax*), Virginia Opossum (*Didelphis virginiana*), Striped Skunk (*Mephitis mephitis*), other Mustelids (*Mustelidae*) and small rodent species.

American Badger

Targeted American Badger habitat assessment surveys were undertaken as part of the MESP study, with a methodology based on Ontario Regulation 437/09 and MNRF input on multiple occasions.

In total, 27 burrows were recorded in the MESP General Study Area. Most were located between Blenheim Road and the CPR line (field edge abutting Vegetation Unit 23 and along the Blenheim Road berm) and several were found along forest/wetland – field interfaces.

Based on a lack of consistent characteristics indicative of badger dens, none of the burrows were determined to likely be badger burrows, and only two showed evidence of recent use. As such it was WSP's assessment that there is no evidence of American Badger use in the MESP General Study Area. Additional survey details and results are provided in the MESP NES report.

During subsequent field surveys, no burrows with definitive American Badger characteristics were recorded.

Bats

Suitable habitat for SAR bats is present in the woodlands within the MESP General Study Area (i.e., within WSU 1 and WSU 4) as these communities maintain trees >10cm dbh (per MNRF 2017); these woodlands will be retained in full, with development setbacks and other mitigation measures.

Based on the 2014, 2015 and 2017 bat habitat suitability field surveys, and vegetation no hibernacula are present and no suitable SAR bat habitat (i.e., cavity and snag trees with suitable loose bark conditions or buildings) is present within areas directly impacted by the proposed development.

Based on monitoring completed by WSP from 2021 - 2024, there have been no substantive changes to existing mammal habitat.



6.5 Wildlife Movement Opportunities

Based on the multi-year suite of surveys completed for the MESP study, combined with secondary source information and general knowledge of the area, the MESP NES characterized wildlife movement opportunities within the MESP General Study Area.

A key outcome of that study was the identification of key areas for wildlife movement and recommended locations for linkages and wildlife passage structures to support those functions. The intent is for these linkages to provide connections between natural areas / critical life cycle habitats and contribute to broader landscape scale function and connectivity, via three categories: Maintain, Enhance or Restore. Based on survey results and habitat in the areas to be connected, the primary target group for corridor design is herpetofauna (including Ambystomid salamanders, anurans, turtles, and snakes).

With respect to the Subject Property, one linkage area was identified in the MESP NES: Linkage 8a between WSU 3 and WSU 6.

As noted in the MESP NES, the objective of Ecological Linkage 8a / 8b¹⁴ is to restore connectivity between the currently isolated Central Wetland to the adjacent larger existing natural features to the west and east. These linkages will facilitate wildlife movement between herpetofaunal breeding habitat (WSU 3, WSU 6), overwintering habitat (WSU 1, WSU 3 and WSU 6), and foraging and juvenile dispersal areas (existing wetland / woodland and future buffer zones in WSU 1, WSU 3 and WSU 6). In addition, they will provide supplemental movement areas for other wildlife taxa and a suitable corridor for plant propagule exchange between wetland / woodland areas. Conceptual design details for these linkages were provided in the MESP NES.

The MESP NES also identified additional linkages in the Study Area and on adjacent lands: Linkages 1, 2, 6, 7a, 7b, 8b and 9.

Linkages 1 and 2, within WSU 2 and WSU 3, were identified in the MESP NES as connections to be 'enhanced' via the establishment of naturalized buffers in current active croplands – to increase width of natural areas, provide additional habitat diversity, visually screen internal (core) areas from open / developed lands and reduce potential for edge effect and drying of soils (for species requiring moist - wet habitat), all of which improve opportunity for wildlife movement – all taxa / guilds.

¹⁴ Linkage 8b extends east from the Central Wetland (WSU6) to the Devil's Creek valleylands (WSU1).



Linkages 6 (west end of Barrie's Lake), 7a and 7b are recommended crossings of Blenheim Road to the south of the Subject Property, with associated eco-passages / wildlife fencing. It is our understanding that two eco-passages and associated wildlife fencing was installed on Blenheim Road north of Barrie's Lake in 2020 between Linkage 6 and 7a. Implementation of any additional linkages in this area would be subject to confirmation and additional design as part of a separate process and undertaken by others. No further discussion is provided herein.

Implementation of Linkage 8b has been completed as part of the approved Plans of Subdivision in the City lands to the east (Westwood Village Phase 1), and wildlife crossings at the Bismark Drive and Newman Drive extensions have been installed as of April 2023.

Linkage 9, an area of active cropland and degraded wetland between WSU 2 and WSU 3, was identified in the MESP NES as a connection to be 'restored', with specific measures dependent on whether a road crossing was identified. Since approval of the MESP, alternate road connections have been confirmed and a crossing at this location is no longer being contemplated. Section 7.3.3.2 of the MESP NES concluded that, if a road crossing was not identified, "the proposed setbacks and buffer management measures will retain and enhance existing wildlife movement opportunities between WSU 2 and WSU 3 (with voluntary landowner adoption of buffers and management measures in areas outside of the DSA encouraged)".

Wildlife passage monitoring will primarily target herpetofauna, but other wildlife encountered will be recorded. See Section 13 for further discussion regarding future monitoring requirements for wildlife passage monitoring.

7.0 AQUATIC RESOURCES

No defined watercourses are present on the Subject Property. Diffuse and defined channels associated with Cruickston Creek are located on adjacent lands to the north. Several wetland areas are that may provide habitat for aquatic species are present within and adjacent to the Subject Property (i.e., WSU 2, WSU 3, WSU 6 and Barrie's Lake [WSU 8]). All are located outside of lands proposed for development.

The largest of these wetland areas, Barrie's Lake (~ 21.7 ha) is a permanent pond / wetland (PSW) dominated by open water, fen and marsh communities. Depths in and along the edge average 0.3 m with mainly soft substrates consisting of muck and organics. Morphology is characterized as stagnant water with emergent / floating / submergent vegetation (75:25, open water: vegetation ratio), comprised of water lilies / duckweed in open water, with Leatherleaf and graminoids on the islands. Along the perimeter of the lake, emergent vegetation consisted of Reed-canary Grass and cattails, in addition to abundant duckweed. Barrie's Lake provides areas of deep (>2 m) open water, with large areas of



wetland / aquatic vegetation. Based on Geospatial Ontario database information, Barrie's Lake provides habitat for at least one fish species; Brown Bullhead (*Ameiurus nebulosus*), with the potential for other fish species to be present.

The remaining wetland areas associated with WSU's 2, 3 and 6 are all permanent wetland features that support areas of open water. No defined surface water features drain to or from any of these features and each of them are similar in their physical characteristics as it relates to potential aquatic habitat. Substrates in each consist generally of silt, organics and muck, with depths in the middle that are likely able to sustain fish populations year-round, at least during some years. Morphology in each is characterized as stagnant water with emergent vegetation, generally composed of graminoids and cattails. In each wetland, fish use is unknown and though there is potential for permanent fish populations to exist, no fish have been observed by WSP staff during any of the survey years (2008 – 2020), or during monitoring from 2021 - 2024. Furthermore, the presence of Ambystomid salamanders suggest that fish are less likely to be present.

8.0 DEVELOPMENT PROPOSAL

8.1 Proposed Land Uses

The Hallman Construction Limited and Brian Domm Consolidated Draft Plans of Subdivision for Westwood Phase 2 (March 25, 2026) encompass approximately 25 ha of active agriculture / previously graded lands and will include:

- Single detached residential dwellings;
- Multiple residential dwellings;
- Neighbourhood parks and open space network;
- Walkways and emergency accesses;
- Municipal rights-of-way (ROW) with widths of 18.5 m; and
- A wildlife corridor block.

Refer to the Consolidated Draft Plans of Subdivision (MHBC, March 25, 2026), shown on Figure 6 and included in Appendix H, for additional details.

As input to the development of the Draft Plans, natural heritage limits were delineated. Setback and buffer requirements were then determined based on the features and functions of these adjacent features (as discussed in following sections).

8.2 Development Setbacks and Buffers

8.2.1 *Natural Heritage System*

A detailed constraints analysis was undertaken as part of the MESP study. It included a qualitative assessment of wildlife habitat significance and/or sensitivity, based on habitat rarity or uniqueness in the local landscape, presence of SAR and SCC, floral and faunal richness, species composition, presence of sensitive or habitat-specific species and level of anthropogenic disturbance / influence (e.g., presence and abundance of urban-tolerant or urban-adapted species). That assessment also considered representation of habitat types and context / importance within the local landscape. Refer to the MESP NES report for additional details.

From that analysis, the primary areas of constraint within the study area associated with natural heritage features and functions were identified. The primary constraint areas within or immediately adjacent to the study area, summarized below, form part of the *Natural Heritage System*, as recommended and approved in the MESP study (as shown on Figure 2).

- Lands designated as part of the Blair-Bechtel-Cruickston ESL, including portions of the Barrie's Lake - Bauman Creek PSW, Barrie's Lake ESPA to the south-west, and the rare Charitable Research *Reserve* ('rare') lands to the north-west.
- The 'Central Wetland' feature (part of the Barrie's Lake – Bauman Creek PSW).

Field surveys and analyses subsequent to the MESP confirm findings and recommendations therein. No changes are proposed to the MESP-recommend *Natural Heritage System*.

8.2.2 *Development Setbacks*

One of the key mitigation and protection measures for natural heritage features is the establishment of development buffers, which includes not only physical development setback distances, but other buffer management measures. Often, other mitigation measures can be as important as the physical setback distance in an integrated buffer management approach.

Buffers and development setbacks from natural features were developed through the MESP study process to mitigate potential impacts from future development and provide enhancement opportunities. As part of the MESP process, natural heritage feature boundaries (including wetland, woodland and CEFs) were first delineated by WSP staff, then verified in the field by City, Region and GRCA staff (see Section 5.3). Approved boundaries were then surveyed, as shown on Figure 5 and Draft Plans.

A comprehensive analysis was then undertaken in the determination of buffers and development setbacks, as discussed in Section 7.2 of the MESP NES report. Development setbacks, as shown on MESP Figure 14 (updated, as shown on Figure 5 herein), are the greater of:



- 50 m from the PSW wetland boundary (marsh / pond habitat to the west): Vegetation Units 1B, 11A, 11B and 12
- 30 m from the PSW wetland boundary (treed swamp habitats to the west and north): Vegetation Units 4 and 5
- 15 m from woodland driplines (non-wetland areas to the west and north): Vegetation Units 1A, 2 and 3

These recommended setbacks were used to delineate the limits of the proposed subdivisions. These have been established through installation of the ESC fencing in 2022 at the setback.

There are no changes to recommended setbacks as per to the approved MESP.

8.2.3 *Buffer Management*

The following provides a summary of key ecological management objectives of the buffer areas:

- Vegetation and tree root protection.
- Protection of surface water quality from potential effects of sedimentation / erosion, nutrient loading, contaminants and thermal impacts.
- Reducing potential for physical edge effects via establishment of a more robust and dense edge vegetation community.
- Protection and enhancement of woodland and forest interior habitat (including habitat for forest interior or forest-associated birds and woodland-breeding amphibians), via increased functional setbacks from 'core' areas and increased woodland size – relative to agricultural use.
- Protection and enhancement of herpetofauna breeding and foraging habitat.
- Protection and enhancement of Lepidoptera / Odonata breeding and foraging habitat.
- Reducing potential occupancy-related activities (e.g., encroachment, dumping, noise / lighting, etc.), via physical separation and buffer management measures – along with other mitigation measures.
- Enhancement of ecological corridors, via development setbacks and buffer zone enhancements (See Section 10.1.2).
- The Draft Plan and Servicing Strategy respects the setback limit, with grading in the buffer restricted to several small areas, as shown on Figures AG1.1, AG1.2 and AG1.3 in MTE 2026a.

Recommended setbacks and buffer management as discussed above have been confirmed through analysis in support of the current submission. No changes are proposed.



All plans, including the Consolidated Draft Plan of Subdivision, respect the identified development setbacks.

8.2.4 *Ecological Corridor Design*

Ecological corridor objectives and conceptual design details are presented in Section 6.5 and Section 10.1.2 of this report. Some additional clarification regarding corridor design details has been provided in Section 10.1.2.

A detailed design for the corridor, including planting plans, will be prepared following Draft Plan approval and prior to servicing, grading and registration. A draft plan condition to this effect is recommended. The intent is to provide a design that is consistent with the ecological corridor on the adjacent lands in the City of Cambridge (Westwood Village Phase 1), which has been subject to detailed planting plans (approved Drawings L-400, L-410, L-415 and L-100 included in Appendix J). Installation of the ecological corridor on lands to the east has been initiated, and the wildlife crossing structures at Newman Drive and Bismark Drive have been installed as of April 2023.

8.3 **Stormwater Management**

8.3.1 *SWM History, Objectives & Criteria*

The MESP outlined a preliminary municipal servicing strategy for the broader MESP area, which included: sanitary, storm, and watermain servicing, along with a stormwater management (SWM) strategy. The recommended SWM solution was designed to maximize the use of existing storm drainage infrastructure, maintain current levels of infiltration into the ground, maintain surface water inputs into local wetland features, and mitigate the potential for stream erosion. The recommended solution consisted of multiple types of stormwater management infrastructure, including lot-level and conveyance infiltration facilities, along with several extended detention end-of-pipe stormwater management facilities.

As part of final design for the adjacent Hallman and Cachet Subdivisions in the City of Cambridge, a Final SWM Report (FSWMR) was submitted by MTE in August 2019 (and revised April 15, 2020). The SWM approach for the entire Westwood Village Community has been developed to be consistent with the conceptual solution recommended within the MESP. The additional Township land (i.e., the Subject Property) was included as part of the overall SWM strategy, to ensure that adequate SWM infrastructure has been planned for eventual development of these lands.

Stormwater Management Facility 2 (SWMF 2) within the Cachet Subdivision has been designed to service the majority of the Subject Property. A small drainage area of the Domm lands, of approximately 3.6 ha, was proposed to drain to a future SWM facility within the Domm lands. However,



as part of the pre-consultation process for the current submission, it was requested that MTE revisit the SWM strategy and determine if this drainage area could be serviced by SWMF 2.

An Environmental Compliance Approval was issued for SWMF 2 by MECP (formerly known as MOE) in November 2020; SWMF 2 is within the Cachet Subdivision adjacent to the central wetland. To facilitate the servicing of the Subject Property by SWMF 2, the storm sewer system within the Cachet Subdivision has been designed to accommodate the ultimate build-out of the Subject Property. A roof water collection system was also recommended to collect clean roof water from a portion of the Subject Property to provide surface water inputs into Wetland 2 (the central wetland), which is located adjacent to SWMF 2. Construction of SWMF 2 has been completed.

Key objectives of the SWM strategy for the Subject Property (MTE 2026b) have considered natural heritage input. They are as follows:

- Include the necessary controls to protect the hydrology and water quality of the receiving water systems.
- Document criteria for the management of stormwater runoff from the Subject Property.
- Recommend a comprehensive plan for controlling the quality and quantity of stormwater runoff from the Subject Property.
- Verify the capacity of SWMF 2 to provide sufficient quality and quantity controls for the Subject Property.
- Recommend a comprehensive plan for balancing infiltration to groundwater and surface water inputs to existing features.
- Ensure that the final engineering of the downstream SWM infrastructure incorporates the recommendations of the Preliminary SWM Report (MTE 2026b).

The following SWM criteria were established in the Preliminary SWM Report (MTE 2026b):

- **Water Quality** – Provide an *Enhanced* (MOE 2003) level of stormwater quality treatment prior to discharge to surface or groundwater systems.
- **Water Quantity** – Control peak flow rates to creek systems to existing levels, to minimize flooding and preserve hydraulic and hydrologic functions.
- **Water Balance**
 - *Infiltration* – Maintain or enhance existing recharge rates across the development area.
 - *Surface Water* – Maintain existing surface water volume and hydro-period inputs into environmental features to the east (Wetland 2) and west / north (Wetlands 1, 4, 5 and 6).

8.3.2 SWM Strategy for the Subject Property

The proposed SWM strategy for the Subject Property is presented in the Preliminary SWM Report (MTE April 2026b); the SWM strategy outlined in that report continues to be recommended as the preferred alternative. The SWM strategy includes the following key elements:

- **Use of an existing SWM Facility for surface water quality and quantity control**, conveyed by a storm sewer network in the road rights-of-way.
 - **Quality control.** SWMF2, in the adjacent Westwood Village Phase 1 lands, will provide *Enhanced* quality control from the contributing drainage area for storms up to and including the Regional storm event. SWMF2 is a wetland facility that incorporates a permanent pool and two sediment forebays which provide dilution and settling. Native plantings around the SWM facility will stabilize the banks and help to mitigate temperature increases.
 - **Quantity control.** All flows up to and including the Regional storm event will be controlled to the capacity of the proposed storm connection to the Princess Street storm sewer. SWMF 2 also utilizes the adjacent Wetland 2 for storage (above the 5-year storm). Capacity in SWMF2 was confirmed through the SWM analysis (MTE 2021). Emergency overflow is provided with two spill points: southeast to the wildlife crossing beneath Bismark Drive; and southwest toward Wetland 4 via the ecological corridor / wildlife crossing beneath Newman Drive.
 - No new SWM facilities are proposed on the Subject Property.
- **Implementation of at-source roof infiltration facilities** throughout the property
 - At the lot-level, infiltration facilities are proposed to be connected to the majority of roof areas within the development. All lot-level infiltration systems for single family lots will be located in the backyards and have been designed to accept 25 mm of runoff.
- **Implementation of a conveyance infiltration facility**
 - A conveyance infiltration facility (infiltration facility located along the conveyance route) will also be provided to infiltrate treated 'non-roof' (road, front / rear yard) runoff. The conveyance facility within the subject lands has been designed to infiltrate 25 mm of contributing runoff. The area contributing to the conveyance infiltration facility is illustrated in **Figure 4.2.** of the Preliminary SWM Report (MTE 2026b).
- **Water Balance.** See Section 8.3.3. Infiltration targets will be met and surface water inputs to the adjacent natural areas will be maintained post-development.
- **Future SWM Analysis**

- Note that some Blocks within the Draft Plan lands that will be developed through a future Site Plan Approval process. As part of that process, a *Stormwater Management Brief* will be prepared identifying the stormwater management criteria for the Block and how the stormwater control measures will adhere to the Subdivision SWM criteria as established in the Preliminary SWM Report (MTE 2026b).
- A preliminary **Erosion & Sediment Control** (ESC) strategy, as discussed in Section 8 of the Preliminary SWM Report (MTE 2026b).
- A During-construction and Post-construction **Surface Water and Groundwater Monitoring Plan**, as discussed in Section 7 of the Preliminary SWM Report (MTE 2021). Note that surface and groundwater monitoring has been undertaken; see Section 4.4 for MTE monitoring report references.

8.3.3 *Water Balance*

A Water Balance analysis has been completed, as discussed in Section 5.5 of the Preliminary SWM Report (MTE 2026b). The MESP established that both existing infiltration rates and existing surface water inputs to key natural features were to be maintained post-development as described below.

The water balance strategy outlined in the Preliminary SWM Report (MTE 2026b) continues to be recommended as the preferred alternative.

8.3.3.1 **Infiltration**

The infiltration strategy includes lot level and conveyance controls, which will meet or exceed pre-development average annual volumes (i.e., average annual infiltration depth of 262.5 mm, which slightly exceeds the pre-development value of 256.4 mm).

- **Lot level infiltration** facilities will include direct connections to roof leaders on residential lots and a series of independent infiltration galleries on condominium blocks. All residential blocks will have infiltration galleries, except for those reserved for the surface water balance to the wetlands – as discussed below.
- A **conveyance control** will include an infiltration gallery and an upstream oil and grit separator to treat stormwater prior to entering the facility. The proposed SWM strategy includes a conveyance infiltration facility (CIF), located within the central park block (Block 16-Stage 1, Domm) of the proposed development. Figure 4.2 in MTE 2026b illustrates the drainage area of the conveyance facility which serves to infiltrate ‘non-roof’ runoff in order to provide a distributed infiltration balance to pre-development levels. The overflows from the CIF will discharge to the proposed storm sewer system in the subject lands.



8.3.3.2 Surface Water Inputs to Wetlands

The proposed SWM plan demonstrates that pre-development surface water volume inputs into the wetland features surrounding the development will be maintained post-development, by a combination of inputs from the rear yards / roof areas of lots adjacent to the wetlands and contributions from a roof drainage collection system (third-pipe' system). The areas designated as contributing to the wetland surface water balance are shown on Figure 2.1, Figure 4.2, Figure F.1 and Figure F. 2 of the Preliminary SWM Report (MTE 2026b), with detailed water balance assessments in Appendix F of that report.

In the lots with roofs draining to Wetland 2, the proposed 'third pipe' system will replace the roof infiltration galleries. For the residential lots (in the Cachet Subdivision) adjacent to Wetland 2, runoff from the roofs will be directed to Wetland 2 through downspouts and overland routing.

Wetland 2

Wetland 2 (hydrograph 5312), in the Cachet Subdivision adjacent to SWMF 2, receives a pre-development runoff volume of 23,800 m³ (MESP 2013). In the post-development condition, Wetland 2 receives a direct runoff volume of 6,442 m³, which is supplemented by directing clean roof water year-round via a 'third-pipe' system, to achieve an annual post-development runoff volume of 24,569 m³.

Wetland 2 primarily receives surface balance inputs from the contributing roof areas, rather than runoff from SWMF 2. All SWMF 2 discharge up to and including the 5-year storm event, which would include all winter month melts and events, outlets to the Princess Street storm sewer. In this manner, SWMF 2 has an inherent wetland winter bypass, which functions passively, avoiding ecological impacts associated with chloride loading.

Wetland 3

Wetland 3 (hydrograph 1402) is located south of the Subject Property and receives a pre-development runoff volume of 37,300 m³, a very small portion of which is on the Subject Property. In the post-development condition, it receives post-development non-winter runoff from Facility 1 outlet totaling 6,860m³, runoff from the undeveloped buffer (catchment 402), proposed Blenheim Road, and the rear yard / roof areas of the Subject Property (catchment 712) for a total post-development runoff volume of 38,920 m³ - a very small (4%) surface water runoff surplus.

Wetland 4 and 5

Wetland 4 and 5 (hydrograph 1405), which are hydraulically connected, are located west of the Subject Property and receive a pre-development runoff volume of 55,000 m³. In the post-development condition, they receive surface water input from the undeveloped buffer and the rear yard / roof areas of



the subject lands (catchment 708 and 712) for a total post-development runoff volume of 55,708 m³, a very slight increase of less than 1%.

West Wetland (VP1)

Vernal Pond 1 is located west of the Subject Property (see Figures 2 and 6). It receives a pre-development runoff volume of 3,802 m³. In the post-development condition, it receives surface water input from the undeveloped buffer and the rear yard / roof areas of the Subject Property, for a total post-development runoff volume of 3,882 m³, a very slight increase of less than 2% relative to pre-development.

East Wetland (VP7)

Vernal Pond 7 is located in the *rare* 'hogsback' north of the Subject Property (see Figures 2 and 6). It receives a pre-development runoff volume of 9,135 m³. In the post-development condition, it will receive surface water input from the undeveloped buffer and the rear yard / roof areas of the adjacent lots and additional roof drainage collected through a third pipe system within the Subject Property. A total of 9,535 m³ of post-development runoff will be contributed to this wetland, a slight increase of less than 4%.

Wetland 6 / Cruickston Creek

Cruickston Creek, downstream of the proposed development area (hydrograph 1110), receives a pre-development runoff volume of 46,300 m³, via concentration of diffuse drainage through the surrounding 'hogsback' swamp into a channel toward the north end of that feature. It will receive a total post-development runoff volume of 46,300 m³, matching pre-development.

All residential blocks will have infiltration galleries, except for those reserved for the surface water balance to the wetlands. In the lots with roofs draining to Wetland 2, the proposed 'third pipe' system will replace the roof infiltration galleries. For the residential lots (in the Cachet Subdivision) adjacent to Wetland 2, runoff from the roofs will be directed to Wetland 2 through downspouts and overland routing. It is estimated that drainage from a total roof area of 1.54 ha within the Subject Property will be directed to Wetland 2 via a 'third-pipe' system. Downspouts will be directly connected to the 'third-pipe' storm sewer system via a separate storm sewer connection. The total roof areas of 0.13 ha, 0.95 ha, 1.05 ha, 0.03 ha and 0.08 ha will drain from the subject lands to Wetland 3, Wetland 4 and 5, VP7 and VP1, respectively, to maintain surface water inputs.

8.3.4 Surface Water Quality Management

The primary mechanism for surface water quality management is provided via control in SWMF 2, which has been designed to meet *Enhanced* (Level 1) water quality protection.



As part of the MESP study, a water quality management strategy was developed to address two key water quality parameters; chlorides and nutrients. Details of the strategy are provided in the MESP study report. Key strategies have been refined for the development lands as discussed below.

The water quality management strategy outlined in the Preliminary SWM Report (MTE 2026b) continues to be recommended as the preferred alternative.

8.3.4.1 Chlorides

Based on groundwater chemistry analysis, as described in the Hydrogeological Assessment (MTE 2021) and associated addendum (MTE 2026c), there appear to be minimal sodium, chloride or nitrate impacts on the Subject Property in the pre-development condition.

To mitigate potential impacts from chloride loading into the receiving wetlands, an option for a winter by-pass was considered for SWM Facilities 1 and 2. As noted above, SWMF 2 has an effective wetland winter bypass, which functions passively, avoiding ecological impacts associated with chloride loading.

A *Chloride Impact Assessment* was undertaken, as discussed in Section 6 of the Preliminary SWM Report (MTE 2026b). That included the calculation of salt loading from de-icing operations to groundwater to ensure that groundwater chloride concentrations will remain within *Reasonable Use Guidelines* established by MECP (previously MOE).

Per that analysis, the estimated post-development groundwater chloride concentration of 13 mg/L is below the corresponding RUC limit of 126 mg/L. For the multiple residential blocks, it is likely that snow removal and ice control will be undertaken by a private winter maintenance service provider. As such, it is recommended that site specific *Salt Management Plans* be implemented as part of the future development of these sites. The purpose of these *Salt Management Plans* will be to reduce the impact of all winter maintenance activities involving salting practices on the surface water and groundwater resources. The *Salt Management Plans* should outline operational practices and strategies for three main areas of concern: general salt use, salt storage, and snow storage / disposal. With respect to snow storage, it is recommended that the snow be stored on impervious surfaces that are connected to a storm sewer system, to prevent chloride impacted water from infiltrating directly into the groundwater system.

8.3.4.2 Nutrients

Under previous agricultural conditions, application of agricultural crop fertilizer likely contributed to nutrient loading in wetlands within the Study Area.

It is anticipated that nutrient inputs to natural features within the development lands will decline under proposed conditions via several mechanisms: 1) reduced application of fertilizers as the lands transition



from agricultural to urban land use; 2) increased effectiveness of filtration / uptake through enhanced and much larger vegetated buffer areas; 3) implementation of SWM strategies; and 4) stewardship initiatives to reduce fertilizer application on residential lots / blocks.

8.3.4.3 Erosion & Sediment Control

Erosion & Sediment Control (ESC) measures are identified in Section 8 of the Preliminary SWM Report (MTE 2026b). Guidance regarding sequence of activities, soil storage, fencing, access and inspection are provided, with final ESC Plans to be prepared at detailed design in consideration of these elements.

8.4 Functional Servicing

Grading and servicing are addressed in the Westwood Village Community (Phase 2). Brian Domm Subdivision. Hallman Subdivision. Functional Servicing Report (MTE 2026a). The servicing strategy outlined in the Functional Servicing Report (MTE 2026a) continues to be recommended as the preferred alternative. Key findings are as follows:

1. The subdivisions have been designed to implement the Cambridge West Community Master Environmental Servicing Plan (November 2013).
2. Proposed grading – The roadworks and lot grading within the proposed development can be completed in compliance with the City of Cambridge's Design Standards while maintaining the minimum required cover over the proposed sewers, maximizing the allowable flows to existing infrastructure, minimizing the need for retaining walls.

Overall grading is excluded from the buffer, except for several small locations (between 56 m² and 397 m²; total of 1,158 m²) required for transitional grading (to limit the requirement for retaining walls) along rear yards that abut the buffer. These small areas are all well outside of the retained natural heritage features, within portions of the Subject Property formerly used for agriculture and will ultimately become part of the enhanced buffer. Grading plans are included in Figures AG1.1, AG1.2 and AG1.3 in MTE 2026a.

3. Streets within the subdivisions will be constructed to the City of Cambridge's Design Standards;
4. Sanitary and storm sewage collection – The proposed development can be adequately serviced through the extension of the existing gravity sewers along the future extension of Newman Drive.
5. There is adequate capacity in the Galt Wastewater Treatment Plant to accommodate sanitary flow from the proposed subdivisions.
6. Water Distribution – Water supply for the proposed development can satisfactorily meet the pressure and flow demands through connections to extensions of the existing municipal water distribution system.

7. Stormwater management for most of the development will be directed to and can be accommodated by the adjacent SWMF 2 within the Cachet subdivision, as outlined in the Preliminary SWM Report (MTE 2026b). A small portion will be directed to and can be accommodated by the existing SWMF on the Newman Lands.
8. The proposed development can be adequately serviced through the extension of existing utilities, including hydro, gas, cable TV, and telephone.

9.0 POLICY ASSESSMENT

Relevant planning legislation and policy pertinent are summarized in the following sections. An overview of key policies and implications is provided along with an assessment of the policy as it relates to natural heritage features within the Study Area.

9.1 Fisheries Act

9.1.1 *Overview of Key Policies*

The purpose of the federal Fisheries Act (Canada 1985) is to maintain healthy, sustainable, and productive Canadian fisheries through the prevention of pollution and the protection of fish and their habitat. Under the Fisheries Act (Canada 1985), work in and near water must comply with the fish and fish habitat protection provisions of the Fisheries Act by incorporating measures (DFO 2019) to avoid:

- causing the death of fish
- harmful alteration, disruption, or destruction (HADD) of fish habitat in your work, undertaking or activity

All projects where work is being proposed that cannot avoid impacts to fish or fish habitat or are at high risk of causing impacts require a Fisheries and Oceans Canada (DFO) project review (DFO 2019). If potential impacts can be avoided, project approval is not required (DFO 2020).

When reviewing a project, DFO will identify potential risks of the project to the conservation and protection of fish and fish habitat. If it is determined that the project is likely to result in death of fish or HADD of fish habitat, an Authorization is typically required under the Fisheries Act. Proponents of projects requiring a Fisheries Act authorization may be required to also submit a habitat offsetting plan, which provides details of how the death of fish and/or HADD of fish habitat will be offset, and outlines associated costs and monitoring commitments. Proponents also have a duty to notify DFO of any unforeseen activities during the project that cause harm to fish or fish habitat.



9.1.2 Study Assessment

9.1.2.1 Applicability

There are no watercourses within the Subject Property that are subject to the Fisheries Act. Waterbodies within the study area that have confirmed fish use (i.e., Barrie's Lake), and potential fish use (i.e., wetlands associated with WSU's 2, 3 and 6) and Cruickston Creek are all outside of the development envelope and will not be directly impacted by the development.

9.1.2.2 Conclusion

Potential impacts to fish and fish habitat associated with the proposed development are limited to downstream indirect or secondary impacts of the construction and alteration of nutrient and allochthonous inputs due to the change in land use. With maintenance of hydrogeological inputs to receiving areas, the proper installation and operation of standard mitigation measures (specifically ESC measures), and mitigation proposed via the SWM strategy, potential impacts on aquatic habitat will be mitigated such that the project complies with the Fisheries Act.

9.2 Migratory Birds Convention Act

9.2.1 Overview of Key Policies

The Migratory Birds Convention Act, MBCA (1994) and Migratory Birds Regulations, MBR (2022) protect most species of migratory birds anywhere they are found in Canada, including surrounding ocean waters, 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 Environment and Climate Change Canada (ECCC) as:

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



ECCC implements policies and guidelines to protect migratory birds, their eggs and their nests. There is guidance on the ECCC website to minimize the risk of incidental take effects on migratory birds, achieve compliance with the law and maintain sustainable populations of migratory birds¹⁵.

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 ECCC website¹⁶.

9.2.2 Study Assessment

9.2.2.1 Applicability

Potential MBCA compliance implications may occur during the construction phase of development projects when the land is cleared and grubbed of vegetation, potentially removing nests of migratory birds.

9.2.2.2 Results and Conclusions

Seventy-nine migratory bird species subject to the MBCA were recorded with some level of breeding evidence within WSUs 2, 3, 4, 6 and 8. None of these species is solely dependent on the habitat to be directly impacted by proposed development (i.e., almost entirely active croplands) and there is no suitable nesting habitat for several species in areas of proposed development (Bank Swallow, Barn Swallow, Chimney Swift and Great Blue Heron). Most are generalist and/or urban-adapted species and no habitat unique in the local landscape will be impacted by proposed works. Compliance with the MBCA will be achieved using the following due diligence approach:

- Proponent awareness of the MBCA, the potential for nesting in the area and potential for impacts to migratory birds, nests and eggs. The adjacent areas provide suitable habitat for nesting of woodland, wetland 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 this area – which for most species extends from early April through late August¹⁷;

¹⁵ <https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratory-birds/guidelines.html>

¹⁶ <https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratory-birds/general-nesting-periods/nesting-periods.html>

- Avoiding works in key sensitive locations;
 - The proposed development area is entirely outside of the Natural Heritage System, as identified in the MESP and confirmed in the current study. The footprint of proposed works is primarily active crop lands
- Minimizing vegetation removals;
 - No removal or disturbance of sensitive natural vegetation areas is required .
- Implementing post-construction habitat creation / restoration;
 - See Section 10.1. To be finalized following draft plan approval
- Recommending Best Management Practices (BMPs) during construction to minimize potential indirect impacts to vegetation / potential nesting habitat outside of the direct footprint.
 - See Section 10.1.

9.3 Species at Risk Act

9.3.1 Overview of Key Policies

The federal Species at Risk Act (SARA; 2022) 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 private lands throughout Canada only to aquatic species and species of migratory birds protected by the Migratory Birds Convention Act listed as Endangered, Threatened, or Extirpated under Schedule 1 of SARA. For other listed wildlife species, these prohibitions apply only in federal lands. However, the Governor in Council may, by order, apply these prohibitions to

¹⁷ <https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratory-birds/general-nesting-periods/nesting-periods.html>



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 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 listed by COSEWIC 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.

9.3.2 Study Assessment

9.3.2.1 Applicability

The project is on non-federal (private / municipal) lands and there is no order by Governor in Council; hence SARA only applies to aquatic and migratory bird species and habitat.

9.3.2.2 Results and Conclusions

Individuals and Residences:

Six SARA-listed migratory bird species were recorded in the study area:

- **Bank Swallow** (Threatened, Schedule 1): Foraging visitants (up to 40 individuals) recorded on various dates foraging over wetlands and agricultural fields. No suitable nesting habitat is present within the development envelope. No impacts to Bank Swallow individuals or habitat are anticipated with retention of wetlands and application of development setbacks and buffer enhancements.
- **Barn Swallow** (Threatened, Schedule 1): Foraging visitants (up to 40 individuals) recorded on various dates foraging over wetlands and agricultural fields. Confirmed nesting habitat is present within the barn at 1034 Roseville Road. No suitable nesting habitat is present within the development envelope. No impacts to Barn Swallow individuals or habitat are anticipated with retention of barn, wetlands and application of development setbacks and buffer enhancements.
- **Bobolink** (Threatened, Schedule 1): One individual (possible breeder) recorded in 2014 within pasture fronting 1034 Roseville Road. No suitable nesting habitat is present within the



development envelope. No impacts to Bobolink individuals or habitat are anticipated with retention of pasture and application of development setbacks and buffer enhancements.

- **Canada Warbler** (Threatened, Schedule 1): Two individuals recorded in WSU 2 in 2012 (probable migrants). No breeding evidence recorded. No suitable nesting habitat is present within the development envelope. No impacts to Canada Warbler individuals or habitat are anticipated with retention of natural habitats and application of development setbacks and buffer enhancements.
- **Chimney Swift** (Threatened, Schedule 1): Foraging visitants recorded in low numbers (2-4 individuals) on various dates foraging over wetlands and agricultural fields. No suitable nesting habitat is present within the development envelope. No impacts to Chimney Swift individuals or habitat are anticipated with retention of wetlands and application of development setbacks and buffer enhancements.
- **Least Bittern** (Threatened, Schedule 1): Two individuals recorded in WSU 3 wetland in 2011 (possible breeders) and one individual recorded in WSU 6 wetland in 2019 (probable breeder). No suitable nesting habitat is present within the development envelope. No impacts to Least Bittern individuals or habitat are anticipated with retention of wetlands and application of development setbacks and buffer enhancements.

Critical Habitat:

No *critical habitat* for SARA-listed aquatic or migratory bird species is present within the proposed area of works and none is known on adjacent lands where there is potential for indirect impact.

Further, we are aware of no downstream *critical habitat* for aquatic SAR which would be impacted by the proposed activities with the proper implementation of recommended mitigation and protection measures.

Recommendations:

Implement all recommended during-construction measures / best-management practices to mitigate potential impact to SAR individuals and recommended SWM measures to mitigate potential impact to downstream aquatic habitat.

Implement all requirements for MBCA compliance (See Section 9.2) and ESA compliance (See Section 9.4).

9.4 Species Conservation Act

9.4.1 Overview of Key Policies

SAR designations for species in Ontario are initially determined by the *Committee on the Status of Species at Risk in Ontario* (COSSARO), and if approved by the provincial Minister of Environment, Conservation and Parks, species are added to the Species Conservation Act (SCA) which came into effect March 30, 2026 (Ontario 2025). At the time of writing, the SCA had just come into effect and a number of definitions and specific details with respect to prohibited activities were not yet available. However, it is expected that the SCA will include provisions for protected species (i.e., species listed as Threatened, Endangered or Extirpated under the SCA) and their habitat (i.e., prohibitions against damage or destruction to a protected species habitat), unless that activity has been registered with the Province or a permit acquired.

9.4.2 Study Assessment

9.4.2.1 Applicability

Species afforded protection under the SCA (2025) and their habitats have been reviewed within the current EIS Study Area. Confirmed and potentially suitable habitat is present for species afforded protection under the SCA (2025).

9.4.2.2 Habitat Assessment / Screening

A SAR habitat suitability evaluation ('screening') for the Study Area was undertaken in advance of fieldwork. This screening was based on a list of SAR known to occur within the region from a review of various sources including: species indicated by MNR through correspondence as part of the Cambridge West MESP process; NHIC website; Ebird website; Ontario Reptile and Amphibian Atlas website; and DFO aquatic species at risk mapping.

The screening is summarized in Appendix E, Table E.1. In that process, we assessed 'potential for species presence in the Study Area based on the 'key habitats used by species' (based on SARO website habitat descriptions and MNR input). Considering findings of surveys and habitat suitability, we then assessed 'potential for impacts to species and/or habitats'.

9.4.2.3 Results and Conclusions

We concluded that for many of the listed species, potential presence within the Study Area was 'none' or 'low' given a lack of suitable or preferred habitat and/or rarity of the species. This was confirmed through field survey results. For these species, the likelihood of impacts was also 'none'.

For 25 species, there is some potential for use based on one or more of the following factors: the presence of potentially suitable habitat in the vicinity of the Study Area; the relative commonness of species; known records from the local area; and/or habitat requirements are not specific (i.e., they are 'generalists' that use a wide variety of natural and semi-natural habitat types). In addition, 11 species were confirmed within the Study Area through field surveys. For these potential / confirmed species, we assessed the likelihood of impacts based on field survey results, known records and the proposed activity / development.

Key conclusions are as follows:

- Two *Endangered* SAR species were recorded during field surveys:
 - Butternut. One individual tree located more than 50 m from the woodland edge, within a woodland to be protected (WSU 4). No impacts are anticipated.
 - Black Ash. Multiple individuals present in Unit 1b, along the interior margin of Unit 3, and within Units 4 and 5. All individuals are >30 m from the development limit. Therefore, no impacts to Black Ash habitat (30 m radial distance around the stem as defined in O. Reg. 832/21) are anticipated with retention of natural habitats and implementation of development setbacks and buffer enhancements.
- Four *Threatened* SAR were recorded during surveys in the Study Area: Bank Swallow; Bobolink; Chimney Swift; and Least Bittern. Note that none of these species are subject to the protection provisions of the SCA.
 - See Section 9.3.2 for details and commentary. No impacts are anticipated.
- Potential maternity roosting habitat for *Endangered* SAR bats is present in the woodland habitat within WSU 4. No impacts to potential bat habitat are anticipated with the retention of woodland habitats and implementation of development setbacks and buffer enhancements.
- Although not subject to the provisions of the SCA, five *Special Concern* species were recorded in the Study Area:
 - **Barn Swallow.** Foraging visitants (up to 40 individuals recorded on various dates foraging over wetland / agricultural fields). Confirmed nesting in a barn at 1034 Roseville Road. No suitable nesting habitat is present within the development envelope. No impacts to individuals or habitat are anticipated with retention of natural habitats and implementation of development setbacks and buffer enhancements.
 - **Canada Warbler:** Two individuals recorded in WSU 2 in May 2009 (probable migrants). No breeding evidence was recorded. No impacts to individuals or habitat are anticipated with retention of natural habitats and implementation of development setbacks and buffer enhancements.

- **Eastern Wood Pewee:** Probable breeders recorded in low numbers (1-4 individuals) across various dates within WSU 4 and along the margins of WSU 3 and WSU 8. No impacts individuals or habitat are anticipated with retention of woodland habitats and implementation of development setbacks and buffer enhancements.
- **Monarch:** Recorded in low numbers in WSU 2, 3 and 8. No impacts to Monarch habitat are anticipated with retention of natural habitats and implementation of development setbacks and buffer enhancements.
- **Snapping Turtle:** Recorded in low numbers in WSU 2, 3, 6 and 8. No impacts to individuals or habitat are anticipated with retention of wetland habitat and implementation of development setbacks, enhancement/creation of ecological linkages and wildlife passages and other mitigation measures.
- For other SAR species with some potentially suitable habitat in or adjacent to the development envelope, but not recorded during field surveys, no impacts are anticipated, based on one or more of the following factors (Appendix E):
 - All sensitive natural features with potential SAR habitat (i.e., wetlands and natural vegetation communities) are being retained, with development setbacks and a future naturalized and enhanced buffer;
 - The small size and/or marginal quality of potentially suitable habitat;
 - Potential impacts are restricted to non-critical habitat (e.g., non-specific foraging habitat for breeding birds, but not breeding / nesting habitat);
 - Presence of abundant and generally much larger / higher quality habitat in the local landscape;
 - Low likelihood of occurrence; and
 - Implementation of mitigation / protection measures such as retention of suitable habitat, encounter protocols, exclusion fencing or timing windows to avoid sensitive periods.

9.5 Provincial Planning Statement

9.5.1 Overview of Key Policies

The Ontario Provincial Planning Statement (PPS; MMAH October 2024) identifies natural heritage objectives and provisions related to development and site alteration in and/or adjacent to certain natural heritage features.

Per Section 4.1.4, development and site alteration shall not be permitted in:



1. Significant Wetlands in Ecoregions 5E, 6E, and 7E1; and
2. Significant Coastal Wetlands.

Per Section 4.1.5, 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:

3. Significant Wetlands in the Canadian Shield north of Ecoregions 5E, 6E, and 7E.
4. Significant Woodlands in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Marys River);
5. Significant Valleylands in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Marys River);
6. Significant Wildlife Habitat;
7. Significant Areas of Natural and Scientific Interest; and
8. Coastal Wetlands in Ecoregions 5E, 6E, and 7E1 that are not subject to policy 4.1.4(b)

Per Section 4.1.6, *“Development and site alteration shall not be permitted in fish habitat except in accordance with provincial and federal requirements.”*

Per Section 4.1.7, *“Development and site alteration shall not be permitted in habitat of endangered species and threatened species, except in accordance with provincial and federal requirements.”*

Per Section 4.1.8, *“Development and site alteration shall not be permitted on adjacent lands to the natural heritage features and areas identified in policies 4.1.4, 4.1.5 and 4.1.6 unless the ecological function of the adjacent lands has been evaluated and it has been demonstrated that there will be no negative impacts on the natural features or on their ecological functions.”*

9.5.2 Study Assessment

9.5.2.1 Applicability

An assessment of PPS natural heritage policies undertaken as part of the MESP identified the presence of fish habitat, Significant Wildlife Habitat (SWH), Significant Woodlands (regionally significant), Significant Valleylands, habitat of *Endangered* and *Threatened* species, and Provincially Significant Wetlands in the MESP General Study Area. That assessment generally remains applicable to the current study, with updates and refinements related to the development proposal, as summarized below.

- **Significant Wetlands** in Ecoregions 5E, 6E, and 7E1.
 - Portions of the *Barrie's Lake – Bauman Creek Wetland Complex* PSW are present within the Study Area. PSW limits, features, and functions were identified in the MESP; wetland delineation limits were updated in 2019 with no substantive changes (Section 5.3)
 - No PSW is present within the Subject Property. All PSW wetlands on adjacent lands are to be retained in full, with minimum development setbacks of 30 - 50 m and enhanced / naturalized buffers.
 - Conclusion: no impact to feature or function with implementation of recommended protection, mitigation and enhancement measures.
- **Significant Coastal Wetlands**
 - Not applicable.
- **Significant Wetlands** in the Canadian Shield north of Ecoregions 5E, 6E, and 7E1.
 - Not applicable.
- **Significant Woodlands** in Ecoregions 6E and 7E.
 - Significant Woodland (per Policy 3.A.3.1 of the Cambridge Official Plan) is present: Vegetation Units 2, 3 and 5. Woodland limits, features and functions were identified in the MESP; functions and attributes were confirmed through the current study and woodland limits were updated in 2019 with no substantive changes (Section 5.3).
 - Conclusion: no development within woodland; no impact to feature or function, with implementation of recommended protection, mitigation and enhancement measures.
- **Significant Valleylands** in Ecoregions 6E and 7E.
 - None present on Subject Property or within the Study Area.
 - Conclusion: no development within significant valleyland; no impact to feature or function.
- **Significant Wildlife Habitat.**
 - All of the larger habitat blocks within the MESP General Study Area (WSU 1-8) were assessed to meet criteria for *Significant Wildlife Habitat* in the MESP, based on direction / guidance provided in the Significant Wildlife Habitat Technical Guide ('SWHTG', OMNR 2000) and the Draft Ecoregion 6E Criteria Schedule, Addendum to the Significant Wildlife Habitat Technical Guide (OMNR 2012).

- Within the MESP General Study Area, four areas of confirmed SWH were identified: WSU 1 (woodland); WSU 2 (wetland); the movement area between WSU2/3 and WSU 6; and the movement area between WSU 1 and WSU 6.
- Subsequent to the MESP submission, updated SWH schedules were issued: Significant Wildlife Habitat Criterion Schedules for Ecoregion 6E (MNR 2015). In consideration of additional data collected through 2014 - 2015 and 2019 - 2020, we have re-evaluated the SWH analysis using the updated SWH Criterion Schedules (2015). See Appendix F for the full evaluation.
- The ten confirmed and one candidate SWH criteria within the MESP General Study Area as identified in the MESP study have been reconfirmed, with no proposed changes to SWH area limits. Within the current Study Area, these SWH habitat features include the following:
 - Candidate SWH:
 - Bat Maternity Colonies (WSU 4)
 - Confirmed SWH:
 - Turtle Wintering Areas (WSU 2, 3, 6 and 8)
 - Waterfowl Nesting Area (WSU 2, 3, 4, 6 and 8)
 - Turtle Nesting Areas (WSU 3, 6 and 8)
 - Seeps and Springs (WSU 4)
 - Amphibian Breeding Habitat – Woodland (WSU 3, 4 and 8)
 - Amphibian Breeding Habitat – Wetland (WSU 2, 3, 6 and 8)
 - Woodland Area Sensitive Breeding Bird Habitat (WSU 4)
 - Marsh Breeding Bird Habitat (WSU 2, 3, 6 and 8)
 - Habitat for Special Concern and Rare Species (WSU 2, 3, 4, 6 and 8)
 - Amphibian Movement Corridors (between WSU 2 and WSU 6; between WSU 2 and WSU 6; between WSU 3 and 6; between WSU 3 and 8)
- Conclusion: with the exception of amphibian movement corridors, there is no development proposed within candidate / confirmed SWH areas. Further, no impact to SWH features or functions (including SCC habitat recorded in these areas) are anticipated, with implementation of recommended protection, mitigation and enhancement measures identified herein (including implementation of a wildlife movement corridor and eco-passage).

• **ANSI.**

- No ANSIs are present within the Study Area.
- Conclusion: no development within ANSIs; no impact to feature or function.
- **Coastal wetlands** in Ecoregions 5E, 6E, and 7E1 that are not subject to policy 2.1.4(b).
 - Not applicable.
- **Fish Habitat.**
 - See Section 7.0 for an assessment of aquatic features and fish habitat. Barrie's Lake provides confirmed fish habitat and other open water wetlands within the Study Area may provide fish habitat, though this has not been confirmed.
 - Conclusion: no development within confirmed or potential fish habitat; no impacts to features or functions, with implementation of recommended protection, mitigation and enhancement measures.
- **Habitat of Endangered and Threatened Species.**
 - See discussion in Section 9.4.2.
 - Conclusion: no development within confirmed and/or *critical habitat*; no impact to features or functions with implementation of recommended protection, mitigation and enhancement measures.
- **Development on Adjacent Lands.**
 - Lands adjacent to features identified in Policies 4.1.4, 4.1.5 and 4.1.6 have been considered in the current study, with mitigation / potential impacts to their ecological features and functions addressed in Section 10 of the current report.
 - Conclusion: With recommended retention / protection, mitigation and enhancement measures identified herein, we conclude that development on the Subject Property adjacent to identified natural heritage features can be undertaken with no negative impacts to those features or their ecological and hydrogeological functions.

9.5.2.2 Conclusions

With recommended mitigation and protection measures, including commitments to future work, the proposed development is consistent with the natural heritage policies of the PPS. In accordance with Policy 4.1.8, the current report demonstrates that development and site alteration on lands adjacent to the natural heritage features and areas identified in policies 4.1.4, 4.1.5, and 4.1.6 will not result in negative impacts on the natural features or their ecological functions.

9.6 Region of Waterloo Official Plan

As of January 1, 2025, changes to Ontario's land use planning framework under Bill 23 (the More Homes Built Faster Act, 2022) came into effect for the Regional Municipality of Waterloo. As a result, certain land-use planning responsibilities were transferred from the Region to the area municipalities – the cities and townships within Waterloo Region.

Relevant regional official plan policies and designations as they existed on January 1, 2025, are discussed in Section 9.7.

9.7 Cambridge Official Plan

9.7.1 Overview of Key Policies

Chapter 3 of the Cambridge Official Plan (2018) identifies the 'Natural Heritage System' of *natural features* and their associated *ecological functions*. *Natural features* include *Landscape Level Systems* (Section 3.A.2), *Core Environmental Features* (Section 3.A.3), *Locally Significant Natural Areas* (LSNA; Section 3.A.4), *Natural Features Linkages* (Section 3.A.5), and *Fish Habitat* (Section 3.A.7). Policies of the Cambridge Official Plan (2018) seek to maintain, enhance, and/or restore the Natural Heritage System of Cambridge.

As per policies of the Cambridge Official Plan (2018), development and site alteration proposed adjacent to the above noted features requires the completion of an *Environmental Impact Statement* to evaluate potential impacts.

- *Landscape Level Systems* are identified on Map 9 and include three Environmentally Sensitive Landscapes (ESL).
- *Core Environmental Features* are identified on Map 9 and include:
 - Significant Habitat of Endangered or Threatened Species;
 - Provincially Significant Wetlands;
 - Environmentally Sensitive Policy Areas;
 - Significant Woodlands; and
 - Environmentally Significant Valley Features.
- *Locally Significant Natural Areas* are unmapped and include:
 - Wetlands regulated by GRCA that are not *Core Environmental Features*;
 - Wooded areas identified by Ministry of Natural Resources that are not *Core Environmental Features*;
 - Significant Wildlife Habitat generally consisting of one or more of the following: seasonal concentration areas; rare vegetation communities or specialized habitats for wildlife; habitats of species of conservation concern; or wildlife movement corridors;



- perennial or intermittent watercourses; and
 - Environmentally Significant Groundwater Discharge and Recharge Areas.
- Natural Features Linkages
- Restoration Areas and Vegetation Management
- Fish Habitat

9.7.2 Study Assessment

- Landscape Level Systems:
 - None is present within the proposed development envelope.
 - The *Blair-Betchtel-Cruickston ESL* is present on adjacent lands to the west. This area will be retained in full, with development setbacks, buffer enhancements and other mitigation measures.
- *Core Environmental Features (CEF)*, which include:
 - None is present within the proposed development envelope.
 - Lands designated as part of the *Blair-Betchtel-Cruickston ESL*, including the Barrie's Lake - Bauman Creek PSW, Barrie's Lake ESPA to the south-west, and the *rare* lands to the north-west (PSW and Significant Woodland).
 - The 'Central Wetland' feature (part of the Barrie's Lake – Bauman Creek PSW).
 - All of these areas will be retained in full, with development setbacks, buffer enhancements and other mitigation measures.
- Locally Significant Natural Areas (LSNA), which include:
 - Wetlands regulated by GRCA that are not CEFs (i.e., not PSW):
 - Wooded areas identified by MNRF that do not qualify as a CEF (i.e., non-Significant Woodlands):
 - None is present within the proposed development envelope. The woodland on adjacent lands is considered a Significant Woodland. See discussion in Section 9.5.2.
 - Significant Wildlife Habitat:
 - See discussion in Section 9.5.2.
 - Perennial or intermittent watercourses:

- None is present within the development envelope and impacts to those on adjacent lands (e.g., Cruickston Creek) will be avoided with the implementation of recommended mitigation measures.
- Environmentally Significant Groundwater Discharge and Recharge Areas:
 - The Subject Property is within a mapped *Significant Groundwater Recharge Area* (SGRA)¹⁸ with mapped vulnerability scores ranging between 2 to 4, but outside of mapped wellhead water quantity zones and a Highly Vulnerable Aquifer (HVA) designation.
 - A small portion of the Subject Property along the eastern boundary is within a mapped *Groundwater Under Direct Influence* (GUDI) vulnerability area with an associated vulnerability score of 8.1.
 - The Subject Property is not within an identified Regional Recharge Area (per Map 6g of the Regional Official Plan (2015)).
 - Potential impacts will be mitigated by maintaining infiltration across the Subject Property.
- Natural Features Linkages
 - Several areas of existing or proposed ecological linkages were identified in the MESP: between WSU 2/3 (outside of the Subject Property); between the Central Wetland (WSU 6) and the Barrie's Lake (WSU 8) – Bauman Creek PSW (WSU 2/3); and between the Central Wetland (WSU 6) and the Gilholm-Salisbury PSW (outside the Subject Property). See Figure 6.
 - These linkages were confirmed through updated work completed in 2014 - 2020 and no changes are proposed as part of the current study. The linkage from WSU 3 to WSU 6 has been identified on the Draft Plan, with an eco-passage constructed at the Newman Drive crossing. The east portion of that linkage has been established as part of the Westwood Village Phase 1 development, and the wildlife crossings at the Newman Drive and Bismark Drive extensions were installed in April 2023.
- Restoration Areas and Vegetation Management

¹⁸ GRCA 'GRIN' mapping; Geospatial Ontario Source Protection Atlas

- A **Tree Management Plan**, per the Tree Management Policies and Guidelines for New Developments (City of Cambridge 2002) will be prepared to the satisfaction of the City, prior to Draft Plan approval.
- Fish Habitat
 - See discussion in Sections 7.0 and 9.5.2.

9.7.3 Conclusion

With recommended protection, mitigation and enhancement measures, including commitments to future work, the proposed development is consistent with the natural heritage policies of the Cambridge Official Plan.

9.8 Township of North Dumfries Official Plan

9.8.1 Overview of Key Policies

The Township of North Dumfries Official Plan was approved by the Region of Waterloo in 2014 and consolidated in November 2018, with only a few policies currently under appeal. Within the Official Plan, a *Natural Heritage System* consisting of *Landscape Level Systems* (LSLs), CEF's, *Fish Habitat*, *Supporting Environmental Features*, and linkages has been identified. LSLs and CEFs were designated by the Region (ROP 2015) and are also included in the Cambridge Official Plan (2018). Township policy in regard to infrastructure within and adjacent to these features generally aligns with the policies in the Cambridge Official Plan.

Key policies associated with the *Natural Heritage System* designation with respect to development and site alteration are consistent with those in the Cambridge Official Plan (2018) and include the requirement for the completion of an EIS that demonstrates no adverse ecological effects.

9.8.2 Study Assessment

As described in the Cambridge Official Plan assessment (Section 9.7), all features within the *Natural Heritage System* will be retained in full, with development setbacks, buffer enhancements and other mitigation measures.

9.8.3 Conclusion

With recommended mitigation and protection measures, including commitments to future work, the proposed development is consistent with the natural heritage policies of the Township OP.

9.9 Grand River Conservation Authority

9.9.1 Overview of Key Policies & Regulated Areas

Per Section 28 of the Conservation Authorities Act R.S.O. 1990, GRCA has the responsibility to regulate activities in hazard lands (e.g., areas in and near watercourses (and their associated valleys, if applicable), wetlands, shorelines or floodplains). Ontario Regulation 41/24: Prohibited Activities, Exemptions and Permits is a regulation issued under the Conservation Authorities Act that provides a mechanism for the GRCA to issue permits for development within areas regulated under Section 28 of the Conservation Authorities Act.

Per Section 28.1 (1) of the Conservation Authorities Act:

- An authority may issue a permit to a person to engage in an activity specified in the permit that would otherwise be prohibited by Section 28, if, in the opinion of the authority,
 - The activity is not likely to affect the control of flooding, erosion, dynamic beaches or pollution or the conservation of land;
 - The activity is not likely to create conditions or circumstances, that, in the event of a natural hazard, might jeopardize the health or safety of persons or result in the damage or destruction of property; and
 - Any other requirements that may be prescribed by the regulations are met.

Portions of the Subject Property are regulated by the GRCA under Ontario Regulation 41/24 of the Conservation Authorities Act. Per GRCA online mapping (accessed February 2026), and as confirmed through WSP fieldwork, the following Regulated Areas are present in the Study Area:

- **Regulated Watercourse and associated valleys**
 - None is present within the Subject Property
 - Cruickston Creek is present on adjacent lands to the northwest
- **Steep Slopes**
 - None is present within the Subject Property
 - Present on adjacent lands in WSU 3 and WSU 4
- **Floodplains**
 - None is present within the Subject Property
 - Present on adjacent lands in WSU 2, WSU 3, WSU 4 and WSU 8
- **Wetlands**
 - Several large wetlands are present on adjacent lands (in WSU 2, 3, 4, 6 and 8). Limits were confirmed by GRCA during the MESP and updated / confirmed as part of

the current study; surveyed limits are included on mapping herein and respected in the Draft Plan.

- One small (0.07 ha) GRCA regulated, evaluated wetland is located on the Subject Property (Vegetation Unit 18). As part of the MESP, Vegetation Unit 18 was evaluated. It was concluded that the feature did not satisfy the OWES “50% wetland vegetation” rule and should therefore be reclassified to non-wetland status and removed from the *Barrie’s Lake - Bauman Creek PSW* Complex. It was also previously concluded that Unit 18 met criteria for ‘development’ (i.e., removal) per applicable policy in force at the time of that evaluation: Policy 8.4.4 of the Policies for the Administration of the Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulation. Ontario Regulation 150/06 (GRCA 2015).
- Removal of this feature was subsequently reviewed under current GRCA policies as identified in: Grand River Conservation Authority Policies for the Administration of the Prohibited Activities, Exemptions and Permits Regulation. Ontario Regulation 41/24 (GRCA 2025). Per Policy 8.4.4, this wetland is less than 0.5 ha, it is not located within a floodplain or watercourse, and its removal will not result in adverse impacts or hazards associated with flooding, erosion or unstable soils.
- In addition, as part of the current study, an updated evaluation of wetland status was undertaken by WSP (Appendix G) and submitted to MNRF on September 15, 2020. That analysis was consistent with the MESP NES; it recommended that Vegetation Unit 18 should be declassified to non-wetland status and removed from the *Barrie’s Lake – Bauman Creek PSW*.
- As noted in an email dated January 18, 2021, MNRF agreed that this wetland should be removed from the PSW.
- Based on updated field work and analysis, Vegetation Unit 18 under current conditions, meets criteria for ‘development’ (i.e., removal) per GRCA Policy 8.4.4.

9.9.2 Conclusions

The proposed development will retain all PSW wetland (and other regulated features – slopes, watercourse) on adjacent lands - with substantial development setbacks, a large enhanced / naturalized buffer and other mitigation measures as described herein. This EIS demonstrates that there will be no negative impacts on those natural features or their ecological functions. As such, the proposed development complies with relevant GRCA policies.

10.0 IMPACTS & MITIGATION

As part of the MESP NES, an assessment was undertaken to identify potential impacts of alterations to land uses adjacent to natural heritage features (i.e., from agricultural to urban developed lands) and recommend mitigation measures. That assessment has been refined as part of the current EIS for the Consolidated Draft Plan of Subdivision, based on updated site-specific fieldwork / analyses and other supporting technical studies.

10.1 Mitigation Measures

10.1.1 Overview of Key Recommendations

To mitigate potential impacts to natural features on adjacent lands and their ecological functions, a number of key measures are recommended: retention of those features in full; implementation of development setbacks and enhanced buffer areas; establishment of a formal ecological linkage between WSU 3 and WSU 6; and a suite of additional measures as discussed below.

Pre-construction

The following measures are to be prepared, confirmed / finalized and installed prior to site alterations related to the development proposal for the Subject Property.

1. **Finalize the SWM strategy at detailed design.** The *Preliminary SWM Strategy* includes the following key elements:
 - **Use of an existing SWM Facility** to provide *Enhanced* surface water quality and quantity control for all flows up to and including the Regional storm event - conveyed by a storm sewer network in the road rights-of-way. No new SWM facilities are proposed on the Subject Property
 - **Implementation of at-source roof infiltration facilities** throughout the property
 - **Implementation of a conveyance infiltration facility**
 - **Water Balance.** Infiltration targets will be met and surface water inputs to the adjacent natural areas will be maintained post-development
2. Implement the **natural area setbacks** that form the development limit (Section 8.2.2).
3. Incorporate **building design considerations** to mitigate impacts to wildlife
 - a. **Lighting:** strategies to minimize light pollution and 'lightshed' of light (i.e., distribution and coverage) into the natural areas (i.e., through use of bird and bat-friendly lighting technologies and minimizing lighting adjacent to buffers / natural areas.

- b. **Bird friendly building design:** Integrate specific building design elements to mitigate the risk of bird collisions (e.g., window glass type / treatments, visual markers, awnings, internal and external lighting operation). The *Fatal Light Awareness Program* (FLAP) Canada provides guidelines for design.¹⁹

Specific design considerations for lighting and bird-friendly design are outlined in the Urban Design Guidelines (UDG), Westwood Village (Phase 2) Community (MHBC; March 2026), included as part of the current submission. Excerpts from the UDG are included in Appendix I.

Final details regarding lighting, bird friendly design and stewardship will be included at Detailed Design, following Draft Plan Approval. A condition to this effect is recommended as a condition of draft plan approval.

4. Develop **Salt Management Plans** for the private multiple blocks. In addition, salt application should be restricted to the extent possible. Refer to Section 6 of the Preliminary SWM Report (MTE 2026b) for additional discussion. Information regarding chlorides and the importance and sensitivity of the adjacent natural features will be included in a Stewardship Brochure provided to residents (Appendix L).
5. Prepare a **Tree Management Plan**, per the Tree Management Policies and Guidelines for New Developments (City of Cambridge 2002).
6. Implement **Best Management Practices**: to be finalized at detailed design, and included on construction drawings, as relevant:
 - a. Finalize the **Erosion & Sediment Control** (ESC) Plan; implement any required ESC measures (e.g., install fencing) prior to and throughout construction. This strategy will mitigate impacts on vegetation, wildlife (including wildlife habitat) and aquatic resources by implementing ESC fencing at grading limits (consisting of filter fabric and page wire fencing); preventing sedimentation in adjacent natural features; erosion blankets on steep slopes, where required; temporary rock check dams in swales; timely re-vegetation of exposed soils; and regular site inspection, maintenance and reporting to ensure the controls are working properly.
 - b. Prepare a **Spills Management Plan** to reduce potential for contamination of groundwater, receiving watercourses and adjacent vegetation. Implement relevant measures, as required.

¹⁹ <https://flap.org/>

- c. Follow **Guidelines for heavy equipment use** to reduce potential for damage to natural areas (mechanical damage to trees, soils compaction etc.).
 - d. Implement / follow recommended measures in the **Clean Equipment Protocol for Industry** (Holloran 2013).
 - e. Implement and follow applicable guidance and incorporate relevant information in engineering drawings / tenders as found in the following documents regarding **Jefferson Salamander and wildlife encounters** (Appendix K).
 - Jefferson Salamander Awareness Information. Westwood Village, Cambridge West (WSP; April 2020)
 - Cambridge West Lands – Jefferson Salamander (*Ambystoma jeffersonianum*) Encounter Response Plan (WSP; December 2016)
 - f. Install vegetation protection fencing / temporary wildlife fencing, coincident with the ESC fencing **prior to construction or site alteration**.
 - Note that this was installed at the grading limits in advance of preliminary site grading / filling undertaken in 2020 (May-June 2020).
7. Implement the **Biological Monitoring Program** as determined through the MESP
- a. Undertake pre-construction monitoring; prepare annual reports. Note that biological monitoring, as specified in Section 11 and consistent with the program identified in the approved MESP, was undertaken from 2019 - 2024. Annual reports have been and will continue to be submitted under separate cover.
 - b. Address recommendations, where required.
8. Prepare **Buffer Planting Plan and SWM Planting Plan**
- a. Install recommended plantings / seeding per approved plans, if required (note this could be completed during construction).
9. Implement / Install additional **Vegetation Protection Measures**, as specified in the future Tree Management Plan.
10. **Tree and Vegetation Protection** - Temporary tree and vegetation protection fencing, which can be combined with ESC fencing, is recommended to prevent damage to adjacent natural areas during construction (i.e., mechanical damage, soil compaction). This detail will be provided in the Tree Management Plan.
- Note that the ESC fencing installed in May-June 2020 also functions as vegetation protection fencing.
11. **Stewardship measures**

- a. Prepare '*Sensitive Features Limit*' **Signage**. Install signage at regular intervals along the natural heritage feature limits, as shown on Figure 6.
 - b. Prepare a **Homeowner Stewardship Brochure**. The brochure is intended to inform residents and/or property managers about adjacent natural areas and how they can be responsible stewards of these natural resources. Topics to address include: proper handling of yard waste and composting; potential impacts and control / disposal of fertilizers and herbicides / pesticides, de-icing salts, driveway and automotive cleaning residues; protection of soil and vegetation in the natural areas; explanation of the importance of saplings and native ground flora; pet implications and control; and invasive plant spread from yards. It is recommended that the brochure be provided to all landowners / property managers and made available at the sales trailer or at the Township office. The brochure should be part of the property sale documentation, to ensure that next generation purchasers are informed about environmental stewardship.
 - c. As part of the approved subdivision lands to the immediate east, a Stewardship Brochure was submitted and approved in 2021 (see Appendix M). It is recommended that the brochure to be prepared for the current application is consistent with that brochure, with refinements as required for specific elements of this application.
12. Install **Temporary Wildlife Exclusion Fencing** at the grading limit. Fencing should consider recommended design installation guidelines in the *Best Management Practices – Reptile and Amphibian Exclusion Fencing Version 1.1* (MNR; July 2013); updated 2025²⁰, including:
- a. **Design / Type**. Heavy-duty geotextile fencing installed on post and paige wire fencing, wire side facing the development area, and the geotextile side facing the Natural Heritage Conservation Zone (to prevent turtles from using the wire to climb the fence).
 - Height of 60 cm above ground
 - Buried 10 - 20 cm below ground
 - b. **Timing**. Installed outside of the turtle active season (i.e., installed between October to May)
 - c. **Inspection and Maintenance**. Regularly inspect and maintain in good condition to ensure functionality (e.g., after spring thaw and heavy rains).

²⁰ [Reptile and amphibian exclusion fencing | ontario.ca](https://www.ontario.ca/govt/reptile-and-amphibian-exclusion-fencing)



Note that this fencing was installed at the grading limits in advance of preliminary site grading / filling undertaken in 2020. The fencing serves both as ESC, temporary wildlife exclusion fencing and vegetation protection fencing.

The installed fencing meets specifications noted above and is being inspected regularly and maintained throughout ongoing construction.

During-construction

The following measures are to be implemented or continued throughout the construction period.

1. Implement / install outstanding **SWM measures**
2. Implement any outstanding ESC measures. Regularly inspect **ESC fencing**
 - a. Implement repairs to maintain fencing in good condition
3. Continue with **Biological Monitoring**; prepare annual reports
 - a. Address recommendations, as required
4. Implement / install outstanding **Buffer Planting Plan** and **SWM Planting Plan** elements (e.g., planting, seeding, wildlife habitat elements)
5. Regularly inspect **Vegetation Protection Fencing**
 - a. Implement repairs to maintain fencing in good condition
6. Regularly inspect **Temporary Wildlife Exclusion Fencing**
 - a. Implement repairs to maintain fencing in good condition
7. Implement applicable **Best Management Practices**
8. Implement applicable guidance re: **Jefferson Salamander / wildlife encounters** (Appendix K)

Post-construction

The following measures are to be implemented post-construction.

1. Remove **ESC fencing**
2. Remove **temporary Vegetation Protection Fencing**
3. Remove **temporary Wildlife Exclusion Fencing**
4. Continue with post-construction **Biological Monitoring** per approved program duration; prepare annual reports
 - a. Address recommendations, as required

5. Implement / install outstanding **Buffer Planting Plan** and **SWM Planting Plan** elements (e.g., replacement plantings)
6. Install **Permanent Fencing** (e.g., chain-link) to minimize human access and disturbance in the retained areas to the west and north. See Figure 6 for location.
 - a. Implement repairs to maintain fencing in good condition
7. Install **Permanent Wildlife Exclusion Fencing** (coincident with chain-link fence). See Figure 6 for location.
 - a. Implement repairs to maintain fencing in good condition
8. Implement applicable guidance re: **Jefferson Salamander and wildlife encounters**

10.1.2 *Ecological Enhancement Plan*

10.1.2.1 **Enhancement Strategies**

Objectives for ecological enhancement and restoration were identified in the MESP NES. These have been carried forward in the development of the Ecological Enhancement Plan for the Subject Property / current submission, as part of two key strategies:

1. Improved linkage / connectivity between natural areas, particularly habitats for critical life-cycle components (e.g., breeding ponds / overwintering areas).
 - A formal ecological corridor will be constructed between WSU 3 and WSU 6, including an eco-passage at the Newman Drive crossing (constructed in 2023). This will directly connect to the portion of the ecological corridor on lands to the east (Westwood Village Phase 1).
 - Connectivity within adjacent lands to the west / north (WSU 2 / 3 / 4) will be enhanced via enhanced buffering and restricted access.
2. Implementation of a naturalized 15 m to 50 m buffer area to achieve the following:
 - Improved core habitat buffering / protection
 - Increased core area functional size (in total, this will provide an additional 6+ha of natural habitat contiguous with the ESL / CEF)
 - Increased successional habitat area / diversity via planting and seeding
 - Enhancement of foraging habitat for herpetofauna, Lepidoptera / Odonata and avifauna
 - Turtle nesting habitat creation / enhancement
 - Waterfowl nesting habitat creation / enhancement

- Provision of wildlife passage at the Newman Drive crossing.

One additional enhancement strategy has been undertaken: **Invasive Species Control**.

- Based on field work findings, and consistent with recommendations for the adjacent developments to the east (30T-16103 and 30T-16104), control measures for European Reed, a highly invasive perennial grass species, were recommended and undertaken.
- Experts at the Invasive Phragmites Control Centre (IPCC) were engaged in 2017 for the Westwood Village Phase 1 lands to: assess the existing stands; provide input to the determination of priority control areas; develop a control program; and undertake control measures. A control program using stem cutting and herbicides was identified as the recommended approach.
- European Reed control measures and monitoring were undertaken by IPCC from 2017 to 2022, on both Westwood Village Phase 1 and Phase 2 lands. IPCC treated two areas on the Phase 2 lands annually from 2017 to 2022, both at WSU 3; one location near Vegetation Monitoring Plot V16; and one location on the west side of that wetland. Supplemental monitoring of European Reed has been undertaken by WSP during biological monitoring surveys for the Westwood Village Phase 1 and Phase 2 lands. Based on success of treatment, invasive species control measures have ceased, and no further control measures are recommended.

10.1.2.2 Design Considerations

The following design considerations are provided for the enhancement strategy elements, to be finalized at detailed design following Draft Plan approval.

Ecological Corridor

The proposed design for the corridor on the Subject Property is consistent with the design of the ecological corridor that has been constructed on the Westwood Village Phase 1 lands (see Drawings L-400, L-410, L-415 and L-100 included in Appendix J). The following objectives and design elements recommended:

- The **objective** is to restore connectivity between the currently isolated Central Wetland (WSU 6) on lands to the east to WSU 3 (west of the Subject Property), providing a long-term viable connection between critical life cycle habitats (wildlife movement between breeding, foraging and overwintering areas, plant dispersal, juvenile wildlife dispersal) and contributing to broader landscape scale function and connectivity. The primary target group is herpetofauna.
- Minimum **Width** of 30 m
- **Funnel / Exclusion Walls**. A continuous low 'funnel / exclusion wall' will be incorporated at corridor limits and extending north and south of the corridor at the interface with adjacent natural areas to the west (see Figure 6 for location and MTE Figures XS1.3 and XS1.4 in

Appendix J for details). This is intended to direct wildlife movement between natural areas and exclude wildlife from future developed areas. Exclusion wall specifications to consider:

- Continuous, with no gaps;
 - Vertical face, with top overhang / lip (if feasible) to discourage wildlife climbing and movement over fence top;
 - Average height of 0.6 m to restrict climbing and reduce potential for sediment accumulation in the adjacent corridor (range of 45 to 60 cm high, 'field fit' based on soils / grades at installation).
 - Long-term durability and low maintenance (e.g., resistant to frost heave, breakdown).
- **Wildlife Crossing Structure.** A culvert has been installed at the Newman Drive crossing location to accommodate herpetofaunal / small mammal passage, with the following design attributes (see MTE Figures XS1.3 and XS1.4 in Appendix J):
 - The (0.9 m height x 3.6 m width x 25.0 m length) dimensions are suitable for herpetofaunal / small mammal passage with an *Openness Ratio* (OR) of 0.13 (Newman Drive), meeting the target OR of 0.10 identified in the MESP. The length of the structure (wildlife travel distance) was minimized through design measures, including wing walls and retaining walls.
 - The culvert is a concrete box design to provide suitable conditions for migrating herpetofauna.
 - The crossing structure was installed in April 2023.
 - **Planting Strategy.** A conceptual planting strategy was identified as part of the MESP NES, consisting primarily of dense, low growing shrubs (particularly tolerant and/or dense and thorn-producing species), with some taller shrubs and trees in 'nodes' or 'clusters'. These general recommendations have been carried forward and expanded upon as part of the Ecological Enhancement Plan, as summarized herein. Recommended species include: Sugar Maple, Eastern White Cedar, Hackberry, Red Oak, Red-osier Dogwood, Purple-flowering Raspberry, Gray Dogwood, Nannyberry, Winterberry, American Elder and herbaceous species per "Upland Native Meadow Mix CVC 7".
- A Tree Management Plan (TMP), including Buffer Planting Plans and Corridor Planting Plans, will be prepared at detailed design; this will include additional planting details. The TMP and planting plans will be consistent with the corridor planting plans for the adjacent subdivisions, as included in Appendix J.
- **Wildlife Cover Elements.** In addition to native plantings, other 'hard' cover elements to shelter and protect smaller / more sensitive wildlife will be included (e.g., rootwads, vegetation, habitat

logs and shelter rock piles). Conceptual design elements are summarized in Table 13; to be finalized at final design, consistent with plans included in Appendix J.

- **Restricted Access.** Permanent continuous fencing along the length of the corridor will be installed as to prevent uncontrolled access / dumping, etc. See Figure 6.
- **Signage / Stewardship.** Natural areas signage is proposed along the corridor and interpretive signage at the Newman Drive crossing is recommended for consideration. The stewardship brochure will include discussion of the ecological corridor.

Buffer Areas

The MESP NES recommended two key elements for buffer enhancement: native species plantings and targeted wildlife habitat creation. These have been incorporated into the current plan as follows:

- **Native Species Plantings and/or Managed Succession.** Recommended plantings within the buffer areas are consistent with the ecological corridor, consisting of dense, low growing shrubs (particularly tolerant and/or dense and thorn-producing species), with taller shrubs and trees in ‘nodes’ or ‘clusters’.

Recommended species include: Dogwoods, Willows, Prickly-ash, Nannyberry and Elderberry. The plantings would form a mix of successional habitats (meadow, thicket) with some denser thicket / screening areas. A Detailed Vegetation Management Plan will be prepared at detailed design and will include all planting details.

- **Targeted Habitat Creation.** Consistent with MESP recommendations, four specialized habitat types are proposed for consideration with within the buffer areas:
 - Lepidoptera / Odonata Foraging and Breeding Habitat, considering:
 - Location. Ideally concentrated at south-facing or leeward sites. Conceptual locations shown on Figure 6.
 - Open areas for thermal basking and foraging (e.g., bare soil or sand, rock piles or flat rocks on the ground or piles of logs).
 - A mix of moist and dry meadow habitats – to augment breeding and foraging habitat (greater habitat diversity, increased use by prey insects).
 - Seeding and/or planting butterfly-attracting plants, both host plant species as well as potential nectar source species (e.g., Hackberry [host plant for Tawny Emperor]; Prickly-Ash [host plant for Giant Swallowtail]; *Carex* spp. [host plants for several Skipper spp.]).
 - Ongoing management to maintain early successional / open habitat and manage succession (e.g., periodic mowing and Invasive species control).
 - Turtle Nesting Habitat, considering:

- Location. South or west-facing sites adjacent to WSU 2/3, locations that have attributes consistent with the MESP (e.g., warmth and light for basking, away from roads and increased activity, and in close proximity to wetland / aquatic habitat). Conceptual locations shown on Figure 6.
- Size. Minimum size of 6 m x 10 m for each nesting area.
- Construction methods:
 - Remove vegetation layer (using backhoe or rakes) to expose soil.
 - Lay geo-textile cloth across the excavated area to minimize vegetation establishment (note: the cloth must be buried well below nesting depth [12"]).
 - Dump a well-mixed substrate composed of ~30% gravel to 70% sand atop the geo-textile cloth to a depth of at least 14".
 - Create different slopes and depths of substrate throughout the site to give turtles a variety of micro-habitat conditions to select from.
 - Create a 30% slope towards the water's edge.
- Waterfowl Nesting Habitat
 - Location. Adjacent to WSU 2 / 3, areas of waterfowl use.
 - Habitat Attributes. A mix of dense native grasses, forbs and small shrubs is recommended, along with interspersed areas of target habitats for turtles and insects and habitat cover elements. The detailed planting plan will include different types of vegetation (structural, species composition), as well as different densities / configurations, which will increase potential diversity of species using the buffers as nesting sites.
- Herpetofauna and Avifauna Habitat
 - The recommended buffer management measures for turtle nesting, Lepidoptera / Odonata habitat creation and waterfowl nesting habitat will also provide enhancements to herpetofaunal and avifaunal foraging and breeding habitat.
 - Increased floristic and vegetation community diversity and inclusion of other habitat elements (e.g., cover) in the buffers will provide increased area and habitat diversity for both herpetofauna and avifauna, supplementing the core habitat in retained wetland/ponds and woodland areas.

- **Additional recommendations regarding herpetofauna** have been identified based on the decision of the (Ministry of Environment and Climate Change (MOECC)²¹ in response to the MESP Part II Order Requests for the MESP (in a letter to the City of Cambridge dated October 2, 2015). In that letter, MOECC notes that individual environmental assessments for the EA are not required, subject to several conditions, two of which are of relevance to the current EIS:

1. In consultation with the MNRF, the City will prepare a response plan for Jefferson Salamander, in the event that it is discovered in the Plan area.

Regarding Condition #1, WSP prepared a Response Plan for Jefferson Salamander; refer to Appendix K. This plan was provided to MNRF on February 11, 2016, and finalized based on an MNRF response on February 16, 2016.

2. The City will examine additional enhancement measures for habitat suitable for Western Chorus Frog during detailed design of the Projects.

Regarding Condition #2, Western Chorus Frog (*Pseudacris triseriata*), which has been recorded breeding in wetland habitats in and adjacent to the Subject Property (i.e., WSU 2, WSU 3 and WSU 6). Consistent with recommendations for the Westwood Village Phase 1 development, *Typha* spp., *Glyceria grandis*, *Poa palustris*, and *Carex* spp., along with a mix of other herbaceous plants, will be included in the planting plans prepared at detailed design, along with the other targeted and general habitat enhancements identified for other wildlife.

10.2 Impacts

As part of the MESP NES, a preliminary assessment was undertaken to identify potential impacts associated with alterations to land uses adjacent to natural heritage features (i.e., from agricultural to urban developed lands) and to recommend mitigation measures. That assessment has been updated and refined as part of this EIS based on updated fieldwork / analyses and site-specific details of the draft Plan of Subdivision and supporting studies.

Potential impacts are discussed in two categories:

- Direct Impacts – associated with the direct removal of natural features / habitats, caused by the actual “footprint” of the undertaking (e.g., clearing and grading of subject lands, direct alteration of surface water features).

²¹ MOECC is now named “Ministry of the Environment, Conservation and Parks” (MECP)



- Indirect Impacts – associated with; 1) site alteration (e.g., alterations to surface water and groundwater quality / quantity), 2) temporary disruption of features / habitats or displacement of species with active construction activities (e.g., impact to water quantity / quality, temporary physical disturbance, erosion, etc.), and 3) post-development occupancy activities (e.g., occupancy activities such as dumping of waste material, creation of indiscriminate trails).

A summary of the analysis of potential impacts, recommended mitigation measures and the overall residual effect after mitigation has been applied is provided in Table 7. An overview of key recommended mitigation measures and strategies is provided in Section 10.1. The Consolidated Draft Plans of Subdivision layout is shown in relation to existing natural features on Figure 6, with the full plan (MHBC March 26, 2026) also included in Appendix H.

As noted, the Subject Property was formerly under active agricultural use for many years; as of 2020, the lands have undergone preliminary grading. In accordance with Permit No. 690/19. Natural heritage limits were delineated and setbacks were identified in the MESP and confirmed herein. The proposed Draft Plan was developed in respect of these limits. As such, development will be restricted to the lands that have been area-graded.



Table 11. Potential Natural Heritage Impacts and Proposed Mitigation Measures

FEATURE SIGNIFICANCE & SENSITIVITY	NATURAL ENVIRONMENT IMPACTS	RECOMMENDED MITIGATION MEASURES	RESIDUAL EFFECTS
Aquatic Resources			
Subject Property - No watercourses or waterbodies present within the proposed development envelope. Study Area / Adjacent Lands - Barrie's Lake (WSU 8) provides direct fish habitat (based on secondary source information). - Other adjacent wetland features (i.e., open water wetland habitat within WSU 2, WSU 3 and WSU 6, as well as drainage features within WSU 4) may provide fish habitat, though no fish have been observed in any of these areas across the many years of survey. Additionally, note that the presence of Ambystomid salamanders in the wetlands suggests that fish are less likely to be present in these areas.	Direct Impacts - None. Indirect Impacts There is potential for indirect impacts to wetlands that may support fish populations as a result of construction, changes in adjacent land use, changes to hydrology and hydrogeology and occupancy-related impacts. Water quality. Potential impacts to receiving areas as the result of SWM discharge. Construction-related Impacts (short-term). These include: erosion and sedimentation; spills of contaminants/fuels; removal of riparian vegetation; short term impacts related to dewatering. Hydrogeology and Hydrology. Wetlands could potentially be impacted by changes to groundwater and surface water inputs as a result of changes to adjacent land use. Occupancy-related Impacts. These may include: refuse dumping; effects of salt spray from road maintenance or water quality effects related to residential uses (i.e., chlorides, pesticides).	Indirect Impacts to be mitigated as follows: Water Quality - The SWM strategy will provide Enhanced treatment, reducing potential for development-related impacts, an improvement over the current / historic untreated condition associated with active agriculture (fertilizer, herbicide / pesticides). - No SWM facilities will outlet to confirmed fish habitat (Barrie's Lake) or potential fish habitat. - Minimizing direct SWM outletting to aquatic features. No new SWM facilities are proposed. SWMF2 on adjacent lands will treat flows from the Subject Property, minimizing potential for impact to sensitive natural areas to the west and north (including Ambystomid salamander breeding habitat). Water Balance. Surface and groundwater inputs to adjacent natural areas will be maintained post-development per analysis in the Preliminary SWM Report (MTE 2026b), Hydrogeological Assessment (MTE 2021) and its associated addendum (MTE 2026c). Erosion & Sediment Control (ESC) Plan. Guidance is provided in the Preliminary SWM Report (MTE 2026b); to be finalized at detailed design. Considerations: - ESC fencing will be installed prior to site grading to prevent entry of sediment into retained natural areas (note: installed in 2020). - Any temporarily stockpiled soil, debris or other excess materials, and any construction-related materials, will be properly contained (e.g., with ESC fencing) in areas separated at least 30 m from retained natural areas. - All construction materials, excess materials and debris will be removed and appropriately disposed of following construction. Spills Prevention and Emergency Response Plan. All construction-related activities will be controlled to prevent entry of any petroleum products, debris or other potential contaminants/deleterious substances to retained natural areas in accordance with a Spills Prevention and Emergency Response Plan. The Plan, as well as appropriate emergency response materials, will be kept on site throughout construction and all employees made aware of its requirements and response protocols. Dewatering Management. A dewatering assessment at final design will include measures to ensure discharge to retained natural areas from dewatering will not impact receiving water quality via: water quality targets and use of treatment methods such as filtering; dissipation of discharge to prevent erosion and scouring; a mitigation plan for potential draw down of water levels from adjacent dewatering activities; and a monitoring plan to assess impacts and effectiveness of mitigation plan. Details to be determined through application of a PTTW. Buffer Management. The proposed buffer between the development limit and the retained natural areas will be managed to provide a more protective edge to the adjacent natural areas and reduce potential for occupancy-related impacts such as uncontrolled access to the retained natural areas and rear lot spread.	No residual negative effects of the proposed development to aquatic resources are anticipated, with proper implementation of the recommended mitigation measures. - No SWM discharge to fish habitat. - No SWM discharge to watercourses. - No new SWM facilities or discharge to adjacent sensitive natural areas to the north and west. - Residual long-term effects to hydrogeology and surface water quality in adjacent aquatic resources bodies are not anticipated, considering that groundwater and surface water inputs will be maintained. - The enhanced / larger buffer will provide improved nutrient filtering. Long-term impacts to groundwater quality are not anticipated, with the implementation of proposed infiltration strategies. Residual impacts from construction are not anticipated, with implementation of recommended ESC and spills management plan.



FEATURE SIGNIFICANCE & SENSITIVITY	NATURAL ENVIRONMENT IMPACTS	RECOMMENDED MITIGATION MEASURES	RESIDUAL EFFECTS
<u>Vegetation and Flora</u>			
Subject Property • Vegetation. None. Formerly active agricultural use (row crops) with one small anthropogenic wetland (VU18). • Designated Areas. None present. • Species at Risk: None present. • Species of Conservation Concern: None present. • Flora significance and sensitivity: Low. Study Area / Adjacent Lands • Vegetation. Wetlands (Veg. Units 1b, 4, 5, 10a, 11a, 11b, 12 and 18), deciduous forest (Veg. Units 1a, 2 and 3) and upland cultural habitats (Veg. Units 1a and 10b; inclusions). • Designated Areas. Wetlands to the east, west, and south are included within the <i>Barrie's Lake - Bauman Creek</i> PSW. Several of these wetlands plus the woodland to the north have several overlapping provincial and municipal designations (CEF, ESPA, and ESL). • Species at Risk and Species of Conservation Concern: 31 SCC recorded, including SAR and Regionally significant species. See Section 5.2 for details • Flora significance and sensitivity: High. Diverse mix of treed and non-treed habitats; PSW wetland and upland vegetation.	Direct Impacts • Minimal. Removal of a very small area of anthropogenic vegetation in Vegetation Unit 18 (0.07 ha). 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. • Surface Water quality impacts to wetlands (long-term). Potential for increased sedimentation / erosion, contamination and salt loading. • Hydrology. Potential changes to the hydrological regime in the wetlands resulting from increases in impervious surfaces and reduction of run-off inputs to the wetlands. • Hydrogeology. Potential impacts to the groundwater regime (decreased recharge / infiltration) and subsequent impacts to the wetlands. Potential for contamination of groundwater. • Construction-related Impacts (short-term). These include: damage to vegetation outside the work zone; sedimentation; spills of contaminants/fuels; soil compaction; short term impacts related to dewatering. • Occupancy-related Impacts. These may include: woodland and wetland edge effects (e.g., invasive species proliferation); unofficial trail creation; vandalism; refuse / vegetation dumping; effects of salt from road maintenance or water quality effects related to residential uses (i.e., chlorides, pesticides). • Trails. Though no trails are proposed within or adjacent to the natural areas, impacts to nearby natural areas may result from informal trail creation. Mitigated via fencing, buffer plantings and stewardship.	Direct Impacts to be mitigated by: • Avoiding sensitive natural areas. • Installing temporary Vegetation Protection Fencing prior to site grading to delineate the work zone and prevent direct damage to adjacent retained vegetation (i.e., mechanical damage, root damage, soil compaction). • Maintain ESC fencing in working condition throughout construction. Note that ESC fencing was installed in May-June 2020 (see Figure 6) and also functions as Vegetation Protection Fencing. Indirect Impacts to be mitigated by: • Surface Water quality (long-term). Mitigated by implementing: SWM measures (per final SWM report); development setbacks and fencing / restricted access (to reduce potential for direct impact / contamination); stewardship measures; and BMPs during construction (ESC plan, Spills Management Plan, Clean Equipment Protocol etc.). The buffer between the wetland / woodland and future homes will provide a net improvement over the historic condition (i.e., active agriculture, with pesticide / herbicide applications). Potential for chloride impacts to wetlands mitigated through: the SWM strategy (no new SWM facilities, winter by-pass for SWMF); improved buffering; stewardship measures; and future preparation Salt Management Plans, where required. • Surface Water Inputs (long-term): Surface water inputs to adjacent wetlands (Wetlands 2, 3, 4, 5, 6, VP1, VP7) from the Subject Property will be maintained in the post-development condition via direct runoff from rear yards / buffer area and a third-pipe system collecting clean roof runoff. • Groundwater quality (long-term). Addressed by the same measures for surface water quality protection (i.e., E&S Plan, SWM strategy, chloride management, BMPs and stewardship). • Groundwater inputs. Groundwater inputs will be maintained across the Subject Property post-development (MTE 2026b). • Permanent Fencing. To be installed along the natural area / development interface to reduce intrusion, uncontrolled dumping and rear lot 'spreading'. • Buffer Management. The buffer adjacent to retained wetlands / woodlands will be enhanced to provide a more protective edge, greater diversity and reduced potential for uncontrolled access and lot spread. • Erosion & Sediment Control (ESC) Plan. To prevent sedimentation of off-site retained natural areas. ESC fencing was installed prior to site grading (June 2020). • Stewardship. An integrated stewardship approach is recommended, including: signage at the natural feature limits; and a homeowner brochure. • Invasive Species Management: European Reed control program initiated in 2017, completed in 2022 based on success of treatment. • Monitoring. Potential long-term impacts to retained natural areas will be assessed through the annual biological monitoring program per Section 11.0 of this report.	Residual impacts to vegetation are not anticipated, with proper implementation of recommended mitigation and protection measures. • All NHS natural areas will be retained in full and protected with development setbacks – which will provide dripline and root zone protection (well beyond the current state). These setbacks, coupled with buffer zone management measures, will help to maintain or improve edge integrity by establishing a thicker, more diverse edge zone. • Exotic and invasive species are prevalent at the edges of the forest, and present but typically not abundant in the forest. Given development in the broader landscape, some increase in exotic species is likely. The intent is to reduce this to the extent possible. Future potential management to be informed by monitoring. • Permanent fencing and stewardship measures will help to reduce secondary effects on forest / wetland integrity following development and occupancy. • Residual long-term effects to hydrogeology and surface water quality in the PSW are not anticipated based on maintenance of groundwater and surface water inputs and improved runoff treatment via buffering and SWM strategy. • Long-term impacts to groundwater quality are not anticipated with implementation of proposed infiltration strategies and potential future work (e.g., Salt Management Plans). • Residual impacts from construction are not anticipated with implementation of vegetation protection fencing, ESC fencing, and other BMPs.



FEATURE SIGNIFICANCE & SENSITIVITY	NATURAL ENVIRONMENT IMPACTS	RECOMMENDED MITIGATION MEASURES	RESIDUAL EFFECTS
Wildlife			
Subject Property Habitat. Pre-graded as of 2020. Formerly, the Subject Property was under active agricultural use (row crops). Provides limited foraging opportunity for wildlife species. Species at Risk and Species of Conservation Concern: None that is restricted to or dependent on the Subject Property. Significance and sensitivity: Very low. Formerly common, tolerant anthropogenic or culturally influenced habitats. No specialized or significant wildlife habitat. Study Area / Adjacent Lands Habitat. Mosaic of forest, swamp, marsh and cultural habitats. Species at Risk and of Conservation Concern: Several SAR and SCC were recorded in the adjacent natural features. Significance and sensitivity: High. Good habitat diversity, sensitive and specialized habitat types (e.g., riparian / aquatic, wetlands for amphibian breeding).	Potential impacts on wildlife habitat are similar vegetation (i.e., direct / indirect impacts to habitat – removals, fragmentation, occupancy related effects etc.). Some additional occupancy-related effects are specific to wildlife. Direct Impacts - Potential for impacts to wildlife during and post-construction Loss of wildlife habitat is restricted to one small anthropogenic feature (VU18). No direct impact to habitat in the NHS. Crop fields, formerly present on the property, are widespread / abundant in the local landscape. Movement opportunities. None across the Subject Property; former agricultural fields may have provided some potential for movement, but there were no defined movement areas and the lack of natural vegetation cover would have been a barrier for more sensitive species. Opportunities to restore and enhance movement have been identified herein. Indirect Impacts There is potential for indirect impacts to wildlife habitats on adjacent lands as a result of construction, changes to hydrology and occupancy related activities. Construction-related impacts. These are generally limited to temporary disturbances during construction. Potential for sedimentation and contamination are addressed by ESC controls, SWM measures and BMPs. Surface Water quality impacts (long-term). Potential for increased sedimentation / erosion, contamination and salt loading, particularly for sensitive habitats (e.g., amphibian breeding ponds). Hydrology. Potential changes to the hydrological regime in the wetlands resulting from increases in impervious surfaces and reduction of run-off inputs to the wetlands. Hydrogeology. Potential impacts to the groundwater regime (decreased recharge / infiltration) and subsequent impacts to the wetlands. Potential for contamination of groundwater. Occupancy-related impacts. e.g., pet predation; woodland edge effects; and other degradation of wildlife habitat. Potential for light impacts which may negatively impact nocturnal wildlife.	Direct Impacts - Potential for impacts to wildlife during and post-construction mitigated by: temporary and permanent wildlife exclusion measures; establishment of the ecological corridor; following awareness and encounter protocols; and stewardship measures. Indirect Impacts to be mitigated by: Retention and protection of vegetation resources in adjacent natural areas (as discussed above) will also protect wildlife habitat. Specific mitigation measures are as follows: Linkages / movement opportunities. Local wildlife movement opportunities will be enhanced through the creation of the formal wildlife linkage / corridor between WSU 3 and WSU 6 and improvements to movement opportunities between WSU 2 / 3 / 4 via buffer enhancements. Habitat for wildlife SAR and SCC. Habitat for woodland species (including potential SAR bat habitat) to be retained in full, with setbacks and buffer enhancements. Additional measures are proposed to protect wildlife habitat, including: ESC measures; maintenance of hydrological inputs; fencing / restricted access; and stewardship initiatives (e.g., signage, homeowner brochures). ESC Controls / SWM Strategy: designed to reduce the potential for sedimentation or contamination of adjacent areas and maintain inputs to receiving areas, with additional chloride mitigation as discussed above. Surface water and groundwater inputs to receiving areas, including sensitive wildlife habitat, will be maintained post-construction (MTE 2026b). Occupancy-related impacts to wildlife / habitat will be mitigated by: permanent fencing at lot / block limits to restrict access and prevent rear lot ‘spreading’; wildlife exclusion fencing at the development / natural area interface; and stewardship initiatives (signage, homeowner brochure). The intent is to direct wildlife movement to the wildlife corridor / out of the developed area, restrict occupant access to sensitive areas and inform local residents about the sensitivity of adjacent natural areas. - Incorporate building design / operation considerations to mitigate impacts to wildlife: - Lighting: strategies to minimize light pollution and ‘lightshed’ (i.e., distribution and coverage) into the natural areas (i.e., through use of bird and bat-friendly lighting tech and minimizing lighting adjacent to buffers / natural areas. - Bird friendly building design: Integrate specific building design elements to mitigate the risk of bird collisions (e.g., window glass type / treatments, visual markers, awnings, internal and external lighting operation). The Fatal Light Awareness Program (FLAP) Canada provides guidelines for design. See Section 10.1.1 and Appendix I. Surface Water quality of wetland habitats (long term). Mitigated by: development setbacks and fencing / restricted access (to reduce potential for direct impact / contamination); enhanced buffer; stewardship; and SWM strategy. Monitoring. Potential impacts to wildlife / wildlife habitats will be assessed through the annual biological monitoring program discussed in Section 11.0 of this report.	Residual impacts to wildlife and wildlife habitat resulting from development on the Subject Property are not anticipated, considering the existing condition (pre-graded; returned to interim agriculture) and former condition (active croplands), which provide habitat primarily for common, tolerant wildlife species. All NHS natural areas will be retained in full and protected with development setbacks. Potential impacts will be further mitigated by improved natural area buffering and enhancements. Additional measures are proposed to reduce potential for indirect impacts to offsite wildlife habitat (i.e., ESC, SWM treatment of contaminants, maintenance of hydrological inputs to dependent features, buffering of sensitive areas). Stewardship measures are proposed to raise awareness of the sensitivity of adjacent natural areas and further reduce potential for indirect (occupancy-related) impacts. It is acknowledged that in any populated area there is potential for unauthorized intrusion and damage to natural areas, and less tangible but inferred effects of occupancy on breeding bird activity. Population changes in breeding birds are inevitably related to the approved transformation of the broader landscape in the Region. Changes can also be affected by factors outside the Region, such as alteration / loss of wintering habitat, severe climatic conditions during migration activity, and changes in migratory stopover habitat. Hence, it must be recognized that shifts in wildlife species composition may be inevitable in this area over time, and in fact have probably already occurred with changes in the regional landscape.

11.0 BIOLOGICAL MONITORING

11.1 Overview of Monitoring

A multi-faceted monitoring program was developed as part of the MESP study, including hydrological, groundwater, and biological components. In addition to biological monitoring, surface water and groundwater monitoring was undertaken by MTE Consultants as part of the MESP, including: climate monitoring (weather station); stream temperature monitoring; water quality (wetland and stream) sampling; wetland water level monitoring; baseflow rate sampling; continuous streamflow rate monitoring; and ambient air temperature monitoring. Proposed monitoring by MTE is discussed in Section 7 of the Preliminary SWM Report (MTE 2026b). It includes the following elements: Surface Water Quality; Groundwater Quality; Groundwater Level; Wetland Level; ESC; and SWM Facility operation. Locations are shown on Figure 7.2 of the Preliminary SWM Report (MTE 2026b). Biological and hydrogeological data and analyses will be undertaken and considered in an integrated manner, with relevant information included in reports.

This section outlines the recommended biological monitoring program for the proposed development on the Subject Property. The detailed monitoring program identified in the approved MESP was used as the basis for the recommended monitoring program for the current proposal, with refinements to specific field survey locations. Note that this is also consistent with monitoring being undertaken as part of the ongoing Westwood Village Phase 1 development to the east.

Monitoring is recommended in three stages, as follows:

1. Pre-construction: for two years prior to any site grading or construction (initiated in 2014 for some sites and 2019 for others – described below).
2. During-construction: throughout the duration of construction to 90% of building permits having been issued.
3. Post-construction: to take place for two years following the substantial completion of the development (90% of building permits having been issued).

Refer to Figure 2 for biological monitoring locations. Note that monitoring surveys have been completed in each year from 2019 - 2024 and are discussed in reports submitted under separate cover.

Surface and groundwater monitoring has been undertaken by MTE, as discussed in reports listed in Section 4.4.



11.2 Biological Monitoring Components

Recommended biological monitoring components, including timing and methodology, are detailed in Table 8. Monitoring locations related to development of the Subject Property are shown in Figure 2. Note that some monitoring locations are 'shared' with adjacent lands (e.g., monitoring within WSU 6).

Table 12. Recommended Biological Monitoring Components

TYPE OF MONITORING	DEVELOPMENT PHASE	LOCATION(S)	METHODOLOGY / TIMING
Vegetation – Transect - Plot Monitoring	All	- Eleven permanent plots, V3 to V10 and V16 to V20, have been set up to address the vegetation community diversity within the Study Area (i.e., wetland and upland habitats, all major ELC types). Locations are shown in Figure 2. - In 2014 and 2015, permanent plots V3 to V8 were monitored by WSP. In 2019, plots V9, V10 and V16 to V20 were established and monitored each year from 2020 - 2024.	Twice annual monitoring (June and September). Each plot consists of two stakes spaced 10 m apart; one stake is the photo reference point, the other is the endpoint of the 10 m transect. Four 0.5 m square quadrats are established along the plot line (at 1 m, 3 m, 5 m and 8 m). Each quadrat consists of nine sub-plots. Each quadrat is inventoried for plant species (presence / absence, frequency of occurrence) and additional measurements and observations are made, including the dominant vegetation between the photo and reference points; the depth and location of any standing water between the photo and reference points; and general notes on community health and site disturbance. Inventoried plant species are characterized by their <i>Coefficient of Conservatism</i> (CC) and <i>Coefficient of Wetness</i> (CW), with mean CC and CW values calculated and compared over time.
Vegetation – General Habitat Inspection	All	Areas in the general vicinity of the permanent vegetation plots (Figure 2) and a general once-over to look for new infestations of invasive non-indigenous species which may be facilitated by disturbance related to the development of new subdivisions	General habitat inspection, recording general biophysical conditions, noting site changes (e.g., trails, rubbish, dumping, establishment / proliferation of invasive non-indigenous species, vandalism etc.) and taking photographs. General inspection of Invasive European Reed abundance in areas of proposed control.
Avifauna – Breeding Bird Surveys	All	- WSU 2, WSU3, WSU 4, WSU 6, and WSU 8 (west end) - Five areas (WSU 1, WSU 2, WSU3, WSU 6 and WSU 8 (east end)) were monitored in 2014, 2015 and from 2019 - 2024.	Two rounds of spring surveys (late May through July). Areas are thoroughly covered by walking random transects (or surveying from pond edges) recording presence, abundance and level of breeding evidence (using Ontario Breeding Bird Atlas [OBBA] protocols
Avifauna – Migrant Waterfowl Supplemental Surveys	All	- WSU 2, WSU 3, WSU 6 and WSU 8 (west end) - WSU 2, WSU3, WSU 6 and WSU 8 (east end) were monitored in 2014, 2015 and from 2019 - 2024.	In conjunction with other spring surveys (i.e., amphibian breeding, turtle basking, wildlife passage monitoring). Pond / wetland areas are incidentally surveyed during other surveys, recording species, presence and abundance
Avifauna – Marsh Bird Surveys	All	- WSU 2, WSU 3, WSU 6 and WSU 8 (west end) - WSU 2, WSU 3, WSU 6 and WSU 8 (east end) were monitored in 2014, 2015 and from 2019 - 2024.	At least two early morning or evening surveys from mid-May to early July (with at least 10 days between surveys), conducted at consistent point count stations. Following the Marsh Monitoring Program (MMP) (Bird Studies Canada) survey methodology. The MMP methodology has the following key elements: at least two surveys; early am timing (30 minutes before sunrise to 10 am) or evening (four hours before sunset to onset of darkness); stationary counts at stations at least 250 m apart; conducted when weather conditions are warm and dry with little wind; 15-minute call response broadcasts at each station, with 5 minutes of passive listening, 5 minutes of call broadcasts and 5 minutes of passive listening; recording numbers, species and location of marsh birds and habitat characteristics; use standardized field data sheets
Avifauna – Least Bittern Surveys	All	- WSU 2, WSU 3, WSU 6, and WSU 8 (west end) - WSU 2, WSU 3, WSU 6 and WSU 8 (east end) were monitored in 2014, 2015 and from 2019 - 2024.	At least three early morning surveys from early May to mid-July (with at least 10 days between surveys), conducted at consistent point count stations. Following the National Least Bittern Survey Protocol (Environment Canada 2011) or other suitable survey methodology. The Environment Canada methodology has the following key elements: at least 3 surveys; early am timing (30 minutes before sunrise to 10 am); stationary counts at stations at least 250 m apart; not conducted under adverse weather conditions (e.g., rain, fog, extreme heat or winds exceeding 19 km/h); 13-minute call response broadcasts at each station, with 5 minutes of passive listening, 5 minutes of call broadcasts and 3 minutes of passive listening; recording numbers, call type and distance of recorded Least Bitterns; recording other marsh birds and habitat characteristics; use standardized field datasheets.
Herpetofauna – Spring Amphibian Breeding Surveys	All	- Six monitoring stations in WSU 3, WSU 4, WSU 6, and WSU 8 - All areas were monitored in 2014, 2015 and from 2019 - 2024.	Three rounds of spring survey (April to June). Spring amphibian breeding activity is assessed using the Marsh Monitoring Program (MMP) amphibian calling survey protocol (Bird Studies Canada 2008, revised 2009). Three rounds of the survey are undertaken during the spring and early summer, generally at least 10 days apart, with the suitability of timing confirmed by referencing other local sites with known amphibian populations and/or liaison with other researchers. Following guidelines of the MMP, nighttime air temperatures are ideally greater than 5°C for the first survey, 10°C for the second survey, and 17°C for the third survey. Each calling station is surveyed for three minutes, between one-half hour after sunset and midnight. Using the MMP, amphibian calling activity is rated using three levels: Level 1 (individual calls can be counted with no overlap), Level 2 (some calls can be counted or estimated, some overlap) or Level 3 (calls continuous and overlapping, individuals not distinguishable).



TYPE OF MONITORING	DEVELOPMENT PHASE	LOCATION(S)	METHODOLOGY / TIMING
Herpetofauna – Turtle Basking Surveys	All	- WSU 3, WSU 6, and WSU 8 (west end) - WSU 2, WSU 3, WSU 6, and WSU 8 (east end) were monitored in 2014, 2015 and from 2019 - 2024.	Five spring surveys (mid-April to mid-June) – when turtle species recorded during the current study or potentially present in the area are actively basking and moving. This survey period also partially overlaps with the nesting season for expected turtle species. Ponds / wetlands (WSU 3, 6, and 8) and adjacent areas including roads are carefully scanned with binoculars or spotting scopes for evidence of turtle basking, movement or nesting. Surveyors record absence or presence, species and incidental observations of other wildlife. Surveys start early to late morning and end early to late afternoon, with start times dependent on previous overnight temperatures and projected temperatures for the day of the survey (e.g., if overnight temperatures are cooler than normal, surveys should start later in the morning to allow for daytime temperatures to increase, to improve chances of observing basking turtles). Surveys are generally be conducted on warm, sunny or partly sunny days with air temperatures between 10°C and 25°C. Observations include photographs, GPS coordinates for notable findings (e.g., turtle nesting evidence, road mortalities / crossings), the direction of movement and description of basking features. Survey time, air temperature, sky code and wind scale are recorded for each survey. For turtle observations, GPS location, the direction of movement and description of basking features being used are noted, as relevant.
Buffer Integrity and Functioning	Post Construction	Permanent plots to be established within future buffer areas adjacent to WSU 3 and WSU 4. None has been established or monitored to date.	Twice annual monitoring in conjunction with vegetation plot monitoring in core areas (June and September). Transect-plot monitoring as described above.
Wildlife Passage Monitoring	During / Post Construction	- One ecological linkage area between WSU 3 and WSU 6. - Other linkages are present on adjacent lands; with monitoring occurring at all locations in 2024 as part of the Westwood Village Phase 1 biological monitoring program.	Primarily targeting herpetofauna but other wildlife will be addressed with the recommended components. Effectiveness monitoring of mitigation and enhancement measures: (i.e., ensuring funnel / exclusion walls, wildlife passage measures, plantings / cover elements etc. are installed, in good health / condition and functioning as intended). Once annually in early spring (before March 15); supplemented by additional checks during other monitoring events. - Exclusion areas / corridor monitoring (WSU 6 area only): 5 suitable nights in March-April for spring amphibian movement (i.e., high relative humidity, fog, or light rain and anticipated overnight temperatures above 0°C). - On suitable nights between 0.5 hr after sunset and 12 am complete multiple passes along the corridor (i.e., minimum of 2 passes or 1.5 hr search effort) slowly walking both sides of the exclusion fence conducting visual sweeps using flashlights and/or headlamps. Vegetation and potential cover objects along the exclusion measures are searched for amphibians and other wildlife. Record pertinent survey details such as date; start and end time; staff; weather conditions; general site conditions (e.g., vegetation cover - density, type, etc.; adjacent activities / land use). For wildlife observations, record: species and number of individuals observed; the direction of travel (inferred or as observed); location; representative photographs; evidence of movement (e.g., scat, tracks, etc.) without direct observation. - Photo monitoring of crossing structures: - Continuous monitoring from April to July. - Photo monitoring of crossing structures at Newman Drive and Bismark Drive extensions, and other areas, where possible (i.e., Blenheim Road at the east end of Barrie's Lake and Devil's Creek). Timed shutter-release or movement-triggered camera systems are to be installed in the two (potentially four) crossing structures shown in Figure 2, using best available technology. Given that the primary target wildlife group is herpetofauna, it is recommended that cameras are installed prior to mid-March, then activated and checked / downloaded regularly through mid-July – this captures the core spring and summer movement period for amphibians and turtles. - Post-construction monitoring should be undertaken to assess the condition of infrastructure / plantings and quantify wildlife use (i.e., monitoring to assess corridor, funnel wall effectiveness and use of wildlife structures).

12.0 CONCLUSIONS & RECOMMENDATIONS

12.1 Conclusions

With the proper implementation of the recommended protection, mitigation and enhancement measures identified herein, residual impacts to retained natural heritage features are anticipated to be minor or negligible, and the ecological and hydrogeological functions of those features will persist. This is based on the following considerations:

The broader environmental context has been considered in the following manner:

- The Draft Plan is consistent with and builds on all recommendations in the MESP NES. Further, the plan was prepared with input from WSP ecologists and has had appropriate regard for environmental features. The Draft Plan accurately delineates the surveyed limits of natural features and the subdivision limits are based on recommended setbacks, with the intervening buffer area proposed to be zoned for open space purposes.
- The natural environment review and site investigations have fulfilled the role of addressing ecosystem features / functions and identifying opportunities, constraints, mitigation and enhancement strategies.
- Guidance documents such as the Township Official Plan and Cambridge Official Plan recognize and anticipate that changes in the landscape matrix will occur. Most notably, this area is undergoing a shift in land use from agricultural to urban residential.
- The present work implements the Township and City objectives, providing a detailed review and recommendations for the Subject Property and adjacent lands. This is consistent with the consideration of ecosystem function.

The areas to be retained (i.e., the NHS components) and recommended setbacks mitigate potential direct and indirect impacts to the features and functions, including the CEF (PSW or Significant Woodland), aquatic habitat and habitat for *Species of Conservation Concern*, including SAR.

- These NHS features will be retained in full and protected with setbacks, buffer enhancement, fencing, wildlife exclusion measures, signage, and stewardship measures.
- The form and function of NHS natural areas will be maintained with implementation of the identified SWM strategy which includes Enhanced surface water quality control, quantity control and post-development maintenance of surface and groundwater inputs.
- Other recommended measures will enhance the ecological linkage, buffers and create specialized habitat. Native species plantings, with wildlife habitat structures / target habitat is



proposed in the buffer and corridor. These will add habitat diversity, increase the size of the natural features, increase the effectiveness of the buffer, and provide an overall net benefit.

Note that the conclusions and recommendations of the MESP NES have been confirmed and re-iterated as discussed herein. Updated fieldwork and analyses have been refined to address specifics of the development proposal for the Subject Property. No substantive changes to existing conditions, as reported in the MESP NES, were identified through 2014 - 2015 and 2019 – 2024 fieldwork.

12.2 Recommendations

To ensure that environmental protection and mitigation measures are properly managed during and after site development, the following recommendations / actions are identified (to be confirmed through conditions of Draft Plan approval):

- Incorporate recommendations for conditions of draft plan approval as noted herein.
- Implement all recommended protection, mitigation and enhancement measures.
- Implement Best Management Practices during construction and carry out works in consideration of recommended timing.
- Continue the biological monitoring and surface / groundwater monitoring programs to monitor the health of retained natural areas as development and occupancy proceeds.
- Identify Tree management / protection measures through a Detailed Vegetation Management Plan (DVMP) or Tree Management Plan (TMP).

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FIGURES

Figure 1. Designated Natural Features

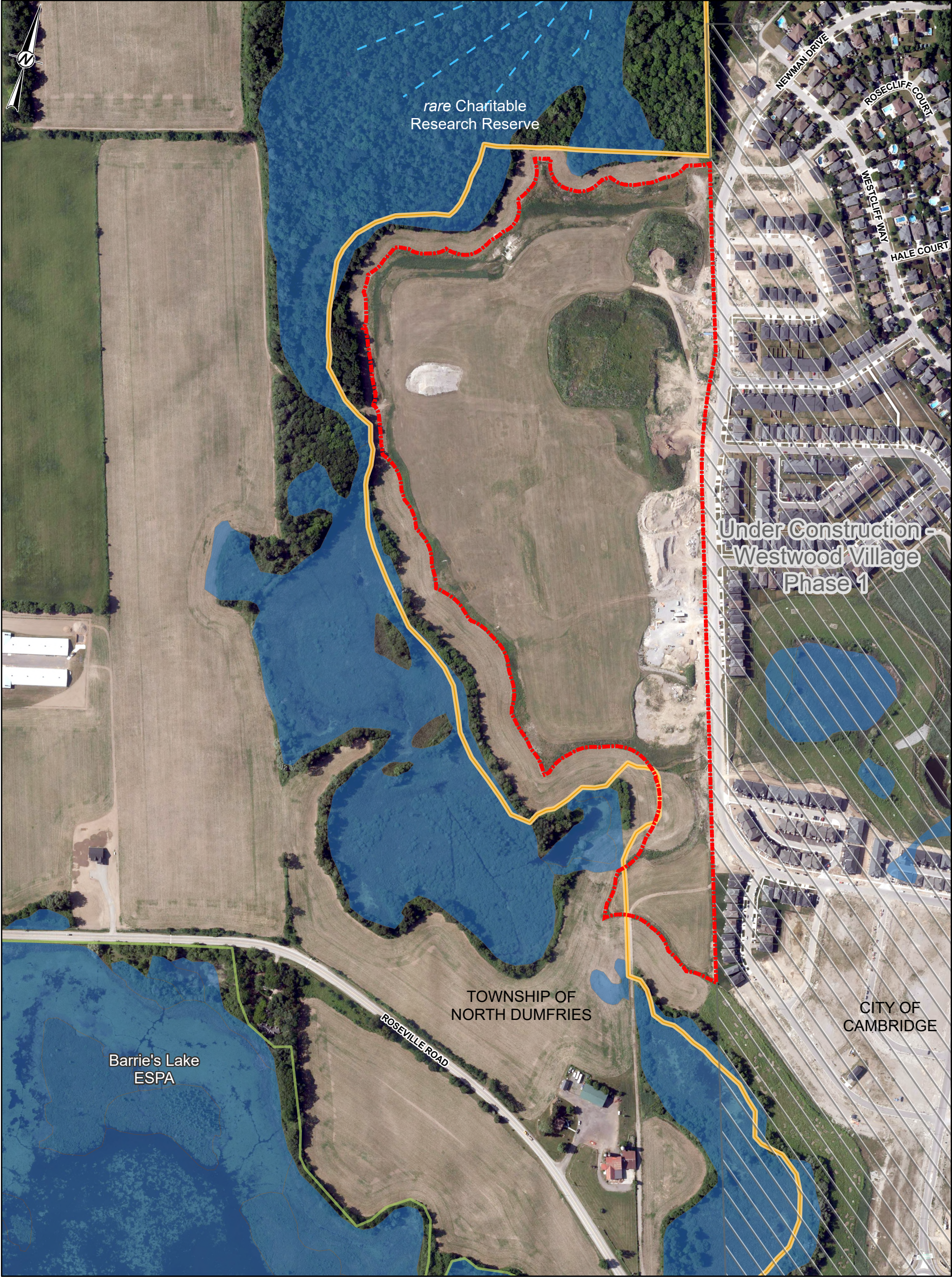
Figure 2. Biological Monitoring Locations

Figure 3. Vegetation Communities

Figure 4. Wildlife Survey Locations

Figure 5. Environmental Feature Limits & Setbacks

Figure 6. Draft Plan & Environmental Management Recommendations



- LEGEND**
- SUBJECT PROPERTY
 - SEEPAGE
 - CITY LANDS
 - ESPA BOUNDARY (RMOW)
 - BARRIES LAKE BAUMAN CREEK WETLAND COMPLEX
 - BLAIR-BECHTEL-CRUICKSTON ENVIRONMENTALLY SIGNIFICANT LANDSCAPE

NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)
1. CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE - ONTARIO
2. BASE MAP: FIRST BASE SOLUTIONS
3. COORDINATE SYSTEM: NAD 1983 UTM ZONE 17N



CLIENT
HALLMAN CONSTRUCTION LIMITED &
GATESTONE DEVELOPMENT CORPORATION

PROJECT
WESTWOOD VILLAGE, CAMBRIDGE
PHASE 2 - SCOPED EIS

TITLE
DESIGNATED NATURAL FEATURES

CONSULTANT	YYYY-MM-DD	2026-03-31
	DESIGNED	----
	PREPARED	LT
	REVIEWED	----
	APPROVED	----

PROJECT NO. CA0066625	CONTROL 0001	REV. A	FIGURE 1
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LEGEND

SUBJECT PROPERTY

SEEPAGE

VERNAL POND

CITY LANDS

PRE/DURING/POST-CONSTRUCTION MONITORING

VEGETATION

VEGETATION MONITORING PLOT

WILDLIFE

SPRING AMPHIBIAN SURVEY STATIONS

TURTLE BASKING SURVEY LOCATIONS

MARSH BIRD AND LEAST BITTERN MONITORING

BREEDING BIRD SURVEYS

MIGRANT WATERFOWL

WILDLIFE CORRIDOR

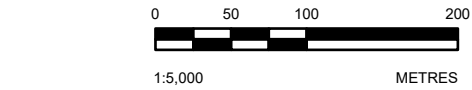
WILDLIFE SURVEY UNIT (WSU)

DURING/POST-CONSTRUCTION MONITORING

WILDLIFE CROSSING / STRUCTURE MONITORING *

WILDLIFE PASSAGE MONITORING

* Completed as part of another study



NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)
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2. BASE MAP: FIRST BASE SOLUTIONS
3. COORDINATE SYSTEM: NAD 1983 UTM ZONE 17N

CLIENT
HALLMAN CONSTRUCTION LIMITED &
GATESTONE DEVELOPMENT CORPORATION

PROJECT
WESTWOOD VILLAGE, CAMBRIDGE
PHASE 2 - SCOPED EIS

TITLE
BIOLOGICAL MONITORING LOCATIONS

CONSULTANT	YYYY-MM-DD	2026-03-31
	DESIGNED	----
	PREPARED	LT
	REVIEWED	----
	APPROVED	----

PROJECT NO. CA0066625	CONTROL 0001	REV. A	FIGURE 2
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ELC Vegetation Communities	
Unit 1a	FOD1-4 Dry-Fresh Oak - Hardwood Deciduous Forest FOD3-1 Dry-Fresh Poplar Deciduous Forest CUM1-1 Dry-Moist Old Field Meadow
Unit 1b	SWT3-2 Willow Organic Thicket Swamp SWT3-7 Winterberry Organic Thicket Swamp MAM3-3 Reed-canary Grass Organic Meadow Marsh MAM3-9 Forb Organic Meadow Marsh MAS3-1 Cattail Organic Shallow Marsh SAF3-1 Duckweed Floating-leaved Shallow Aquatic
Unit 2	FOD5-3 Dry-Fresh Sugar Maple – Oak Deciduous Forest
Unit 3	FOD5-2 Dry-Fresh Sugar Maple – Beech Deciduous Forest
Unit 4	SAF3-1 Duckweed Floating-leaved Shallow Aquatic SWT3-7 Winterberry Organic Thicket Swamp
Unit 5	SWM6-1 Birch-Conifer Organic Mixed Swamp
Unit 10a	SAF3-1 Duckweed Floating-leaved Shallow Aquatic MAS3-1 Cattail Organic Shallow Marsh MAM3-3 Reed-canary Grass Organic Meadow Marsh
Unit 10b	CUM1-1 Dry-Moist Old Field Meadow
Unit 11a	SWT3-2 Willow Organic Thicket Swamp
Unit 11b	SAF3-1 Duckweed Floating-leaved Shallow Aquatic MAS3-1 Cattail Organic Shallow Marsh MAM3-3 Reed-canary Grass Organic Meadow Marsh
Inclusions: CUM1-1 Dry-Moist Old Field Meadow CUW1 Mineral Cultural Woodland	
Unit 12	SAF3-1 Duckweed Floating-leaved Shallow Aquatic MAM2-2 Reed-canary Grass Mineral Meadow Marsh
Unit 18	ELC not applicable

LEGEND

SUBJECT PROPERTY

CITY LANDS

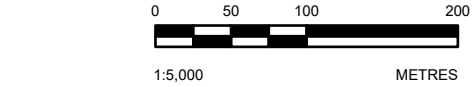
ELC VEGETATION COMMUNITIES

PROVINCIALY SIGNIFICANT SPECIES

BUTTERNUT

NORTHERN PIN OAK

BLACK ASH (SCATTERED THROUGHOUT UNIT)



NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)
1. CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE - ONTARIO
2. BASE MAP: FIRST BASE SOLUTIONS
3. COORDINATE SYSTEM: NAD 1983 UTM ZONE 17N

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HALLMAN CONSTRUCTION LIMITED &
GATESTONE DEVELOPMENT CORPORATION

PROJECT
WESTWOOD VILLAGE, CAMBRIDGE
PHASE 2 - SCOPED EIS

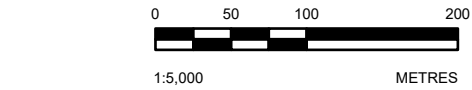
TITLE
VEGETATION COMMUNITIES

CONSULTANT	YYYY-MM-DD	2026-03-31
DESIGNED	----	
PREPARED	LT	
REVIEWED	----	
APPROVED	----	

PROJECT NO. CA0066625	CONTROL 0001	REV. A	FIGURE 3
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- LEGEND**
- SUBJECT PROPERTY
 - SEEPAGE
 - CITY LANDS
 - WILDLIFE**
 - SPRING AMPHIBIAN SURVEY STATIONS
 - TURTLE BASKING SURVEY LOCATIONS
 - MARSH BIRD AND LEAST BITTERN MONITORING
 - BREEDING BIRD SURVEYS
 - MIGRANT WATERFOWL
 - WILDLIFE SURVEY UNIT (WSU)



NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)
1. CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE - ONTARIO
2. BASE MAP: FIRST BASE SOLUTIONS
3. COORDINATE SYSTEM: NAD 1983 UTM ZONE 17N

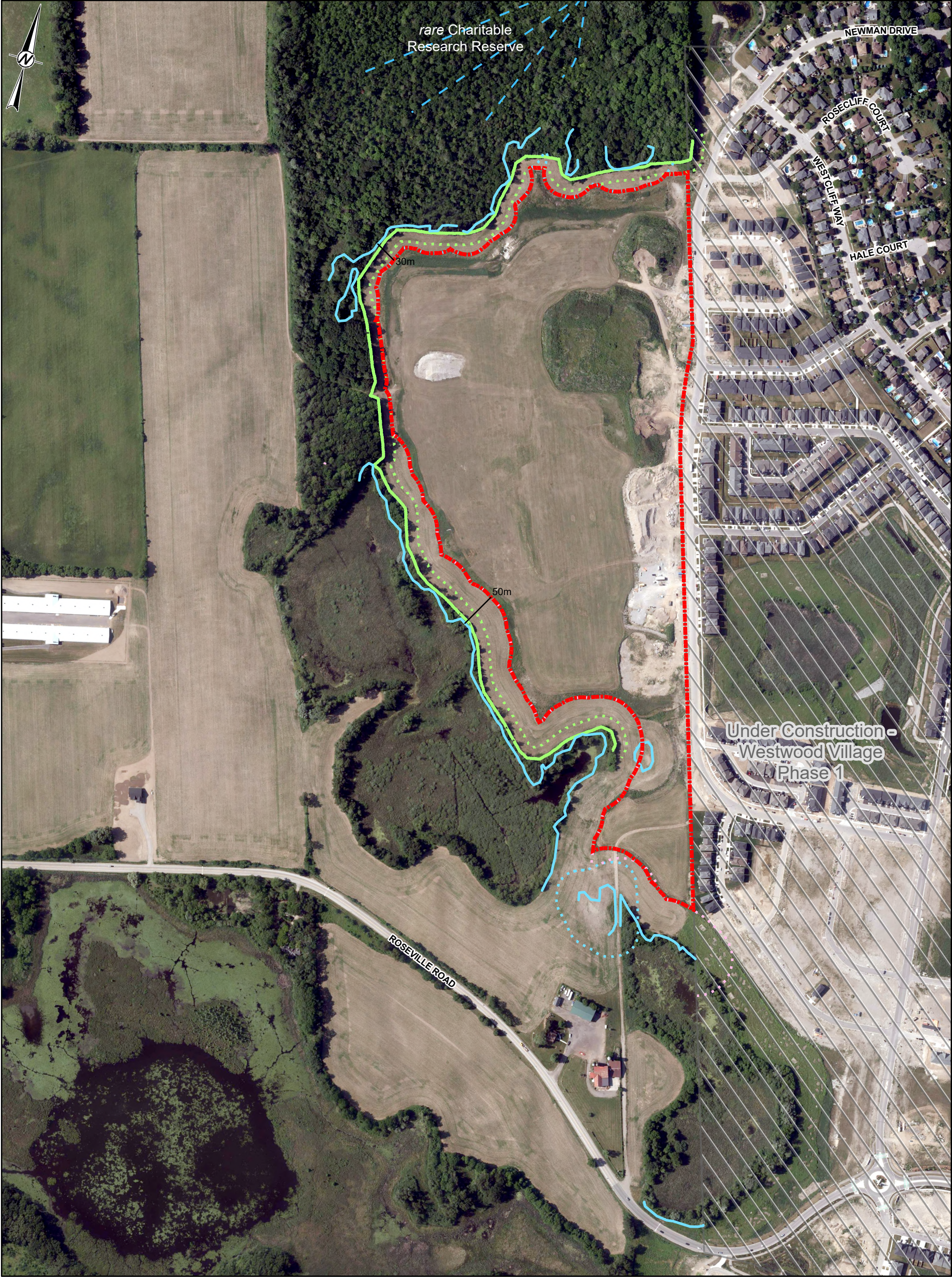
CLIENT
HALLMAN CONSTRUCTION LIMITED &
GATESTONE DEVELOPMENT CORPORATION

PROJECT
WESTWOOD VILLAGE, CAMBRIDGE
PHASE 2 - SCOPED EIS

TITLE
WILDLIFE SURVEY LOCATIONS

CONSULTANT	YYYY-MM-DD	2026-03-31
	DESIGNED	----
	PREPARED	LT
	REVIEWED	----
	APPROVED	----

PROJECT NO. CA0066625	CONTROL 0001	REV. A	FIGURE 4
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- LEGEND**
- SUBJECT PROPERTY
 - SEEPAGE
 - CITY LANDS
 - SURVEYED WOODLAND CEF LIMIT (WSP; 2019)
 - WOODLAND CEF SETBACK (15M)
 - SURVEYED PSW WETLAND LIMIT (WSP; 2019)
 - WETLAND (SWAMP) SETBACK (30M)
 - WETLAND (POND / MARSH) SETBACK (50M)

NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)
1. CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE - ONTARIO
2. BASE MAP: FIRST BASE SOLUTIONS
3. COORDINATE SYSTEM: NAD 1983 UTM ZONE 17N

CLIENT
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GATESTONE DEVELOPMENT CORPORATION

PROJECT
WESTWOOD VILLAGE, CAMBRIDGE
PHASE 2 - SCOPED EIS

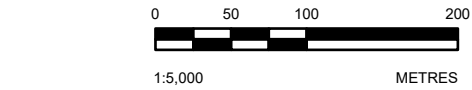
TITLE
ENVIRONMENTAL FEATURE LIMITS AND SETBACKS

CONSULTANT	YYYY-MM-DD	2026-03-31
	DESIGNED	----
	PREPARED	LT
	REVIEWED	----
	APPROVED	----

PROJECT NO. CA0066625	CONTROL 0001	REV. A	FIGURE 5
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LEGEND	
	SUBJECT PROPERTY
	SEEPAGE
	VERNAL POND
	CITY LANDS
	DRAFT PLAN
	ECOLOGICAL LINKAGES
	BUFFER/CORRIDOR ENHANCEMENT AREA
	FENCING AND SIGNAGE
	INTERIM WILDLIFE FUNNEL FENCING/SEDIMENT & EROSION CONTROL
	FUNNEL FENCING AND PERMANENT FENCING
	'NATURAL AREAS' SIGNAGE
	LEP/ODO HABITAT CREATION
	TURTLE NESTING HABITAT CREATION



NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)
1. CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE - ONTARIO
2. BASE MAP: FIRST BASE SOLUTIONS
3. COORDINATE SYSTEM: NAD 1983 UTM ZONE 17N

CLIENT
HALLMAN CONSTRUCTION LIMITED &
GATESTONE DEVELOPMENT CORPORATION
PROJECT
WESTWOOD VILLAGE, CAMBRIDGE
PHASE 2 - SCOPED EIS

TITLE
DRAFT PLAN AND ENVIRONMENTAL
MANAGEMENT RECOMMENDATIONS

CONSULTANT	YYYY-MM-DD	2026-03-31
	DESIGNED	----
	PREPARED	LT
	REVIEWED	----
	APPROVED	----

PROJECT NO. CA0066625	CONTROL 0001	REV. A	FIGURE 6
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APPENDIX A

TERMS OF REFERENCE

**WESTWOOD VILLAGE, PHASE 2
TOWNSHIP OF NORTH DUMFRIES**

**SCOPED ENVIRONMENTAL
IMPACT STUDY**

DRAFT TERMS OF REFERENCE

September 2020





SIGNATURES

Prepared by

Jennifer McPhee, M.Sc.
Ecology - Botanist and ISA Certified Arborist

August 20, 2020

Date

Reviewed and approved¹ by

Jeff Gross, M.Sc.
Senior Ecologist

September 16, 2020

Date

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1.0 INTRODUCTION

WSP Canada Group Limited (WSP) is pleased to submit these draft *Terms of Reference* (TOR) for a Scoped Environmental Impact Study (EIS) in support of a future development application for Phase 2 of Westwood Village located within the Township of North Dumfries (the 'Subject Property'). See attached Consolidated Draft Plan (Figure 1)(MHBC; September 10, 2020) for property location.

WSP (formerly MMM Group and Ecoplans) was retained in 2008 by Hallman Construction Limited and Brian Domm Farms Limited to undertake natural environment studies in support of planning and development applications for the Cambridge West lands, Cambridge, Ontario. To date, WSP has authored or provided natural heritage input to the following reports:

- Cambridge West Community, Master Environmental Servicing Plan and Community Master Plan. Technical Work Plan (MHBC et.al.; November 2010)
- Cambridge West MESP, Natural Environment Study. Final (Ecoplans; November 2013)
- Cambridge West Collector Road Network Class Environmental Assessment. Technical Memorandum - Natural Heritage. Evaluation of Alternatives (MMM; October 2015)
- Cambridge West Lands - Jefferson Salamander Encounter Response Plan - Revised (WSP/ MMM: December 2016)
- Cambridge West Lands, Hallman Construction Limited & Brian Domm Ltd., Draft Plan of Subdivisions, Cambridge, Ontario. Scoped Environmental Impact Study (MMM Group; December 2016)
- Cambridge West Lands, Hallman Construction Limited & Brian Domm Ltd., Draft Plan of Subdivision, Cambridge, Ontario. Scoped Environmental Impact Study - Addendum 1 (WSP; October 2017)
- Cambridge West Lands. Opinion re: Construction Timing for Migratory Birds and Bald Eagles (WSP; February 1, 2018)
- Collector Road Network Class Environmental Assessment. Environmental Study Report. Cambridge West, City of Cambridge. Natural Heritage Summary Report (WSP; April 2018)
- Cambridge West Lands, Hallman Construction Limited & Brian Domm Ltd., Draft Plan of Subdivision, Cambridge, Ontario. Pre-Construction (2014-2015) Biological Monitoring Report (WSP; 2020)
- Cambridge West Lands, Hallman Construction Limited & Brian Domm Ltd., Draft Plan of Subdivision, Cambridge, Ontario. Pre-Construction (2019) Biological Monitoring Report (WSP; 2020)

- Cambridge West Lands, Hallman Construction & Cachet Developments (Cam West) Inc. Tree Management Plan (Cambridge West Lands), Cambridge Ontario (WSP; August 2019)
- Cambridge West Lands, Hallman Construction & Cachet Developments (Cam West) Inc. Tree Management Plan, Realigned Blenheim Road and Related Infrastructure, Cambridge Ontario (WSP; February 2020)
- Cambridge West Lands, Hallman Construction & Cachet Developments (Cam West) Inc. Blenheim Road Re-alignment and Devil's Creek Culvert Replacement (WSP; April 2020)

2.0 SCOPE OF WORK

A substantial amount of fieldwork, analysis, reporting and agency liaison has occurred throughout the Cambridge West community planning process to date. It is important to note that fieldwork documented in the reports listed in Section 1.0 included comprehensive and detailed coverage of lands within the current study area (i.e., the Subject Property and other lands located in the Township collectively referred to as the “Township lands”²) and that previous studies considered the Township lands as part of the broader Cambridge West study area. See Appendix A for MESP figures that show relevant information. It is also important to note that ongoing fieldwork will be undertaken for the adjacent lands (Draft Plans of Subdivision 30T-16103 and 30T-16104) as part of biological monitoring; see Figure 9 of the Scoped EIS (MMM 2016) for biological monitoring locations on adjacent City lands.

The recommended scope of work discussed herein builds upon previous work, as documented in the MESP Natural Environment Study, NES (MMM; 2013), Scoped EIS (MMM; 2016) and Scoped EIS Addendum (WSP; 2017). The scope is also consistent with EIS requirements and guidelines from the City of Cambridge, Region of Waterloo and Grand River Conservation Authority (GRCA) and the *Technical Work Plan* implemented in the MESP.

It also incorporates input received at the following meetings and agency liaison:

- October 3, 2019. Pre-consultation Meeting. Attended by staff from Region of Waterloo, Township of North Dumfries, City of Cambridge, GRCA, Energy + Inc., and proponents / study team.
- October 18, 2019. Site meeting to review feature limits previously flagged by WSP. Attended by staff from Region of Waterloo, Township of North Dumfries, City of

² Although within the “General Study Area” boundaries as defined in the MESP, field work in the Township Lands was comprehensive and detailed, generally consistent within the field surveys completed in the “Development Study Area”

Cambridge, GRCA, MHBC and WSP.

- March 9, 2020. Meeting at Township. Attended by staff from Township of North Dumfries and City of Cambridge, as well as proponents / study team

Key elements of the work plan are discussed below.

Task 1: Existing Conditions Characterization

Existing conditions were characterized using background information, field survey results from MESP, from data collected in 2019 and 2020, and from related surveys

Natural heritage features and functions within and adjacent to the subject property are well understood, based on the comprehensive field surveys completed through the MESP and associated road network planning studies (see relevant MESP figures in Appendix A). However, to update and refine this understanding as input to the development planning process for the subject lands, the following field surveys were completed in 2019, primarily within WSU 2 / WSU 3 / WSU 4³, with additional coverage in WSU 6 and WSU 8⁴ (as applicable and pending access):

- **Aquatics:** reconnaissance level habitat update (no fish sampling or spawning surveys) in WSU 2 / WSU3 / WSU 4
- **Vegetation and Floristics Update** (WSU 2 / WSU3 / WSU 4):
 - Refinement of vegetation community description and mapping - per the Ecological Land Classification System for Southern Ontario (Lee et.al. 1998);
 - Vegetation community significance was evaluated using Natural Heritage Resources of Ontario: Vegetation Communities of Southern Ontario (Bakowsky 1996) and vegetation community significance listed on the NHIC / Biodiversity Explorer website at the time of report preparation.
 - Three-season botanical inventory
 - Plant species status was evaluated using the Region of Waterloo Listing of Significant Vascular Plants (1999) for regional significance; the NHIC website for provincial rarity ranks (i.e. S-Ranks); the Species At Risk in Ontario list (MNR – current list at the time of report preparation) for provincial status designations; and the Canadian Species At Risk list (COSEWIC – current list at the time of report preparation) for national status designations.

³ Survey locations / station labelling are consistent with previous work except where new / additional areas have been recommended.

⁴ Additional reconnaissance level surveys are recommended in WSU 8 (Barrie's Lake) to provide context. These will be conducted from Roseville Road with no entry into Barrie's Lake

- **Breeding Bird Survey:** Two early morning surveys between late May and early July in WSU 2 / WSU3 / WSU 4 / WSU 6 (transects) and WSU 8 (roadside station)
- **Turtle basking survey:** Five targeted spring surveys (early April-early June) in WSU 2 / WSU3 / WSU 4 / WSU 6 / WSU 8
- **Spring anuran breeding survey:** Three evening surveys at stations in WSU 2 / WSU3 / WSU 4 / WSU 6 / WSU 8 per the Marsh Monitoring Program (MMP) protocol
- **Marsh bird survey:** Two targeted early morning or evening surveys between May 20 and July 5 at stations in WSU 2 / WSU3 / WSU 4 / WSU 6 / WSU 8 - per the Marsh Monitoring Program (MMP) protocol (Bird Studies Canada; 2009)
- **Least Bittern Survey:** Three targeted early morning spring surveys from early May to mid-July at stations in WSU 2 / WSU3 / WSU 4 / WSU 6 / WSU 8 – per the National Least Bittern Survey Protocol (Environment Canada; 2011).
- **Verification of confirmed wetland and dripline limits,** based on in-season field surveys.
 - Wetland and dripline limits were previously determined in the MESP NES (Figure 4) using spring and summer field surveys, based on dominant vegetation, per ELC habitat classifications / Ontario Wetland Evaluation System (OWES) guidelines (2013) / Region of Waterloo's Greenlands Network Implementation Guidelines, 2nd Draft (2010). Preliminary wetland / dripline delineations by Ecoplans were completed on nine dates in 2010 and 2011 and confirmed by City / Region / GRCA staff during site walks in 2010 and 2011.
 - Wetland and dripline limits within the City of Cambridge were verified during 2014 / 2015 fieldwork, with no changes.
 - Limits were reviewed in the field based on existing conditions and updated guidelines (e.g., Final Greenlands Network Implementation Guidelines (2016)) in 2019 and confirmed with agencies on October 18, 2019. See Figure 2 for surveyed limits.

The following surveys were completed in 2020:

- **Breeding Bird Survey:** Two early morning surveys between late May and early July in WSU 2 / WSU3 / WSU 4 / WSU 6 (transects) and WSU 8 (roadside station)
- **Turtle basking survey:** Five targeted spring surveys (early April-early June) in WSU 2 / WSU3 / WSU 4 / WSU 6 / WSU 8
- **Spring anuran breeding survey:** Three evening surveys at stations in WSU 2 / WSU3 / WSU 4 / WSU 6 / WSU 8 per the Marsh Monitoring Program (MMP) protocol

- **Marsh bird survey:** Two targeted early morning or evening surveys between May 20 and July 5 at stations in WSU 2 / WSU3 / WSU 4 / WSU 6 / WSU 8 - per the Marsh Monitoring Program (MMP) protocol (Bird Studies Canada; 2009)
- **Least Bittern Survey:** Three targeted early morning spring surveys from early May to mid-July at stations in WSU 2 / WSU3 / WSU 4 / WSU 6 / WSU 8 – per the National Least Bittern Survey Protocol (Environment Canada; 2011).

Task 2: Data Analysis & Evaluation

Data analysis and presentation will include:

- Presentation of vegetation communities and other key results on current aerial photography
- Preparation of floristic and faunal inventories keyed to vegetation communities and/or wildlife survey units
- Identification / discussion of species and habitats of conservation concern (including Species at Risk (SAR) - based on relevant municipal, provincial and federal lists most current at the time of report preparation
- Discussion of terrestrial vegetation, wetlands and wildlife habitat significance and sensitivity, including consideration of the broader ecosystem
- Consideration of vegetation – hydrogeological interactions
- Consideration of available SAR Recovery Strategies, as relevant to the study.
- Natural System Linkages and Functions – update / confirmation of analysis presented in the MESP and Scoped EIS including:
 - Delineation of natural environment features and identification of ecological functions within the natural heritage system, including a description of contiguous natural areas and existing corridors and linkages and general comment on corridors and linkages in the broader landscape, based on secondary source information.
 - Confirmation and/or refinement of City and Regional Official Plan mapping designations
 - Confirming and/or refining previously recommended environmental setbacks, as shown on MESP NES Figure 14.
 - Confirmation of natural heritage constraint mapping, as shown on MESP NES Figure 15.
 - Confirming and/or refining previous recommendations for ecological enhancements, linkages or restoration and shown on MESP NES Figure 16 and Figure 17.

- Confirming previous evaluations of *Environmentally Sensitive Policy Areas* (ESPA) and *Locally Significant Natural Areas* (LSNA)

Task 3: Review, input to and Integration of other technical studies

WSP ecology will work as part of an integrated study team which includes MHBC (planning), MTE Consultants (engineering) and Paradigm Transportation Solutions Limited (transportation).

Information collected by other study team members as input to the draft planning process for the subject property will be reviewed by ecology staff and considered and integrated into the EIS, where relevant (e.g., hydrogeology, soils, grading etc.).

Task 4: Input to Development Proposal

Based on the confirmed / updated environmental constraint limits, consolidated data review, and consideration of other relevant technical information, WSP ecology staff will provide input to the development limits and proposed development plan.

Task 5: Impact and Mitigation Analysis

The details of the proposed development, including stormwater management plans etc., will be reviewed to identify potential impacts on ecological features and functions. Potential impacts will be determined based on the direct, indirect, and induced effects of the proposed development. Mitigation and enhancement recommendations will be identified, including consideration of previous MESP / EIS recommendations. A 'Net Effects Assessment' will be completed to identify any residual effects after recommended mitigation/compensation is employed.

Task 6: Reporting

The scoped EIS report will include characterization of the existing natural features and functions, assessment of applicable policy, details of the proposed undertaking, impact analysis, and mitigation / enhancement recommendations. The report will also include technical appendices, such as species lists, air photos, and representative photographs. Mapping of natural features will also be provided on an air photo base. A draft report will be submitted to the City of Cambridge, Region of Waterloo, Region of Waterloo Ecological and Environmental Advisory Committee (EEAC) and GRCA for review and comment. The report will subsequently be finalized based on agency and EEAC comments.

3.0 BIOLOGICAL MONITORING

3.1 OVERVIEW

This section outlines the recommended biological monitoring program for the proposed development on the subject property. Consistent with recommendations in the MESP Natural Environment Study and EIS reports for adjacent lands, we recommend undertaking pre-, during- and post-construction biological monitoring for the proposed development.

Since a comprehensive and detailed monitoring program was identified in the approved MESP, we have used that as the basis to determine monitoring for the current proposal, with refinements for specific field survey locations.

In addition to biological monitoring, surface water and groundwater monitoring were undertaken by MTE Consultants. Biological and hydrogeological data and analyses will be undertaken and considered in an integrated manner, with relevant information included in reports.

Monitoring is recommended in three stages, as follows:

1. Pre-construction: for two years prior to any site grading or construction (initiated in 2014 for some sites and 2019 for others – described below)
2. During-construction: throughout the duration of construction to 90% build-out
3. Post-construction: to take place for two years following the substantial completion of the development (90% of building permits having been issued)

3.2 BIOLOGICAL MONITORING COMPONENTS

Recommended biological monitoring components, including timing and methodology, are detailed in Table. Monitoring locations for the Subject Property are shown in Figure 3. Note that some monitoring locations are 'shared' between the subject property and adjacent lands (e.g., monitoring within WSU 6).

Table 1. Biological Monitoring Components

Type of Monitoring	Development Phase	Location(s)	Methodology / Timing
Vegetation – Quantitative Photo Plot Monitoring	All	Eleven permanent plots, V3 to V10 and V16 to V20, have been set up to address the vegetation community diversity within the study area (i.e., wetland and upland habitats, all major ELC types). Locations are shown in Figure 3. In 2014 and 2015, permanent plots V3 to V8 were monitored by WSP. In 2019, plots V9, V 10 and V16 to V20 were established and continued in 2020	Twice annual monitoring (June and September). Each plot consists of two stakes spaced 10 m apart; one stake is the photo reference point, the other is the endpoint of the 10 m transect. Four 0.5 m square quadrats are established along the plot line (at 1 m, 3 m, 5 m and 8 m). Each quadrat consists of nine sub-plots. Each quadrat is inventoried for plant species (presence / absence, frequency of occurrence) and additional measurements and observations are made, including the dominant vegetation between the photo and reference points; the depth and location of any standing water between the photo and reference points; and general notes on community health and site disturbance. Inventoried plant species are characterized by their <i>Coefficient of Conservatism</i> (CC) and <i>Coefficient of Wetness</i> (CW), with mean CC and CW values calculated and compared over time.
Vegetation – General Habitat Inspection	All	Areas in the general vicinity of the permanent vegetation plots (Figure 3) and a general once-over to look for new infestations of invasive non-indigenous species which may be facilitated by disturbance related to the development of new subdivisions	General habitat inspection, recording general biophysical conditions, noting site changes (e.g., trails, rubbish, dumping, establishment / proliferation of invasive non-indigenous species, vandalism etc.) and taking photographs
Avifauna – Breeding Bird Surveys	All	WSU 2, WSU3, WSU 4, WSU 6 and WSU 8 (west end) Five areas (WSU 1, WSU 2, WSU3, WSU 6 and WSU 8 (east end)) were monitored in 2014, 2015, 2019, and 2020.	Two rounds of spring surveys (late May through July). Areas are thoroughly covered by walking random transects (or surveying from pond edges) recording presence, abundance and level of breeding evidence (using <u>Ontario Breeding Bird Atlas</u> [OBBA] protocols
Avifauna – Migrant Waterfowl Supplemental Surveys	All	WSU 2, WSU 3, WSU 6 and WSU 8 (west end) WSU 2, WSU3, WSU 6 and WSU 8 (east end) were monitored in 2014, 2015, 2019, and 2020.	In conjunction with other spring surveys (i.e., amphibian breeding, turtle basking, wildlife passage monitoring). Pond / wetland areas are incidentally surveyed during other surveys, recording species, presence and abundance
Avifauna – Marsh Bird Surveys	All	WSU 2, WSU 3, WSU 6 and WSU 8 (west end) WSU 2, WSU 3, WSU 6 and WSU 8 (east end) were monitored in 2014, 2015, 2019, and 2020.	At least two early morning or evening surveys from mid-May to early July (with at least 10 days between surveys), conducted at consistent point count stations. Following the <u>Marsh Monitoring Program</u> (MMP) (Bird Studies Canada) survey methodology. The MMP methodology has the following key elements: at least two surveys; early am timing (30 minutes before sunrise to 10 am) or evening (four hours before sunset to onset of darkness); stationary counts at stations at least 250 m apart; conducted when weather conditions are warm and dry with little wind; 15-minute call response broadcasts at each station, with 5 minutes of passive listening, 5 minutes of call broadcasts and 5 minutes of passive listening; recording numbers, species and location of marsh birds and habitat characteristics; use standardized field data sheets

Type of Monitoring	Development Phase	Location(s)	Methodology / Timing
Avifauna – Least Bittern Surveys	All	WSU 2, WSU 3, WSU 6, and WSU 8 (west end) WSU 2, WSU 3, WSU 6 and WSU 8 (east end) were monitored in 2014, 2015, 2019, and 2020.	At least three early morning surveys from early May to mid-July (with at least 10 days between surveys), conducted at consistent point count stations. Following the <u>National Least Bittern Survey Protocol</u> (Environment Canada 2011) or other suitable survey methodology. The Environment Canada methodology has the following key elements: at least 3 surveys; early am timing (30 minutes before sunrise to 10 am); stationary counts at stations at least 250 m apart; not conducted under adverse weather conditions (e.g., rain, fog, extreme heat or winds exceeding 19 km/h); 13-minute call response broadcasts at each station, with 5 minutes of passive listening, 5 minutes of call broadcasts and 3 minutes of passive listening; recording numbers, call type and distance of recorded Least Bitterns; recording other marsh birds and habitat characteristics; use standardized field datasheets.
Herpetofauna – Spring Amphibian Breeding Surveys	All	Six monitoring stations in WSU 3, WSU 4, WSU 6, and WSU 8 All areas were monitored in 2014, 2015, 2019, and 2020.	Three rounds of spring survey (April to June). Spring amphibian breeding activity is assessed using the <u>Marsh Monitoring Program</u> (MMP) amphibian calling survey protocol (Bird Studies Canada 2008, revised 2009). Three rounds of the survey are undertaken during the spring and early summer, generally at least 10 days apart, with the suitability of timing confirmed by referencing other local sites with known amphibian populations and/or liaison with other researchers. Following guidelines of the MMP, nighttime air temperatures are ideally greater than 5°C for the first survey, 10°C for the second survey, and 17°C for the third survey. Each calling station is surveyed for three minutes, between one-half hour after sunset and midnight. Using the MMP, amphibian calling activity is rated using three levels: Level 1 (individual calls can be counted with no overlap), Level 2 (some calls can be counted or estimated, some overlap) or Level 3 (calls continuous and overlapping, individuals not distinguishable).
Herpetofauna – Turtle Basking Surveys	All	WSU 3, WSU 6, and WSU 8 (west end) WSU 2, WSU 3, WSU 6, and WSU 8 (east end) were monitored in 2014, 2015, 2019, and 2020.	Five spring surveys (mid-April to mid-June) – when turtle species recorded during the current study or potentially present in the area are actively basking and moving. This survey period also partially overlaps with the nesting season for expected turtle species. Ponds / wetlands (WSU 3, 6, and 8) and adjacent areas including roads are carefully scanned with binoculars or spotting scopes for evidence of turtle basking, movement or nesting. Surveyors record absence or presence, species and incidental observations of other wildlife. Surveys start early to late morning and end early to late afternoon, with start times dependent on previous overnight temperatures and projected temperatures for the day of the survey (e.g., if overnight temperatures are cooler than normal, surveys should start later in the morning to allow for daytime temperatures to increase, to improve chances of observing basking turtles). Surveys are generally be conducted on warm, sunny or partly sunny days with air temperatures between 10°C and 25°C. Observations include photographs, GPS coordinates for notable findings (e.g., turtle nesting evidence, road mortalities / crossings), the direction of movement and description of basking features. Survey time, air temperature, sky code and wind scale are recorded for each survey. For turtle observations, GPS location, the direction of movement and description of basking features being used are noted, as relevant.

Type of Monitoring	Development Phase	Location(s)	Methodology / Timing
Buffer Integrity and Functioning	Post Construction	Permanent plots to be established within future buffer areas adjacent to WSU 3 and WSU 4. None has been established or monitored to date.	Twice annual monitoring in conjunction with vegetation plot monitoring in core areas (June and September). Quantitative photo-plot monitoring as described above.
Wildlife Passage Monitoring	During / Post Construction	One future ecological linkage area between WSU 3 and WSU 6. Other linkages are present on adjacent lands. None has been installed or monitoring to date.	Primarily targeting herpetofauna but other wildlife will be addressed with the recommended components. Effectiveness monitoring of mitigation and enhancement measures: (i.e., ensuring funnel / exclusion walls, wildlife passage measures, plantings / cover elements etc. are installed, in good health / condition and functioning as intended) Once annually in early spring (before March 15); supplemented by additional checks during other monitoring events. Exclusion areas / corridor monitoring (WSU 6 area only): 5 suitable nights in March-April for spring amphibian movement (i.e., high relative humidity, fog, or light rain and anticipated overnight temperatures above 0°C). On suitable nights between 0.5 hr after sunset and 12 am complete multiple passes along the corridor (i.e., minimum of 2 passes or 1.5 hr search effort) slowly walking both sides of the exclusion fence conducting visual sweeps using flashlights and/or headlamps. Vegetation and potential cover objects along the exclusion measures are searched for amphibians and other wildlife. Record pertinent survey details such as date; start and end time; staff; weather conditions; general site conditions (e.g., vegetation cover - density, type, etc.; adjacent activities / land use). For wildlife observations, record: species and number of individuals observed; the direction of travel (inferred or as observed); location; representative photographs; evidence of movement (e.g. scat, tracks, etc.) without direct observation. Photo monitoring of crossing structures: Continuous monitoring from April to July. Photo monitoring of crossing structures, within the HCL/Domm lands (i.e., Newman Drive and Bismark Drive extensions), and other areas, where possible (i.e., Blenheim Road at the east end of Barrie's Lake and Devil's Creek). Timed shutter-release or movement-triggered camera systems are to be installed in the two (potentially four) crossing structures shown in Figure 3, using best available technology. Given that the primary target wildlife group is herpetofauna, it is recommended that cameras are installed prior to mid-March, then activated and checked / downloaded regularly through mid-July – this captures the core spring and summer movement period for amphibians and turtles. Post-construction monitoring should be undertaken to assess the condition of infrastructure / plantings and quantify wildlife use (i.e., monitoring to assess corridor, funnel wall “effectiveness” and use of wildlife structures).

3.3 ANALYSIS & REPORTING

Annual biological monitoring reports will be prepared and submitted for approval. Reports will include the status of activities, discussion of field survey results, recommendations for remedial actions if required, anticipated activities in the next year and recommendations for future monitoring (e.g., any changes to the program).

APPENDIX A

FIGURES - SUBJECT PROPERTY

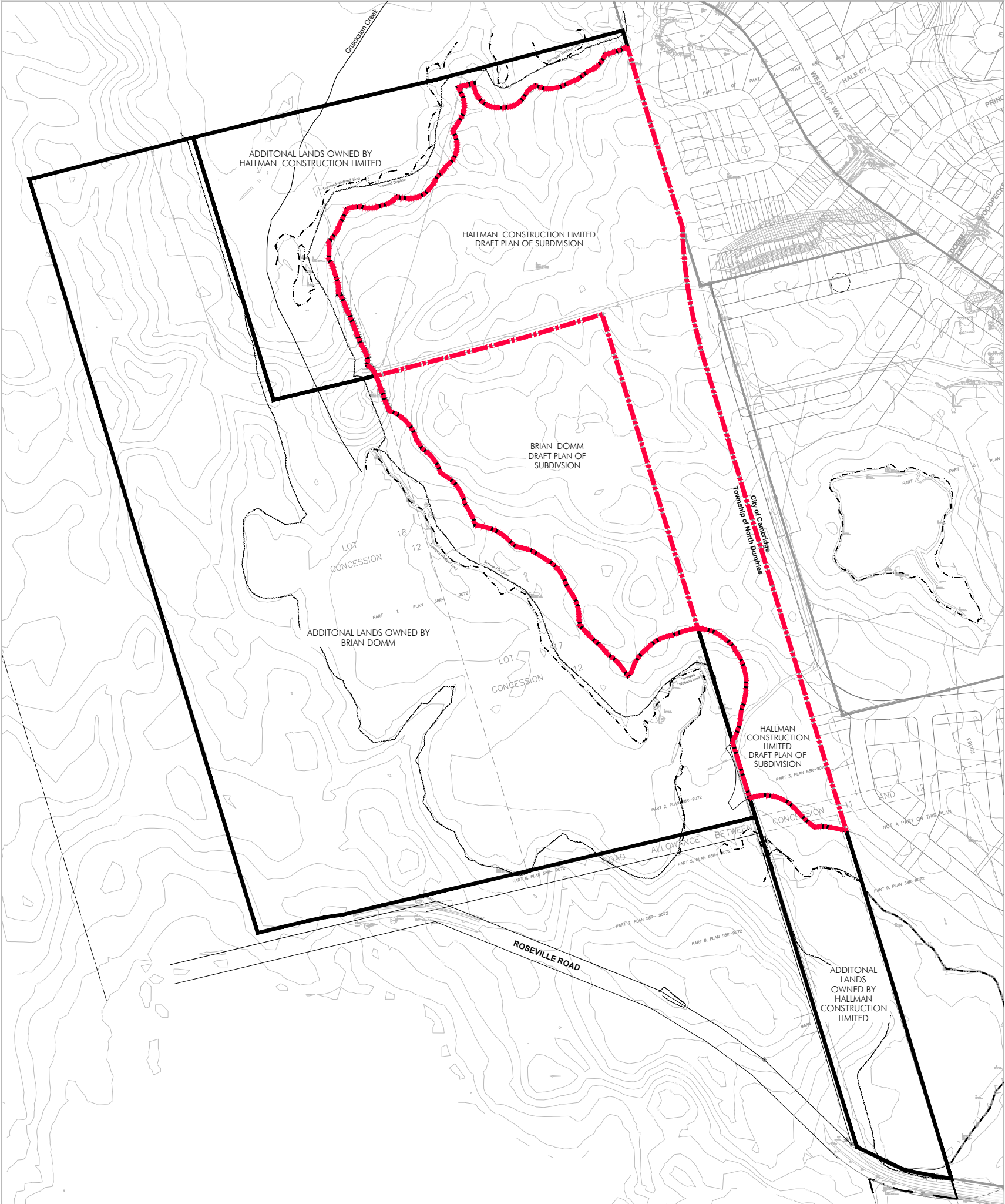
Figure 1. Consolidated Draft Plan

Figure 2. Feature Limits & Setbacks

Figure 3. Biological Monitoring Locations

CONSOLIDATED
DRAFT PLAN OF
SUBDIVISION AND
ADDITIONAL LANDS

Legal Description
PART OF LOTS 17 AND 18, CONCESSION 12
TOWNSHIP OF NORTH DUMFRIES
REGIONAL MUNICIPALITY OF WATERLOO



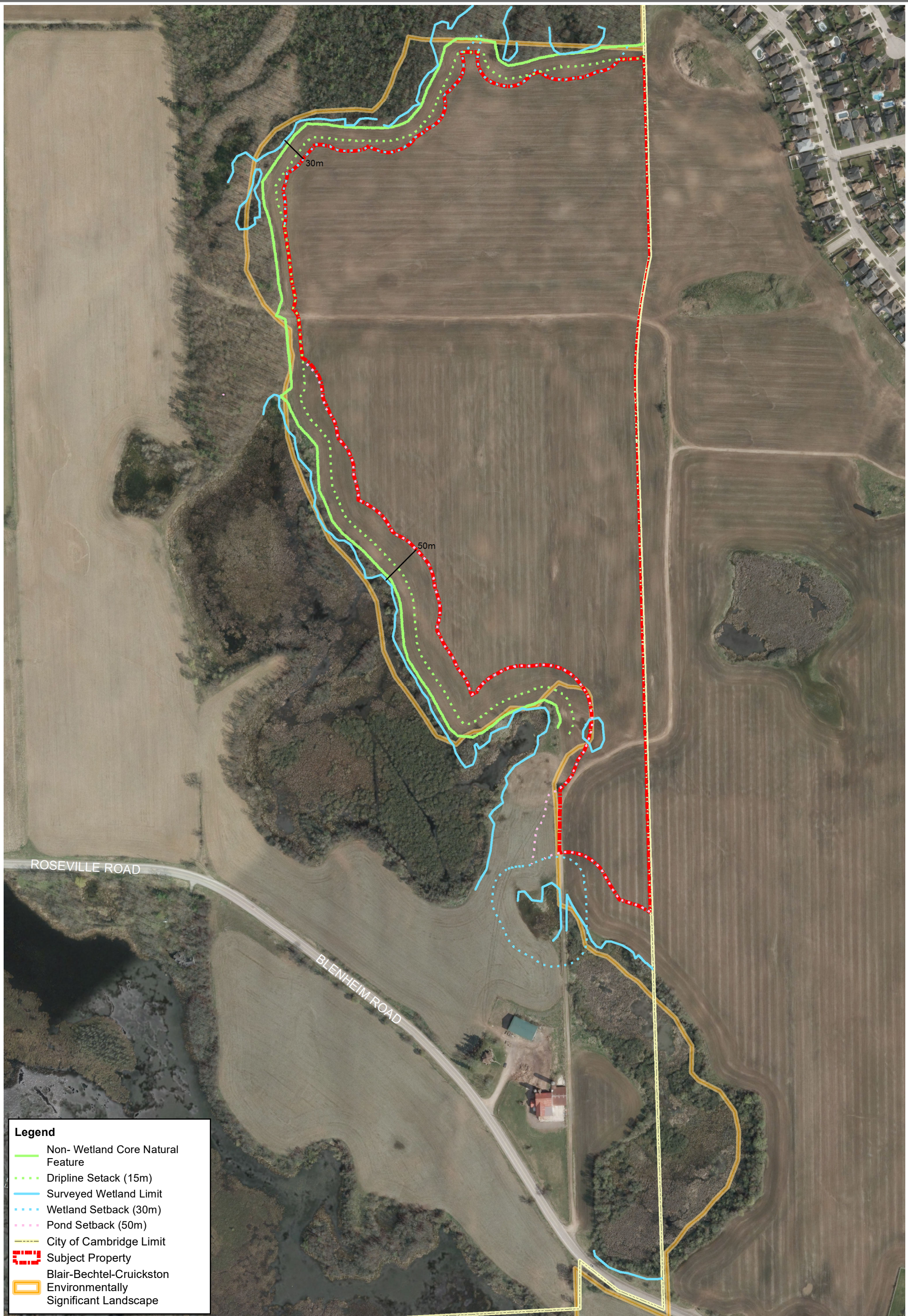


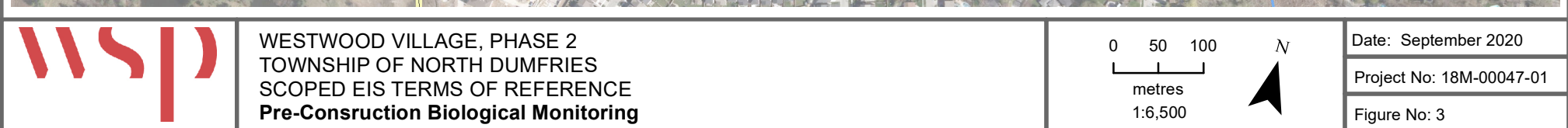
PLANNING
URBAN DESIGN
& LANDSCAPE
ARCHITECTURE

205-546-1868 | 800-665-5555 | 1000-1000-1000 | 1000-1000-1000

Approval Stamp	Date September 10, 2020
	File No. 0800C
	Plan Scale 1:1,250 (25x36)
	Drawn By D.G.S.
	Checked By P.B.
Project Westwood Phase 2	Other
File Name DRAFT PLAN	Dwg No. 1 of 1
Scale Bar	

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APPENDIX B

MESP NES FIGURES (2013)

Figure 1
Figure 2
Figure 3
Figure 4
Figure 5
Figure 8
Figure 9
Figure 11
Figure 12
Figure 14
Figure 15
Figure 16
Figure 17

SCOPED EIS (2016)

Figure 7
Figure 8
Figure 9

APPENDIX B

FIELD SURVEY CHRONOLOGY



Field Chronology (2008 - 2024)

Date	Staff	Task	Total hours
2008			60
Apr-22	KLF/RH	Site reconnaissance and Calling Amphibian Survey # 1 – 9 sites	6
Apr-23	KLF	Vernal pond reconnaissance assessment	1
May-29	HA	Breeding Bird Survey #1	6
Jun-04	KLF/EW	Calling Amphibian Survey # 2	6
Jun-12	RH, LV	Vegetation Survey - ELC mapping, spring vegetation inventory; Breeding Bird Survey # 2	15
Jun-23	KLF/EW	Calling Amphibian Survey # 3; Road / mortality survey.	7
Jul-24	KLF/SD	Dip netting vernal ponds	5.5
Aug-12	CC/KLE	Site Reconnaissance - aquatic habitat / survey locations; vernal pond habitat assessment / survey locations	11
Sep-19	JG	Vegetation (ELC) and botanical inventory – central pond; general wildlife survey	2.5
2009			252.5
Mar-10	KLF/KH/KD	Site Reconnaissance & pond (minnow) trap setting.	18
Mar-11	KLF/EG	Pond (minnow) trap survey / check and closing	11
Mar-18	KLF/EG/	Pond (minnow) trap setting	15
Mar-19	KLF/HB	Pond (minnow) trap survey / check and closing	12
Mar-25	HB/HA	Pond (minnow) trap setting	8
Apr-02	RH/EG	Road / mortality Survey; Pond (minnow) trap setting	2
Apr-03	HB/EG/SL/RH	Pond (minnow) trap survey / check	12
Apr-04	EB, JH	Pond (minnow) trap survey / check and closing	11
Apr-14	HA/KLF	Pond (minnow) trap survey / check	8
Apr-15	KLF/JH	Pond (minnow) trap survey / check and closing	11
Apr-20	KLF/ EG	Pond (minnow) trap setting; daytime road / mortality survey	12
Apr-21	KLF/CM	Pond (minnow) trap survey; Daytime road / mortality survey	12
Apr-22	KLF/ EG/ SL	Pond (minnow) trap survey; Daytime road / mortality survey; Amphibian Call survey # 1; Nocturnal Road / mortality survey	14
Apr-23	KLF/EG	Pond (minnow) trap survey / check and closing	11
May-14	KLF/SL	Calling Amphibian survey # 2 (Started but cancelled due to weather – resurveyed on May 28 th)	1
May-20	JG/HA	Vegetation / botanical inventory; supplemental avifaunal survey; Breeding bird survey # 1	13
May-22	JG	Vegetation / botanical inventory; avifaunal survey (migrants / breeding birds).	5
May-28	KLF/SL	Calling amphibian survey # 2; Road / mortality survey	4
Jun-22	KLF/SL	Calling amphibian survey # 3; Road / mortality survey	4
Jul-09	HA	Breeding Bird Survey #2	8
Sept. 1	KB/BM	Botanical inventory; ELC classification / description; Supplementary avifaun survey; Odonata and Lepidoptera survey	21
Sept. 2	KB/BM	Botanical inventory; ELC classification / description	18.5
Sept. 16	KB/BM	Botanical inventory; ELC classification / description	21
2010			567.5
Jan-21	JG	Winter wildlife survey	3.5
Mar-09	RH/HA	Nocturnal Owl Survey # 1 (Stations 1, 2, 3, and 4)	4
Mar-11	JG	Migrant avifauna survey; incidental winter wildlife observations; vernal pond reconnaissance	2
Mar-18	JG	Migrant avifauna survey (coverage – all areas except Devil's Creek forest / swamp area); vernal pond habitat assessment / reconnaissance	3
Mar-19	HA/KD	Vernal pond trapping reconnaissance and habitat assessment; drift fence set up reconnaissance	9
Mar-20	HA/RH/ KH	Pitfall trap installation; migrant avifaunal survey	8.5
Mar-22	KH/KD/HB	Pitfall and pond (minnow) trap installation / setting	14
Mar-23	KD/JH	Pitfall and pond (minnow) trap survey	11
Mar-24	JH/SD/JG	Pitfall and pond (minnow) trap survey; Migrant / supplementary avifauna survey	14
Mar-25	HA/SL	Nocturnal Owl Survey # 2 (Stations 1, 2, 3, and 4)	4
Mar-27	KD/KL	Pitfall and pond (minnow) trap setting	8



Date	Staff	Task	Total hours
Mar-28	KD/RCO/KD/SL	Pitfall and pond (minnow) trap survey; Road / mortality Survey	7.5
Mar-29	KD/RH	Pitfall and pond (minnow) trap survey	12
Apr-03	KH/KD	Pitfall and pond (minnow) trap setting (Pond 1)	4
Apr-04	KH/KL	Pitfall and pond (minnow) trap survey (Pond 1); Road / mortality survey	10
Apr-05	KD/JH	Pitfall and pond (minnow) trap survey (Pond 1); Pitfall and pond (minnow) trap setting (Ponds 2-5)	10
Apr-06	KD/CM	Pitfall and pond (minnow) trap survey	14
Apr-07	KH/LM/HB/SD/JG	Pitfall and pond (minnow) trap survey' Supplementary avifauna survey; Calling amphibian survey # 1; Road / mortality survey	33
Apr-08	HA/JH/SL/CM	Pitfall and pond (minnow) trap survey	15
Apr-09	KD/LM/HB/CM	Pitfall and pond (minnow) trap survey	8
Apr-15	HB/AW	Supplemental drift fence survey (herptile / mammal)	2.5
Apr-16	HB/JH/CM/LM	Pitfall and pond (minnow) trap setting	8.5
Apr-17	HA/SL/JH/AW	Pitfall and pond (minnow) trap survey	10
Apr-18	KH/KL/LM	Pitfall and pond (minnow) trap survey	8
Apr-25	KD/AD/KH	Pitfall and pond (minnow) trap setting	6
Apr-26	HA/LM/HB/JH	Pitfall and pond (minnow) trap survey	8
May-18	JG/KH/SL	Avifauna survey (all areas); Turtle basking survey (coverage – all wetlands); Calling amphibian survey #2	9
Jun-02	RH/SD	Wetland limit flagging; botanical inventory; ELC habitat assessment	10
Jun-03	RH/SD	Wetland limit flagging; botanical inventory; ELC habitat assessment	10
Jun-04	RH	Botanical inventory of Units 2, 3, 6, 7, 14, 15	6
Jun-07	RH/SD	Wetland limit flagging; botanical inventory; ELC habitat assessment	16
Jun-08	HA	Breeding bird survey; turtle basking survey; supplemental vernal pond and wetland wildlife survey; Wetland limit flagging; botanical inventory; ELC habitat assessment	19
Jun-17	RH	Wetland limit flagging	1
Jun-21	JH	Odonata and Lepidoptera survey	6
Jun-22	KH/AW	Calling amphibian survey # 3; Road / mortality survey	6
Jun-28	JG	Avifauna survey; Odonata and Lepidoptera survey; Turtle basking survey (coverage – south and mid/north wetlands)	4
Jul-01	JG/JH	Breeding bird survey; Odonata and Lepidoptera survey; Turtle basking survey (coverage – south and mid/north wetlands)	10
Jul-07	HA	Breeding bird survey; turtle basking survey; supplemental vernal pond and wildlife survey; Road/mortality survey	7
Jul-10	JH	Breeding bird survey	4.5
Jul-14	KD/LM	Daytime road / mortality survey (snakes and turtles)	3
Jul-26	HA/JH	Odonata and lepidoptera survey; Nocturnal avifauna survey (Whip-poor- will and Common Nighthawk target)	13
Jul-28	RH	Vegetation survey of Unit 14 – field visit cut short due to lightening	0.5
Aug-05	RH	Vegetation survey / botanical inventory (Units 4, 5, 10)	6
Aug-06	RH, KD	Vegetation survey / botanical inventory (Units 1 and 11)	14
Aug-17	JH, JG	Odonata and Lepidoptera survey; Avifauna survey; Basking Turtle survey (coverage – full site)	15
Sep-01	JG	Supplemental avifauna survey; Lepidoptera and Odonata survey	5
Sep-02	RH	Wetland and dripline flagging (revisions based on GRCA field walk).	4
Sep-10	HA/HM	Cover board set up; Reptile road / mortality survey	4
Sep-15	HA	Badger habitat survey	4
Sep-21	HA	Badger habitat survey; cover board survey; Reptile road / mortality survey	4.5
Sep-30	RH	Fall Botanical Survey of Units 6, 7, 8, 9, 13, 14, 15	6
Oct-01	HA	Badger habitat survey; cover board survey	3.5
Oct-04	RH	Vegetation survey of hedgerows and Units 11 and 16	6.5
Oct-07	RH, BD	Vegetation survey of Units 7, 8, 13, 14	8
Oct-08	HA	Cover board survey; Reptile road / mortality survey	2.5
Oct 27	SL, KH/RH/KD	Wetland / Dripline flagging; botanical inventory / habitat assessment; Fall Spawning Survey (Devil's Creek); Aquatic habitat assessment	30
Oct. 28	JG	Supplemental avifauna survey; Odonata and Lepidoptera survey	4
Nov-03	SL, KD	Fall Spawning Survey (Unnamed Trib); General aquatic habitat assessment	9



Date	Staff	Task	Total hours
Nov-05	SL, KH	Fall Spawning Survey (Newman's Creek); General aquatic habitat assessment	5
Nov-11	KH/KD	Benthic survey reconnaissance and sampling station setup	9
Nov-23	KD, EB	Benthic survey - sampling at stations B2 and B5 (VP2 & VP5)	12
Nov-24	SL, JE	Fall Spawning Survey (all creeks) - 2nd round	8
Nov-29	KD, CM	Benthic survey - sampling at stations B1 and B3 (VP1 & VP3)	12
Dec-02	KD, KH	Benthic survey - sampling at station B4 (VP4)	8
Dec-03	SL, JE	Fall Spawning Survey (all creeks) - 3rd round	11
Dec-09	KD, CM	Benthic survey - sampling at stations B6 and B7 (Devil's Creek & Newman's Creek)	14
2011			369.75
Mar-15	HA/HM	Nocturnal Owl Survey #1	4
Mar-22	KH	Vernal pond reconnaissance / habitat assessment	2
Mar-31	JG	Migrant avifaunal survey; general wildlife survey (coverage – wetlands; Barrie's Lake)	3
Apr-01	HA/HM	Nocturnal Owl Survey # 2	4
Apr-03	KD/JH	Pond (minnow) trap setting (VP1)	2
Apr-04	KH/HM/KD	Pond (minnow) trap survey (VP1); Pond (minnow) and pitfall trap setting (VP1 and DF3)	7
Apr-05	KD/JH/JG	Migrant avifaunal survey; general wildlife survey (coverage wetlands; Barrie's Lake); Pond (minnow) and pitfall trap survey (VP1 and DF3)	5.5
Apr-06	HM/KD/KL	Pond (minnow) and pitfall trap setting (VP1, DF2 and DF3); Supplemental drift fence survey (DF1, DF2 and DF3) to check for any wildlife caught along the fences	7.5
Apr-07	HA/JH	Pond (minnow) and pitfall trap survey (VP1, DF2 and DF3); supplemental drift fence survey (DF1)	4
Apr-08	KH, HM/JG	Migrant avifaunal survey; general wildlife survey (coverage – wetlands; Barrie's Lake); Pond (minnow) and pitfall trap survey (VP1, DF2 and DF3); supplemental drift fence survey (DF1)	8
Apr-09	HA, CM	Pond (minnow) and pitfall trap survey (VP1, DF1, DF2 and DF3)	5
Apr-10	KD, RH	Pond (minnow) and pitfall trap survey (VP1, DF1, DF2 and DF3)	5
Apr-11	HA, JH	Pond (minnow) and pitfall trap survey (VP1, DF1, DF2 and DF3)	6
Apr-12	KH, KD, KL	Pond (minnow) and pitfall trap survey (VP1, DF1, DF2 and DF3); Calling amphibian survey #1 (Stn 1-10); Road / mortality survey	10.5
Apr-13	KD, HM	Pond (minnow) and pitfall trap survey (VP1, DF1, DF2 and DF3)	6
Apr-14	HM, JH	Pond (minnow) and pitfall trap survey (VP1, DF1, DF2 and DF3)	6
Apr-15	HA, HD	Pond (minnow) and pitfall trap survey (VP1, DF1, DF2 and DF3)	4
Apr-16	JH, AD	Pond (minnow) and pitfall trap survey (VP1, DF1, DF2 and DF3)	4
Apr-17	JH, JE	Pond (minnow) and pitfall trap survey (VP1, DF1, DF2 and DF3)	4
Apr-18	HA, LM	Pond (minnow) and pitfall trap survey (VP1, DF1, DF2 and DF3)	5
Apr-19	KD, LM	Pond (minnow) and pitfall trap survey (VP1, DF1, DF2 and DF3)	4
Apr-20	KD, LM	Pond (minnow) and pitfall trap survey (VP1, DF1, DF2 and DF3)	6
Apr-21	HA, LM	Pond (minnow) and pitfall trap survey (VP1, DF1, DF2 and DF3)	5
Apr-22	KH, HM	Supplemental drift fence survey (DF1, DF2 and DF3) to check for any wildlife caught along the fences	2
Apr-23	HA, LM, HM	Supplemental drift fence survey (DF1, DF2 and DF3) to check for any wildlife caught along the fences; Turtle basking survey	7
Apr-25	KH, KD, RH	Wetland Flagging: Re-flagged southern projection of central wetland (VP2); Pitfall trap setting (VP1, DF1, DF2 and DF3)	5
Apr-26	HA, LM	Pitfall trap survey (DF1, DF2 and DF3); pond trap setting (VP1)	7
Apr-27	HA, LM	Pond (minnow) and pitfall trap survey (VP1, DF1, DF2 and DF3)	10
Apr-28	KH, CM	Pond (minnow) and pitfall trap survey (VP1, DF1, DF2 and DF3)	9
Apr-29	JG	Migrant avifaunal survey (full coverage); turtle basking survey (ponds)	4
May-04	HA, HM	Setting out replacement coverboards	4
May-11	JG	Migrant avifaunal survey (full coverage); turtle basking survey (ponds)	4
May-13	HM	Turtle basking survey	3
May-17	KD, CM	Benthic survey - sampling at stations B6 and B7 (Devil's Creek & Newman's Creek)	12
May-19	KH, LM	Calling amphibian survey #2 (Stn 1-10); Cover board survey	5
May-20	HA	Cover board survey	2
May-25	HA, HM	Badger habitat survey; Breeding bird survey #1	17
May-27	KD, LM	Road / mortality survey	3



Date	Staff	Task	Total hours
May-31	HM	Turtle basking survey	2.25
Jun-01	BD, RH, HM	Vegetation inventory of Units 3, 14, 15 (with focus on Hawthorns); Cover board survey	7.5
Jun-08	HA	Breeding bird survey; Turtle nesting survey	8.5
Jun-09	BD	Vegetation assessment / botanical inventory	3
Jun-20	HM	Turtle nesting survey	4.25
Jun-21	KH/KD	Calling amphibian survey #3; Road / mortality survey	5.5
Jun-23	HA/JH	Marsh Bird Monitoring survey; Cover board survey; Insect survey	16
Jun-28	HA	Turtle nesting survey	3
Jul-07	HM	Cover board survey	4
Jul-12	HM	Marsh Bird Monitoring survey	6
Jul-18	BD/KH	Wetland delineation; botanical inventory and ELC assessment	16
Jul-25	JH	Lepidoptera and Odonata survey	8
Jul-26	HM	Cover board survey	3.5
Aug-11	HM	Cover board survey	3
Aug-25	HM/JH	Cover board survey; Lepidoptera and Odonata survey	12
Sep-12	BD	Vegetation survey and botanical inventory (hedgerows and Unit 16)	7
Sep-13	BD	Soils check at Veg Unit 16	1.5
Sep-16	HM	Cover board survey	3.5
Oct-07	HM	Cover board survey	3.5
Oct-28	HM	Cover board survey	3.5
Nov-01	JG	Vegetation - ELC habitat refinements; supplemental wildlife	4
Nov-02	JE/KD	Fall Spawning Survey 1 (Devil's Creek, Newman's Creek, Un-named Tributary)	5.5
Nov-04	HD	Vegetation / habitat refinements; botanical inventory	7
Nov-12	JE/KD	Fall Spawning Survey 2 (Devil's Creek, Newman's Creek, Un-named Tributary)	5.5
Dec-08	JE/KD	Fall Spawning Survey 3 (Devil's Creek, Newman's Creek, Un-named Tributary) and Habitat Mapping	9.75
Dec-12	JE/KD	Habitat Mapping	5
2012			18.75
Feb-23	BD	Forest assessment for old growth attributes	7
Mar-20	JG	Avifauna - migrant / winter survey (entire site)	3
Mar-21	BD	Veg./ habitat refinements; botanical inventory (Barrie's Lake)	3
Aug-28	JE	Habitat Mapping of Racine Pond	5.75
2013			15
Apr-23	BD	Wetland evaluation VU16, VU18	7.5
May-17	BD	Edge assessment	5
Jul-24	BD	Check status of Persicaria punctatum, VU17	0.5
Jul-31	RH	Wetland Confirmation	2
2014			106.5
21-Apr	TP	Blanding's Turtle, supplemental BB, and general wildlife surveys (WSU 2 and 8)	8
24-Apr	TP	Blanding's Turtle, supplemental BB, and general wildlife surveys (WSU 3 and 6)	3
25-Apr	KVS, SL	Spring amphibian survey (MMP): Stations AM-1 through AM-8	4.5
5-May	JH	Blanding's Turtle, supplemental BB, and general wildlife surveys (WSU 2, 3, 6 and 8)	4
5-Jun	JH	Blanding's Turtle, supplemental BB, and general wildlife surveys (WSU 2, 3, 6 and 8)	4
19-May	KVS, SL	Spring amphibian survey (MMP): Stations AM-1 through AM-8	4
21-May	JH	Blanding's Turtle, supplemental BB, and general wildlife surveys (WSU 2, 3, 6 and 8)	4
26-May	JH	Breeding Bird Survey - WSU1, 2,3,4,6,8 Blanding's Turtle, supplemental BB, and general wildlife surveys (WSU 2, 3, 6 and 8)	9.5
2-Jun	KVS, SL	Spring amphibian survey (MMP): Stations AM-1 through AM-8	4
3-Jun	JH	Breeding Bird Survey - WSU1, 2,3,4,6,8	5
6-Jun	JG	Marsh Monitoring (Birds) and Least Bittern Survey - Station A (Barries Lake east end), Station B (WSU 2), Station C (WSU 6) and Station D (WSU 3)	5



Date	Staff	Task	Total hours
16-Jun	JH	Breeding Bird Survey - WSU1, 2,3,4,6,8	5
20-Jun	JG	Marsh Monitoring (Birds) and Least Bittern Survey - Station A (Barries Lake east end), Station B (WSU 2), Station C (WSU 6) and Station D (WSU 3)	5
26-Jun	NC, CM	Vegetation Monitoring (including plot set up)	7.5
27-Jun	NC	Vegetation Monitoring	6
4-Jul	JG	Marsh Monitoring (Birds) and Least Bittern Survey - Station A (Barries Lake east end), Station B (WSU 2), Station C (WSU 6) and Station D (WSU 3)	5
8-Jul	CL, SL	Aquatic Habitat Assessment for Blenheim Rd re-alignment at Devil's Creek Crossing (called short due to Thunder)	5
10-Jul	CL, SL	Aquatic Habitat Assessment for Blenheim Rd re-alignment at Devil's Creek Crossing	4
25-Sep	NC, CM	Vegetation Monitoring, ELC at Devil's Creek crossing area	8
5-Dec		Bat habitat and general wildlife habitat assessment	6
2015			116.25
14-Apr	TP	Turtle Basking (incl BLTU) Surveys (Round 1), Migrant Waterfowl (Supplemental) Surveys (WSU 2, 3, 6, 8), General Wildlife	9
15-Apr	TP/MD	Amphibian Calling Survey Round 1 / Migrant Waterfowl (Supplemental) Surveys (WSU 2, 3, 6, 8)	7
25-Apr	JH	Turtle Basking (incl BLTU) Surveys (Round 2) / Migrant Waterfowl (Supplemental) Surveys (WSU 2, 3, 6, 8)	8
2-May	JH	Turtle Basking (incl BLTU) Surveys (Round 3) / Migrant Waterfowl (Supplemental) Surveys (WSU 2, 3, 6, 8)	8
8-May	JH	Turtle Basking (incl BLTU) Surveys (Round 4) / Migrant Waterfowl (Supplemental) Surveys (WSU 2, 3, 6, 8)	7
8-May	MD, CM	Amphibian Calling Survey Round 2 / Migrant Waterfowl (Supplemental) Surveys (WSU 2, 3, 6, 8)	5
14-May	JH	Turtle Basking (incl BLTU) Surveys (Round 5) / Migrant Waterfowl (Supplemental) Surveys (WSU 2, 3, 6, 8)	8.5
23-May	JH	Least Bittern Survey Round 1 (WSU 2, 3, 6, 8)	2
2-Jun	JH	Breeding Bird Survey Round 1 (WSU 1, 2,3,6,8); / Marsh Monitoring (Birds) Survey Round 1 (WSU 2, 3, 6, 8); / Least Bittern Survey Round 2 (WSU 2, 3, 6, 8)	10.75
13-Jun	JH	Breeding Bird Survey Round 2 (WSU1, 2,3,6,8); / Least Bittern Survey Round 3 (WSU 2, 3, 6, 8)	7
14-Jun	CoM, JM	Amphibian Calling Survey Round 3	3
23-Jun	JH	Marsh Monitoring (Birds) Survey Round 2 (WSU 2, 3, 6, 8)	2
29-Jun	NC, JM	Vegetation Monitoring	12
30-Jun	NC	Vegetation Monitoring	7
30-Sep	JM	Vegetation Monitoring	10
2-Oct	JM, SL	Vegetation Monitoring	10
2016			233
8-Mar	KD/RL	Pond Assessment at VP1 and VP5. / Put out traps at VP1 and VP5	8
8-Mar	JM/RL	Salamander Trap Setting at VP1	1
9-Mar	HD/KD/MD/NC	Salamander Trap Check at VP1	3
9-Mar	KD/NC	Pond assessment at VP2, 6, 7, 8, 9, 10. / Put out traps at VP2, 7 and 8.	14
9-Mar	NC/CoM	Salamander Trap Setting at VP1, 2, 5, 7, and 8	6
10-Mar	HD/JH	Salamander Trap Check - VP1 and 2	5
10-Mar	KD/CL	Salamander Trap Check at VP5, 7 and 8. / Pond assessment at VP6, 6B, 9 and 10. Put out traps at VP6B and 10	12
10-Mar	BF/SL/RL/SG	Salamander Trap Set at VP1, 2, 5, 6B, 7, 8, 10	8
11-Mar	KH/EK	Salamander Trap Check at VP1, 2, 5, & 6B	5
11-Mar	KD/JM	Salamander Trap Check at VP7, 8, and 10. / Pond Assessment at VP6 and 9	6
14-Mar	KD/CoM	Pond Assessment at VP6, VP9 and VP10	4
14-Mar	CoM/DT	Salamander Trap Set at VP8, 7, 10, 1(Shared with NC/SG)	5
14-Mar	NC/SG	Salamander Trap Set at VP2, 5, 6b, 1 (shared with CoM/DT)	5
15-Mar	KD/MD	Salamander Trap Check at VP2, 5, 6B, 1 (shared with JH/TP)	7
15-Mar	JH/TP	Salamander Trap Check at VP7, 8, 10 and 1 (shared with KD/MD)	7
15-Mar	CoM/EK	Salamander Trap Set at VP8, 7, 10, 1	5
15-Mar	DT/SG	Salamander Trap Set at VP2, 5, 6b,	5
16-Mar	HD/JV	Salamander Trap Check at VP2, 5, 6B, 1 (shared with JH/TP)	7
16-Mar	TP/JH	Salamander Trap Check at VP8, VP7, VP10 and VP1 (shared with HD/JV)	7
22-Mar	KD/CL	Pond Assessment at VP6, VP9 and VP10	4



Date	Staff	Task	Total hours
22-Mar	TP, MD	Salamander Trap Set at VP2 and VP5	4
22-Mar	CoM, EK	Salamander Trap Set at VP 7, 8, 10, 1, and 6b	4
23-Mar	JM, SL	Salamander Trap Check at VP8, 7, 10, 1	4
23-Mar	CoM, LT	Salamander Trap Check at VP5, VP2, VP6b	4
30-Mar	JM, KD	Pond Assessment at VP6, VP9 and VP10	6
30-Mar	CoM, HD	Salamander Trap Set at VP1, 6, 7, 8, 9, & 10	4
30-Mar	SG, TP	Salamander Trap Set at VP2, 5, & 6b	4
31-Mar	JM, CoM	Salamander Trap Check at VP5, VP2, & VP1	8
31-Mar	NC, KD	Salamander Trap Check at VP7, 8, 9, 10, 6, & 6b	8
14-Apr	MD, RL	Salamander Trap Set at VP2, 5, 6b	4
14-Apr	CoM, SL	Salamander Trap Set at VP1, 6, 7, 8, 9, & 10	4
15-Apr	KD, JM	Salamander Trap Check at VP2, VP 5 and VP1	8
15-Apr	JH, SL	Salamander Trap Check at VP6, 6b, 7, 8, 9 and 10	8
21-Apr	KD, MD	Salamander Trap Set at VP6, 7, 8, 9 and 10	3
21-Apr	TP, CoM	Salamander Trap Set at VP1, 2, 5, 6B	3
22-Apr	JH, RL	Salamander Trap Check at VP6, 7, 8, 9 and 10	4
22-Apr	SL, CoM	Salamander Trap Check at VP1, 1, 5 and 6B	4
25-Apr	CoM, JH	Salamander Trap Set at VP1, 6, 7, 8, 9 and 10	4
25-Apr	TP, SG	Salamander Trap Set at VP2, 5 and 6B	3
26-Apr	MD, JH	Salamander Trap Check at VP6, 7, 8, 9 and 10	4
26-Apr	CoM, SG	Salamander Trap Check at VP1, 2, 5 and 6B	4
2-May	CL, CoM	Pond assessment at all ponds; trap take-down	10
2017			12.75
2-Mar	JM	Recording Phragmites abundance and locating rare oak species	4
16-May	JG, JM	Site Walk to evaluate collector road alignment alternatives; vegetation and wildlife	6
27-Jun	LW	Locating Dotted Smartweed and identifying oaks; supplemental wildlife observations	2.75
2018			28.25
17-Jan	MD	Winter Raptor survey (Round 1)	3.5
13-Feb	MD	Winter Raptor survey (Round 2)	2.75
5-Mar	MD	Winter Raptor survey (Round 3)	3
23-Nov	JM, LW	Tree inventory	16
10-Dec	LW	Tree inventory, Phragmites abundance, Sky Blue Aster survey	3
2019			135
8-April	SL, LW	Amphibian Calling Survey Round 1	5
5-May	TP	Turtle Basking Survey Round 1, Migrant Waterfowl Survey (WSU 2,3,6,8, [West end]), General Wildlife	5.75
15-May	TP	Turtle Basking Survey Round 2, Migrant Waterfowl Survey (WSU 2,3,6,8, [West end]), General Wildlife	5.25
21-May	TP	Turtle Basking Survey Round 3, Migrant Waterfowl Survey (WSU 2,3,6,8, [West end]), General Wildlife	5
29-May	SL, MD	Amphibian Calling Survey Round 2, Marsh Bird Survey Round 1	7
30-May	JM, CB	ELC and Vegetation Inventory Round 1	8
31-May	TP	Turtle Basking Survey Round 4, Least Bittern Survey (Round 1: WSU 2,3,6,8 [West end]), Breeding Birds (Round 1: WSU1, 2,3,4,6,8 [West end]), General Wildlife	9.5
18-Jun	TP	Turtle Basking Survey Round 5, Least Bittern Survey (Round 2: WSU 2,3,6,8 [West end]), Breeding Birds (Round 2: WSU1, 2,3,4,6,8 [West end]), General Wildlife	8.5
24-Jun	JM, CB	Vegetation Monitoring for Upland Plots	15
25-Jun	JM, CB	Vegetation Monitoring for Upland Plots	10
27-Jun	SL, MD	Amphibian Calling Survey Round 3, Marsh Bird Survey Round 2	7
28-Jun	TP	Least Bittern Survey (Round 3: WSU 2,3,6,8 [West end]), General Wildlife	1
17-Jul	JM	ELC and Vegetation Inventory Round 2	6
23-Jul	JM	Wetland Delineation	7
30-Jul	JM	Wetland Delineation	7



Date	Staff	Task	Total hours
23-Sep	JM, CB	Vegetation Monitoring for Wetland Plots	15
24-Sep	JM, CB	Vegetation Monitoring for Upland Plots, Acorn collection from Hill's Oak	13
2020			110
8-Apr	SL, MD	Amphibian Calling Survey Round 1	4
27-Apr	TP	Turtle Basking Survey Round 1, Migrant Waterfowl Survey (WSU 2,3,6,8 [West end]), General Wildlife	5
16-May	TP	Turtle Basking Survey Round 2, Migrant Waterfowl Survey (WSU 2,3,6,8 [West end]), General Wildlife	5.5
21-May	TP	Turtle Basking Survey Round 3, Migrant Waterfowl Survey (WSU 2,3,6,8 [West end]), General Wildlife	5.5
25-May	SL, MD	Amphibian Calling Survey Round 2, Marsh Bird Survey Round 1	7
27-May	TP	Least Bittern Survey (Round 1: WSU 2,3,6,8 [West end]), Breeding Birds (Round 1: WSU1, 2,3,4,6,8 [West end]), General Wildlife	5
1-Jun	TP	Turtle Basking Survey Round 4, Migrant Waterfowl Survey (WSU 2,3,6,8 [West end]), General Wildlife	4
13-Jun	TP	Turtle Basking Survey Round 5, Migrant Waterfowl Survey (WSU 2,3,6,8 [West end]), General Wildlife	3.5
17-Jun	SL, MD	Amphibian Calling Survey Round 3, Marsh Bird Survey Round 2	8
18-Jun	TP	Least Bittern Surveys (Round 2: WSU 2, 3, 6, 8 [West end]), Breeding Bird Surveys (Round 2: WSU1, 2, 3, 4, 6, 8 [West end]), General Wildlife	6
23-Jun	JM, CB	Vegetation Monitoring for Wetland Plots	15
24-Jun	JM, CB	Vegetation Monitoring for Upland Plots	15
6-Jul	TP	Least Bittern Surveys (Round 3: WSU 2, 3, 6, 8 [West end]), General Wildlife	1
23-Sep	JM, CP	Vegetation Monitoring for Wetland Plots	15
24-Sep	JM	Vegetation Monitoring for Upland Plots, Acorn collection from Hill's Oak	5
29-Sep	CP	Vegetation Monitoring for Upland Plots	5.5
2021			95.75
6-Apr	TP	Turtle Basking (incl. Blanding's Turtle) surveys (Round 1) and Migrant Waterfowl Surveys (WSU 2, 3, 6, 8 [West end]) General Wildlife	4.75
12-Apr	SL, CVD	Amphibian Calling Survey (Round 1)	5
23-Apr	TP	Turtle Basking (incl. Blanding's Turtle) surveys (Round 2) and Migrant Waterfowl Surveys (WSU 2, 3, 6, 8 [West end]) General Wildlife	4
12-May	TP	Turtle Basking (incl. Blanding's Turtle) surveys (Round 3) and Migrant Waterfowl Surveys (WSU 2, 3, 6, 8 [West end]) General Wildlife	3.75
31-May	MD, CVD	Marsh Bird Surveys (Round 1) – (WSU 2, 3, 6, 8 [West end])	4
31-May	MD, CVD	Amphibian Calling Survey (Round 2)	4.5
7-Jun	TP	Turtle Basking (incl. BLTU) surveys (Round 4), Breeding Bird Surveys (Round 1a) and Least Bittern Surveys (Round 1) - (WSU 2, 3, 6, 8 [West end])	4.75
8-Jun	TP	Breeding Bird Surveys (Round 1b) – WSU 1 and 4	2.25
16-Jun	TP	Turtle Basking (Incl. Blanding's Turtle) Surveys (Round 5) and General Wildlife (WSU 2, 3, 6, 8 [West end])	2.5
16-Jun	CP, AT	Vegetation Monitoring for wetland plots (City/TWP)	18
17-Jun	CP, AT	Vegetation Monitoring for woodland plots (City)	12
28-Jun	LW, CB	Amphibian Calling Survey (Round 3)	6
28-Jun	TP	Breeding Bird Surveys (Round 2a) and Least Bittern Surveys (Round 2a) – (WSU 2, 3, 8 [West end])	2.5
29-Jun	TP	Breeding Bird Surveys (Round 2b) and Least Bittern Surveys (Round 2b) – (WSU 1, 4, 6)	2.75
30-Jun	TP	Marsh Bird Surveys (Round 2) – (WSU 2, 3, 6, 8 [West end])	1
5-Jul	TP	Least Bittern Surveys (Round 3) – (WSU 2, 3, 6, 8 [West end])	1
29-Sep	AT, PP	Vegetation Monitoring for wetland plots (City/TWP)	14
7-Oct	CP	Hill's Oak Collection	3
2022			113.25
12-Apr	TP	Turtle Basking (incl BLTU) Survey (Round 1) and Migrant Waterfowl Surveys (WSU 2, 3, 6, 8 [West end]), General Wildlife	6
22-Apr	TP	Turtle Basking (incl BLTU) Survey (Round 2) and Migrant Waterfowl Surveys (WSU 2, 3, 6, 8 [West end]), General Wildlife	4
25-Apr	MD, PP	AC Survey (Round 1)	6
29-Apr	TP, PP	Turtle Basking (incl BLTU) Survey (Round 3) and Migrant Waterfowl Surveys (WSU 2, 3, 6, 8 [West end]), General Wildlife	9
5-May	TP	Turtle Basking (incl BLTU) Survey (Round 4) and Migrant Waterfowl Surveys (WSU 2, 3, 6, 8 [West end]), General Wildlife	4.5



Date	Staff	Task	Total hours
13-May	TP	Turtle Basking (incl BLTU) Survey (Round 5) and Migrant Waterfowl Surveys (WSU 2, 3, 6, 8 [West end]), General Wildlife	3.75
24-May	MD, LT	Marsh Bird Survey (Round 1)	3
25-May	MD, LT	AC Survey (Round 2)	4.5
2-Jun	TP	Breeding Bird Survey (Round 1) -- WSU 1 and 4	5
2-Jun	TP	LEBI Survey (Round 1) -- (WSU 2, 3, 6, 8 [West end])	1
25-Jun	TP	Breeding Bird Survey (Round 2) -- WSU 1 and 4	4.5
25-Jun	TP	LEBI Survey (Round 2) -- (WSU 2, 3, 6, 8 [West end])	1
30-Jun	ND, CB	AC Survey (Round 3)	5.5
4-Jul	CB, CP	Vegetation monitoring (woodland plots)	10
4-Jul	MD	Marsh Bird Survey (Round 2) -- (WSU 2, 3, 6, 8 [West end])	12
6-Jul	CB, CP	Vegetation monitoring (wetland plots)	10
9-Jul	SG	LEBI Survey (Round 3) -- (WSU 2, 3, 6, 8 [West end])	1.5
29-Sep	CB,CP	Vegetation monitoring (wetland plots)	12
30-Sep	CB, CP	vegetation monitoring (woodland plots)	10
2023			98.75
12-Apr	TP	Turtle Basking (incl BLTU) Survey (Round 1) and Migrant Waterfowl Surveys (WSU 2, 3, 6, 8 [West end]), General Wildlife	6
14-Apr	ND, CB	Spring amphibian breeding surveys (Marsh Monitoring Protocol, MMP) – all locations	5
27-Apr	TP	Turtle Basking (incl BLTU) Survey (Round 2) and Migrant Waterfowl Surveys (WSU 2, 3, 6, 8 [West end]), General Wildlife	5
5-May	TP	Turtle Basking (incl BLTU) Survey (Round 3) and Migrant Waterfowl Surveys (WSU 2, 3, 6, 8 [West end]), General Wildlife	4.5
11-May	ND, CB	Spring amphibian breeding surveys (Marsh Monitoring Protocol, MMP) – all locations	5
19-May	TP	Turtle Basking (incl BLTU) Survey (Round 4) and Migrant Waterfowl Surveys (WSU 2, 3, 6, 8 [West end]), General Wildlife	3.75
25-May	TP	Breeding Bird Survey (Round 1) -- WSU 1, 3, 4, 6	5
25-May	TP	LEBI Survey (Round 1) -- (WSU 3, 6)	0.5
26-May	TP	Turtle Basking (incl BLTU) Survey (Round 5), General Wildlife	3.25
26-May	TP	Breeding Bird Survey (Round 1, cont') -- WSU 2, 8 [West end]	1.75
26-May	TP	LEBI Survey (Round 1, cont') -- WSU 2, 8 [West end]	0.5
31-May	MD, ND	Marsh Bird Survey (Round 1) -- (WSU 2, 3, 6, 8 [West end])	5
6-June	TP	Breeding Bird Survey (Round 2) -- WSU 2, 3, 8 [West end]	3
6-June	TP	LEBI Survey (Round 2) -- WSU 2, 3, 8 [West end]	0.75
7-June	TP	Breeding Bird Survey (Round 2, cont') -- WSU 1,4,6	2.5
7-June	TP	LEBI Survey (Round 2, cont') -- WSU 6	0.25
20-June	TP	LEBI Survey (Round 3) -- (WSU 2, 3, 6, 8 [West end])	1
22-June	ND, CB	Spring amphibian breeding surveys (Marsh Monitoring Protocol, MMP) – all locations	5
27-June	CB	Vegetation monitoring (woodland plots)	8
28-June	CB, CP	vegetation monitoring (wetland plots)	12
10-July	TP	Marsh Bird Survey (Round 2) -- (WSU 2, 3, 6, 8 [West end])	1
26-Sep	CB	Vegetation monitoring (woodland plots)	8
27-Sep	CB, RJ	vegetation monitoring (wetland plots)	12
2024			166.75
6-Mar	JG, PP	Site recon visit	5
9-Apr	SL, PP	Wildlife Camera Installation	5
10-Apr	ND, SS	Spring amphibian breeding surveys (Marsh Monitoring Protocol, MMP) – all locations and Wildlife Corridor Inspection	5
10-Apr	MD	Turtle Basking (incl BLTU) Survey (Round 1) and Migrant Waterfowl Surveys (WSU 2, 3, 6, 8 [West end]), General Wildlife	4
18-Apr	CB, PP	Wildlife Corridor Inspection (Round 1)	4
22-Apr	CB, PP	Wildlife Corridor Inspection (Round 2)	4



Date	Staff	Task	Total hours
26-Apr	MD	Turtle Basking (incl BLTU) Survey (Round 2) and Migrant Waterfowl Surveys (WSU 2, 3, 6, 8 [West end]), General Wildlife	3.75
29-Apr	CB, PP	Wildlife Corridor Inspection (Round 3)	4
30-Apr	CB, RJ	Wildlife Corridor Inspection (Round 4)	4
3-May	CB, MD	Wildlife Corridor Inspection (Round 5)	6
7-May	MD	Turtle Basking (incl BLTU) Survey (Round 3) and Migrant Waterfowl Surveys (WSU 2, 3, 6, 8 [West end]), General Wildlife	3.25
10-May	ND, PP	Spring amphibian breeding surveys (Marsh Monitoring Protocol, MMP) – all locations and Wildlife Corridor Inspection	4.5
16-May	MD	Turtle Basking (incl BLTU) Survey (Round 4) and Migrant Waterfowl Surveys (WSU 2, 3, 6, 8 [West end]), General Wildlife	3.5
24-May	GG	Turtle Basking (incl BLTU) Survey (Round 5) and Migrant Waterfowl Surveys (WSU 2, 3, 6, 8 [West end]), General Wildlife	3.25
30-May	MD	Marsh Bird Survey (Round 1) -- (WSU 2, 3, 6, 8 [West end])	2
12-Jun	MD	Breeding Bird Survey (Round 1) – WSU 2, 3, 4, 6, 8 [West end]	4.25
12-Jun	MD	LEBI Survey (Round 1) -- (WSU 2, 3, 6, 8 [West end])	2
20-Jun	MD	LEBI Survey (Round 2) -- (WSU 6)	0.25
27-Jun	CB	Vegetation Monitoring (woodland plots)	8
28-Jun	MD	Breeding Bird Survey (Round 2) – WSU 2, 3, 4, 8 [West end]	3.75
28-Jun	MD	LEBI Survey (Round 2, cont') – (WSU 2, 3, 8 [West end])	2
28-Jun	CB, SS	Vegetation Monitoring (wetland plots)	14
3-Jul	CB, GG	Vegetation Monitoring (buffer plot installation and wetland plots)	14
4-Jul	CB, GG	Vegetation Monitoring (buffer plot installation and wetland plots)	14
4-Jul	MD	Marsh Bird Survey (Round 2) -- (WSU 2, 3, 6, 8 [West end])	1.5
8-Jul	PP	Breeding Bird Survey (Round 2, cont') -- WSU 6	1.75
8-Jul	PP	LEBI Survey (Round 2) – (WSU 2, 3, 6, 8 [West end])	2
9-Jul	CB	Vegetation Monitoring (woodland plots)	8
27-Sep	CB	Vegetation Monitoring (woodland plots)	8
1-Oct	CB, SS	Vegetation Monitoring (wetland plots)	14
3-Oct	CB	Vegetation Monitoring (buffer and woodland plots)	8
Total			2,499.75

APPENDIX C

VASCULAR PLANT SPECIES LIST



Table C.1. Vascular Plant Species List, Westwood Village Phase 2 Study Area

SCIENTIFIC NAME	COMMON NAME	CC ¹	CW ¹	WEEDINESS ¹	OWES WETLAND PLANT ²	G RANK ³	S RANK ⁴	COSEWIC ⁵	SARA ⁶	SARO ⁷	CAROLINIAN ZONE (OLDHAM 2017) ⁸	WATERLOO REGION (1999) ⁸	PHYSIOLOGY ¹	NATIVE STATUS ⁹	UNIT 1A	UNIT 1B	UNIT 2	UNIT 3	UNIT 4	UNIT 5	UNIT 10	UNIT 11	UNIT 12	UNIT 18
<i>Abutilon theophrasti</i>	Velvetleaf		3	-1		GNR	SNA				IC		Forb	I							X			X
<i>Acer negundo</i>	Manitoba Maple	0	0		X	G5	S5				C		Tree	N	X	X					X	X		
<i>Acer rubrum</i>	Red Maple	4	0		X	G5	S5				C		Tree	N		X			X	X		X		
<i>Acer saccharum</i>	Sugar Maple	4	3			G5	S5				C		Tree	N	X	X	X	X	X	X		X		
<i>Acer spicatum</i>	Mountain Maple	6	3		X	G5	S5				U		Tree	N						X				
<i>Acer x freemanii</i>	Freeman's Maple	6	-5		X	GNA	SNA				hyb		Tree	N						X		X		
<i>Actaea pachypoda</i>	White Baneberry	6	5			G5	S5				C		Forb	N			X	X						
<i>Actaea rubra</i>	Red Baneberry	6	3			G5	S5				C		Forb	N			X							
<i>Aegopodium podagraria</i>	Goutweed		0	-3		GNR	SNA				IU		Forb	I	X									
<i>Agrimonia gryposepala</i>	Hooked Agrimony	2	3			G5	S5				C		Forb	N			X	X		X				
<i>Agrostis gigantea</i>	Redtop		-3	-2		G4G5	SNA				IC		Grass	I							X			
<i>Agrostis scabra</i>	Rough Bentgrass	6	0		X	G5	S5				R		Grass	N					X					
<i>Alisma triviale</i>	Northern Water-plantain	1	-5		X	G5	S5				X		Forb	N		X				X	X	X	X	X
<i>Alliaria petiolata</i>	Garlic Mustard		0	-3		GNR	SNA				IC		Forb	I	X		X	X				X		
<i>Allium tricoccum</i> var. <i>tricoccum</i>	Wild Leek	7	3			G--T5	S4				C		Forb	N			X	X						
<i>Amaranthus retroflexus</i>	Redroot Amaranth		3	-1		G5	SNA				IC		Forb	I							X			
<i>Ambrosia artemisiifolia</i>	Common Ragweed	0	3			G5	S5				C		Forb	N	X						X	X	X	
<i>Amelanchier arborea</i>	Downy Serviceberry	5	3			G5	S5				C		Tree	N				X						
<i>Amelanchier laevis</i>	Smooth Serviceberry	5	5			G5	S5				C		Tree	N			X	X	X					
<i>Amphicarpaea bracteata</i>	American Hog Peanut	4	0		X	G5	S5				C		Forb	N				X		X				
<i>Anemone quinquefolia</i>	Wood Anemone	7	0			G5	S5				C		Forb	N			X	X		X				
<i>Anthemis cotula</i>	Stinking Chamomile		3	-1		G5	SNA				IU		Forb	I	X									
<i>Apocynum androsaemifolium</i>	Spreading Dogbane	3	5			G5	S5				C		Forb	N	X									
<i>Apocynum cannabinum</i> var. <i>cannabinum</i>	Hemp Dogbane	3	0			G5T5	S5				C		Forb	N	X			X						
<i>Aralia nudicaulis</i>	Wild Sarsaparilla	4	3			G5	S5				C		Forb	N			X	X	X	X				
<i>Aralia racemosa</i>	American Spikenard	7	5			G5	S5				C		Forb	N						X				
<i>Arctium minus</i>	Common Burdock		3	-2		GNR	SNA				IC		Forb	I	X		X	X						
<i>Arisaema triphyllum</i>	Jack-in-the-pulpit	5	-3		X	G5	S5				C		Forb	N			X	X		X				
<i>Asarum canadense</i>	Canada Wild Ginger	6	5			G5	S5				C		Forb	N				X						
<i>Asclepias exaltata</i>	Poke Milkweed	8	5			G5	S4				R		Forb	N			X	X						
<i>Asclepias incarnata</i>	Swamp Milkweed	6	-5		X	G5	S5				C		Forb	N					X		X	X		
<i>Asclepias syriaca</i>	Common Milkweed	0	5			G5	S5				C		Forb	N	X						X	X		
<i>Athyrium filix-femina</i>	Common Lady Fern	4	0			G5	S5						Fern	N				X		X				
<i>Barbarea vulgaris</i>	Bitter Wintercress		0	-1		GNR	SNA				IC		Forb	I	X									



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<i>Berberis thunbergii</i>	Japanese Barberry		3	-3		GNR	SNA				IX		Shrub	I			X	X		X				
<i>Berberis vulgaris</i>	Common Barberry		3	-2		GNR	SNA				IX		Shrub	I							X			
<i>Berteroa incana</i>	Hoary Alyssum		5	-3		GNR	SNA				IX		Forb	I	X						X			
<i>Betula alleghaniensis</i>	Yellow Birch	6	0		X	G5	S5				C		Tree	N				X	X	X				
<i>Betula papyrifera</i>	Paper Birch	2	3		X	G5	S5				C		Tree	N				X	X	X				
<i>Bidens cernua</i>	Nodding Beggarticks	2	-5		X	G5	S5				C		Forb	N		X					X	X	X	X
<i>Bidens frondosa</i>	Devil's Beggarticks	3	-3		X	G5	S5				C		Forb	N		X				X		X		X
<i>Bidens tripartita</i>	Three-parted Beggarticks	5	-3		X	G5	S5?				C		Forb	N		X			X	X		X		
<i>Bidens vulgata</i>	Tall Beggarticks	5	0		X	G5	S5				C		Forb	N		X								
<i>Boehmeria cylindrica</i>	False Nettle	4	-5		X	G5	S5				C		Forb	N					X	X				
<i>Brachyelytrum erectum</i>	Southern Shorthusk	7	3		X	G4G5	S4				U		Grass	N				X						
<i>Bromus inermis</i>	Smooth Brome		5	-3		G5	SNA				IC		Grass	I	X							X	X	X
<i>Bromus tectorum</i>	Downy Brome		5	-2		GNR	SNA				IC		Grass	I							X			
<i>Calamagrostis canadensis</i> var. <i>canadensis</i>	Bluejoint Reedgrass	4	-5		X	G5T5	S5				C		Grass	N		X						X		
<i>Calla palustris</i>	Wild Calla	8	-5		X	G5	S5				R	W*	Forb	N		X								
<i>Caltha palustris</i>	Yellow Marsh Marigold	5	-5		X	G5	S5				C		Forb	N					X	X				
<i>Capsella bursa-pastoris</i>	Common Shepherd's Purse		3	-1		GNR	SNA				IC		Forb	I	X									
<i>Cardamine diphylla</i>	Two-leaved Toothwort	7	3			G5	S5				C		Forb	N						X				
<i>Cardamine pensylvanica</i>	Pennsylvania Bittercress	6	-3		X	G5	S5				C		Forb	N					X	X				
<i>Carduus acanthoides</i>	Spiny Plumeless-thistle		5			GNR	SNA				IC		Forb	I							X			
<i>Carex arctata</i>	Drooping Woodland Sedge	5	5			G5	S5				C		Sedge	N				X						
<i>Carex atherodes</i>	Wheat Sedge	6	-5		X	G5	S4				R	W	Sedge	N								X		
<i>Carex bromoides</i>	Brome-like Sedge	7	-3		X	G5	S5				C		Sedge	N						X				
<i>Carex crinita</i>	Fringed Sedge	6	-5		X	G5	S5				C		Sedge	N					X	X	X	X		
<i>Carex cristatella</i>	Crested Sedge	3	-3		X	G5	S5				C		Sedge	N					X					
<i>Carex deweyana</i>	Dewey's Sedge	6	3			G5	S5				C		Sedge	N			X	X						
<i>Carex gracillima</i>	Graceful Sedge	4	3		X	G5	S5				C		Sedge	N				X		X				
<i>Carex hystericina</i>	Porcupine Sedge	5	-5		X	G5	S5				C		Sedge	N							X	X		
<i>Carex intumescens</i>	Bladder Sedge	6	-3		X	G5	S5				C		Sedge	N				X		X				
<i>Carex lacustris</i>	Lake Sedge	5	-5		X	G5	S5				C		Sedge	N		X				X		X		
<i>Carex laevivaginata</i>	Smooth-sheathed Sedge	8	-5		X	G5	S4				U	W	Sedge	N						X				
<i>Carex laxiculmis</i> var. <i>laxiculmis</i>	Spreading Sedge	7	3			G5T5	S4				C	W	Sedge	N				X						
<i>Carex leptonervia</i>	Finely-nerved Sedge	5	0			G5	S5				U		Sedge	N				X						
<i>Carex pedunculata</i>	Long-stalked Sedge	5	3			G5	S5				C		Sedge	N				X		X				
<i>Carex pellita</i>	Woolly Sedge	2	-5		X	G5	S5				C		Sedge	N		X								



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<i>Carex pensylvanica</i>	Pennsylvania Sedge	5	5			G5	S5				C		Sedge	N			X	X		X				
<i>Carex pseudocyperus</i>	Cyperus-like Sedge	6	-5		X	G5	S5				U		Sedge	N					X			X		
<i>Carex radiata</i>	Eastern Star Sedge	4	0		X	G5	S5				C		Sedge	N				X		X				
<i>Carex rosea</i>	Rosy Sedge	2	5			G5	S5				C		Sedge	N			X	X						
<i>Carex scabrata</i>	Eastern Rough Sedge	8	-5		X	G5	S5				U	W	Sedge	N						X				
<i>Carex sp.</i>	Sedge sp.												Sedge		X	X				X				
<i>Carex sparganioides</i>	Burreed Sedge	5	3			G5	S4S5				C	W*	Sedge	N			X	X						
<i>Carex stipata</i>	Awl-fruited Sedge	3	-5		X	G5	S5				C		Sedge	N			X	X			X			
<i>Carex stricta</i>	Tussock Sedge	4	-5		X	G5	S5				C		Sedge	N		X			X	X				
<i>Carex tenera</i>	Tender Sedge	4	0		X	G5	S5				C		Sedge	N			X							
<i>Carex tuckermanii</i>	Tuckerman's Sedge	7	-5		X	G5	S5				U	W	Sedge	N								X		
<i>Carex utriculata</i>	Beaked Sedge	7	-5		X	G5	S5				R													
<i>Carex vulpinoidea</i>	Fox Sedge	3	-5		X	G5	S5				C		Sedge	N						X	X		X	
<i>Carpinus caroliniana</i>	Blue-beech	6	0		X	G5	S5				C		Tree	N			X	X	X	X				
<i>Carya cordiformis</i>	Bitternut Hickory	6	0			G5	S5				C		Tree	N			X	X						
<i>Caulophyllum thalictroides</i>	Blue Cohosh	5	5			G5	S5				X		Forb	N			X	X						
<i>Celtis occidentalis</i>	Common Hackberry	8	0			G5	S4				C	W*	Tree	N			X	X						
<i>Ceratophyllum demersum</i>	Common Hornwort	4	-5		X	G5	S5				U		Forb	N		X					X			
<i>Chelidonium majus</i>	Greater Celandine		5	-3		GNR	SNA				IU		Forb	I			X							
<i>Chelone glabra</i>	White Turtlehead	7	-5		X	G5	S5				C		Forb	N					X	X				
<i>Chenopodium album</i>	Common Lamb's-quarters		3	-1		G5	SNA				IC		Forb	I							X			
<i>Chrysosplenium americanum</i>	American Golden-saxifrage	8	-5		X	G5	S4				U		Forb	N					X					
<i>Cichorium intybus</i>	Wild Chicory		5	-1		GNR	SNA				IC		Forb	I	X				X				X	
<i>Cicuta bulbifera</i>	Bulbous Water-hemlock	5	-5		X	G5	S5				C		Forb	N		X		X	X	X	X	X		
<i>Cicuta maculata</i>	Spotted Water-hemlock	6	-5		X	G5	S5						Forb	N					X	X				
<i>Cinna latifolia</i>	Drooping Woodreed	7	-3		X	G5	S5				R		Grass	N						X				
<i>Circaea alpina</i>	Small Enchanter's Nightshade	6	-3		X	G5	S5				C		Forb	N						X				
<i>Circaea canadensis</i>	Broad-leaved Enchanter's Nightshade	2	3			G5	S5				C		Forb	N	X		X	X						
<i>Cirsium arvense</i>	Canada Thistle		3	-1		G5	SNA				IC		Forb	I	X						X	X	X	
<i>Cirsium vulgare</i>	Bull Thistle		3	-1		GNR	SNA				IC		Forb	I	X						X			
<i>Clintonia borealis</i>	Yellow Clintonia	7	0		X	G5	S5				U		Forb	N						X				
<i>Comarum palustre</i>	Marsh Cinquefoil	7	-5		X	G5	S5				R		Forb	N					X					
<i>Convallaria majalis</i>	European Lily-of-the-valley		5	-2		G5	SNA				IX		Forb	I			X	X						
<i>Coptis trifolia</i>	Goldthread	7	-3		X	G5	S5				C		Forb	N						X				
<i>Cornus alternifolia</i>	Alternate-leaved Dogwood	6	3			G5	S5				C		Shrub	N			X	X		X				



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<i>Cornus canadensis</i>	Bunchberry	7	0			G5	S5				U		Shrub	N						X				
<i>Cornus obliqua</i>	Silky Dogwood	2	-3		X	G5	S5				C		Shrub	N		X						X		
<i>Cornus racemosa</i>	Grey Dogwood	2	0		X	G5	S5				C		Shrub	N			X					X		
<i>Cornus rugosa</i>	Round-leaved Dogwood	6	5			G5	S5				C		Shrub	N	X									
<i>Cornus sericea</i>	Red-osier Dogwood	2	-3		X	G5	S5				C		Shrub	N		X		X	X	X	X	X		
<i>Corylus cornuta</i>	Beaked Hazelnut	5	3			G5	S5				U		Shrub	N						X				
<i>Crataegus coccinea</i> var. <i>pringlei</i>	Pringle's Hawthorn	4	5			G--T5	S5				U	W*	Tree	N				X						
<i>Crataegus macrosperma</i>	Big-fruited Hawthorn	4	5			G5	S5				C		Tree	N			X							
<i>Crataegus punctata</i>	Dotted Hawthorn	4	5			G5	S5				C		Tree	N	X									
<i>Crepis capillaris</i>	Smooth Hawksbeard		5	-1		GNR	SNA				IR		Forb	I	X									
<i>Cynoglossum officinale</i>	Common Hound's-tongue		5	-1		GNR	SNA				IU		Forb	I							X			
<i>Cyperus esculentus</i>	Perennial Yellow Flatsedge	1	-3		X	G5	S5				C		Sedge	N							X			X
<i>Cystopteris bulbifera</i>	Bulblet Bladder Fern	5	-3		X	G5	S5				C		Fern	N						X				
<i>Dactylis glomerata</i>	Orchard Grass		3	-1		GNR	SNA				IC		Grass	I							X		X	
<i>Datura stramonium</i>	Jimsonweed		5	-1		GU	SNA				IR		Forb	I	X						X			
<i>Daucus carota</i>	Wild Carrot		5	-2		GNR	SNA				IC		Forb	I	X						X	X	X	X
<i>Diervilla lonicera</i>	Northern Bush-honeysuckle	5	5			G5	S5				C		Shrub	N	X		X	X						
<i>Digitaria sanguinalis</i>	Hairy Crabgrass		3	-1		G5	SNA				IC		Grass	I							X			
<i>Dipsacus fullonum</i>	Common Teasel		3	-1		GNR	SNA				IC		Forb	I	X						X			
<i>Dirca palustris</i>	Eastern Leatherwood	7	0			G4	S4				U		Shrub	N				X						
<i>Dryopteris carthusiana</i>	Spinulose Wood Fern	5	-3		X	G5	S5				C		Fern	N			X		X	X				
<i>Dryopteris cristata</i>	Crested Wood Fern	7	-5		X	G5	S5				U		Fern	N					X	X				
<i>Dryopteris intermedia</i>	Evergreen Wood Fern	5	0			G5	S5				C		Fern	N				X	X	X		X		
<i>Dulichium arundinaceum</i>	Three-way Sedge	7	-5		X	G5	S5				R		Sedge	N					X					
<i>Echinochloa crus-galli</i>	Large Barnyard Grass		-3	-1	X	GNR	SNA				IC		Grass	I	X						X	X	X	X
<i>Echinocystis lobata</i>	Wild Cucumber	3	-3		X	G5	S5				C		Vine	N	X							X		X
<i>Echium vulgare</i>	Common Viper's Bugloss		5	-2		GNR	SNA				IC		Forb	I							X			
<i>Eleocharis obtusa</i>	Blunt Spikerush	5	-5		X	G5	S5				C		Sedge	N							X	X		
<i>Eleocharis palustris</i>	Common Spikerush	6	-5		X	G5?	S5				R		Sedge	N							X	X	X	
<i>Eleocharis</i> sp.	Spikerush sp.												Sedge	N		X								
<i>Elymus hystrix</i>	Bottlebrush Grass	5	5			G5	S5				C		Grass	N				X						
<i>Epifagus virginiana</i>	Beechdrops	6	5			G5	S5				C		Forb	N				X		X				
<i>Epilobium ciliatum</i>	Northern Willowherb	3	-3		X	G5	S5						Forb	N						X				
<i>Epilobium coloratum</i>	Purple-veined Willowherb	3	-5		X	G5	S5				C		Forb	N							X			
<i>Epilobium hirsutum</i>	Great-hairy Willowherb		-4		X	GNR	SNA				IU		Forb	I							X			
<i>Epilobium parviflorum</i>	Small-flowered Willowherb		3	-1	X	GNR	SNA				IU		Forb	I	X					X	X	X		X



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<i>Epipactis helleborine</i>	Broad-leaved Helleborine		3	-2		GNR	SNA				IC		Forb	I			X	X	X	X	X			
<i>Equisetum arvense</i>	Field Horsetail	0	0		X	G5	S5				C		Fern	N				X	X	X	X	X		X
<i>Equisetum fluviatile</i>	Water Horsetail	7	-5		X	G5	S5				U		Fern	N		X								
<i>Equisetum hyemale</i>	Common Scouring-rush	2	0		X	G5	S5				C		Fern	N				X		X				
<i>Equisetum palustre</i>	Marsh Horsetail	10	-3		X	G5	S5				R	W	Fern	N						X				
<i>Equisetum scirpoides</i>	Dwarf Scouring-rush	7	0		X	G5	S5				R		Fern	N				X						
<i>Erigeron annuus</i>	Annual Fleabane	0	3			G5	S5				C		Forb	N	X						X		X	
<i>Erigeron canadensis</i>	Canada Horseweed	0	3			G5	S5				C		Forb	N	X						X	X	X	X
<i>Erigeron philadelphicus</i>	Philadelphia Fleabane	1	-3		X	G5	S5				C		Forb	N	X									
<i>Erigeron strigosus</i>	Rough Fleabane	4	3			G5	S5				C		Forb	N	X					X				
<i>Erucastrum gallicum</i>	Common Dog Mustard		5	-1		G5	SNA				IX		Forb	I	X									
<i>Erysimum cheiranthoides</i>	Wormseed Wallflower		3	-1		G5	S5				IC		Forb	I	X									
<i>Erythronium americanum</i>	Yellow Trout Lily	5	5			G5	S5						Forb	N			X	X						
<i>Euonymus obovatus</i>	Running Strawberry-bush	6	5			G5	S4				C		Shrub	N			X	X						
<i>Eupatorium perfoliatum</i>	Common Boneset	2	-3		X	G5	S5				C		Forb	N		X				X	X			
<i>Eurybia macrophylla</i>	Large-leaved Aster	5	5			G5	S5				C		Forb	N				X		X				
<i>Euthamia graminifolia</i>	Grass-leaved Goldenrod	2	0			G5	S5				C		Forb	N								X		
<i>Eutrochium maculatum</i>	Spotted Joe Pye Weed	3	-5		X	G5	S5						Forb	N		X				X	X			
<i>Fagus grandifolia</i>	American Beech	6	3			G5	S4				C		Tree	N			X	X	X					
<i>Fallopia convolvulus</i>	Eurasian Black Bindweed		3	-1		GNR	SNA				IC		Vine	I							X			
<i>Festuca rubra</i>	Red Fescue		3			G5	S5						Grass	N									X	
<i>Fragaria vesca ssp. americana</i>	Woodland Strawberry	4	3			G5T5	S5				U		Forb	N				X			X	X		
<i>Fragaria virginiana ssp. virginiana</i>	Wild Strawberry	2	3			G5T5	S5				C		Forb	N						X	X	X		
<i>Frangula alnus</i>	Glossy Buckthorn		0	-3	X	GNR	SNA				IU		Shrub	I	X		X	X	X	X	X	X		
<i>Fraxinus americana</i>	White Ash	4	3			G5	S4				C		Tree	N			X	X						
<i>Fraxinus nigra</i>	Black Ash	7	-3		X	G5	S4	THR		END	C		Tree	N		X		X	X	X				
<i>Fraxinus pennsylvanica</i>	Green Ash	3	-3		X	G5	S4				C		Tree	N				X		X				
<i>Fraxinus sp.</i>	Ash sp.												Tree					X		X				
<i>Galium aparine</i>	Common Bedstraw	4	3			G5	S5				C		Forb	N			X		X		X			
<i>Galium mollugo</i>	Smooth Bedstraw		5	-2		GNR	SNA				IU		Forb	I							X	X	X	
<i>Galium obtusum</i>	Blunt-leaved Bedstraw	6	-3		X	G5	S4S5				C	W*	Forb	N								X		
<i>Galium palustre</i>	Common Marsh Bedstraw	5	-5		X	G5	S5				R		Forb	N		X				X		X		
<i>Galium triflorum</i>	Three-flowered Bedstraw	4	3			G5	S5				C		Forb	N			X	X		X				
<i>Geranium maculatum</i>	Spotted Geranium	6	3			G5	S5				C		Forb	N			X	X						
<i>Geranium robertianum</i>	Herb-Robert	2	3	-2		G5	S5				C		Forb	I			X	X						
<i>Geum aleppicum</i>	Yellow Avens	2	0		X	G5	S5				C		Forb	N	X		X			X		X		



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<i>Geum canadense</i>	Canada Avens	3	0		X	G5	S5				C		Forb	N	X		X							
<i>Geum fragarioides</i>	Barren Strawberry	5	5			G5	S5				U		Forb	N	X			X		X				
<i>Glechoma hederacea</i>	Ground-ivy		3	-2		GNR	SNA				IC		Forb	I							X			
<i>Glyceria grandis</i>	Tall Mannagrass	5	-5		X	G5	S5				U		Grass	N							X		X	
<i>Glyceria septentrionalis</i>	Eastern Mannagrass	7	-5		X	G5	S4				U	W*	Grass	N							X	X		
<i>Glyceria sp.</i>	Mannagrass sp.												Grass							X				
<i>Glyceria striata</i>	Fowl Mannagrass	3	-5		X	G5	S5				C		Grass	N		X			X	X				
<i>Glycine max</i>	Soybean		5	-1		GNR	SNA				IR		Forb	I							X			X
<i>Gymnocarpium dryopteris</i>	Common Oak Fern	7	3		X	G5	S5				U		Fern	N				X		X				
<i>Hackelia virginiana</i>	Virginia Stickseed	5	3			G5	S5				C	W*	Forb	N	X		X	X		X				
<i>Hamamelis virginiana</i>	American Witch-hazel	6	3			G5	S4S5				C		Shrub	N						X				
<i>Hepatica acutiloba</i>	Sharp-lobed Hepatica	8	5			G5	S5				C		Forb	N			X							
<i>Hepatica americana</i>	Round-lobed Hepatica	6	5			G5	S5				C		Forb	N				X						
<i>Hesperis matronalis</i>	Dame's Rocket		3	-3		G4G5	SNA				IC		Forb	I	X		X	X						
<i>Hylodesmum glutinosum</i>	Large Tick-trefoil	6	5			G5	S4				U		Forb	N				X						
<i>Hypericum punctatum</i>	Spotted St. John's-wort	5	0		X	G5	S5				C		Forb	N								X		
<i>Ilex verticillata</i>	Common Winterberry	5	-3		X	G5	S5				C		Shrub	N		X			X	X				
<i>Impatiens capensis</i>	Spotted Jewelweed	4	-3		X	G5	S5				C		Forb	N		X	X		X	X				
<i>Inula helenium</i>	Elecampane		3	-2	X	GNR	SNA				IU		Forb	I							X			
<i>Iris versicolor</i>	Harlequin Blue Flag	5	-5		X	G5	S5				C		Forb	N					X	X		X		
<i>Juglans cinerea</i>	Butternut	6	3			G4	S2?	END	END	END	U		Tree	N				X						
<i>Juglans nigra</i>	Black Walnut	5	3			G5	S4?				C	W*+	Tree	N	X			X						
<i>Juncus articulatus</i>	Jointed Rush	5	-5		X	G5	S5				U		Rush	N							X	X		
<i>Juncus bufonius</i>	Toad Rush	1	-3		X	G5	S5				C		Rush	N							X			
<i>Juncus canadensis</i>	Canada Rush	6	-5		X	G5	S5				R	W	Rush	N		X						X		
<i>Juncus dudleyi</i>	Dudley's Rush	1	-3		X	G5	S5				C		Rush	N							X			
<i>Juncus effusus ssp. solutus</i>	Soft Rush	4	-5		X	G5T5	S5?						Rush	N		X					X	X	X	
<i>Lactuca serriola</i>	Prickly Lettuce		3	-1		GNR	SNA				IC		Forb	I	X									
<i>Laportea canadensis</i>	Wood Nettle	6	-3		X	G5	S5				C		Forb	N	X									
<i>Larix laricina</i>	Tamarack	7	-3		X	G5	S5				U		Tree	N						X				
<i>Leersia oryzoides</i>	Rice Cutgrass	3	-5		X	G5	S5				C		Grass	N				X	X	X	X	X		
<i>Leersia virginica</i>	White Cutgrass	6	-3		X	G5	S4				C		Grass	N				X						
<i>Lemna minor</i>	Small Duckweed	5	-5		X	G5	S5?				C		Forb	N		X			X	X	X	X	X	
<i>Lemna trisulca</i>	Star Duckweed	6	-5		X	G5	S5				U		Forb	N		X			X		X	X		
<i>Leonurus cardiaca</i>	Common Motherwort		5	-2		GNR	SNA				IC		Forb	I	X		X				X			
<i>Lepidium virginicum</i>	Poor-man's Peppergrass	0	3			G5	S5				U		Forb	N							X			



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<i>Linaria vulgaris</i>	Butter-and-eggs		5	-1		GNR	SNA				IC		Forb	I							X			
<i>Lindera benzoin</i>	Northern Spicebush	6	-3		X	G5	S4				C		Shrub	N						X				
<i>Lonicera dioica</i>	Limber Honeysuckle	5	3			G5	S5				C		Vine	N			X							
<i>Lonicera hirsuta</i>	Hairy Honeysuckle	7	0			G5	S5				R	W	Shrub	N			X	X						
<i>Lonicera tatarica</i>	Tatarian Honeysuckle		3	-3		GNR	SNA				IC		Shrub	I	X							X		
<i>Lonicera x bella</i>	Bell's Honeysuckle		3	-3		GNA	SNA				hyb		Shrub	I				X						
<i>Lotus corniculatus</i>	Garden Bird's-foot Trefoil		3	-2		GNR	SNA				IC		Forb	I	X						X			
<i>Ludwigia palustris</i>	Marsh Seedbox	5	-5		X	G5	S5				C		Forb	N								X		
<i>Luzula acuminata</i>	Hairy Woodrush	6	3			G5	S5				C		Rush	N				X		X				
<i>Lycopus americanus</i>	American Water-horehound	4	-5		X	G5	S5				C		Forb	N								X		
<i>Lycopus europaeus</i>	European Bugleweed		-5			GNR	SNA				IC		Forb	I							X	X		
<i>Lycopus uniflorus</i>	Northern Water-horehound	5	-5		X	G5	S5				C		Forb	N		X			X	X	X	X		
<i>Lysimachia borealis</i>	Northern Starflower	6	0			G5	S5				C		Forb	N						X				
<i>Lysimachia ciliata</i>	Fringed Yellow Loosestrife	4	-3		X	G5	S5				C		Forb	N						X	X			
<i>Lysimachia nummularia</i>	Creeping Yellow Loosestrife		-3	-3		GNR	SNA				IC		Forb	I							X			
<i>Lysimachia terrestris</i>	Swamp Yellow Loosestrife	6	-5		X	G5	S5				R	W	Forb	N						X				
<i>Lysimachia thyrsoiflora</i>	Tufted Yellow Loosestrife	7	-5		X	G5	S5				U		Forb	N							X	X		
<i>Lythrum salicaria</i>	Purple Loosestrife		-5	-3	X	G5	SNA				IC		Forb	I		X				X	X	X		
<i>Maianthemum canadense</i>	Wild Lily-of-the-valley	5	3			G5	S5				C		Forb	N	X		X	X	X	X				
<i>Maianthemum racemosum</i>	Large False Solomon's-seal										C		Forb	N	X		X	X		X				
<i>Maianthemum stellatum</i>	Star-flowered Solomon's-seal	6	0			G5	S5				C		Forb	N				X		X				
<i>Malva neglecta</i>	Dwarf Mallow		5	-1		GNR	SNA				IC		Forb	I							X			
<i>Matricaria discoidea</i>	Pineappleweed		3			G5	SNA				IC		Forb	I	X									
<i>Matteuccia struthiopteris</i>	Ostrich Fern	5	0		X	G5	S5						Fern	N						X				
<i>Medeola virginiana</i>	Indian Cucumber-root	8	3			G5	S5				C		Forb	N			X							
<i>Medicago lupulina</i>	Black Medick		3	-1		GNR	SNA				IC		Forb	I							X		X	
<i>Melica smithii</i>	Smith's Melic Grass	9	5			G4	S4				R		Grass	N							X			
<i>Melilotus albus</i>	White Sweet-clover		3	-3		G5	SNA				IC		Forb	I	X									
<i>Mentha canadensis</i>	Canada Mint	3	-3			G5	S5				C		Forb	N		X					X	X		
<i>Mitchella repens</i>	Partridgeberry	6	3			G5	S5				C		Shrub	N				X		X				
<i>Mitella diphylla</i>	Two-leaved Mitrewort	5	3		X	G5	S5				C		Forb	N						X				
<i>Morus alba</i>	White Mulberry		0	-3		GNR	SNA				IC		Tree	I	X									
<i>Myosotis scorpioides</i>	True Forget-me-not		-5			GNR	SNA				IC		Forb	I										
<i>Nabalus albus</i>	White Rattlesnakeroot	6	3		X	G5	S5				C		Forb	N				X		X				
<i>Nabalus altissimus</i>	Tall Rattlesnakeroot	5	3			G5	S5				U		Forb	N				X						
<i>Nasturtium officinale</i>	Common Watercress		-5	-1		GNR	SNA				IX		Forb	I						X				



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<i>Nepeta cataria</i>	Catnip		3	-2		GNR	SNA				IC		Forb	I							X			
<i>Nicandra physalodes</i>	Apple-of-peru		5	-1		GNR	SNA				IR		Forb	I							X			
<i>Oenothera biennis</i>	Common Evening Primrose	0	3			G5	S5				C		Forb	N	X						X			
<i>Onoclea sensibilis</i>	Sensitive Fern	4	-3		X	G5	S5				C		Fern	N		X		X	X	X		X		
<i>Oryzopsis asperifolia</i>	Round-leaved Mountain ricegrass	6	5			G5	S5				C		Grass	N				X		X				
<i>Osmunda regalis</i>	Royal Fern	7	-5		X	G5	S5				C		Fern	N					X	X				
<i>Osmundastrum cinnamomeum</i>	Cinnamon Fern	7	-3		X	G5	S5				C		Fern	N					X	X				
<i>Ostrya virginiana</i>	Eastern Hop-hornbeam	4	3			G5	S5				C		Tree	N			X	X		X				
<i>Oxalis stricta</i>	European Wood-sorrel		3			G5	S5				C		Forb	I	X						X			
<i>Panax trifolius</i>	Dwarf Ginseng	8	5			G5	S4				R	W	Forb	N						X				
<i>Panicum capillare</i>	Common Panicgrass	0	0			G5	S5				C		Grass	N	X						X			X
<i>Panicum flexile</i>	Wiry Panicgrass	8	-3		X	G5	S4				R		Grass	N							X			
<i>Panicum miliaceum</i>	Proso Millet		5	-1		GNR	SNA				IR		Grass	I							X			
<i>Parthenocissus quinquefolia</i>	Virginia Creeper	6	1			G5	S4?				U	W*	Vine	N	X									
<i>Parthenocissus vitacea</i>	Thicket Creeper	4	3			G5	S5				C		Vine	N	X		X	X		X	X			
<i>Pedicularis canadensis</i>	Canada Lousewort	7	3			G5	S5				U		Forb	N			X	X						
<i>Persicaria amphibia</i>	Water Smartweed	5	-5			G5	S5				C		Forb	N		X			X		X	X		
<i>Persicaria hydropiper</i>	Marshpepper Smartweed		-5		X	GNR	SNA				IC		Forb	I							X			
<i>Persicaria lapathifolia</i>	Pale Smartweed	2	-3	-1	X	G5	S5				C		Forb	N		X					X	X		
<i>Persicaria maculosa</i>	Spotted Lady's-thumb		-3	-1	X	G3G5	SNA				IC		Forb	I	X						X	X		
<i>Persicaria pensylvanica</i>	Pennsylvania Smartweed	3	-3		X	G5	S5				C		Forb	N							X			
<i>Persicaria sagittata</i>	Arrow-leaved Smartweed	5	-5		X	G5	S4S5				U	W	Forb	N		X								
<i>Phalaris arundinacea</i> var. <i>arundinacea</i>	Reed Canarygrass	0	-3		X	G5TNR	S5				C		Grass	N		X			X	X	X	X	X	X
<i>Phleum pratense</i>	Common Timothy		3	-1		GNR	SNA				IC		Grass	I	X						X		X	X
<i>Phragmites australis</i> ssp. <i>australis</i>	European Reed		-3		X	G5T5	SNA				IC		Grass	I		X					X			
<i>Phryma leptostachya</i>	Lopseed	6	3			G5	S4S5				C		Forb	N			X							
<i>Pilea fontana</i>	Lesser Clearweed	5	-3		X	G5	S4				U	W	Forb	N				X	X					
<i>Pilea pumila</i>	Dwarf Clearweed	5	-3		X	G5	S5				C		Forb	N		X			X	X				
<i>Pilosella piloselloides</i>	Tall Hawkweed		5	-2		GNR	SNA				C		Forb	I	X									
<i>Pinus strobus</i>	Eastern White Pine	4	3		X	G5	S5				C		Tree	N	X		X	X	X	X				
<i>Plantago major</i>	Common Plantain		3	-1		G5	SNA				IC		Forb	I	X						X			X
<i>Plantago rugelii</i>	Rugel's Plantain	1	0			G5	S5				C		Forb	N	X									
<i>Poa compressa</i>	Canada Bluegrass	0	3			GNR	SNA				IC		Grass	I	X	X	X			X				
<i>Poa palustris</i>	Fowl Bluegrass	5	-3		X	G5	S5				C		Grass	N								X		
<i>Poa pratensis</i> ssp. <i>pratensis</i>	Kentucky Bluegrass		3			G5T5	SNA				IC		Grass	I	X	X					X	X	X	
<i>Podophyllum peltatum</i>	May-apple	5	3			G5	S5				C		Forb	N	X		X	X						



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<i>Polygaloides paucifolia</i>	Fringed Milkwort	6	3			G5	S5				R		Forb	N				X		X				
<i>Polygonatum biflorum</i>	Giant Solomon's Seal	8	3			G5	S4						Forb	N				X						
<i>Polygonatum pubescens</i>	Hairy Solomon's Seal	5	5			G5	S5				C		Forb	N			X	X						
<i>Polygonum aviculare</i>	Prostrate Knotweed		3	-1		GNR	S4?				IC		Forb	I	X									
<i>Polystichum acrostichoides</i>	Christmas Fern	5	3			G5	S5				C		Fern	N				X						
<i>Populus balsamifera</i>	Balsam Poplar	4	-3		X	G5	S5				U		Tree	N		X						X		
<i>Populus deltoides</i>	Eastern Cottonwood	4	0			G5	S5					W+	Tree	N								X		
<i>Populus grandidentata</i>	Large-toothed Aspen	5	5			G5	S5				C		Tree	N			X	X						
<i>Populus tremuloides</i>	Trembling Aspen	2	0			G5	S5				C		Tree	N	X					X		X		
<i>Portulaca oleracea</i>	Common Purslane		3			GU	SNA				IU		Forb	I	X									
<i>Potamogeton sp.</i>	Pondweed sp.												Forb	N		X								
<i>Potamogeton zosteriformis</i>	Flat-stemmed Pondweed	5	-5		X	G5	S5				R		Forb	N		X					X			
<i>Potentilla norvegica</i>	Rough Cinquefoil	0	0		X	G5	S5						Forb	N							X			
<i>Potentilla recta</i>	Sulphur Cinquefoil		5	-2		GNR	SNA				IC		Forb	I	X		X							
<i>Prunella vulgaris</i>	Common Self-heal		0			G5	S5						Forb					X						
<i>Prunus avium</i>	Sweet Cherry		5			GNR	SNA				IC		Tree	I								X		
<i>Prunus serotina</i>	Black Cherry	3	3			G5	S5				C		Tree	N	X		X	X		X				
<i>Prunus virginiana</i>	Chokecherry	2	3			G5	S5						Shrub	N	X		X	X		X				
<i>Pteridium aquilinum</i>	Bracken Fern	2	3			G5	S5				C		Fern	N				X		X				
<i>Pyrola elliptica</i>	Shinleaf	5	5			G5	S5				U		Forb	N				X						
<i>Quercus alba</i>	White Oak	6	3			G5	S5				C		Tree	N	X		X							
<i>Quercus ellipsoidalis</i>	Northern Pin Oak	9	5			G5	S3				R	W	Tree	N	X									
<i>Quercus macrocarpa</i>	Bur Oak	5	3		X	G5	S5				C		Tree	N	X		X			X				
<i>Quercus rubra</i>	Northern Red Oak	6	3			G5	S5				C		Tree	N	X		X	X		X				
<i>Ranunculus abortivus</i>	Kidney-leaved Buttercup	2	0			G5	S5				C		Forb	N			X	X		X				
<i>Ranunculus acris</i>	Common Buttercup		0	-2	X	G5	SNA				IC		Forb	I			X	X			X		X	
<i>Ranunculus hispidus var. caricetorum</i>	Northern Swamp Buttercup	5	-5		X	G5	S5				C		Forb	N						X		X		
<i>Ranunculus pensylvanicus</i>	Pennsylvania Buttercup	3	-5		X	G5	S5				C		Forb	N		X								
<i>Ranunculus recurvatus</i>	Hooked Buttercup	4	-3			G5	S5				C		Forb	N		X		X						
<i>Ranunculus sceleratus var. sceleratus</i>	Cursed Buttercup	2	-5		X	G5T5	SNA						Forb	N		X			X		X	X		
<i>Rhamnus cathartica</i>	European Buckthorn		0	-3	X	GNR	SNA				IC		Tree	I	X		X	X		X	X	X		
<i>Ribes americanum</i>	American Black Currant	4	-3		X	G5	S5				C		Shrub	N		X	X	X						
<i>Ribes cynosbati</i>	Eastern Prickly Gooseberry	4	3			G5	S5				C		Shrub	N			X	X						
<i>Rorippa palustris ssp. palustris</i>	Marsh Yellowcress	3	-5		X	G5T5	S5?				C		Forb	N							X	X		
<i>Rosa blanda</i>	Smooth Rose	3	3			G5	S5				C		Shrub	N	X									
<i>Rosa canina</i>	Dog Rose		5	-1		GNR	SNA				IX		Shrub	I				X						



SCIENTIFIC NAME	COMMON NAME	CC ¹	CW ¹	WEEDINESS ¹	OWES WETLAND PLANT ²	G RANK ³	S RANK ⁴	COSEWIC ⁵	SARA ⁶	SARO ⁷	CAROLINIAN ZONE (OLDHAM 2017) ⁸	WATERLOO REGION (1999) ⁸	PHYSIOLOGY ¹	NATIVE STATUS ⁹	UNIT 1A	UNIT 1B	UNIT 2	UNIT 3	UNIT 4	UNIT 5	UNIT 10	UNIT 11	UNIT 12	UNIT 18
<i>Rosa multiflora</i>	Multiflora Rose		3	-3		GNR	SNA				IC		Shrub	I	X			X		X				
<i>Rubus allegheniensis</i>	Alleghany Blackberry	2	3			G5	S5				C		Shrub	N			X	X						
<i>Rubus hispidus</i>	Bristly Dewberry	6	-3		X	G5	S4				C	W#	Shrub	N		X								
<i>Rubus idaeus ssp. strigosus</i>	American Red Raspberry	2	3			G5T5	S5				C		Shrub	N	X		X					X		
<i>Rubus occidentalis</i>	Black Raspberry	2	5			G5	S5				C		Shrub	N			X	X						
<i>Rubus pubescens</i>	Dwarf Raspberry	4	-3		X	G5	S5				C		Forb	N				X		X				
<i>Rudbeckia hirta</i>	Black-eyed Susan	0	3			G5	S5				C		Forb	N	X									
<i>Rudbeckia laciniata</i>	Cut-leaved Coneflower	7	-3		X	G5	S5				U		Forb	N						X				
<i>Rumex crispus</i>	Curly Dock		0	-2	X	GNR	SNA				IC		Forb	I	X						X	X		
<i>Rumex obtusifolius</i>	Bitter Dock		-3	-1	X	GNR	SNA				IX		Forb	I			X				X			
<i>Rumex verticillatus</i>	Swamp Dock	7	-5		X	G5	S4				U		Forb	N		X								
<i>Sagittaria latifolia</i>	Broad-leaved Arrowhead	4	-5		X	G5	S5				C		Forb	N		X						X		
<i>Salix alba</i>	White Willow		-3	-2	X	G5	SNA				IX		Tree	I		X								
<i>Salix amygdaloides</i>	Peach-leaved Willow	6	-3		X	G5	S5				C		Tree	N		X			X		X			
<i>Salix bebbiana</i>	Bebb's Willow	4	-3		X	G5	S5				C		Shrub	N		X					X			
<i>Salix discolor</i>	Pussy Willow	3	-3		X	G5	S5				C		Shrub	N					X			X		
<i>Salix eriocephala</i>	Cottony Willow	4	-3		X	G5	S5				C		Shrub	N		X			X	X	X	X		
<i>Salix euxina</i>	Crack Willow		0			GNR	SNA				IC		Tree	I		X						X		
<i>Salix interior</i>	Sandbar Willow	1	-3		X	GNR	S5				C		Shrub	N								X		
<i>Salix lucida</i>	Shining Willow	5	-3		X	G5	S5				U		Shrub	N							X	X		
<i>Salix nigra</i>	Black Willow	6	-5		X	G5	S4				U		Tree	N		X						X		
<i>Salix petiolaris</i>	Meadow Willow	3	-3		X	G5	S5				C		Shrub	N		X						X		
<i>Salix purpurea</i>	Purple Willow		-3	-2	X	G5	SNA				IU		Shrub	I		X						X		
<i>Salix x fragilis</i>	Hybrid White Willow		0	-3	X	GNA	SNA				hyb		Tree	I		X						X		
<i>Sambucus canadensis</i>	Common Elderberry	5	-3		X	G5	S5				C		Shrub	N		X				X	X	X		
<i>Sambucus racemosa</i>	Red Elderberry	5	3			G5	S5				C		Shrub	N			X	X				X		
<i>Sanguinaria canadensis</i>	Bloodroot	5	3			G5	S5				C		Forb	N				X		X				
<i>Schoenoplectus tabernaemontani</i>	Soft-stemmed Bulrush	5	-5		X	G5	S5				C		Sedge	N		X								
<i>Scirpus atrovirens</i>	Dark-green Bulrush	3	-5		X	G5	S5				C		Sedge	N							X	X		
<i>Scirpus cyperinus</i>	Common Woolly Bulrush	4	-5		X	G5	S5				C		Sedge	N		X			X			X		
<i>Scutellaria galericulata</i>	Marsh Skullcap	6	-5		X	G5	S5				C		Forb	N		X			X			X		
<i>Scutellaria lateriflora</i>	Mad-dog Skullcap	5	-5		X	G5	S5				C		Forb	N		X			X	X		X		
<i>Setaria faberi</i>	Giant Foxtail		3	-1		GNR	SNA				IC		Grass	I	X									
<i>Setaria pumila</i>	Yellow Foxtail		0	-1		GNR	SNA				IC		Grass	I	X						X			
<i>Setaria viridis</i>	Green Foxtail		5	-1		GNR	SNA				IC		Grass	I							X			X
<i>Silene latifolia</i>	White Champion		5	-2		GNR	SNA				IX		Forb	I							X			



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<i>Sium suave</i>	Common Water-parsnip	4	-5		X	G5	S5				C		Forb	N		X			X	X		X		
<i>Smilax herbacea</i>	Herbaceous Carrionflower	5	0			G5	S4?				C		Vine	N			X	X						
<i>Smilax tamnoides</i>	Hispid Greenbrier	6	0			G5	S5				C		Vine	N	X			X						
<i>Solanum dulcamara</i>	Climbing Nightshade		0	-2	X	GNR	SNA				IC		Forb	I	X	X		X	X	X	X	X		
<i>Solanum americanum</i>	American Black Nightshade	1	3			G5	S5				C		Forb	N	X						X			
<i>Solidago altissima</i>	Tall Goldenrod	1	3			G5	S5				C		Forb	N	X						X	X		
<i>Solidago caesia</i>	Blue-stemmed Goldenrod	5	3			G5	S5				C		Forb	N				X						
<i>Solidago canadensis</i>	Canada Goldenrod	1	3			G5	S5				C		Forb	N					X	X				
<i>Solidago flexicaulis</i>	Zigzag Goldenrod	6	3			G5	S5				C		Forb	N								X		
<i>Solidago gigantea</i>	Giant Goldenrod	4	-3		X	G5	S5				C		Forb	N					X					
<i>Solidago patula</i>	Round-leaved Goldenrod	8	-5		X	G5	S4				C		Forb	N					X	X				
<i>Solidago rugosa</i>	Rough-stemmed Goldenrod	4	0			G5	S5						Forb	N				X		X				
<i>Sonchus arvensis ssp. arvensis</i>	Field Sow-thistle		3	-1		GNRTNR	SNA				IC		Forb	I							X	X		
<i>Sonchus asper</i>	Prickly Sow-thistle		3	-1		GNR	SNA				IX		Forb	I	X						X	X		
<i>Sparganium eurycarpum</i>	Broad-fruited Burreed	3	-5		X	G5	S5				C		Forb	N		X			X		X		X	
<i>Spiraea alba</i>	White Meadowsweet	3	-3		X	G5	S5				C		Shrub	N		X						X		
<i>Spirodela polyrhiza</i>	Great Duckweed	4	-5		X	G5	S5				U		Forb	N		X					X	X		
<i>Streptopus lanceolatus</i>	Rose Twisted-stalk	7	3			G5	S5				U		Forb	N						X				
<i>Stuckenia filiformis</i>	Thread-leaved Pondweed	8	-5		X	G5	S5				R	W*	Forb	N		X								
<i>Stuckenia pectinata</i>	Sago Pondweed	4	-5		X	G5	S5				U		Forb	N							X			
<i>Symphoricarpos albus</i>	Thin-leaved Snowberry	7	3			G5	S5				U		Shrub	N			X	X						
<i>Symphyotrichum cordifolium</i>	Heart-leaved Aster	5	5			G5	S5				C		Forb	N				X		X				
<i>Symphyotrichum ericoides</i>	White Heath Aster	4	3			G5	S5				C		Forb	N	X									
<i>Symphyotrichum firmum</i>	Glossy-leaved Aster	4	-3			G5	S4?				X		Forb	N				X						
<i>Symphyotrichum lanceolatum</i>	Panicked Aster	3	-3		X	G5	S5				C		Forb	N	X					X	X	X		
<i>Symphyotrichum lateriflorum</i>	Calico Aster	3	0			G5	S5				C		Forb	N						X				
<i>Symphyotrichum novae-angliae</i>	New England Aster	2	-3			G5	S5				C		Forb	N	X			X				X		
<i>Symphyotrichum pilosum var. pilosum</i>	Old Field Aster	1	3			G5T5	S5				C		Forb	N	X							X		
<i>Symphyotrichum urophyllum</i>	Arrow-leaved Aster	6	5			G4G5	S4				C		Forb	N								X		
<i>Symplocarpus foetidus</i>	Eastern Skunk Cabbage	7	-5		X	G5	S5				C		Forb	N				X	X	X	X			
<i>Taraxacum officinale</i>	Common Dandelion		3	-2		G5	SNA				IC		Forb	I	X		X			X	X		X	
<i>Thalictrum dioicum</i>	Early Meadow-rue	6	3			G5	S5				C		Forb	N				X						
<i>Thelypteris noveboracensis</i>	New York Fern	7	0			G5	S4S5				C		Fern	N						X				
<i>Thelypteris palustris</i>	Marsh Fern	5	-3		X	G5	S5				C		Fern	N					X	X				
<i>Thlaspi arvense</i>	Field Pennycress		5	-1		GNR	SNA				IC		Forb	I	X									
<i>Thuja occidentalis</i>	Eastern White Cedar	4	-3		X	G5	S5				C		Tree	N				X		X				



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<i>Tiareella cordifolia</i>	Heart-leaved Foamflower	6	3		X	G5	S5				C		Forb	N				X		X				
<i>Tilia americana</i>	Basswood	4	3			G5	S5				C		Tree	N			X	X						
<i>Toxicodendron radicans</i> var. <i>rydbergii</i>	Western Poison Ivy	2	0			G--T5	S5				C		Vine	N			X	X		X				
<i>Trifolium hybridum</i>	Alsike Clover		3	-1		GNR	SNA				IC		Forb	I							X	X		
<i>Trifolium pratense</i>	Red Clover		3	-2		GNR	SNA				IC		Forb	I	X						X		X	
<i>Trifolium repens</i>	White Clover		3	-1		GNR	SNA				IC		Forb	I	X									
<i>Trillium grandiflorum</i>	White Trillium	5	3			G5	S5				C		Forb	N	X		X	X		X				
<i>Trillium</i> sp.	Trillium sp.												Forb					X						
<i>Triosteum aurantiacum</i>	Orange-fruit Horse-gentian	7	5			G5	S4S5				U		Forb	N			X	X						
<i>Tsuga canadensis</i>	Eastern Hemlock	7	3		X	G5	S5				C		Tree	N				X						
<i>Tussilago farfara</i>	Coltsfoot		3	-2	X	GNR	SNA				IC		Forb	I	X						X			
<i>Typha angustifolia</i>	Narrow-leaved Cattail		-5		X	G5	SNA				IC		Forb	I		X					X	X	X	
<i>Typha latifolia</i>	Broad-leaved Cattail	1	-5		X	G5	S5				C		Forb	N		X					X	X		
<i>Typha x glauca</i>	Blue Cattail		-5		X	GNA	SNA				hyb		Forb	I		X					X	X	X	
<i>Ulmus americana</i>	White Elm	3	-3		X	G5	S5				C		Tree	N		X	X	X	X	X	X	X	X	
<i>Urtica dioica</i> ssp. <i>gracilis</i>	Slender Stinging Nettle	2	0		X	G5T5	S5				C		Forb	N		X					X			
<i>Uvularia grandiflora</i>	Large-flowered Bellwort	6	5			G5	S5				C		Forb	N				X						
<i>Vaccinium angustifolium</i>	Early Lowbush Blueberry	6	3			G5	S5				C	W*	Shrub	N				X	X					
<i>Verbena hastata</i>	Blue Vervain	4	-3		X	G5	S5				C		Forb	N							X			
<i>Verbena urticifolia</i>	White Vervain	4	0		X	G5	S5				C		Forb	N	X									
<i>Veronica chamaedrys</i>	Germander Speedwell		5	-1		GNR	SNA				IR		Forb	I	X			X						
<i>Veronica officinalis</i>	Common Speedwell		5	-2		G5	SNA				IX		Forb	I	X	X								
<i>Viburnum acerifolium</i>	Maple-leaved Viburnum	6	5			G5	S5				C		Shrub	N				X						
<i>Viburnum lantana</i>	Wayfaring Viburnum		5	-1		GNR	SNA				IX		Shrub	I	X	X								
<i>Viburnum lentago</i>	Nannyberry	4	0		X	G5	S5				C		Shrub	N	X				X	X		X		
<i>Viburnum opulus</i> ssp. <i>opulus</i>	Cranberry Viburnum		-3	-1	X	G5TNR	SNA				IX		Shrub	I			X							
<i>Viburnum rafinesquianum</i>	Downy Arrowwood	7	5			G5	S5				C		Shrub	N	X			X						
<i>Vicia cracca</i>	Tufted Vetch		5	-1		GNR	SNA				IX		Forb	I	X						X	X		
<i>Viola cucullata</i>	Marsh Blue Violet	5	-5		X	G5	S5				C		Forb	N					X					
<i>Viola labradorica</i>	Labrador Violet	3	0			G5	S5				C		Forb	N				X						
<i>Viola pubescens</i>	Downy Yellow Violet	5	3			G5	S5				C		Forb	N			X	X						
<i>Viola sororia</i>	Woolly Blue Violet	4	0		X	G5	S5				C		Forb	N			X	X		X				
<i>Viola</i> sp.	Violet sp.												Forb				X	X	X					
<i>Vitis riparia</i>	Riverbank Grape	0	0			G5	S5				C		Vine	N	X		X	X	X	X		X		
<i>Wolffia borealis</i>	Northern Watermeal	4	-5		X	G5	S5				U	W*	Forb	N		X					X	X		
<i>Wolffia columbiana</i>	Columbia Watermeal	4	-5		X	G5	S5				U	W*	Forb	N		X					X	X		



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<i>Zanthoxylum americanum</i>	Northern Prickly-ash	3	3			G5	S5				C	W*	Shrub	N			X			X				
Totals	428				191			2	1	1		29			106	82	94	145	69	147	134	115	29	18



Legend:

Scientific Name, Common Name and Family	
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. <u>Floristic Quality Assessment System for Southern Ontario</u> . Natural Heritage Information Centre, Ministry of Natural Resources. Peterborough, Ontario.	
NHIC:	http://www.sse.gov.on.ca/sites/MNR-PublicDocs/EN/ProvincialServices/Ontario_Vascular_Plants.xlsx
CC and CW values reflect updates by NHIC, current as of Dec. 28, 2020).	
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:	Weediness Score, 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).
² OWES Wetland Plant List	
Ontario Ministry of Natural Resources. 2013. <u>Ontario Wetland Evaluation System Southern Manual. 3rd Edition, Version 3.3</u>	
Species presence or absence on the Ontario Wetland Evaluation System (OWES) Wetland Plant List.	
Codes are defined as follows:	
X:	Present on the list
³ G-Rank (Global)	
Global Status from Nature Serve (via NHIC, Feb 28, 2020)	
NS:	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#:	Intraspecific Taxon (trinomial) - The status of intraspecific 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 intraspecific 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 (Feb 20, 2020)

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.	
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 other factors.
S5:	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 – subnational 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 Feb 20, 2020)

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>

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 – 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

<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.

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 MECP SARO list website: <https://www.ontario.ca/page/species-risk-ontario>

- EXP: 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**

Region of Waterloo

Regional Municipality of Waterloo, 1999. Revisions to Waterloo Region's Significant Species List: Vascular Plants Component. Report to Planning and Culture Committee PC-99-028.1. Approved by Council June 23, 1999.

Codes are defined as follows:

- W: Significant in the Region of Waterloo
- W*: Significant in the Region of Waterloo but with the expectation that additional research may prove otherwise.
- W+: Significant in the Region of Waterloo ONLY if demonstrably indigenous – most populations in RMW are thought to be of non-indigenous origin.
- W#: Significant in the Region of Waterloo but known RMW reports are treated as hypothetical.

Carolinian Zone

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 within each jurisdiction within the Carolinian Zone are based on "previous lists, personal communications, and the author's knowledge of the Carolinian Zone flora. An overall status in the Carolinian Zone is provided based on status in each of the 11 areas and general knowledge of the Carolinian Zone flora."

Codes are defined as follows (**CZ Status Column Only**)

- H: Historic. Native in all Carolinian Zone areas and no known records for at least 30 years in all areas where native and ranked (i.e. not X). Occasionally used for a native species known to be extirpated from its only known Carolinian Zone location(s).
- R: Rare. Native to the Carolinian Zone and (a) rare (as defined in source lists; sometimes including "very uncommon") or historic (no records in ≥30 years) in more than half of the Carolinian Zone areas (≥6) in which it is native and ranked (i.e. not X); or (b) if rare or historic in <6 areas it must be uncommon or common in no more than one area.
- U: Uncommon. Native in the Carolinian Zone and (a) listed as common in no more than one Carolinian Zone area; and (b) not rare or historic in more than half of the Carolinian Zone areas (≥6) in which it is native and ranked (i.e. not X).
- C: Common. Native in the Carolinian Zone and (a) common in at least two Carolinian Zone areas; and (b) not rare or historic in more than half of the Carolinian Zone areas (≥6) in which it is native and ranked (i.e. not X).
- X: No status. Present and native in the Carolinian Zone 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 in the Carolinian Zone.
- CZ: Restricted in Ontario as a native species to the Carolinian Zone
- cz: Nearly restricted in Ontario as a native species to the Carolinian Zone (approximately 90%+ records)
- Note: In a few cases, based on professional opinion, Carolinian Zone status ranks departed from the above criteria, particularly if the species is not ranked (i.e. X) in at least four Carolinian Zone areas.

⁹**Native Status**

Based on VASCAN and NHIC (February 28, 2020)

- 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 D

WILDLIFE SURVEY RESULTS



Spring Amphibian Breeding Survey Results (Maximum Calling Code), Westwood Village Phase 2

Species	AC3 ¹ (AM2) – in WSU2								AC4 ² (AM11) – in WSU8								AC5 (AM3) – in WSU2								AC6 (AM4) – in WSU3								AC7 (AM6) – in WSU6							
	2008-2011	2014-2015	2019	2020	2021	2022	2023	2024	2008-2011	2019	2020	2021	2022	2023	2024	2008-2011	2014-2015	2019	2020	2021	2022	2023	2024	2008-2011	2014-2015	2019	2020	2021	2022	2023	2024	2008-2011	2014-2015	2019	2020	2021	2022	2023	2024	
American Toad	1	1	1			2	3	1	1					3		1	1				1	3	1	2					1	2	1	1	1				1	3		
American Bullfrog									3	1	1		1	1																										
Chorus Frog	1								2							2								1								1								
Green Frog	3	2	1	1			1	1	3	1	1	1	1	1	2	1	2	1	1		1	1	1	3	2	1	1		1	1	1	2	1	1	1		1	1	1	
Gray Treefrog	3	3	3	3		3	2	3	3	1	1	1	1	1	1	3	3	3	3	1	3	3	2	3	3	3	3		3	1	2	3	3	3	3	1	3	1	1	
Northern Leopard Frog	2	2		1		1		1	2			1	1	3	1		3		1	1	1	1	1	2	2		1		1	1	1		1		1	1	2	2	1	
Spring Peeper	3	3	3	3	1	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	3	3	3	3	3	3	3	3	3	3	
Wood Frog	3	3	1	1				1	2					1		2	3	1	2			1	1	3	3		2	2		1	1				1			1	1	
Species Richness	7	6	5	5	1	4	4	6	8	4	4	4	5	7	4	6	6	4	5	3	5	6	6	7	5	3	5	2	5	6	6	5	5	3	5	3	5	6	5	
Average Species Richness	5								5								5								5								5							

Species	AC9 (AM5) – in WSU3								AC8 ³ (AM9) – in WSU4								AM10 ³ -- in WSU4						AM12 ⁴ -- in WSU4					
	2008-2011	2014-2015	2019	2020	2021	2022	2023	2024	2008-2011	2014-2015	2019	2020	2021	2022	2023	2024	2019	2020	2021	2022	2023	2024	2019	2020	2021	2022	2023	2024
American Toad						2	1	1		1																	1	
American Bullfrog																												
Chorus Frog	1								2																			
Green Frog	3	1	2	2		1	1	1	1	1						1												
Gray Treefrog	3	3	3	3		3	3	3	3	3		3			1									2			1	
Northern Leopard Frog	1	1		2	1	1	1	1	1	3																		1
Spring Peeper	3	3	3	3	3	3	3	3	3	3	3	3	3	2	31	3	3						1	1	1	1	1	1
Wood Frog		3	1	3	3		1	1	3	1		2	3	1		1	3									1	1	
Species Richness	5	5	4	5	3	5	6	6	6	6	1	3	2	2	3	3	2	0	0	0	0	0	1	2	1	1	4	3
Average Species Richness	5								3								0						2					

¹ Station identifiers indicated as ‘ACx’ are for 2008-2011 surveys, while those indicated ‘AMx’ are corresponding to 2014-2024 survey station identifiers.

² Surveyed during MESP and 2019-2024 surveys.

³ Initiated in 2019.



Avifauna Survey Results (2008 – 2012; 2014; 2015; 2019 – 2024) – WSU 2

Common Name	Srank	SARO Status	COSEWIC Status	SARA Status	Waterloo Region Significance	Area Sensitive	2008-2012		2014		2015		2019		2020		2021		2022		2023		2024	
							Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status
Alder Flycatcher	S5B				W								1	POSS									1	POSS
American Coot	S3B,S4N				W	X	1	POSS																
American Crow	S5						3	PROB	4	POSS	1	POSS											3	PROB
American Goldfinch	S5						5	PROB			5	PROB	3	PROB	2	PROB	2	POSS	6	PROB	2	PROB	4	PROB
American Redstart	S5B				W	X																	2	POSS
American Robin	S5						5	CONF	5	CONF	7	CONF	3	PROB	3	PROB	6	CONF	3	PROB	3	PROB	6	PROB
American Woodcock	S4B																	1	POSS			1	POSS	
Baltimore Oriole	S4B						3	PROB	1	PROB	3	CONF			1	POSS	1	POSS	1	POSS	1	POSS		
Bank Swallow	S4B	THR	THR	THR			3	OBS	10	OBS	5	OBS											4	OBS
Barn Swallow	S4B	SC	SC	THR			30	CONF	15	OBS	15	OBS	10	OBS	9	OBS	4	OBS	3	OBS	10	OBS	6	OBS
Belted Kingfisher	S5B,S4N				U						1	OBS											1	OBS
Black-billed Cuckoo	S4S5B				W												1	PROB	1	POSS				
Black-capped Chickadee	S5						4	PROB	2	POSS			2	POSS	2	PROB			1	PROB	1	POSS	2	PROB
Blue Jay	S5																	1	POSS					
Blue-winged Teal	S3B,S4M								1	POSS											1	POSS		
Bobolink	S4B	THR	SC	THR					1	POSS														
Brown-headed Cowbird	S5						3	PROB	5	CONF					1	POSS	4	PROB	5	PROB	1	POSS	3	PROB
Canada Goose	S5						10	CONF	6	POSS	7	CONF	10	CONF	18	POSS			8	POSS	8	POSS		
Canada Warbler	S5B	SC	SC	THR	W	X	2	POSS																
Cedar Waxwing	S5						8	PROB	2	POSS	3	PROB	4	PROB	3	PROB	4	POSS	4	PROB	2	POSS	4	PROB
Chimney Swift	S3B	THR	THR	THR			4	OBS																
Chipping Sparrow	S5B,S3N						1	POSS									1	POSS	1	POSS				
Cliff Swallow	S4S5B				W*		3	OBS	7	OBS			1	OBS										
Common Gallinule	S3B				W		7	CONF	1	PROB			2	PROB										
Common Grackle	S5						11	CONF	32	CONF	15	CONF	6	PROB	7	POSS	2	POSS	3	PROB	4	PROB	1	POSS
Common Raven	S5																						2	POSS
Common Yellowthroat	S5B,S3N						3	POSS	2	PROB	2	PROB					1	PROB	2	PROB	1	PROB	2	POSS
Downy Woodpecker	S5												1	POSS			2	POSS	1	PROB	1	POSS		
Eastern Kingbird	S4B						2	POSS	2	PROB	2	PROB					1	POSS			1	POSS	2	POSS
Eastern Phoebe	S5B						1	POSS							1	POSS								
European Starling	SNA						14	CONF	35	CONF	11	CONF	1	POSS	1	POSS	4	PROB	1	POSS			6	CONF



Common Name	Srank	SARO Status	COSEWIC Status	SARA Status	Waterloo Region Significance	Area Sensitive	2008-2012		2014		2015		2019		2020		2021		2022		2023		2024	
							Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status
Gray Catbird	S5B,S3N						1	PROB	1	POSS	3	POSS	1	POSS	1	POSS	2	PROB	3	PROB	1	PROB	2	PROB
Great Blue Heron	S4				W										1	OBS			1	OBS			1	OBS
Green Heron	S4B				W		1	POSS	1	POSS														
Hairy Woodpecker	S5					X													1	POSS			1	POSS
Horned Lark	S4								4	PROB													1	POSS
House Finch	SNA						2	POSS	2	POSS	1	POSS												
House Sparrow	SNA						5	PROB	10	OBS	2	POSS							2	POSS				
House Wren	S5B								1	POSS			1	POSS										
Indigo Bunting	S5B						1	POSS	2	PROB									1	POSS	1	POSS	1	POSS
Killdeer	S4B						3	PROB	1	POSS	2	PROB			1	POSS	1	PROB	1	PROB	1	POSS	2	POSS
Mallard	S5						10	CONF	8	PROB	4	PROB	3	PROB					2	PROB	2	POSS	3	PROB
Marsh Wren	S4B,S3N				W		2	PROB	2	POSS											1	POSS		
Mourning Dove	S5						4	PROB	2	POSS			1	POSS			1	POSS	2	PROB	5	POSS	1	POSS
Mourning Warbler	S5B				W								1	POSS										
Northern Cardinal	S5						1	POSS			2	POSS	2	PROB	1	PROB	3	PROB	2	PROB	3	PROB	2	PROB
Northern Flicker	S5								1	POSS	2	POSS							2	PROB			1	PROB
Northern Rough-winged Swallow	S4B						2	POSS							2	OBS			10	POSS			2	POSS
Orchard Oriole	S4B				W						1	POSS												
Pied-billed Grebe	S4B,S2N				W		1	POSS	1	PROB			1	PROB	1	POSS								
Red-eyed Vireo	S5B																1	POSS						
Red-tailed Hawk	S5																				1	POSS		
Red-winged Blackbird	S5						100	CONF	16	CONF			20	CONF	20	PROB	17	PROB	12	PROB	12	PROB	12	PROB
Rock Pigeon	SNA														1	OBS	2	POSS						
Rose-breasted Grosbeak	S5B																1	POSS	1	POSS				
Sandhill Crane	S5B,S3N				W	X													2	POSS				
Savannah Sparrow	S5B,S3N					X	2	POSS																
Song Sparrow	S5						7	PROB	8	CONF	6	CONF	3	PROB	4	PROB	3	PROB	7	PROB	5	PROB	4	PROB
Sora	S5B				W		1	POSS	1	POSS					1	POSS					1	POSS		
Spotted Sandpiper	S5B								2	PROB	2	PROB	2	PROB	1	PROB			1	POSS	1	POSS		
Swamp Sparrow	S5B,S4N								2	PROB	2	PROB	1	PROB	1	POSS			2	PROB	1	PROB	3	PROB
Tree Swallow	S4S5B						8	PROB	10	PROB	10	PROB	4	PROB									1	POSS
Trumpeter Swan	S4						2	PROB							6	CONF								
Virginia Rail	S4S5B				W		2	PROB			1	PROB			1	POSS					2	PROB	1	PROB



Common Name	Srank	SARO Status	COSEWIC Status	SARA Status	Waterloo Region Significance	Area Sensitive	2008-2012		2014		2015		2019		2020		2021		2022		2023		2024	
							Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status
Warbling Vireo	S5B						3	CONF	1	PROB	2	POSS	3	PROB	2	PROB	2	PROB	2	PROB	2	PROB	3	PROB
Willow Flycatcher	S4B						3	PROB	2	PROB	3	PROB	2	PROB	2	PROB	1	POSS	4	PROB	2	PROB	1	PROB
Wilson's Snipe	S5B				W				6	POSS														
Wood Duck	S5B,S3N				W*		10	CONF	4	PROB	2	PROB	2	PROB	11	CONF					3	PROB	2	PROB
Yellow Warbler	S5B						3	PROB	5	PROB	6	CONF	3	CONF	5	PROB	5	PROB	4	PROB	4	PROB	4	PROB
Yellow-billed Cuckoo	S4B				W										1	POSS								
Yellow-rumped Warbler	S5B,S4N				W		1	POSS															2	POSS
Total # of species							45		41		30		28		30		25		36		31		38	
Total # of breeding species							42		37		27		26		26		24		34		30		34	



Avifauna Survey Results (2008 – 2012; 2014; 2015; 2019 – 2024) – WSU 3

Common Name	Srank	SARO Status	COSEWIC Status	SARA Status	Waterloo Region Significance	Area Sensitive	2008-2012		2014		2015		2019		2020		2021		2022		2023		2024	
							Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status
Alder Flycatcher	S5B				W								2	POSS							1	POSS	1	POSS
American Black Duck	S4				W				2	PROB														
American Coot	S3B,S4N				W	X	2	POSS																
American Crow	S5						4	PROB	2	POSS	2	POSS	1	POSS	2	POSS			1	POSS	1	POSS	1	POSS
American Goldfinch	S5						9	PROB	5	POSS			2	PROB	9	PROB	10	PROB	6	PROB	4	PROB	5	PROB
American Redstart	S5B				W	X	3	PROB							2	POSS							2	POSS
American Robin	S5						10	CONF	8	CONF			3	PROB	6	PROB	14	CONF	4	PROB	2	PROB	2	PROB
Baltimore Oriole	S4B						4	CONF	3	PROB	3	CONF	1	PROB	1	POSS	2	POSS	2	PROB	1	POSS	3	PROB
Bank Swallow	S4B	THR	THR	THR			6	OBS			15	OBS			3	OBS							8	OBS
Barn Swallow	S4B	SC	SC	THR			10	CONF	10	OBS	15	OBS	1	OBS	1	OBS	1	OBS	3	OBS	8	OBS	4	OBS
Belted Kingfisher	S5B,S4N				U		1	POSS	1	POSS			1	POSS					1	POSS	1	POSS		
Black-billed Cuckoo	S4S5B				W				1	POSS					1	PROB			1	PROB				
Black-capped Chickadee	S5						4	PROB	2	POSS	2	POSS	1	POSS	2	CONF	4	PROB	2	POSS			1	POSS
Blackpoll Warbler	S5B														1	OBS								
Blue Jay	S5										2	POSS			1	POSS	2	POSS						
Blue-winged Teal	S3B,S4M						2	PROB	2	PROB									1	POSS	1	PROB		
Brown Thrasher	S4B				W		1	POSS			1	PROB									1	POSS		
Brown-headed Cowbird	S5						12	PROB	2	POSS	3	PROB	2	PROB	1	POSS	1	PROB			1	PROB	2	PROB
Canada Goose	S5						70	CONF	6	CONF	9	CONF	36	OBS	10	POSS	1	POSS			2	OBS	20	CONF
Cedar Waxwing	S5						7	PROB					3	POSS	4	PROB	4	PROB	2	PROB	2	PROB	5	POSS
Chestnut-sided Warbler	S5B				W		1	POSS													2	POSS		
Chipping Sparrow	S5B,S3N						1	POSS																
Cliff Swallow	S4S5B				W*		40	CONF																
Common Gallinule	S3B				W		6	CONF	3	PROB			1	PROB	1	PROB								
Common Grackle	S5						30	CONF	18	CONF			2	PROB	4	PROB	4	PROB	6	CONF	3	PROB	6	PROB



Common Name	Srank	SARO Status	COSEWIC Status	SARA Status	Waterloo Region Significance	Area Sensitive	2008-2012		2014		2015		2019		2020		2021		2022		2023		2024	
							Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status
Common Yellowthroat	S5B,S3N						3	PROB	5	PROB	3	PROB	2	PROB	3	POSS	3	PROB	5	PROB	5	PROB	1	PROB
Cooper's Hawk	S4				W	X										1	POSS							
Downy Woodpecker	S5						2	CONF	1	POSS			1	POSS	1	PROB	1	POSS	1	POSS	1	POSS		
Eastern Kingbird	S4B						2	PROB	2	PROB	2	PROB	1	POSS	1	POSS	1	PROB	2	PROB			1	PROB
Eastern Phoebe	S5B						6	CONF	1	POSS														
Eastern Wood-pewee	S4B	SC	SC	SC							1	PROB												
European Starling	SNA						30	CONF	16	CONF	25	CONF			3	POSS	2	POSS	6	CONF			10	PROB
Gray Catbird	S5B,S3N						4	PROB	5	CONF	4	PROB	1	PROB	1	POSS	1	PROB	2	PROB	1	POSS	3	PROB
Great Blue Heron	S4				W		2	OBS	2	OBS	1	OBS	1	OBS	1	OBS			2	OBS			1	OBS
Great Crested Flycatcher	S5B										1	PROB			1	POSS	1	POSS						
Green Heron	S4B				W				1	PROB					1	PROB								
Hairy Woodpecker	S5					X	1	POSS											1	POSS				
Hooded Merganser	S5				W		4	CONF	1	PROB			2	PROB										
Horned Lark	S4								2	PROB														
House Finch	SNA						2	POSS											1	POSS			3	PROB
House Sparrow	SNA						8	CONF																
House Wren	S5B						2	POSS	1	PROB			2	POSS			1	POSS	1	POSS				
Indigo Bunting	S5B						2	POSS	1	PROB	2	PROB	1	POSS					1	PROB			2	POSS
Killdeer	S4B						4	CONF	3	PROB	4	CONF							1	POSS	1	POSS	1	POSS
Least Bittern	S4B	THR	THR	THR	CV	X	2	POSS																
Least Flycatcher	S5B				W	X	1	POSS			1	POSS												
Mallard	S5						31	CONF	27	CONF	6	PROB	1	PROB	8	PROB			4	PROB	5	PROB	2	PROB
Marsh Wren	S4B,S3N				W								2	PROB	1	PROB							1	PROB
Mourning Dove	S5						2	POSS	4	PROB	2	POSS	4	PROB	6	PROB	40	PROB	4	PROB	1	POSS	2	POSS
Northern Cardinal	S5						4	PROB					2	PROB	4	PROB	5	PROB	2	PROB	2	PROB	4	PROB
Northern Flicker	S5						1	PROB	2	PROB	2	PROB	1	POSS	1	POSS			1	PROB	2	POSS	1	PROB



Common Name	Srank	SARO Status	COSEWIC Status	SARA Status	Waterloo Region Significance	Area Sensitive	2008-2012		2014		2015		2019		2020		2021		2022		2023		2024	
							Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status
Northern Rough-winged Swallow	S4B						35	CONF	7	OBS													2	PROB
Osprey	S5B				W				1	OBS					1	OBS								
Pied-billed Grebe	S4B,S2N				W		4	CONF	4	PROB			1	POSS	5	CONF								
Red-bellied Woodpecker	S5				W						1	POSS												
Red-eyed Vireo	S5B						1	POSS	2	POSS	3	PROB			1	POSS								
Red-tailed Hawk	S5						1	POSS							1	POSS	1	POSS					1	POSS
Red-winged Blackbird	S5						100	CONF	23	CONF	21	CONF	30	PROB	31	PROB	25	CONF	25	CONF	14	PROB	12	PROB
Rose-breasted Grosbeak	S5B										2	PROB							2	POSS	1	POSS		
Ruby-throated Hummingbird	S5B				W*				1	POSS														
Sandhill Crane	S5B,S3N				W	X	2	PROB	1	POSS			3	PROB			2	POSS			2	PROB		
Savannah Sparrow	S5B,S3N					X			4	PROB							1	PROB						
Song Sparrow	S5						12	CONF	13	CONF	4	CONF	4	PROB	10	PROB	8	PROB	6	PROB	4	PROB	4	PROB
Sora	S5B				W		4	PROB	3	PROB	1	PROB	1	POSS					2	POSS	1	POSS	1	PROB
Spotted Sandpiper	S5B						3	CONF	2	PROB	2	PROB			1	PROB	2	POSS			1	POSS	1	POSS
Swamp Sparrow	S5B,S4N						2	PROB	4	PROB	2	PROB	2	PROB	3	POSS	1	PROB	4	PROB	2	PROB	3	PROB
Tennessee Warbler	S5B																				1	POSS		
Tree Swallow	S4S5B						25	CONF	18	CONF	12	PROB	1	PROB	2	OBS	1	POSS			1	PROB		
Trumpeter Swan	S4						5	CONF	2	PROB			3	POSS	4	POSS							3	POSS
Turkey Vulture	S5B,S3N				W		2	OBS			2	OBS											1	OBS
Vesper Sparrow	S4B				W	X			1	POSS														
Virginia Rail	S4S5B				W		5	PROB	4	PROB	1	PROB							2	PROB	1	POSS	1	PROB
Warbling Vireo	S5B						3	PROB	3	PROB	3	PROB	2	PROB	3	PROB	4	POSS	4	PROB	3	PROB	5	PROB
White-breasted Nuthatch	S5					X	1	POSS			1	POSS	1	POSS			2	POSS						
Wild Turkey	S5						1	POSS			1	POSS												
Willow Flycatcher	S4B						2	PROB	5	PROB	3	POSS	2	PROB	1	PROB	5	PROB	2	PROB	3	PROB	5	PROB
Wood Duck	S5B,S3N				W*		12	CONF	18	CONF	8	CONF	2	PROB	3	CONF			2	PROB	14	CONF	1	PROB



Common Name	Srank	SARO Status	COSEWIC Status	SARA Status	Waterloo Region Significance	Area Sensitive	2008-2012		2014		2015		2019		2020		2021		2022		2023		2024	
							Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status
Yellow Warbler	S5B						12	CONF	11	CONF	5	CONF	2	PROB	4	PROB	5	PROB	7	PROB	5	PROB	4	PROB
Yellow-billed Cuckoo	S4B				W									1	POSS	1	PROB							
Yellow-rumped Warbler	S5B,S4N				W		1	POSS																
Total # of species							61		50		39		39		44		32		37		36		40	
Total # of breeding species							58		46		35		36		38		31		35		34		36	



Avifauna Survey Results (2008 – 2012; 2014; 2015; 2019 – 2024) – WSU 4

Common Name	Srank	SARO Status	COSEWIC Status	SARA Status	Waterloo Region Significance	Area Sensitive	2008-2012		2014		2019		2020		2021		2022		2023		2024	
							Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status
American Crow	S5						6	CONF	7	CONF	3	PROB			8	PROB	2	PROB	2	PROB	1	PROB
American Goldfinch	S5						8	PROB	2	PROB	7	PROB	8	PROB	11	PROB	5	POSS	5	PROB	4	PROB
American Redstart	S5B				W	X	1	PROB			1	POSS	1	POSS					3	PROB		
American Robin	S5						15	CONF	9	CONF	5	PROB	8	CONF	10	CONF	6	PROB	9	PROB	4	CONF
Baltimore Oriole	S4B						2	PROB	1	POSS	2	PROB	1	PROB	1	POSS	2	PROB	2	POSS	1	POSS
Bank Swallow	S4B	THR	THR	THR			8	OBS	1	OBS												
Barn Swallow	S4B	SC	SC	THR			40	OBS														
Bay-breasted Warbler	S5B										1	OBS										
Black-billed Cuckoo	S4S5B				W		1	POSS							1	POSS	2	POSS				
Black-capped Chickadee	S5						9	CONF	6	CONF	4	PROB	4	PROB	9	PROB	4	PROB	2	PROB	4	PROB
Blue Jay	S5						5	PROB	2	POSS	1	PROB	5	PROB	2	PROB	1	PROB	1	POSS	2	PROB
Brown-headed Cowbird	S5						14	CONF	2	CONF	1	PROB	1	PROB	6	PROB	4	POSS	4	PROB	1	POSS
Cedar Waxwing	S5						6	PROB	3	POSS	4	PROB	4	PROB	3	PROB	12	POSS			3	PROB
Chimney Swift	S3B	THR	THR	THR													1	OBS				
Chipping Sparrow	S5B,S3N						2	POSS			1	POSS			6	PROB			1	POSS		
Common Grackle	S5						10	CONF	6	CONF	12	POSS	4	PROB	7	PROB	4	PROB	3	PROB		
Common Yellowthroat	S5B,S3N								1	POSS			1	PROB	3	POSS						
Downy Woodpecker	S5						1	POSS	1	PROB			1	POSS	2	PROB	1	POSS	1	POSS		
Eastern Kingbird	S4B								2	PROB					2	PROB	1	POSS				
Eastern Wood-pewee	S4B	SC	SC	SC			4	PROB	2	PROB	1	PROB	1	PROB	1	PROB	2	PROB	3	POSS	4	POSS
European Starling	SNA						30	CONF	9	CONF	1	POSS							2	POSS		
Field Sparrow	S4B,S3N																				2	POSS
Gray Catbird	S5B,S3N						1	POSS	3	PROB	3	PROB	1	PROB	2	PROB	1	PROB	1	PROB	2	PROB
Great Blue Heron	S4				W		1	OBS							1	OBS						
Great Crested Flycatcher	S5B						2	PROB	1	PROB	2	PROB	1	PROB	4	PROB	2	PROB	1	PROB	3	PROB
Great Horned Owl	S4						1	OBS														
Hairy Woodpecker	S5					X	1	POSS	1	POSS							1	POSS			1	POSS
House Sparrow	SNA														4	PROB						
House Wren	S5B						3	PROB			1	POSS										
Indigo Bunting	S5B						4	PROB	2	PROB	3	POSS	4	PROB	2	PROB	3	PROB	2	PROB	5	PROB
Mourning Dove	S5								2	POSS	1	POSS			3	PROB	1	POSS	1	POSS		
Mourning Warbler	S5B				W								1	POSS								



Common Name	Srank	SARO Status	COSEWIC Status	SARA Status	Waterloo Region Significance	Area Sensitive	2008-2012		2014		2019		2020		2021		2022		2023		2024	
							Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status
Northern Cardinal	S5						4	CONF	2	PROB	3	PROB	4	PROB	4	PROB	2	PROB	3	PROB	2	POSS
Northern Flicker	S5						2	CONF	2	PROB	1	POSS	1	POSS	1	POSS					2	PROB
Northern Mockingbird	S4				W		1	POSS			1	POSS										
Northern Waterthrush	S5B				W				1	POSS									1	POSS		
Pied-billed Grebe	S4B,S2N				W		1	POSS														
Pileated Woodpecker	S5				W	X			1	PROB											1	POSS
Pine Siskin	S5				W						1	POSS										
Pine Warbler	S5B,S3N				W	X	2	POSS	1	PROB	1	POSS					1	POSS			1	POSS
Red-bellied Woodpecker	S5				W		8	PROB	5	PROB	3	PROB	1	PROB	1	POSS	2	PROB	1	POSS	1	POSS
Red-eyed Vireo	S5B						1	POSS	1	PROB	4	PROB	1	POSS	4	PROB	2	PROB	3	PROB	3	PROB
Red-tailed Hawk	S5						50	CONF	7	CONF	1	PROB			1	POSS	1	POSS			1	POSS
Red-winged Blackbird	S5										2	PROB	12	PROB	4	PROB	3	PROB	4	PROB	3	PROB
Rock Pigeon	SNA						3	CONF	3	PROB					3	OBS						
Rose-breasted Grosbeak	S5B						3	POSS											1	POSS		
Ruby-throated Hummingbird	S5B				W*														1	POSS		
Savannah Sparrow	S5B,S3N					X			1	POSS												
Scarlet Tanager	S5B				W	X	3	PROB	4	PROB												
Song Sparrow	S5										5	PROB	3	PROB	6	PROB	5	PROB	5	PROB	2	PROB
Swainson's Thrush	S5B				W						1	OBS										
Tree Swallow	S4S5B						10	CONF														
Turkey Vulture	S5B,S3N				W		4	OBS	3	OBS			1	OBS								
Vesper Sparrow	S4B				W	X	2	POSS														
Warbling Vireo	S5B								2	PROB			1	PROB								
White-breasted Nuthatch	S5					X	4	CONF			2	POSS	1	PROB	3	POSS	1	POSS	1	POSS	2	POSS
Wild Turkey	S5						6	CONF	2	POSS											1	POSS
Winter Wren	S5B,S4N				W	X	2	POSS														
Wood Duck	S5B,S3N				W*		2	PROB					2	POSS								
Yellow Warbler	S5B						1	POSS	5	PROB									1	POSS	2	POSS
Yellow-billed Cuckoo	S4B				W										1	PROB						
Total # of species							43		35		31		26		31		27		27		26	
Total # of breeding species							38		33		29		25		29		26		27		26	



Avifauna Survey Results (2008 – 2012; 2014; 2015; 2019 – 2024) – WSU 6

Common Name	Srank	SARO Status	COSEWIC Status	SARA Status	Waterloo Region Significance	Area Sensitive	2008-2012		2014		2015		2019		2020		2021		2022		2023		2024	
							Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status
American Coot	S3B,S4N				W	X	1	POSS	1	PROB														
American Crow	S5						1	POSS			2	POSS					1	OBS					1	OBS
American Goldfinch	S5						4	PROB					1	POSS	2	PROB	2	PROB	1	PROB	2	POSS	8	PROB
American Robin	S5						2	CONF	6	CONF			2	POSS			2	PROB	2	PROB	1	PROB	2	PROB
American Woodcock	S4B														1	POSS								
Baltimore Oriole	S4B						3	POSS																
Bank Swallow	S4B	THR	THR	THR			8	OBS	40	OBS	1	OBS	25	OBS	6	OBS	2	OBS						
Barn Swallow	S4B	SC	SC	THR			6	OBS	40	OBS	4	OBS	2	OBS	1	OBS	1	OBS	1	OBS	3	OBS	1	OBS
Blue-winged Teal	S3B,S4M						1	POSS	2	POSS														
Brown-headed Cowbird	S5						2	PROB										2	POSS				1	POSS
Canada Goose	S5						18	CONF	11	CONF	7	CONF	3	POSS			8	OBS	3	OBS	1	POSS		
Cedar Waxwing	S5														2	POSS	5	POSS					5	POSS
Cliff Swallow	S4S5B				W*				50	OBS	2	OBS												
Common Gallinule	S3B				W		7	CONF	1	PROB	1	POSS	1	PROB	1	POSS								
Common Grackle	S5						8	CONF	6	CONF	4	CONF			2	PROB			4	PROB	2	PROB	2	PROB
Common Yellowthroat	S5B,S3N						1	POSS					2	POSS					1	POSS				
Double-crested Cormorant	S5B,S4N																	1	OBS					
European Starling	SNA								2	POSS							15	POSS	3	POSS	200	CONF	17	PROB
Great Blue Heron	S4				W		2	OBS	1	OBS							1	OBS						
Green Heron	S4B				W				1	OBS					1	POSS								
Hooded Merganser	S5				W		2	POSS																
Horned Lark	S4						2	PROB	4	CONF							1	POSS	1	POSS				
House Finch	SNA						1	POSS																
House Sparrow	SNA						2	PROB																
Killdeer	S4B						13	CONF	2	PROB	2	PROB			3	POSS	2	PROB	1	PROB	3	PROB	1	PROB
Least Bittern	S4B	THR	THR	THR	CV	X							1	PROB										
Mallard	S5						9	PROB	17	CONF	2	PROB	5	PROB							5	PROB		
Marsh Wren	S4B,S3N				W						1	POSS	3	PROB	1	POSS								
Mourning Dove	S5						22	PROB			2	OBS					2	POSS	50	PROB	1	POSS	5	POSS
Northern Cardinal	S5						1	POSS									1	PROB						
Northern Flicker	S5																				1	POSS		



Common Name	Srank	SARO Status	COSEWIC Status	SARA Status	Waterloo Region Significance	Area Sensitive	2008-2012		2014		2015		2019		2020		2021		2022		2023		2024	
							Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status
Northern Rough-winged Swallow	S4B						4	PROB	9	OBS			1	OBS			10	OBS					1	OBS
Osprey	S5B				W						3	OBS												
Pied-billed Grebe	S4B,S2N				W		9	CONF	3	PROB														
Red-winged Blackbird	S5						50	CONF	8	PROB	12	CONF	21	PROB	23	CONF	14	PROB	15	PROB	12	PROB	34	CONF
Ring-billed Gull	S5																					1	OBS	
Rock Pigeon	SNA								7	OBS														
Rose-breasted Grosbeak	S5B						1	POSS																
Sandhill Crane	S5B,S3N				W	X															2	POSS		
Savannah Sparrow	S5B,S3N					X			2	PROB								1	POSS					
Song Sparrow	S5						2	POSS	2	PROB	1	PROB	3	PROB	4	PROB	6	CONF	6	PROB	7	PROB	17	CONF
Sora	S5B				W		3	POSS	2	PROB	1	POSS						1	POSS					
Spotted Sandpiper	S5B						8	PROB	2	PROB			2	POSS	1	PROB	2	PROB	1	PROB	1	POSS		
Swamp Sparrow	S5B,S4N																					4	POSS	
Tree Swallow	S4S5B						10	PROB	35	CONF	11	PROB	1	OBS			1	POSS			1	OBS		
Turkey Vulture	S5B,S3N				W		8	OBS																
Vesper Sparrow	S4B				W	X			2	PROB														
Virginia Rail	S4S5B				W				1	POSS			1	PROB					1	POSS	1	POSS		
Willow Flycatcher	S4B																	1	PROB	3	POSS	2	PROB	
Wood Duck	S5B,S3N				W*		2	PROB																
Yellow Warbler	S5B						2	POSS										2	POSS			1	POSS	
Total # of species							33		26		16		16		13		18		20		17		17	
Total # of breeding species							29		19		11		12		11		12		17		15		13	



Avifauna Survey Results (2008 – 2012; 2014; 2015; 2019 – 2024) – WSU 8

Common Name	Srank	SARO Status	COSEWIC Status	SARA Status	Waterloo Region Significance	Area Sensitive	2008-2012		2014		2015		2019		2020		2021		2022		2023		2024	
							Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status
Alder Flycatcher	S5B				W								1	POSS										
American Coot	S3B,S4N				W	X														1	POSS			
American Crow	S5						1	POSS			5	PROB			1	POSS	3	POSS	1	POSS	4	PROB	2	PROB
American Goldfinch	S5						3	POSS	2	POSS	2	PROB	2	PROB	4	PROB	3	PROB	5	PROB	2	PROB	2	PROB
American Redstart	S5B				W	X			2	PROB	2	PROB					1	POSS					2	POSS
American Robin	S5						2	PROB			7	CONF	2	PROB	1	PROB	2	POSS	2	PROB	2	PROB	4	PROB
Baltimore Oriole	S4B						1	POSS	3	PROB	2	PROB	1	POSS	1	PROB	1	PROB	1	POSS	1	PROB	1	PROB
Bank Swallow	S4B	THR	THR	THR					6	OBS	9	OBS											10	OBS
Barn Swallow	S4B	SC	SC	THR					10	CONF	10	PROB			1	OBS								
Belted Kingfisher	S5B,S4N				U				2	PROB	1	POSS			1	POSS							1	POSS
Black-billed Cuckoo	S4S5B				W												1	POSS						
Black-capped Chickadee	S5						2	POSS	5	CONF	2	PROB	2	POSS	2	PROB	2	PROB	1	POSS	3	PROB		
Blue Jay	S5						4	POSS					1	POSS			1	POSS	1	POSS				
Brown Thrasher	S4B				W				1	POSS														
Brown-headed Cowbird	S5						1	POSS	3	CONF					1	POSS	2	POSS	2	PROB	1	POSS	1	PROB
Canada Goose	S5						10	CONF	22	CONF	22	CONF	41	CONF	40	CONF	22	PROB	26	POSS	45	POSS	10	CONF
Caspian Tern	S3B,S5M				OV														1	OBS			2	OBS
Cedar Waxwing	S5												4	PROB	4	POSS	2	PROB	2	PROB	10	POSS	1	POSS
Chipping Sparrow	S5B,S3N								2	POSS					1	PROB								
Cliff Swallow	S4S5B				W*				4	OBS														
Common Gallinule	S3B				W		1	POSS																
Common Grackle	S5						10	POSS	24	CONF			3	PROB	7	POSS	4	PROB	1	CONF	5	PROB	4	PROB
Common Nighthawk	S4B	SC	SC	SC	W*														1	OBS				



Common Name	Srank	SARO Status	COSEWIC Status	SARA Status	Waterloo Region Significance	Area Sensitive	2008-2012		2014		2015		2019		2020		2021		2022		2023		2024	
							Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status
Common Raven	S5																2	POSS						
Common Yellowthroat	S5B,S3N								2	PROB	3	PROB	2	PROB	1	PROB	2	PROB	3	PROB	3	PROB	2	PROB
Double-crested Cormorant	S5B,S4N										4	OBS	3	POSS										
Downy Woodpecker	S5						2	POSS	1	POSS	1	POSS	1	POSS	1	POSS	1	PROB	1	POSS			1	POSS
Eastern Kingbird	S4B						1	POSS			2	PROB	1	PROB	2	PROB	1	PROB	1	POSS	1	POSS	2	PROB
Eastern Wood-pewee	S4B	SC	SC	SC																			1	PROB
European Starling	SNA						2	POSS	25	CONF			100	PROB	8	CONF	3	POSS	6	PROB	1	POSS	2	POSS
Gray Catbird	S5B,S3N								5	PROB	4	PROB	1	POSS			1	POSS	1	PROB	2	PROB	1	PROB
Great Blue Heron	S4				W		7	OBS	3	OBS	3	OBS	1	OBS	4	OBS	3	OBS	3	OBS	4	OBS	2	OBS
Great Crested Flycatcher	S5B								1	PROB							1	POSS	1	POSS	1	POSS		
Green Heron	S4B				W				1	POSS														
Hairy Woodpecker	S5					X					1	POSS												
Hooded Merganser	S5				W		4	CONF																
House Finch	SNA								1	POSS														
House Sparrow	SNA																2	PROB	2	POSS	2	POSS		
House Wren	S5B						1	POSS	2	PROB	2	POSS	1	POSS	1	POSS			1	POSS				
Indigo Bunting	S5B								2	PROB	2	PROB											1	POSS
Killdeer	S4B								2	PROB	2	PROB					2	PROB	1	POSS	1	PROB	1	PROB
Mallard	S5						2	POSS	16	CONF	7	CONF	1	POSS	2	PROB	9	PROB	1	POSS	3	PROB	4	POSS
Marsh Wren	S4B,S3N				W								1	POSS	1	POSS								
Mourning Dove	S5						1	POSS					2	POSS	1	POSS	3	PROB	1	POSS	2	PROB	2	PROB
Northern Cardinal	S5						2	PROB	3	PROB	2	POSS			2	PROB	2	PROB	1	PROV	2	PROB	1	PROB
Northern Flicker	S5						1	POSS	2	PROB	1	POSS							1	POSS	1	PROB	1	POSS
Northern Rough-winged Swallow	S4B												4	OBS									2	POSS



Common Name	Srank	SARO Status	COSEWIC Status	SARA Status	Waterloo Region Significance	Area Sensitive	2008-2012		2014		2015		2019		2020		2021		2022		2023		2024	
							Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status	Abundance	Breeding Status
Orchard Oriole	S4B				W										1	POSS								
Osprey	S5B				W				1	OBS			1	PROB					1	OBS	2	OBS	1	OBS
Pied-billed Grebe	S4B,S2N				W		5	CONF	7	CONF	4	PROB	6	CONF	2	CONF							5	CONF
Red-eyed Vireo	S5B								1	POSS									1	POSS	1	POSS		
Red-winged Blackbird	S5						50	CONF	42	CONF	27	CONF	30	CONF	14	CONF	10	PROB	16	CONF	12	PROB	20	PROB
Rose-breasted Grosbeak	S5B								1	POSS							1	POSS	1	POSS			3	CONF
Sandhill Crane	S5B,S3N				W	X	3	PROB	1	PROB			3	PROB			2	PROB	5	POSS	2	PROB	2	PROB
Song Sparrow	S5						3	PROB	11	PROB	5	CONF	2	PROB	2	PROB	3	PROB	4	PROB	3	PROB	3	PROB
Sora	S5B				W																1	POSS		
Spotted Sandpiper	S5B								1	PROB									1	PROB				
Swamp Sparrow	S5B,S4N								3	PROB	2	POSS	1	PROB	1	PROB	2	PROB	2	PROB	2	PROB	2	PROB
Tree Swallow	S4S5B						3	POSS	33	CONF	15	PROB					3	POSS	2	PROB	1	POSS	3	POSS
Trumpeter Swan	S4						2	POSS									5	PROB					2	PROB
Turkey Vulture	S5B,S3N				W						2	POSS												
Virginia Rail	S4S5B				W		2	PROB													1	POSS	1	POSS
Warbling Vireo	S5B								2	PROB	1	POSS	3	PROB	2	PROB	2	PROB	2	PROB	2	PROB	3	PROB
White-breasted Nuthatch	S5					X	1	POSS					2	POSS			2	POSS					1	POSS
Willow Flycatcher	S4B								3	PROB	4	PROB	2	PROB	1	POSS	1	POSS	1	POSS	1	POSS	2	POSS
Wood Duck	S5B,S3N				W*		5	CONF	11	CONF	3	CONF					1	PROB	1	OBS			3	PROB
Yellow Warbler	S5B						1	POSS	7	CONF	8	PROB	2	PROB	4	PROB	3	PROB	3	PROB	3	PROB	2	PROB
Total # of species							30		41		33		31		30		37		39		34		41	
Total # of breeding species							29		37		30		29		28		36		34		32		37	



Notes:

American Coot	Recorded in WSU 2 and WSU 3 on May 20 and May 22, 2009; Recorded in Unit 6 on July 9, 2009. Earlier records possible migrants.
Bank Swallow	Foraging visitants. No suitable nesting habitat (typically sand, clay or gravel river banks or steep cliffs) is present in the study area. Local breeding habitat may be present in nearby gravel pits.
Barn Swallow	Foraging visitants. Confirmed breeding of at least 10 pairs within the barns at 200 Blenheim Road (adjacent to WSU2). No suitable nesting habitat is present elsewhere in the study area.
Bay-breasted Warbler	Recorded on May 31, 2019. Likely a late migrant. Typically breeds further north.
Blackpoll Warbler	Recorded on May 27, 2020. Likely a late migrant. Typically breeds further north.
Black-throated Green Warbler	Recorded on May 20 and May 22, 2009. Likely a late migrant. Typically breeds further north.
Bobolink	Singing singing/displaying male recorded on May 21, 2014 west of the laneway west of WSU 2 (in field adjacent to barn).
Canada Warbler	Recorded on May 20 and May 22, 2009. Likely a late migrant. Typically breeds further north.
Chimney Swift	Nesting habitat not observed in study area; Chimney Swifts are aerial insectivores typically foraging over water, flying distances from nesting site for food supply
Cliff Swallow	Nesting habitat not observed on-site (typically cliffs/bluffs/bridges/houses), however, fledged young observed in WSU 3. CLSW's are aerial insectivores typically foraging over water, flying distances from nesting site for food supply. Nesting present on local bridges (e.g. Grand River).
Common Raven	Active nest with young confirmed on silo (adjacent to WSU6) on May 5, 2019. Three young confirmed in nest on May 21, 2019. One remaining fledged young observed on top of silo on May 31, 2019 (adults still tending). Adults and fledged young observed again on June 18, 2019 within WSU3.
	2020: Adult at active nest in silo (adjacent to WSU2) on April 27, 2020. Pair observed at nest again on May 16, 2020. Adult observed at nest again on May 21, 2020. No sign of adults at silo on May 27, 2020 and nest was knocked over. Not observed again within the study area during remainder of 2020 season.
Osprey	Foraging visitants. No nests recorded.
Northern Rough-winged Swallow	Recorded on May 29, 2008; July 9, 2009; June 8, 2010; July 7, 2010; July 26, 2010; May 25, 2011. Nesting habitat not observed on-site (sandy road banks, steep riparian banks or drainage holes), however, fledged young observed in WSU 3. NRWS's are aerial insectivores typically foraging over water, flying distances from nesting site for food supply.
Northern Waterthrush	1 S recorded on July 26, 2010 WSU 4.
Pine Siskin	Recorded on May 31, 2019. Likely a late migrant. Typically breeds further north.
Swainson's Thrush	Recorded on May 31, 2019. Likely a late migrant. Typically breeds further north.
Yellow-rumped Warbler	Recorded on May 20 and May 22, 2009. Likely a late migrant. Typically breeds further north.

Legend:

¹G-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.

²S-Rank (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.



³SARO (Species at Risk in Ontario) Status

(Provincial status from MECP SARO list website: <https://www.ontario.ca/page/species-risk-ontario>)

- 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.

⁴COSEWIC (Committee on the Status of Endangered Wildlife in Canada)

(COSEWIC status from SARA Registry website: <https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry.html>)

- 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.

⁵SARA (Species at Risk Act) Status and Schedule

(Federal status from SARA Registry website: <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 of special concern.
- Schedule 2:** species listed in Schedule 2 are species that had been designated as endangered or threatened, and have yet to be re-assessed by COSEWIC using revised criteria. Once these species have been re-assessed, they may be considered for inclusion in Schedule 1.
- Schedule 3:** species listed in Schedule 3 are species that had been designated as special concern, and have yet to be re-assessed by COSEWIC using revised criteria. Once these species have been re-assessed, they may be considered for inclusion in Schedule 1.

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 of 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.

⁶Regional Status

Waterloo Region Significance (RMOW) (1996)

From Regional Municipality of Waterloo Significant Species List Breeding Birds (1996). Significant ONLY when evidence of breeding (many are common and widespread as migrants). Main purpose of the list is in evaluation of the 'significant species' criterion for the designation of Environmentally Sensitive Policy Areas.

- W = Waterloo: Regionally Significant
- W* = Significant only when nesting in natural circumstances
- V = Very Rare (0-3 occurrences)
- R = Rare (0-5)
- S = Scarce (6-20)
- U = Uncommon (21-100)
- C = Common (>100)
- I = Introduced
- CV = Canada (COSEWIC) Vulnerable; CT = Canada (COSEWIC) Threatened; CE = Canada (COSEWIC) Endangered
- OV = Ontario (SARO) Vulnerable; OT = Ontario (SARO) Threatened; OE = Ontario (SARO) Endangered

Note: A number of the COSEWIC and SARO designations have changed since when the Region of Waterloo list was created in 1996. Please use the other columns for the most up-to-date COSEWIC and SARO rankings.



7MNRF 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 and Forestry. 2015. Significant Wildlife Habitat Criteria Schedules For Ecoregion 6E. January, 2015. Regional Operations Division, Southern Region Resources Section. 39pp.

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.



Summary of Lepidoptera Species Observed in WSU 2, WSU3, WSU 4, WSU 6, and WSU 8

COMMON NAME	G-RANK ¹	S-RANK ²	SARO (ESA) ³	COSEWIC ⁴	SARA STATUS ⁵	LOCALLY UNCOMMON ⁶	WSU 2 SOUTH-WEST WETLAND				WSU 3 WEST CENTRAL WETLAND				WSU 4 WEST SIDE FOREST				WSU 6 CENTRAL ISOLATED WETLAND			WSU 8 BARRIE'S LAKE EAST AND WEST			
							2010	2011	2014 SUPPLEMENTAL	COMPOSITE	2010	2011	2014 SUPPLEMENTAL	COMPOSITE	2010	2011	2014 SUPPLEMENTAL	COMPOSITE	2010	2011	COMPOSITE	2010	2011	2014 SUPPLEMENTAL	COMPOSITE
American Lady	G5	S5							✓	✓	1			✓											
American Snout	G5	SZB													1			✓							
Black Swallowtail	G5	S5									1		✓	✓	1			✓							
Bronze Copper	G5	S5								✓	1			✓		1		✓	1		✓				
Cabbage White	G5	SE					2	5		✓	25	5		✓	15	5		✓	7	5	✓	3			✓
Clouded Sulphur	G5	S5								✓	25			✓	30	5	✓	✓	15	6	✓				
Columbine Duskywing	G4	S4				✓						2		✓	1			✓							
Common Branded Skipper	G5	S4S5																							
Common Ringlet	G5	S5					2			✓															✓
Common Sootywing	G5	S3S4										1	✓	✓		1		✓							
Common Wood-Nymph	G5	S5								✓															
Dun Skipper	G5	S5										2		✓											
Duskywing Species	G5	S5																✓							
Eastern Comma	G5	S5					1			✓					1			✓						✓	✓
Eastern Tiger Swallowtail	G5	S4S5									1	2	✓	✓	2			✓							
European Skipper	G5	SE					20			✓	10	3		✓	10			✓							
Giant Swallowtail	G5	S3														1		✓							
Hobomok Skipper	G5	S5									1			✓		1		✓							
Least Skipper	G5	S5					3	2		✓	4	7		✓		2		✓		2	✓	5			✓
Monarch	G4	S4	SC	END	SC/1					✓	2	2	✓	✓	2			✓		1	✓	1			✓
Mourning Cloak	G5	S5													2			✓							
Northern Crescent	G5	S5										3		✓											
Orange Sulphur	G5	S5													1			✓							
Painted Lady	G5	SZB									3			✓											
Pearl Crescent	G5	S4									9			✓	5	4		✓							
Question Mark	G5	S5									1			✓											
Red Admiral	G5	SZB					2		✓	✓	3	1	✓	✓			✓	✓	2		✓				
Spicebush Swallowtail	G5	S4				✓																			
Spring Azure	G5	S5							✓	✓							✓	✓							
Summer Azure	G5	S5						1		✓					3			✓				2			✓
Tawny Emperor	G5	S2S3														1		✓							
Tawny-edged Skipper	G5	S5																							
Viceroy	G5	S5										2	✓	✓		1		✓							



COMMON NAME	G-RANK ¹	S-RANK ²	SARO (ESA) ³	COSEWIC ⁴	SARA STATUS ⁵	LOCALLY UNCOMMON ⁶	WSU 2 SOUTH-WEST WETLAND				WSU 3 WEST CENTRAL WETLAND				WSU 4 WEST SIDE FOREST				WSU 6 CENTRAL ISOLATED WETLAND			WSU 8 BARRIE'S LAKE EAST AND WEST			
							2010	2011	2014 SUPPLEMENTAL	COMPOSITE	2010	2011	2014 SUPPLEMENTAL	COMPOSITE	2010	2011	2014 SUPPLEMENTAL	COMPOSITE	2010	2011	COMPOSITE	2010	2011	2014 SUPPLEMENTAL	COMPOSITE
Wild Indigo Duskywing	G5	S4														2		✓						✓	✓
34			1	1	1	2	6	3	3	13	14	11	6	19	13	11	3	24	4	4	6	4	0	2	7



Summary of Odonate Species Observed in WSU 2, WSU 3, WSU 4, WSU 6, and WSU 8

COMMON NAME	G-RANK ¹	S-RANK ²	SARO (ESA) ³	COSEWIC ⁴	SARA STATUS ⁵	LOCALLY UNCOMMON ⁶	WSU 2 SOUTH-WEST WETLAND				WSU 3 WEST CENTRAL WETLAND				WSU 4 WEST SIDE FOREST				WSU 6 CENTRAL ISOLATED WETLAND			WSU 8 BARRIE'S LAKE EAST AND WEST			
							2010	2011	2014 SUPPLEMENTAL	COMPOSITE	2010	2011	2014 SUPPLEMENTAL	COMPOSITE	2010	2011	2014 SUPPLEMENTAL	COMPOSITE	2010	2011	COMPOSITE	2010	2011	2014 SUPPLEMENTAL	COMPOSITE
Amber-winged Spreadwing	G4	S3									3			✓											
American Emerald	G5	S5				✓																		✓	✓
Autumn Meadowhawk	G5	S5								✓	30			✓	15			✓				3			✓
Band-winged Meadowhawk	G5	S4				✓										1		✓							
Black Saddlebags	G5	S4								5				✓	2	3		✓	3						
Black-tipped Darner	G4	S4													5			✓							
Blue Dasher	G5	S5					2	2		✓	6	1		✓					2	9	✓	30			✓
Bluet Species	G5	S5								✓		250		✓				✓		150	✓				
Boreal Bluet	G5	S5										1		✓											
Calico Pennant	G5	S5																							
Canada Darner	G5	S5								✓				✓	2	1		✓							
Carolina Saddlebags	G5	SZB				✓							✓	✓										✓	✓
Chalk-fronted Corporal	G5	S5				✓																		✓	✓
Cherry-faced Meadowhawk	G5	S5													2			✓							
Common Baskettail	G5	S5					2			✓	5			✓	5			✓							
Common Green Darner	G5	S5					1	2	✓	✓	11	3	✓	✓	7	6	✓	✓	4		✓	5		✓	✓
Common Spreadwing	G5	S5														2		✓							
Common Whitetail	G5	S5					2	1		✓	4	3		✓	2	5		✓				3			✓
Dot-tailed Whiteface	G5	S5					20		✓	✓	60	15		✓			✓	✓	10		✓	40	25	✓	✓
Eastern Forktail	G5	S5					20	5		✓	300	25		✓	10			✓	25	15	✓	30			✓
Eastern Pondhawk	G5	S5						1		✓	3			✓						4	✓	9			✓
Ebony Jewelwing	G5	S5																							
Emerald Spreadwing	G5	S5									2	75		✓		5		✓					13		✓
Familiar Bluet	G5	S5					20	10	✓	✓	40	10	✓	✓	10	2		✓	20		✓	20	20		✓
Four-spotted Skimmer	G5	S5					2		✓	✓	20			✓	2			✓	2		✓	1			✓
Fragile Forktail	G5	S4								✓	2	2		✓											
Frosted Whiteface	G5	S5				✓					2		✓	✓		3	✓	✓						✓	✓
Glider Species	G5	S4																							
Halloween Pennant	G5	S4																							
Harlequin Darner	G5	S3													1			✓							
Lance-tipped Darner	G5	S5									3	5		✓	2	7		✓			✓				
Lyre-tipped Spreadwing	G5	S5									10			✓								2			✓
Marsh Bluet	G5	S5									3	35		✓		15		✓							



COMMON NAME	G-RANK ¹	S-RANK ²	SARO (ESA) ³	COSEWIC ⁴	SARA STATUS ⁵	LOCALLY UNCOMMON ⁶	WSU 2 SOUTH-WEST WETLAND				WSU 3 WEST CENTRAL WETLAND				WSU 4 WEST SIDE FOREST				WSU 6 CENTRAL ISOLATED WETLAND			WSU 8 BARRIE'S LAKE EAST AND WEST			
							2010	2011	2014 SUPPLEMENTAL	COMPOSITE	2010	2011	2014 SUPPLEMENTAL	COMPOSITE	2010	2011	2014 SUPPLEMENTAL	COMPOSITE	2010	2011	COMPOSITE	2010	2011	2014 SUPPLEMENTAL	COMPOSITE
Meadowhawk Species	G5	S5								✓		200		✓		50		✓			✓				
Painted Skimmer	G5	S2				✓							✓	✓											
Ruby Meadowhawk	G5	S5													2	2		✓							
Sedge Sprite	G5	S5									10	7		✓							✓				
Shadow Darner	G5	S5													2			✓							
Slaty Skimmer	G5	S4				✓						1		✓											
Slender Spreadwing	G5	S5					5	4		✓	100	10		✓	75	50		✓			✓	3			✓
Spatterdock Darner	G3G4	S1																				3	1		✓
Spotted Spreadwing	G5	S5								✓	25	10		✓	15	5		✓			✓				
Spreadwing Species	G5	S5								✓		500		✓											
Swamp Darner	G5	S2S3													2			✓							
Tule Bluet	G5	S5									5			✓											
Twelve-spotted Skimmer	G5	S5						4		✓	5	3		✓	2	3		✓	5		✓	2	2		✓
Unicorn Clubtail	G5	S2S3																					1		✓
Variable Darner	G5	S5				✓				✓															
Wandering Glider	G5	S4								✓					2	2		✓							
White-faced Meadowhawk	G5	S5					5			✓	15			✓		11		✓							
Widow Skimmer	G5	S5									5			✓								2			✓
51						8	10	8	4	21	25	19	5	33	20	18	3	29	8	4	14	14	6	6	20

Legend:

¹G-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.

²S-Rank (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 SARO List website)

- 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) Status**
(COSEWIC status from SARA Registry website)

- 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 SARA Registry website)

- 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 of special concern.
Schedule 2: species listed in Schedule 2 are species that had been designated as endangered or threatened, and have yet to be re-assessed by COSEWIC using revised criteria. Once these species have been re-assessed, they may be considered for inclusion in Schedule 1.
Schedule 3: species listed in Schedule 3 are species that had been designated as special concern, and have yet to be re-assessed by COSEWIC using revised criteria. Once these species have been re-assessed, they may be considered for inclusion in Schedule 1.

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 of 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 **Regional Status**
Waterloo Region Significance (RMOW) (1996)

APPENDIX E

SPECIES AT RISK HABITAT ASSESSMENT

Taxon	Common Name	Scientific Name	S-rank	SARO Status	SARA Status	COSEWIC Status	COSSARO Status	Habitat Requirements	Probability to Occur in the Study Area	Potential Project Impact and Mitigation
Amphibians	Jefferson Salamander	<i>Ambystoma jeffersonianum</i>	S2	END	END	END	END	In Ontario, Jefferson salamander is found only in southern Ontario, along southern portions of the Niagara Escarpment and western portions of the Oak Ridges Moraine. Jefferson salamander prefers moist, well-drained deciduous and mixed forests with a closed canopy. It overwinters underground in mammal burrows and rock fissures and moves to vernal pools and ephemeral wetlands in the early spring to breed. Breeding ponds are typically located in or near to forested habitats, and contain submerged debris (i.e. sticks, vegetation) for egg attachment sites. Ephemeral breeding pools need to have water until at least mid-summer (mid to late July) (Jefferson Salamander Recovery Team 2010).	Low. Suitable breeding habitat is present within WSU 2, 3, 4, 6 and 8, however, this species was not recorded in the Study Area during multiple years of targeted surveys. Surveys completed: Targeted Jefferson Salamander surveys from 2008-2011 and 2016 (pond trapping, pitfall trapping, dip netting). Supplemental wildlife / amphibian surveys from 2008-2011, 2014-2015 and 2019-2020 (road/mortality, cover boards).	None. No known records and none recorded during targeted surveys. Potentially suitable habitats will be retained as part of the Natural Heritage System.
Amphibians	Unisexual Ambystoma (Jefferson Salamander dependent population)	<i>Ambystoma sp. DU 2</i>	S2	END	END	END	END	In Ontario, the unisexual Jefferson salamander is found within deciduous or mixed forests containing, or adjacent to, suitable breeding ponds. Breeding ponds are normally ephemeral pools that dry in late summer. Terrestrial habitat is in moist woodlands, where the salamanders find shelter under fallen trees or rocks, as well as in mammal burrows. Adults forage during humid conditions at night on the forest floor within 1 km of the breeding pond. These salamanders also require terrestrial overwintering sites below the frost line (COSEWIC 2016).	Low. Suitable breeding habitat is present within WSU 2, 3, 4, 6 and 8, however, this species was not recorded in the Study Area during multiple years of targeted surveys. Surveys completed: Targeted Jefferson Salamander surveys from 2008-2011 and 2016 (pond trapping, pitfall trapping, dip netting). Supplemental wildlife / amphibian surveys from 2008-2011, 2014-2015 and 2019-2020 (road/mortality, cover boards).	None. No known records and none recorded during targeted surveys. Potentially suitable habitats will be retained as part of the Natural Heritage System.
Birds	Eastern Whip-poor-will	<i>Antrostomus vociferus</i>	S4B	SC	THR	THR	SC	In Ontario, whip-poor-will breeds in semi-open forests with little ground cover. Breeding habitat is dependent on forest structure rather than species composition, and is found on rock and sand barrens, open conifer plantations and post-disturbance regenerating forest. Territory size ranges from 3 to 11 ha (COSEWIC 2009). No nest is constructed, and eggs are laid directly on the leaf litter (Mills 2007).	Low. May occur as a migrant, though no suitable breeding habitat is present and this species was not recorded in the Study Area during multiple years of targeted surveys. Surveys completed: Breeding bird surveys – 12 years (2008, 2009, 2010, 2011, 2014-2015, 2019-2024).	None. No known records and no suitable habitat present.
Birds	Short-eared Owl	<i>Asio flammeus</i>	S4?B,S 2S3N	THR	SC	THR	THR	In Ontario, short-eared owl breeds in a variety of open habitats including grasslands, tundra, bogs, marshes, clear-cuts, burns, pastures and occasionally agricultural fields. The primary factor in determining breeding habitat is proximity to small mammal prey resources (COSEWIC 2008). Nests are built on the ground at a dry site and usually adjacent to a clump of tall vegetation used for cover and concealment (Gahbauer 2007).	Low. May occur as a migrant, though no suitable breeding habitat is present and this species was not recorded in the Study Area during multiple years of targeted surveys. Surveys completed: Breeding bird surveys – 12 years (2008, 2009, 2010, 2011, 2014-2015, 2019-2024).	None. No known records and no suitable habitat present.

Taxon	Common Name	Scientific Name	S-rank	SARO Status	SARA Status	COSEWIC Status	COSSARO Status	Habitat Requirements	Probability to Occur in the Study Area	Potential Project Impact and Mitigation
Birds	Canada Warbler	<i>Cardellina canadensis</i>	S5B	SC	THR	SC	SC	In Ontario, breeding habitat for Canada warbler consists of moist mixed forests with a well-developed shrubby understory. This includes low-lying areas such as cedar and alder swamps, and riparian thickets (McLaren 2007). It is also found in densely vegetated regenerating forest openings. Suitable habitat often contains a developed moss layer and an uneven forest floor. Nests are well concealed on or near the ground in dense shrub or fern cover, often in stumps, fallen logs, overhanging stream banks or mossy hummocks (Reitsma et al. 2010).	Confirmed. Marginal suitable habtiat for this species is present in WSU 4. Two individuals were recorded in May 2009 and were determined to be probable migrants as this species typically breeds further north. Surveys completed: Breeding bird surveys – 12 years (2008, 2009, 2010, 2011, 2014-2015, 2019-2024).	None. Potentially suitable habitat will be retained as part of the Natural Heritage System, with buffers and other mitigation measures.
Birds	Henslow's Sparrow	<i>Centronyx henslowii</i>	S1B	END	END	END	END	In Ontario, Henslow's sparrow breeds in large grasslands with low disturbance, such as lightly grazed and ungrazed pastures, fallow hayfields, grassy swales in open farmland, and wet meadows. Preferred habitat contains tall, dense grass cover, typically over 30 cm high, with a high percentage of ground cover, and a thick mat of dead plant material. Henslow's sparrow generally avoids areas with emergent woody shrubs or trees, and fence lines. Areas of standing water or ephemerally wet patches appear to be important. This species breeds more frequently in patches of habitat greater than 30 ha and preferably greater than 100 ha (COSEWIC 2011).	None. No suitable breeding habitat is present and this species was not recorded in the Study Area during multiple years of targeted surveys. Surveys completed: Breeding bird surveys – 12 years (2008, 2009, 2010, 2011, 2014-2015, 2019-2024).	None. No known records and no suitable habitat present.
Birds	Chimney Swift	<i>Chaetura pelagica</i>	S3B	THR	THR	THR	THR	In Ontario, chimney swift breeding habitat is varied and includes urban, suburban, rural and wooded sites. They are most commonly associated with towns and cities with large concentrations of chimneys. Preferred nesting sites are dark, sheltered spots with a vertical surface to which the bird can grip. Unused chimneys are the primary nesting and roosting structure, but other anthropogenic structures and large diameter cavity trees are also used (COSEWIC 2007).	Confirmed. Foraging habitat was present within the Subject Property under the former agricultural land use and is still present within adjacent natural areas. No suitable nesting habitat is present within the Subject Property or adjacent lands, likely present within the local landscape. Low numbers (1-4) recorded foraging over WSU 2, 4 and the former agricultural field; no evidence of nesting. Surveys completed: Breeding bird surveys – 12 years (2008, 2009, 2010, 2011, 2014-2015, 2019-2024).	None. No nesting habitat impacted. Higher quality foraging habitat (relative to area within the development envelope) to be retaiend as part of the Natural Heritage System and additional foraging habitat is abundant in the local landscape.
Birds	Black Tern	<i>Chlidonias niger</i>	S3B,S4M	SC		NAR	END	In Ontario, Black Tern breeds in freshwater marshlands where it forms small colonies. It prefers marshes or marsh complexes > 20 ha which are not surrounded by wooded area. Black Tern is sensitive to the presence of agricultural activities. The Black Tern nests in wetlands with an even combination of open water and emergent vegetation, and still waters of 0.5-1.2 m deep. Preferred nest sites have short dense vegetation or tall sparse vegetation often consisting of cattails, bulrushes and occasionally burreed or other marshland plants. Black Tern also requires posts or snags for perching (Weseloh 2007).	Low. Suitable breeding habitat is present within WSU 8, and there are historical records at this location, however, this species was not recorded in the Study Area during multiple years of targeted surveys. Surveys completed: Breeding bird surveys – 12 years (2008, 2009, 2010, 2011, 2014-2015, 2019-2024).	None. Suitable habitat will be retained as part of the Natural Heritage System.

Taxon	Common Name	Scientific Name	S-rank	SARO Status	SARA Status	COSEWIC Status	COSSARO Status	Habitat Requirements	Probability to Occur in the Study Area	Potential Project Impact and Mitigation
Birds	Common Nighthawk	<i>Chordeiles minor</i>	S4B	SC	SC	SC	SC	In Ontario, these aerial foragers require areas with large open habitat. This includes farmland, open woodlands, clearcuts, burns, rock outcrops, alvars, bogs, fens, prairies, gravel pits and gravel rooftops in cities (Sandilands 2007)	Low. Marginally suitable habitat is present along wetland edges and within unmown lawn / pasture associated with a farm south of the Subject Property, west of WSU 2, however, this species was not recorded in the Study Area during multiple years of targeted surveys. Surveys completed: Breeding bird surveys – 12 years (2008, 2009, 2010, 2011, 2014-2015, 2019-2024).	None. No known records and no suitable habitat present within the development envelope.
Birds	Northern Bobwhite	<i>Colinus virginianus</i>	S1?	END	END	END	END	In Ontario, northern bobwhite breeds in early successional habitats. This species requires a combination of three habitat types: woody cover, cropland and grassland. Croplands provide foraging habitat, grassland and fields are used for nesting, and dense brush provides both winter forage and year-round cover. These birds' nest on the ground in a shallow depression lined with grasses and other dead vegetation (Brennan et al. 2014).	Low. Marginally suitable habitat was present within the Subject Property under former agricultural use, however, this species was not recorded in the Study Area during multiple years of targeted surveys and there are no recent records in the Region. Surveys completed: Breeding bird surveys – 12 years (2008, 2009, 2010, 2011, 2014-2015, 2019-2024).	None. No known records and no suitable habitat present.
Birds	Eastern Wood-pewee	<i>Contopus virens</i>	S4B	SC	SC	SC	SC	In Ontario, eastern wood-pewee inhabits a wide variety of wooded upland and lowland habitats, including deciduous, coniferous, or mixed forests. It occurs most frequently in forests with some degree of openness. Intermediate-aged forests with a relatively sparse midstory are preferred. In younger forests with a relatively dense midstory, it tends to inhabit the edges. Also occurs in anthropogenic habitats providing an open forested aspect such as parks and suburban neighborhoods. Nest is constructed atop a horizontal branch, 1-2 m above the ground, in a wide variety of deciduous and coniferous trees (COSEWIC 2012).	Confirmed. Suitable breeding habitat is present within WSU 2, 3 and 4. Low numbers recorded across multiple years (between 2008-2012, 2014-2015 and 2019-2024) with 'probable' breeding evidence in WSU 3 and 4. Surveys completed: Breeding bird surveys – 12 years (2008, 2009, 2010, 2011, 2014-2015, 2019-2024).	None. Suitable habitat will be retained as part of the Natural Heritage System, with buffers and other mitigation measures.
Birds	Yellow Rail	<i>Coturnicops noveboracensis</i>	S3B	SC	SC	SC	SC	In Ontario, yellow rail breeds mainly in sedge-dominated marshes with wet substrates or standing water up to 15 cm in depth. This species will also breed in wet hayfields. This species may be absent from historically used breeding territories on years when water levels are unsuitable, as habitat must remain wet throughout the nesting season to be used. This species breeds mainly in wetlands larger than 10 ha in area but may breed in much smaller wetlands and will nest colonially (COSEWIC 2001).	Moderate. Suitable habitat is present within WSU 2, 3, 6 and 8, however, this species was not recorded during multiple years of targeted surveys. Surveys completed: Breeding bird surveys – 12 years (2008, 2009, 2010, 2011, 2014-2015, 2019-2024); Marsh bird surveys - 9 years (2011, 2014, 2015, 2019-2024).	None. Suitable habitat will be retained as part of the Natural Heritage System, with buffers and other mitigation measures.

Taxon	Common Name	Scientific Name	S-rank	SARO Status	SARA Status	COSEWIC Status	COSSARO Status	Habitat Requirements	Probability to Occur in the Study Area	Potential Project Impact and Mitigation
Birds	Bobolink	<i>Dolichonyx oryzivorus</i>	S4B	THR	THR	SC	THR	In Ontario, bobolink breeds in grasslands or graminoid dominated hayfields with tall vegetation (Gabhauer 2007). Bobolink prefers grassland habitat with a forb component and a moderate litter layer. They have low tolerance for presence of woody vegetation and are sensitive to frequent mowing within the breeding season. They are most abundant in established, but regularly maintained, hayfields, but also breed in lightly grazed pastures, old or fallow fields, cultural meadows and newly planted hayfields. Their nest is woven from grasses and forbs. It is built on the ground, in dense vegetation, usually under the cover of one or more forbs (Renfrew et al. 2015).	Confirmed. Suitable habitat present within unmown / pasture associated with a farm south of the Subject Property, west of WSU 2. A single individual was recorded in this location with 'possible' breeding evidence in 2014. Surveys completed: Breeding bird surveys – 12 years (2008, 2009, 2010, 2011, 2014-2015, 2019-2024).	None. No recent records (i.e., within 10 years) and no suitable habitat present within the development envelope.
Birds	Acadian Flycatcher	<i>Empidonax virescens</i>	S1B	END	END	END	END	In Ontario, Acadian flycatcher breeds in the understory of large, mature, closed-canopy forests, swamps and forested ravines. This bird prefers forests greater than 40 ha in size and exhibits edge sensitivity preferring the deep interior of the forest. Its nest is loosely woven and placed near the tip of branch in a small tree or shrub often, but not always, near water (Allen et al. 2002).	Low. Marginally suitable habitat present within WSU 4, however, this species was not recorded during multiple years of targeted surveys. Surveys completed: Breeding bird surveys – 12 years (2008, 2009, 2010, 2011, 2014-2015, 2019-2024).	None. Potentially suitable habitat will be retained as part of the Natural Heritage System, with buffers and other mitigation measures.
Birds	Peregrine Falcon	<i>Falco peregrinus</i>	S4	SC	NAR	NAR	SC	In Ontario, peregrine falcon breeds in areas containing suitable nesting locations and sufficient prey resources. Such habitat includes both natural locations containing cliff faces (heights of 50 - 200 m preferred) and anthropogenic landscapes including urban centres containing tall buildings, open pit mines and quarries, and road cuts. Peregrine falcons nest on cliff ledges and crevices and building ledges. Nests consist of a simple scrape in the substrate (COSEWIC 2017).	No suitable breeding habitat is present and this species was not recorded in the Study Area during multiple years of targeted surveys. Surveys completed: Breeding bird surveys – 12 years (2008, 2009, 2010, 2011, 2014-2015, 2019-2024).	None. No known records and no suitable habitat present.
Birds	Barn Swallow	<i>Hirundo rustica</i>	S4B	SC	THR	SC	SC	In Ontario, barn swallow breeds in areas that contain a suitable nesting structure, open areas for foraging, and a body of water. This species nests in human made structures including barns, buildings, sheds, bridges, and culverts. Preferred foraging habitat includes grassy fields, pastures, agricultural cropland, lake and river shorelines, cleared rights-of-way, and wetlands (COSEWIC 2011). Mud nests are fastened to vertical walls or built on a ledge underneath an overhang. Suitable nests from previous years are reused (Brown and Brown 2019).	Confirmed. Foraging habitat was present within the Subject Property under the former agricultural land use and is still present within adjacent natural areas. No suitable nesting habitat is present within the Subject Property or adjacent lands, likely present within the local landscape. Low-moderate numbers (1-40) recorded foraging over WSU 2, 3, 4, 6 and 8; no evidence of nesting. Surveys completed: Breeding bird surveys – 12 years (2008, 2009, 2010, 2011, 2014-2015, 2019-2024).	None. No nesting habitat impacted. Higher quality foraging habitat (relative to area within the development envelope) to be retained as part of the Natural Heritage System and additional foraging habitat is abundant in the local landscape.

Taxon	Common Name	Scientific Name	S-rank	SARO Status	SARA Status	COSEWIC Status	COSSARO Status	Habitat Requirements	Probability to Occur in the Study Area	Potential Project Impact and Mitigation
Birds	Wood Thrush	<i>Hylocichla mustelina</i>	S4B	SC	THR	THR	SC	In Ontario, wood thrush breeds in moist, deciduous hardwood or mixed stands that are often previously disturbed, with a dense deciduous undergrowth and with tall trees for singing perches. This species selects nesting sites with the following characteristics: lower elevations with trees less than 16 m in height, a closed canopy cover (>70 %), a high variety of deciduous tree species, moderate subcanopy and shrub density, shade, fairly open forest floor, moist soil, and decaying leaf litter (COSEWIC 2012).	Moderate. Suitable habitat is present within WSU 4 and there are recent records in the local area, however, this species was not recorded during multiple years of targeted surveys. Surveys completed: Breeding bird surveys – 12 years (2008, 2009, 2010, 2011, 2014-2015, 2019-2024).	None. Suitable habitat will be retained as part of the Natural Heritage System, with buffers and other mitigation measures.
Birds	Yellow-breasted Chat	<i>Icteria virens</i>	S1B	END	END	END	END	In Ontario, yellow-breasted chat breeds in early successional, shrub-thicket habitats including woodland edges, regenerating old fields, railway and transmission line rights-of-way, young coniferous reforestations, and wet thickets bordering wetlands. Tangles of grape (<i>Vitis</i> spp.) and raspberry (<i>Rubus</i> spp.) vines are features of most breeding sites. There is some evidence that the yellow-breasted chat is an area sensitive species. Nests are located in dense shrubbery near to the ground (COSEWIC 2011).	Low. Marginally suitable habitat is present within WSU 4 and 8, however this species was not recorded during multiple years of targeted surveys and this species is generally quite rare in the Region. Surveys completed: Breeding bird surveys – 12 years (2008, 2009, 2010, 2011, 2014-2015, 2019-2024).	None. Potentially suitable habitat will be retained as part of the Natural Heritage System, with buffers and other mitigation measures.
Birds	Least Bittern	<i>Ixobrychus exilis</i>	S4B	THR	THR	SC		In Ontario, least bittern breeds in marshes, usually greater than 5 ha, with emergent vegetation, relatively stable water levels and areas of open water. Preferred habitat has water less than 1 m deep (usually 10 – 50 cm). Nests are built in tall stands of dense emergent or woody vegetation (Woodliffe 2007). Clarity of water is important as siltation, turbidity, or excessive eutrophication hinders foraging efficiency (COSEWIC 2009).	Confirmed. Suitable habitat is present within WSU 2, 3, 6 and 8. Two individuals recorded with 'possible' breeding evidence in 2011 within WSU 3; one individual recorded with 'probable' breeding evidence in 2019 within WSU 6. Surveys completed: Breeding bird surveys – 12 years (2008, 2009, 2010, 2011, 2014-2015, 2019-2024); Marsh bird surveys - 9 years (2011, 2014, 2015, 2019-2024).	None. Suitable habitat will be retained as part of the Natural Heritage System, with buffers and other mitigation measures.
Birds	Red-headed Woodpecker	<i>Melanerpes erythrocephalus</i>	S3	END	END	END	END	In Ontario, red-headed woodpecker breeds in open, deciduous woodlands or woodland edges and are often found in parks, cemeteries, golf courses, orchards and savannahs (Woodliffe 2007). They may also breed in forest clearings or open agricultural areas provided that large trees are available for nesting. They prefer forests with little or no understory vegetation. They are often associated with beech or oak forests, beaver ponds and swamp forests where snags are numerous. Nests are excavated in the trunks of large dead trees (Frei et al. 2017).	Moderate. Suitable habitat is present within WSU 2, 3, 4 and 8 and there are recent records in the Region, however, this species was not recorded during multiple years of targeted surveys. Surveys completed: Breeding bird surveys – 12 years (2008, 2009, 2010, 2011, 2014-2015, 2019-2024).	None. Suitable habitat will be retained as part of the Natural Heritage System, with buffers and other mitigation measures.

Taxon	Common Name	Scientific Name	S-rank	SARO Status	SARA Status	COSEWIC Status	COSSARO Status	Habitat Requirements	Probability to Occur in the Study Area	Potential Project Impact and Mitigation
Birds	Louisiana Waterthrush	<i>Parkesia motacilla</i>	S2B	THR	THR	THR	THR	In Ontario, Louisiana waterthrush inhabits mature forests along steeply sloped ravines adjacent to running water. It prefers clear, cold streams and densely wooded swamps. Trees, bushes, exposed roots, cliffs, banks and mossy logs are favoured nesting spots. Riparian woodlands are preferred stopover sites during migration. Nests are concealed from view at the base of uprooted trees, among mosses, or under logs and in cavities along the stream bank (COSEWIC 2006).	Low. May occur as a migrant, though no suitable breeding habitat is present and this species was not recorded in the Study Area during multiple years of targeted surveys. Surveys completed: Breeding bird surveys – 12 years (2008, 2009, 2010, 2011, 2014-2015, 2019-2024)	None. No known records and no suitable habitat present.
Birds	Horned Grebe	<i>Podiceps auritus</i>	S1B,S3N,S4M	SC	SC	SC		In Ontario, horned grebe breeds in small freshwater ponds, marshes or lake inlets, which includes man-made ponds. Preferred habitat has a mixture of open water and emergent vegetation and is usually less than 10 ha in size. The horned grebe builds a cryptic floating nest in the shallows not far from open water (Hoar 2007).	Moderate. Suitable habitat is present within WSU 2, 3, 6 and 8, however, this species was not recorded during multiple years of targeted surveys. Surveys completed: Breeding bird surveys – 12 years (2008, 2009, 2010, 2011, 2014-2015, 2019-2024); Marsh bird surveys - 9 years (2011, 2014, 2015, 2019-2024).	None. Suitable habitat will be retained as part of the Natural Heritage System, with buffers and other mitigation measures.
Birds	King Rail	<i>Rallus elegans</i>	S1B	END	END	END	END	In Ontario, king rail breeds in freshwater marshes, especially large marshes with a variety of water level conditions and a mosaic of habitats. This species prefers relatively shallow wetlands containing dense emergent vegetation (especially cattails), patches of open water, hummocks, mudflats and shrubby swales. Nests are generally well concealed in patches of dense, uniform vegetation over shallow water areas (COSEWIC 2011).	Moderate. Suitable habitat is present within WSU 2, 3, 6 and 8, however, this species was not recorded during multiple years of targeted surveys. Surveys completed: Breeding bird surveys – 12 years (2008, 2009, 2010, 2011, 2014-2015, 2019-2024); Marsh bird surveys - 9 years (2011, 2014, 2015, 2019-2024).	None. Suitable habitat will be retained as part of the Natural Heritage System, with buffers and other mitigation measures.
Birds	Bank Swallow	<i>Riparia riparia</i>	S4B	THR	THR	THR	THR	In Ontario, bank swallow breeds in a variety of natural and anthropogenic habitats, including lake bluffs, stream and riverbanks, sand and gravel pits, and roadcuts. Nests are generally built in a vertical or near-vertical bank. Breeding sites are typically located near open foraging sites such as rivers, lakes, grasslands, agricultural fields, wetlands and riparian woods. Forested areas are generally avoided (Garrison 1999).	Confirmed. Foraging habitat was present within the Subject Property under the former agricultural land use and is still present within adjacent natural areas. No suitable nesting habitat is present within the Subject Property or adjacent lands, likely present within the local landscape. Low-moderate numbers (1-40) recorded foraging over WSU 2, 3, 4, 6 and 8; no evidence of nesting. Surveys completed: Breeding bird surveys – 12 years (2008, 2009, 2010, 2011, 2014-2015, 2019-2024).	None. No nesting habitat impacted. Higher quality foraging habitat (relative to area within the development envelope) to be retained as part of the Natural Heritage System and additional foraging habitat is abundant in the local landscape.

Taxon	Common Name	Scientific Name	S-rank	SARO Status	SARA Status	COSEWIC Status	COSSARO Status	Habitat Requirements	Probability to Occur in the Study Area	Potential Project Impact and Mitigation
Birds	Cerulean Warbler	<i>Setophaga cerulea</i>	S2B	THR	END	END	END	In Ontario, breeding habitat of cerulean warbler consists of second-growth or mature deciduous forest with a tall canopy of uneven vertical structure and a sparse understory. This habitat occurs in both wet bottomland forests and upland areas, and often contains large hickory and oak trees. This species may be attracted to gaps or openings in the upper canopy. The cerulean warbler is associated with large forest tracks but may occur in woodlots as small as 10 ha (COSEWIC 2010). Nests are usually built on a horizontal limb in the mid-story or canopy of a large deciduous tree (Buehler et al. 2013).	Low. Marginally suitable habitat present within WSU 4, however, this species was not recorded during multiple years of targeted surveys. Surveys completed: Breeding bird surveys – 12 years (2008, 2009, 2010, 2011, 2014-2015, 2019-2024).	None. Potentially suitable habitat will be retained as part of the Natural Heritage System, with buffers and other mitigation measures.
Birds	Eastern Meadowlark	<i>Sturnella magna</i>	S4B,S3 N	THR	THR	THR	THR	In Ontario, eastern meadowlark breeds in pastures, hayfields, meadows and old fields. Eastern meadowlark prefers moderately tall grasslands with abundant litter cover, high grass proportion, and a forb component (Hull 2019). They prefer well drained sites or slopes, and sites with different cover layers (Roseberry and Klimstra 1970).	Low. Suitable habitat present within unmown / pasture associated with a farm south of the Subject Property, west of WSU 2, however, this species was not recorded during multiple years of targeted surveys. Surveys completed: Breeding bird surveys – 12 years (2008, 2009, 2010, 2011, 2014-2015, 2019-2024).	None. Not recorded in the Study Area and no suitable habitat present within the development envelope.
Fish	Northern Brook Lamprey - Great Lakes-Upper St. Lawrence populations	<i>Ichthyomyzon fossor</i>	S3	SC	SC	SC	SC	In Ontario, northern brook lamprey occurs in rivers draining into Lakes Superior, Huron and Erie, as well as in the Ottawa and St. Lawrence Rivers. It is found in clear streams of varying sizes. Adults prefer riffle and run areas of cold-water streams and rivers with gravel and sand substrates. Spawning habitat usually includes a swift current and coarse gravel or rocky substrate, with which males construct inconspicuous nests (COSEWIC 2007).	None. No suitable habitat present.	None. Not suitable habitat present.
Fish	Black Redhorse	<i>Moxostoma duquesnei</i>	S2	THR	THR	THR	THR	In Ontario, black redhorse is limited to only six watersheds. In the Lake Huron drainage, it is found in the Bayfield River, Maitland River and Ausable River watersheds. In the Lake Erie drainage, it is known from the Catfish Creek and Grand River watersheds. It is also present in the Thames River watershed in the Lake St. Clair drainage. The Catfish Creek population is considered extirpated. Black redhorse is a species of freshwater fish endemic to Ontario. Habitats are typically found in moderately sized to large rivers and streams with moderate flows. It is rarely found associated with aquatic vegetation. Preferred substrates include rubble, gravel, sand, boulders and silt. In summer, this fish species generally prefers pools, and they overwinter in deeper pools. Spring spawning has been observed in riffle habitats, over substrates ranging from fine gravel to large cobble, and at water temperatures between 15°C and 21°C (COSEWIC 2015).	None. No suitable habitat present.	None. Not suitable habitat present.

Taxon	Common Name	Scientific Name	S-rank	SARO Status	SARA Status	COSEWIC Status	COSSARO Status	Habitat Requirements	Probability to Occur in the Study Area	Potential Project Impact and Mitigation
Fish	Silver Shiner	<i>Notropis photogenis</i>	S2S3	THR	THR	THR		In Ontario, silver shiner is found in the Thames and Grand Rivers, and it has been recently reported in Bronte Creek and Sixteen Mile Creek which flow into Lake Ontario. They prefer moderately-flowing sections of larger streams with clear water and moderate currents. Usual substrates include gravel, rubble, boulder, and sand. Aquatic vegetation may be present or absent. Silver shiner most frequently occurs in deep, swift riffles and faster currents of pools below riffles. Spawning habitat is suggested to occur in relatively deep riffles (COSEWIC 2011).	None. No suitable habitat present.	None. No suitable habitat present.
Insects	Yellow-banded Bumble Bee	<i>Bombus terricola</i>	S3S5	SC	SC	SC	SC	Yellow-banded bumblebee is a forage and habitat generalist, occupying open woodlands, meadows, grasslands, farmlands and urban parks, and taking nectar from various flowering plants (COSEWIC 2015). It is an early emerging species, making it likely an important pollinator of early blooming wild flowering plants (e.g. wild blueberry) and agricultural crops (e.g., apple). Nest sites are often in abandoned rodent burrows in old fields and queens overwinter by burrowing into loose soil or rotting trees (COSEWIC 2015).	Low. This species is a generalist and could occur wherever suitable nectar sources are presnet. Suitable habitat exists within WSU 2, 3, 4, 6 and 8 and there are recent records in the Region, however, this species was not recorded during any WSP field surveys	None. All natural areas to be retaiend as part of the Natural Heritage System. Additional habitat will be created through naturalization of buffers.
Insects	Monarch	<i>Danaus plexippus</i>	S2N,S4 B	SC	END	END	SC	In Ontario, monarch is found throughout the northern and southern regions of the province. This butterfly is found wherever there is milkweed (<i>Asclepias</i> spp.) plants for its caterpillars and wildflowers that supply a nectar source for adults. It is often found on abandoned farmland, meadows, open wetlands, prairies and roadsides, but also in city gardens and parks. Important staging areas during migration occur along the north shores of the Great Lakes (COSEWIC 2010).	Confirmed. Suitable foraging habitat is present wherever wildflowers occur within WSU 2, 3, 4, 6 and 8, however, suitable breeding habitat (i.e. milkweed species) is limited in these areas. Low numbers (1-2 individuals) recorded across multiple years in these habitats.	None. All natural areas to be retaiend as part of the Natural Heritage System. Additional habitat will be created through naturalization of buffers.
Insects	West Virginia White	<i>Pieris virginiensis</i>	S3	SC				In Ontario, west Virginia white is found primarily in the central and southern regions of the province. This butterfly lives in moist, mature, deciduous and mixed woodlands, and the caterpillars feed only on the leaves of toothwort (<i>Cardamine</i> spp.), which are small, spring-blooming plants of the forest floor. These woodland habitats are typically maple-beech-birch dominated. This species is associated with woodlands growing on calcareous bedrock or thin soils over bedrock (Burke 2013).	Low. While potentially suitable habitat is present within WSU 4, the host larval plant (<i>Cardamine diphylla</i>) for this species was not recorded. This species was not recorded during any WSP field surveys.	None. All natural areas to be retaiend as part of the Natural Heritage System, with buffers and other mitigation measures.

Taxon	Common Name	Scientific Name	S-rank	SARO Status	SARA Status	COSEWIC Status	COSSARO Status	Habitat Requirements	Probability to Occur in the Study Area	Potential Project Impact and Mitigation
Mammals	Silver-haired Bat	<i>Lasionycteris noctivagans</i>	S2S3	END		END	END	Silver-haired Bats occupy a wide diversity of habitats across their geographic range. They roost in a variety of large diameter coniferous and deciduous trees. Roosting occurs primarily under bark and in the cavities of trees, and occasionally buildings. They forage in young and old forest, as well as forest openings (canopy gaps), but are concentrated along forest edges and intact forest. Silver-haired Bats overwinter in the United States, southeastern British Columbia and sometimes the Great Lakes region. In British Columbia, they have been documented hibernating in mines, rock crevices, trees, and snags. Little else is known about their winter ecology.	High. Potential maternity roost habitat present within WSU 2, 3, 4 and 8, though the presence of this habitat has not been confirmed.	None. All natural areas to be retained as part of the Natural Heritage System, with buffers and other mitigation measures and there are no potentially suitable trees within the development envelope.
Mammals	Eastern Red Bat	<i>Lasiurus borealis</i>	S2S3	END		END	END	Eastern Red Bats occupy a wide diversity of habitats across their geographic range. They use both deciduous and coniferous forests, of any age class. Trees used as maternity roosts tend to be large diameter and tall, reaching or exceeding the height of the surrounding canopy. They typically roost among the foliage of trees and occasionally shrubs. Male Eastern Red Bats in particular have been observed to use saplings as roosts, which is rarely reported for reproductive females. They forage in both forested and non-forested habitats. Heavily disturbed habitats are generally avoided. Eastern Red Bats migrate to overwintering areas in the southern United States but their migration routes are not known.	High. Potential maternity roost habitat present within WSU 2, 3, 4 and 8, though the presence of this habitat has not been confirmed.	None. All natural areas to be retained as part of the Natural Heritage System, with buffers and other mitigation measures and there are no potentially suitable trees within the development envelope.
Mammals	Northern Hoary Bat	<i>Lasiurus cinereus</i>	S2S3	END		END	END	Hoary Bats occupy a wide diversity of habitats across their geographic range. They use both deciduous and coniferous forests, of any age class. Trees used as maternity roosts tend to be large diameter and tall, reaching or exceeding the height of the surrounding canopy. They typically roost among the foliage of trees and occasionally shrubs. They forage in the open, and suitable habitats may include wetlands, grasslands and open fields with patchily distributed trees. Heavily disturbed habitats are generally avoided. Hoary Bats migrate to overwintering areas in the southern United States but their migration routes are not known.	High. Potential maternity roost habitat present within WSU 2, 3, 4 and 8, though the presence of this habitat has not been confirmed.	None. All natural areas to be retained as part of the Natural Heritage System, with buffers and other mitigation measures and there are no potentially suitable trees within the development envelope.
Mammals	Eastern Small-footed Myotis	<i>Myotis leibii</i>	S2S3	END			END	Eastern small-footed myotis generally roosts on the ground under rocks, in rock crevices, talus slopes and rock piles, but it occasionally roosts in buildings or very rarely in trees. Entrances of caves or abandoned mines where humidity is low, and temperatures are cool and sometimes subfreezing may be used as hibernacula (Humphrey 2017).	Low. Potentially suitable treed habitat is present within WSU 2, 3, 4 and 8, however, this species prefers to roost under rocks and in buildings, none of which are present on the Subject Property.	None. All natural areas to be retained as part of the Natural Heritage System, with buffers and other mitigation measures and there is no potentially suitable habitat (trees, rock piles, buildings) within the development envelope.

Taxon	Common Name	Scientific Name	S-rank	SARO Status	SARA Status	COSEWIC Status	COSSARO Status	Habitat Requirements	Probability to Occur in the Study Area	Potential Project Impact and Mitigation
Mammals	Little Brown Myotis	<i>Myotis lucifugus</i>	S3	END	END	END	END	In Ontario, this species' range is extensive and covers much of the province. It will roost in both natural and man-made structures. Roosting colonies require a number of large dead trees, in specific stages of decay and that project above the canopy in relatively open areas. May form nursery colonies in the attics of buildings within 1 km of water. Caves or abandoned mines may be used as hibernacula, but high humidity and stable above freezing temperatures are required (ECCC 2018).	High. Potential maternity roost habitat present within WSU 2, 3, 4 and 8, though the presence of this habitat has not been confirmed.	None. All natural areas to be retained as part of the Natural Heritage System, with buffers and other mitigation measures and there are no potentially suitable trees within the development envelope.
Mammals	Northern Myotis	<i>Myotis septentrionalis</i>	S3	END	END	END	END	In Ontario, this species' range is extensive and covers much of the province. It will usually roost in hollows, crevices, and under loose bark of mature trees. Roosts may be established in the main trunk or a large branch of either living or dead trees. Caves or abandoned mines may be used as hibernacula, but high humidity and stable above freezing temperatures are required (ECCC 2018).	High. Potential maternity roost habitat present within WSU 2, 3, 4 and 8, though the presence of this habitat has not been confirmed.	None. All natural areas to be retained as part of the Natural Heritage System, with buffers and other mitigation measures and there are no potentially suitable trees within the development envelope.
Mammals	Tricolored Bat	<i>Perimyotis subflavus</i>	S3?	END	END	END	END	In Ontario, tri-colored bat may roost in foliage, in clumps of old leaves, hanging moss or squirrel nests. They are occasionally found in buildings although there are no records of this in Canada. They typically feed over aquatic areas with an affinity to large-bodied water and will likely roost in close proximity to these. Hibernation sites are found deep within caves or mines in areas of relatively warm temperatures. These bats have strong roost fidelity to their winter hibernation sites and may choose the exact same spot in a cave or mine from year to year (ECCC 2018).	High. Potential maternity roost habitat present within WSU 2, 3, 4 and 8, though the presence of this habitat has not been confirmed.	None. All natural areas to be retained as part of the Natural Heritage System, with buffers and other mitigation measures and there are no potentially suitable trees within the development envelope.
Mammals	American Badger (Southwestern Ontario population)	<i>Taxidea taxus jacksoni</i>	S1	END	END	END	END	In Ontario, American badger's preferred habitats include undisturbed grasslands, shrubby areas and open woodlands, but the species will also use old fields, pastures, edges of agricultural fields and roadsides. The key factor for habitat suitability for this species is presence of prey, comprised mainly of woodchuck and eastern cottontail, and Franklin's ground squirrel in northwestern Ontario (Ontario American Badger Recovery Team 2010).	Low. Badgers are known from the broader area, though habitat quality is limited within the Subject Property and none were observed through many years of fieldwork. Targeted badger den / habitat assessment surveys in 2010 and 2011; supplemental searches during other fieldwork from 2008-2015, 2014-2015 and 2019-2024.	None. Limited potential habitat; all natural areas to be retained as part of the Natural Heritage System, with buffers and other mitigation measures .
Molluscs	Rainbow Mussel	<i>Cambarunio iris</i>	S1	SC	SC	SC	SC	In Ontario, rainbow mussel is found in shallow, well-oxygenated waters of small to medium-sized rivers and sometimes lakes. It is most abundant in waters less than 1 m deep. Preferred substrates are cobble, gravel, sand and occasionally mud (COSEWIC 2015).	None. No suitable habitat present.	None. Not suitable habitat present.
Molluscs	Wavy-rayed Lampmussel	<i>Lampsilis fasciola</i>	S2	THR	SC	SC	THR	In Ontario, wavy-rayed lampmussel inhabits clear, medium-sized rivers and streams, with steady flow and stable substrate. It is typically found in clean sand or gravel substrates, often stabilized with cobble or boulders, in and around riffle areas up to 1 m in depth. It may also be found in large creeks and rivers (Morris 2011).	None. No suitable habitat present.	None. Not suitable habitat present.

Taxon	Common Name	Scientific Name	S-rank	SARO Status	SARA Status	COSEWIC Status	COSSARO Status	Habitat Requirements	Probability to Occur in the Study Area	Potential Project Impact and Mitigation
Reptiles	Snapping Turtle	<i>Chelydra serpentina</i>	S4	SC	SC	SC		Snapping Turtle uses almost every type of freshwater aquatic habitat, but shows preference for areas with shallow, slow-moving water, soft substrates and dense aquatic vegetation. Established populations are most often located in ponds, sloughs, shallow bays or river edges and slow streams, or areas combining several of these wetland habitats. Hibernation takes place under water, on the water bottom beneath logs, sticks, vegetation mats, overhanging banks or in soft substrates. Nesting sites occur within 500m of waterbodies/watercourses in open areas with organic soils, sand, or gravel (COSEWIC 2008).	Confirmed. Suitable habitat is present within WSU 2, 3, 6 and 8. Low numbers (2-8) recorded in most years during targeted surveys in 2011, 2014, 2015 and 2019-2024 in WSU 2, 3, 6 and 8.	None. All natural areas to be retained as part of the Natural Heritage System. Additional habitat will be created through naturalization of buffers.
Reptiles	Blanding's Turtle	<i>Emydoidea blandingii</i>	S3	THR	END	END	THR	In Ontario, Blanding's Turtle will use a variety of aquatic habitats, including swamps, bogs, fens, marshes, lakes, ponds, beaver regulated wetlands, slow-flowing creeks, channels and sloughs. However, it prefers shallow, eutrophic wetlands with organic substrates, slow to no flow and abundant aquatic vegetation. Swamp, pond, marsh, lake, fen and bog habitats are significantly preferred over lotic or ephemeral habitats. This species is known to make extensive inter- and intra-wetland movements and uses multiple bodies of water throughout the active season. Females may make large overland movements of >10km during the nesting season and nest sites may be >1km from the nearest wetlands (average 100-242m). Suitable nesting sites occur in sun-exposed areas with low vegetation cover and loose substrates including organic soils, sand, gravel and cobble. They hibernate singly or communally in shallow waters of suitable waterbodies (COSEWIC 2016).	Low. Suitable habitat is present within WSU 2, 3, 6 and 8, however, this species is rare in the Region and was not recorded during many years of targeted surveys. Surveys completed: Turtle basking surveys in WSU 2, 3, 6 and 8 in 2011, 2014, 2015 and 2019-2024.	None. All natural areas to be retained as part of the Natural Heritage System. Additional habitat will be created through naturalization of buffers.
Reptiles	Northern Map Turtle	<i>Graptemys geographica</i>	S3	SC	SC	SC	SC	In Ontario, northern map turtle prefers large waterbodies with slow-moving currents, soft substrates, and abundant aquatic vegetation. Ideal stretches of shoreline contain suitable basking sites, such as rocks and logs. Along Lakes Erie and Ontario, this species occurs in marsh habitat and undeveloped shorelines. It is also found in small to large rivers with slow to moderate flow. Hibernation takes place in soft substrates under deep water (COSEWIC 2012).	None. No suitable habitat present.	None. Not suitable habitat present.

Taxon	Common Name	Scientific Name	S-rank	SARO Status	SARA Status	COSEWIC Status	COSSARO Status	Habitat Requirements	Probability to Occur in the Study Area	Potential Project Impact and Mitigation
Reptiles	Queensnake	<i>Regina septemvittata</i>	S2	END	END	END	END	In Ontario, queensnake requires permanent aquatic habitat with large flat rocks, either submerged or on the bank/shoreline. Individuals rarely leave the shoreline of permanent bodies of water with abundant shoreline cover and a healthy population of crayfish. They are fairly intolerant of silty substrates and most commonly are found in streams with bedrock and gravel substrates. The best sites have water temperatures that remain at or above 18°C during the active season, have a swift to moderate current and woodland surroundings. Hibernacula may occur in the abutments of old bridges, in clay slopes above the high-water mark and in bedrock fissures (Gillingwater 2011).	None. No suitable habitat present.	None. Not suitable habitat present.
Reptiles	Eastern Ribbonsnake	<i>Thamnophis saurita</i>	S4	SC	SC	SC	SC	In Ontario, eastern ribbonsnake is semi-aquatic, and is rarely found far from shallow ponds, marshes, bogs, streams or swamps bordered by dense vegetation. They prefer sunny locations and bask in low shrub branches. Hibernation occurs in mammal burrows, rock fissures or even ant mounds (COSEWIC 2012).	Moderate. Suitable habitat is present within WSU 2, 3, 4, 6 and 8, however, this species was not recorded during many years of surveys. Surveys completed: Artificial shelter (cover board) surveys on 14 dates in 2010 and 2011; supplemental searches during other field surveys from 2008-2012, 2014, 2015 and 2019-2024.	None. All natural areas to be retained as part of the Natural Heritage System. Additional habitat will be created through naturalization of buffers.
Vascular Plants	Green Dragon	<i>Arisaema dracontium</i>	S3	SC		SC	SC	In Ontario, green dragon occurs in somewhat-wet to wet deciduous forests along streams. In particular, it grows in maple forest and forest dominated by Red ash and White elm trees. Green dragon is restricted to shaded or partially shaded seasonally inundated floodplains (Donley et al. 2013). It is primarily restricted to southwestern Ontario.	Low. Marginally suitable habitat present within swamps (Units 1b, 4 and 5) and adjacent areas, however, this species was not recorded during many years of surveys. Surveys completed: Three season botanical inventory and visual search of vegetation communities between 2008 and 2024; scoped vegetation surveys in 2019.	None. None recorded and all suitable habitat to be retained as part of the Natural Heritage System, with naturalized buffers and other mitigation measures.
Vascular Plants	False Hop Sedge	<i>Carex lupuliformis</i>	S1	END	END	END	END	In Ontario, false hop sedge occurs in marshes, riverine swamps, borders of vernal pools, and wet depressions of forests. It occasionally occurs in shallow water or very wet floodplain forests. Usually grows under a moderately open canopy but can tolerate high levels of sunshine. Substrates are calcareous or neutral and include moist wet mucks, silt loams, or alluvial deposits with a sandy texture (Environment Canada 2014).	Low. Although it has a restricted distribution in Ontario, there are potential recent records in the Region, and some suitable habitat is present within swamps (Units 1b, 4 and 5) and adjacent areas; however, this species was not recorded during many years of surveys. Surveys completed: Three season botanical inventory and visual search of vegetation communities between 2008 and 2024; scoped vegetation surveys in 2019.	None. None recorded and all suitable habitat to be retained as part of the Natural Heritage System, with naturalized buffers and other mitigation measures.

Taxon	Common Name	Scientific Name	S-rank	SARO Status	SARA Status	COSEWIC Status	COSSARO Status	Habitat Requirements	Probability to Occur in the Study Area	Potential Project Impact and Mitigation
Vascular Plants	American Chestnut	<i>Castanea dentata</i>	S1S2	END	END	END	END	In Ontario, American chestnut occurs in mixed or deciduous forests in the Carolinian zone (Farrar 1995). It is often found in communities with dense canopy cover and often associated with oak and maple. This tree grows primarily on acidic, sand or gravel soils (Boland et al. 2012).	Low. The Subject Property is located at the northern limit of this species range and potential habitat occurs in upland forest (Units 1a, 2 and 3), however, this species was not recorded during many years of surveys. Surveys completed: Three season botanical inventory and visual search of vegetation communities between 2008 and 2024; scoped vegetation surveys in 2019.	None. None recorded and all suitable habitat to be retained as part of the Natural Heritage System, with naturalized buffers and other mitigation measures.
Vascular Plants	Eastern Flowering Dogwood	<i>Cornus florida</i>	S2?	END	END	END	END	In Ontario, eastern flowering dogwood grows in the understory of dry to rich deciduous forests, especially on hillsides and riverbanks. It prefers sandy acidic soils but occasionally is found in loams, clays and organic soils (Waldron 2003). This species is restricted to the Carolinian zone of southern Ontario.	Low. Marginally suitable habitat present in upland areas (Units 1a, 2, 3 and 11a), however, this species was not recorded during many years of surveys. Surveys completed: Three season botanical inventory and visual search of vegetation communities between 2008 and 2024; scoped vegetation surveys in 2019.	None. None recorded and all suitable habitat to be retained as part of the Natural Heritage System, with naturalized buffers and other mitigation measures.
Vascular Plants	American Columbo	<i>Frasera caroliniensis</i>	S2	END	END	END	END	In Ontario, American columbo is most commonly associated with open deciduous forested slopes, but it can also be found in thickets, swamps and clearings. It is often associated with oak, hickory and sassafras trees. American columbo grows on a wide variety of soils, particularly dry mesic to mesic clay and clay loam soils (Environment Canada 2019).	Moderate. Suitable habitat is present in upland areas (Units 1a, 2 and 3) and adjacent areas, however, this species was not recorded during many years of surveys. Surveys completed: Three season botanical inventory and visual search of vegetation communities between 2008 and 2024; scoped vegetation surveys in 2019.	None. None recorded and all suitable habitat to be retained as part of the Natural Heritage System, with naturalized buffers and other mitigation measures.
Vascular Plants	Black Ash	<i>Fraxinus nigra</i>	S4	END		THR	END	Found throughout Ontario in moist ecosystems; commonly found in lowland forests, floodplain forests, swamps, fens, and shorelines (MNRF 2019; Catling et al. 2022). This species typically grows on a variety of soil types (often nutrient-rich), and is considered a facultative wetland species (Reznicek et al. 2011; Catling et al. 2022).	Confirmed. Suitable habitat is present in swamps and individuals have been recorded Units 1b, on the margin between Units 3 and 5, Unit 4, and within Unit 5. All trees are interior to the woodland dripline.	None. All confirmed Black Ash habitat (i.e., 30 m radial distance from trunk) to be retained as part of the Natural Heritage System, with naturalized buffers and other mitigation measures.
Vascular Plants	Kentucky Coffee-tree	<i>Gymnocladus dioicus</i>	S2	THR	THR	THR	THR	This species is designated as threatened only in the following geographic areas of Ontario: Counties of Essex, Elgin, Lambton, Middlesex, Norfolk and Oxford and in the Municipality of Chatham-Kent. In Ontario, Kentucky coffee-tree is found in rich, mesic and floodplain forests. Populations are scattered throughout the Carolinian forest in Ontario, but are commonly found near streams, rivers, former swamps and wetlands. Kentucky coffee-tree thrives in disturbed areas, but can survive in most habitats, even difficult ones (e.g. bare or poor soils) as long as sunlight is present (Environment Canada 2014). This species prefers deep, rich soils.	Low. Marginally suitable habitat present in natural areas, however, this species was not recorded during many years of surveys. Surveys completed: Three season botanical inventory and visual search of vegetation communities between 2008 and 2024; scoped vegetation surveys in 2019.	None. None recorded and all suitable habitat to be retained as part of the Natural Heritage System, with naturalized buffers and other mitigation measures.

Taxon	Common Name	Scientific Name	S-rank	SARO Status	SARA Status	COSEWIC Status	COSSARO Status	Habitat Requirements	Probability to Occur in the Study Area	Potential Project Impact and Mitigation
Vascular Plants	Butternut	<i>Juglans cinerea</i>	S2?	END	END	END	END	In Ontario, butternut is found along stream banks, on wooded valley slopes, and in deciduous and mixed forests. It is commonly associated with beech, maple, oak and hickory (Voss and Reznicek 2012). Butternut prefers moist, fertile, well-drained soils, but can also be found in rocky limestone soils. This species is shade intolerant (Farrar 1995).	Confirmed. Suitable habitat is present through wooded areas (Units 1a, 2, 3 and 11a) and one tree was recorded within Unit 3, greater than 50 m from the woodland edge. Surveys completed: Three season botanical inventory and visual search of vegetation communities between 2008 and 2024; scoped vegetation surveys in 2019.	None. All suitable habitat to be retained as part of the Natural Heritage System, with naturalized buffers and other mitigation measures. The confirmed tree will not be impacted by the proposed development given its location within Unit 3 (i.e., over 50 m from the dripline; even greater distance from the development limit).
Vascular Plants	American Ginseng	<i>Panax quinquefolius</i>	S2	THR	END	END	THR	In Ontario, American ginseng is found in moist, undisturbed and relatively mature deciduous woods often dominated by sugar maple. It is commonly found on well-drained, south-facing slopes. American ginseng grows under closed canopies in well-drained soils of glacier origin that have a neutral pH (ECCC 2018).	Moderate. Suitable habitat is present in upland areas (Units 1a, 2 and 3) and adjacent areas, however, this species was not recorded during many years of surveys. Surveys completed: Three season botanical inventory and visual search of vegetation communities between 2008 and 2024; scoped vegetation surveys in 2019.	None. None recorded and all suitable habitat to be retained as part of the Natural Heritage System, with naturalized buffers and other mitigation measures.

APPENDIX F

EVALUATION OF SIGNIFICANT WILDLIFE HABITAT

This evaluation is based on the Significant Wildlife Habitat Ecoregion Criteria Schedules for Ecoregion 6E (MNRF January 2015). The following text and tables are from that document, but include an additional ‘evaluation’ column, with discussion of site-specific attributes within the Westwood Village Phase 2 study area.

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SCHEDULE 6E: IDENTIFICATION OF Significant Wildlife Habitat

This schedule is designed to provide the recommended criteria for identifying Significant Wildlife Habitat (SWH) within Ecoregion 6E ^{ccxvi}. Tables 1.1 through 1.4 within the Schedules provide guidance for SWH designation for the four categories of SWH outlined in the Significant Wildlife Habitat Technical Guide and its Appendices ^{cxlviii}, ^{cxlix}. Table 1.5 contains and provides descriptions for exceptions criteria for ecoregional SWH which will be identified at an ecodistrict scale ^{ccxvi}. Exceptions occur when criteria for a specific habitat are different within an ecodistrict compared to the remainder of an ecoregion or if a habitat only occurs within a restricted area of the ecoregion.

The schedules, including description of wildlife habitat, wildlife species, and the criteria provided for determining SWH, are based on science and expert knowledge. The ELC Ecosite codes are described using the Ecological Land Classification (ELC) for Southern Ontario ^{lxviii}. The information within these schedules will require periodic updating to keep pace with changes to wildlife species status in the Species at Risk in Ontario (SARO) list, or as new scientific information pertaining to wildlife habitats becomes available. Therefore, MNRF will occasionally need to review and update these schedules and provide addenda. A reference document for all SWH is found after the schedules and includes citations for all ecoregional schedules. Each citation used to assist with the criteria for SWH will be indicated by a roman numeric symbol. Where no reference exists, MNRF expert opinion was used for determination of criteria, this symbol “©” represents when MNRF expert opinion was utilized to develop defining criteria.

Criteria For Significant Wildlife Habitat in Ecoregion 6E

1. 1 SEASONAL CONCENTRATION AREAS OF ANIMALS

Seasonal concentration areas are areas where wildlife species occur annually in aggregations at certain times of the year. Such areas are sometimes highly concentrated with members of a given species, or several species, within relatively small areas. In spring and autumn, migratory wildlife species will concentrate where they can rest and feed. Other wildlife species require habitats where they can survive winter. Examples of seasonal concentration areas include deer wintering areas, breeding bird colonies and hibernation sites for reptiles, amphibians and some mammals ^{cxlvi}. Table 1.1 outlines what wildlife habitats and defining criteria that are considered for seasonal concentration areas within Ecoregion 6E.

Table 1.1 Seasonal Concentration Areas of Animals.

Wildlife Habitat	Wildlife Species	CANDIDATE SWH		CONFIRMED SWH	Evaluation
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
1. Waterfowl Stopover and Staging Areas (Terrestrial) Rationale: Habitat important to migrating waterfowl.	American Black Duck American Wigeon Blue-winged Teal Gadwall Green-winged Teal Mallard Northern Pintail Northern Shoveler Wood Duck	CUM1 CUT1 Plus evidence of annual spring flooding from melt water or run-off within these Ecosites.	Fields with sheet water during Spring (mid-March to May). - Fields flooding during spring melt and run-off provide important invertebrate foraging habitat for migrating waterfowl. - Agricultural fields with waste grains are commonly used by waterfowl, these are not considered SWH unless they have spring sheet water available ^{cxlviii}. <u>Information Sources</u> - Anecdotal information from the landowner, adjacent landowners or local naturalist clubs may be good information in determining occurrence. - Reports and other information available from Conservation Authorities - Sites documented through waterfowl planning processes (eg. EHJV implementation plan) - Field Naturalist Clubs - Ducks Unlimited Canada - Natural Heritage Information Centre (NHIC)Waterfowl Concentration Area	Studies carried out and verified presence of an annual concentration of any listed species, evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”^{ccxi} - Any mixed species aggregations of 100[©] or more individuals required. - The flooded field ecosite habitat plus a 100-300m radius, dependant on local site conditions and adjacent land use is the significant wildlife habitat. - Annual use of habitat is documented from information sources or field studies (annual use can be based on studies or determined by past surveys with species numbers and dates). - SWH MiSTIndex #7 provides development effects and mitigation measures.	Multi-year field surveys completed (2008-2011, 2014-2015 and 2019-2024). Hydrologic monitoring completed as part of the MESP No records from landowner, background sources or agencies. CUM and CUT1 habitat is limited to small patches and narrow strips at wetland-woodland margins. Predominant land use is active cropland. Six of the listed species was recorded during field surveys (with maximum numbers in parentheses): - American Black Duck (2) - American Wigeon (8) - Green-winged Teal (50) - Blue-winged Teal (20) - Wood Duck (23) - Mallard (240) All were recorded within open water or woodland units, not in flooded fields. While some of the listed species would be expected to occur over time, potentially at threshold numbers depending on conditions, the site is unlikely to meet criteria consistently over time, as indicated by multi-year studies. This form of potential SWH should be considered temporary, depending on rainfall, drainage, crop type etc. Local topography / drainage is unlikely to produce consistent sheetwater conditions that are suitable for waterfowl. Conclusion: criterion is not met

Wildlife Habitat	Wildlife Species	CANDIDATE SWH		CONFIRMED SWH	Evaluation
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
2. Waterfowl Stopover and Staging Areas (Aquatic) Rationale: Important for local and migrant waterfowl populations during the spring or fall migration or both periods combined. Sites identified are usually only one of a few in the eco-district.	American Black Duck American Wigeon Black Scoter Blue-winged Teal Brant Bufflehead Cackling Goose Canada Goose Canvasback Common Goldeneye Common Merganser Gadwall Greater Scaup Green-winged Teal Hooded Merganser Lesser Scaup Long-tailed Duck Northern Pintail Northern Shoveler Red-breasted Merganser Redhead Ring-necked duck Ruddy Duck Ruddy Duck Snow Goose Surf Scoter White-winged Scoter	MAS1 MAS2 MAS3 SAF1 SAM1 SAS1 SWD1 SWD2 SWD3 SWD4 SWD5 SWD6 SWD7	• Ponds, marshes, lakes, bays, coastal inlets, and watercourses used during migration. Sewage treatment ponds and storm water ponds do not qualify as a SWH, however a reservoir managed as a large wetland or pond/lake does qualify. • These habitats have an abundant food supply (mostly aquatic invertebrates and vegetation in shallow water) <u>Information Sources</u> • Environment Canada • Naturalist clubs often are aware of staging/stopover areas. • OMNRF Wetland Evaluations indicate presence of locally and regionally significant waterfowl staging. • Sites documented through waterfowl planning processes (eg. EHJV implementation plan) • Ducks Unlimited projects • Element occurrence specification by Nature Serve: http://www.natureserve.org • Natural Heritage Information Centre (NHIC) Waterfowl Concentration Area	Studies carried out and verified presence of: • Aggregations of 100© or more of listed species for 7 days©, results in > 700 waterfowl use days. • Areas with annual staging of ruddy ducks, canvasbacks, and redheads are SWH^{cxlix} • The combined area of the ELC ecosites and a 100m radius area is the SWH^{cxlviii} • Wetland area and shorelines associated with sites identified within the SWHTG^{cxlviii} Appendix K^{cxlix} are significant wildlife habitat. • Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”^{ccxi} • Annual Use of Habitat is Documented from Information Sources or Field Studies (Annual can be based on completed studies or determined from past surveys with species numbers and dates recorded). • SWH MIST^{cxlix} Index #7 provides development effects and mitigation measures.	Candidate MAM2, MAM3, MAS3, SAF habitat is present within WSU 2, WSU 3, WSU 6 and WSU 8 (Barrie’s Lake). The following species were recorded in MAM-MAS-SAF habitat (with highest abundance recorded in any survey year noted in parentheses): • Canada Goose (250 – Barrie’s Lake) • American Black Duck (2) • American Wigeon (8) • Green-winged Teal (45) • Blue-winged Teal (12) • Common Merganser (12) • Hooded Merganser (4) • Ring-necked Duck (17) • Bufflehead (12) Within the aforementioned WSU’s, migrant waterfowl recorded during field visits were typically short-duration visitors (i.e. one to several days) in relatively small numbers, with the exception of Canada Geese – recorded 50 – 250 individuals on several ponds and numerous dates. Based on professional expertise / experience and from a local perspective, the above species list and numbers would not be considered unusual or representative of an exceptional site. Diversity / numbers would likely only be considered high only in a local context, as many other wetlands in the region (and riverine areas such as nearby reaches of the Grand River) support far greater diversity / numbers. Conclusion: criterion is not met

Wildlife Habitat	Wildlife Species	CANDIDATE SWH		CONFIRMED SWH	Evaluation
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
3. Shorebird Migratory Stopover Area Rationale: High quality shorebird stopover habitat is extremely rare and typically has a long history of use.	American Golden-Plover Baird's Sandpiper Black-bellied Plover Dunlin Greater Yellowlegs Hudsonian Godwit Least Sandpiper Lesser Yellowlegs Marbled Godwit Pectoral Sandpiper Purple Sandpiper Red-necked Phalarope Whimbrel Ruddy Turnstone Sanderling Semipalmated Plover Semipalmated Sandpiper Short-billed Dowitcher Solitary Sandpiper Spotted Sandpiper Stilt Sandpiper White-rumped Sandpiper	BBO1 BBO2 BBS1 BBS2 BBT1 BBT2 MAM1 MAM2 MAM3 MAM4 MAM5 SDO1 SDS2 SDT1	- Shorelines of lakes, rivers and wetlands, including beach areas, bars and seasonally flooded, muddy and un-vegetated shoreline habitats. - Great Lakes coastal shorelines, including groynes and other forms of armour rock lakeshores, are extremely important for migratory shorebirds in May to mid-June and early July to October. - Sewage treatment ponds and storm water ponds do not qualify as a SWH. <u>Information Sources</u> - Western hemisphere shorebird reserve network. - Canadian Wildlife Service (CWS) Ontario Shorebird Survey. - Bird Studies Canada - Ontario Nature - Local birders and naturalist clubs - Natural Heritage Information Centre (NHIC) Shorebird Migratory Concentration Area	Studies confirming: - Presence of 3 or more of listed species and > 1000^I shorebird use days during spring or fall migration period. (shorebird use days are the accumulated number of shorebirds counted per day over the course of the fall or spring migration period) - Whimbrel stop briefly (<24hrs) during spring migration, any site with >100^I Whimbrel used for 3 years or more is significant. - The area of significant shorebird habitat includes the mapped ELC shoreline ecosites plus a 100m radius area ^{cxlviii} - Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”^{ccxi} - SWH MiST^{cxlix} Index #8 provides development effects and mitigation measures.	Candidate MAM2 and MAM3 habitat is present within WSU 2, WSU 3, WSU 6 and WSU 8 (Barrie's Lake). No natural beach / dune or large mudflats are present. There are no records from landowner, background sources or agencies and no known anecdotal evidence or sites of interest for shorebirds where detailed field surveys were undertaken. Conclusion: criterion is not met
4. Raptor Wintering Area Rationale: Sites used by multiple species, a high number of individuals and used annually are most significant	American Kestrel Northern Harrier Red-tailed Hawk Rough-legged Hawk Snowy Owl	<u>Hawks/Owls:</u> Combination of ELC Community Series; need to have present one Community Series from each land class; Forest: FOD, FOM, FOC. Upland: CUM; CUT; CUS; CUW. <u>Bald Eagle:</u> Forest community Series: FOD, FOM, FOC, SWD, SWM or SWC on shoreline areas adjacent to large rivers or adjacent to lakes with open water (hunting area).	- The habitat provides a combination of fields and woodlands that provide roosting, foraging and resting habitats for wintering raptors. - Raptor wintering (hawk/owl)sites need to be > 20 ha ^{cxlviii, cxlix} with a combination of forest and upland.^{xvi, xvii, xviii, xix, xx, xxi} - Least disturbed sites, idle/fallow or lightly grazed field/meadow (>15ha) with adjacent woodlands ^{cxlix} - Field area of the habitat is to be wind swept with limited snow depth or accumulation. - Eagle sites have open water and large trees and snags available for roosting^{cxlix} <u>Information Sources:</u> - OMNRF Ecologist or Biologist - Naturalist clubs - Natural Heritage Information Centre (NHIC) Raptor Winter Concentration Area - Data from Bird Studies Canada - Results of Christmas Bird Counts - Reports and other information available from Conservation Authorities.	Studies confirm the use of these habitats by: - One or more Short-eared Owls or; One of more Bald Eagles or; At least 10 individuals and two of the listed hawk/owl species[©] - To be significant a site must be used regularly (3 in 5 years)^{cxlix} for a minimum of 20 days by the above number of birds[©]. - The habitat area for an Eagle winter site is the shoreline forest ecosites directly adjacent to the prime hunting area[©] - Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”^{ccxi} - SWH MiST^{cxlix} Index #10 and #11 provides development effects and mitigation measures.	Candidate woodland habitat (primarily FOD) is present WSU 4, but CU habitats are very limited – no large open fields (non-agricultural) are present. Does not meet the 20 ha size threshold. One species was recorded (with maximum numbers in parentheses): Red-tailed Hawk (50) – likely many were observed migrating Other non-breeding raptors which can be observed in southern Ontario during winter were not recorded during the many fall / winter / early spring surveys conducted for this study. Database records and anecdotal / other evidence (i.e., list-servers, local reports) suggest that other areas in the Region are generally notable for repeated over-winter raptor use; we are not aware of any such evidence for the study area. Conclusion: criterion is not met

Wildlife Habitat	Wildlife Species	CANDIDATE SWH		CONFIRMED SWH	Evaluation
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
5. Bat Hibernacula Rationale: Bat hibernacula are rare habitats in all Ontario landscapes.	Big Brown Bat Tri-coloured Bat	Bat Hibernacula may be found in these ecosites: CCR1 CCR2 CCA1 CCA2 (Note: buildings are not considered to be SWH)	- Hibernacula may be found in caves, mine shafts, underground foundations and Karsts. - Active mine sites should not be considered as SWH - The locations of bat hibernacula are relatively poorly known. <u>Information Sources</u> - OMNRF for possible locations and contact for local experts - Natural Heritage Information Centre (NHIC) Bat Hibernaculum - Ministry of Northern Development and Mines for location of mine shafts. - Clubs that explore caves (eg. Sierra Club) - University Biology Departments with bat experts.	- All sites with confirmed hibernating bats are SWH ☺. - The area includes 200m radius around the entrance of the hibernaculum , , ☺ for most development types and 1000m for wind farms^{ccv}. - Studies are to be conducted during the peak swarming period (Aug. – Sept.). Surveys should be conducted following methods outlined in the “Bats and Bat Habitats: Guidelines for Wind Power Projects”^{ccv}. - SWHMiST^{cxlix} Index #1 provides development effects and mitigation measures.	Extensive field surveys (2008-2011, 2014-2015 and 2019-2024) did not detect any evidence of on-site hibernacula. The MNR Wind Atlas shows no known hibernacula within or adjacent to the Subject Property / study area and there are no known hibernacula / colony records from other background sources or anecdotal evidence. Conclusion: criterion is not met
6. Bat Maternity Colonies Rationale: Known locations of forested bat maternity colonies are extremely rare in all Ontario landscapes.	Big Brown Bat Silver-haired Bat	Maternity colonies considered SWH are found in forested Ecosites. All ELC Ecosites in ELC Community Series: FOD FOM SWD SWM	- Maternity colonies can be found in tree cavities, vegetation and often in buildings^{xxii}, ^{xxv}, ^{xxvi}, ^{xxvii}, ^{xxxi} (buildings are not considered to be SWH). - Maternity roosts are not found in caves and mines in Ontario^{xxii}. - Maternity colonies located in Mature deciduous or mixed forest stands^{ccix}, ^{ccx} with >10/ha large diameter (>25cm dbh) wildlife trees^{ccvii} - Female Bats prefer wildlife tree (snags) in early stages of decay, class 1-3 ^{ccxiv} or class 1 or 2 ^{ccxii} . - Silver-haired Bats prefer older mixed or deciduous forest and form maternity colonies in tree cavities and small hollows. Older forest areas with at least 21 snags/ha are preferred^{ccx} <u>Information Sources</u> - OMNRF for possible locations and contact for local experts - University Biology Departments with bat experts.	- Maternity Colonies with confirmed use by; >10 Big Brown Bats☺ >5 Adult Female Silver-haired Bats☺ - The area of the habitat includes the entire woodland or a forest stand ELC Ecosite or an Ecoelement containing the maternity colonies☺. - Evaluation methods for maternity colonies should be conducted following methods outlined in the “Bats and Bat Habitats: Guidelines for Wind Power Projects”^{ccv}. - SWHMiST^{cxlix} Index #12 provides development effects and mitigation measures.	Extensive field surveys (2014-2017) did not detect any evidence of maternity colonies, though there is some potential in larger woodland blocks of WSU 4 – may meet snag density for candidate habitat. Conclusion: Candidate SWH is present in WSU 4; SWH is not confirmed. No impacts are anticipated as Candidate SWH will be retained in full (no removal or direct disturbance), with development setbacks and other mitigation measures.

Wildlife Habitat	Wildlife Species	CANDIDATE SWH		CONFIRMED SWH	Evaluation
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
7. Turtle Wintering Areas Rationale: Generally sites are the only known sites in the area. Sites with the highest number of individuals are most significant.	Midland Painted Turtle Special Concern: Northern Map Turtle Snapping Turtle	Snapping and Midland Painted turtles, ELC Community Classes; SW, MA, OA and SA, ELC Community Series; FEO and BOO Northern Map Turtle - Open Water areas such as deeper rivers or streams and lakes with current can also be used as over-wintering habitat.	- For most turtles, wintering areas are in the same general area as their core habitat. Water has to be deep enough not to freeze and have soft mud substrates. - Over-wintering sites are permanent water bodies, large wetlands, and bogs or fens with adequate Dissolved Oxygen. ^{cix, cx, cxi, cxviii} - Man-made ponds such as sewage lagoons or storm water ponds should not be considered SWH. <u>Information Sources</u> - EIS studies carried out by Conservation Authorities. - Local field naturalists and experts, as well as university herpetologists may also know where to find some of these sites. - OMNRF Ecologist or Biologist - Field Naturalist clubs - Natural Heritage Information Center (NHIC)	- Presence of 5 over-wintering Midland Painted Turtles is significant^l. - One or more Northern Map Turtle or Snapping Turtle over-wintering within a wetland is significant^l. - The mapped ELC ecosite area with the over wintering turtles is the SWH. If the hibernation site is within a stream or river, the deep-water pool where the turtles are over wintering is the SWH. - Over wintering areas may be identified by searching for congregations (Basking Areas) of turtles on warm, sunny days during the fall (Sept. – Oct.) or spring (Mar. – May) ^{cvii}. Congregation of turtles is more common where wintering areas are limited and therefore significant ^{cix, cx, cxi, cxii}. - Congregation of turtles is more common where wintering areas are limited and therefore significant ^{cix, cx, cxi, cxii}. - SWH MiST^{cxlix} Index #28 provides development effects and mitigation measures for turtle wintering habitat.	Candidate habitat (potentially suitable overwintering areas) is present in WSU 2, WSU 3, WSU 6 and WSU 8 (Barrie’s Lake). Based on targeted and supplemental field surveys, we recorded observations or evidence of two species: Midland Painted Turtle and Snapping Turtle. - Basking Midland Painted Turtles were widespread and abundant in the larger ponds during spring surveys (up to 40+ individuals observed in any one location on a single date). This species was also recorded incidentally in moderate numbers during road mortality and pitfall trapping surveys (10-15). Greatest abundances were recorded in WSU 2, WSU 3 and WSU 8 (Barrie’s Lake). - Moderate numbers of Snapping Turtle were recorded (<10 individuals) during spring basking, road / mortality and pitfall trapping survey. Conclusion: Confirmed SWH present in WSU 2, 3, 6 and 8

Wildlife Habitat	Wildlife Species	CANDIDATE SWH		CONFIRMED SWH	Evaluation
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
8. Reptile Hibernaculum Rationale: Generally sites are the only known sites in the area. Sites with the highest number of individuals are most significant.	Snakes: Eastern Gartersnake Northern Brownsnake Northern Red-bellied Snake Northern Ring-necked Snake Northern Watersnake Smooth Green Snake Special Concern: Eastern Ribbonsnake Milksnake Lizard: Special Concern (Southern Shield population): Five-lined Skink	For all snakes, habitat may be found in any ecosite in central Ontario other than very wet ones. Talus, Rock Barren, Crevice, Cave, and Alvar sites may be directly related to these habitats. Observations of congregations of snakes on sunny warm days in the spring or fall is a good indicator. For Five-lined Skink, ELC Community Series of FOD and FOM and Ecosites: FOC1 FOC3	- For snakes, hibernation takes place in sites located below frost lines in burrows, rock crevices and other natural or naturalized locations. The existence of features that go below frost line; such as rock piles or slopes, old stone fences, and abandoned crumbling foundations assist in identifying candidate SWH. - Areas of broken and fissured rock are particularly valuable since they provide access to subterranean sites below the frost line, , , , . - Wetlands can also be important over-wintering habitat in conifer or shrub swamps and swales, poor fens, or depressions in bedrock terrain with sparse trees or shrubs with sphagnum moss or sedge hummock ground cover. - Five-lined skink prefer mixed forests with rock outcrop openings providing cover rock overlaying granite bedrock with fissures . Information Sources - In spring, local residents or landowners may have observed the emergence of snakes on their property (e.g. old dug wells). - Reports and other information available from Conservation Authorities. - Field Naturalist Clubs - University herpetologists - Natural Heritage Information Centre (NHIC) - OMNRF ecologist or biologist may be aware of locations of wintering skinks	Studies confirming: - Presence of snake hibernacula used by a minimum of five individuals of a snake sp. or; individuals of two or more snake spp. - Congregations of a minimum of five individuals of a snake sp. or; individuals of two or more snake spp. near potential hibernacula (eg. foundation or rocky slope) on sunny warm days in Spring (Apr/May) and Fall (Sept/Oct)^I . Note: If there are Special Concern Species present, then site is SWH Note: Sites for hibernation possess specific habitat parameters (e.g. temperature, humidity, etc.) and consequently are used annually, often by many of the same individuals of a local population (i.e. strong hibernation site fidelity). Other critical life processes (e.g. mating) often take place in close proximity to hibernacula. The the feature in which the hibernacula is located plus a 30 m buffer is the SWH^I - SWHMiST^{cxlix} Index #13 provides development effects and mitigation measures for snake hibernacula. - Presence of any active hibernaculum for skink is significant. - SWHMiST^{cxlix} Index #37 provides development effects and mitigation measures for five-lined skink wintering habitat.	Targeted field surveys for snakes were completed from 2008 – 2011, including ‘cover board’ surveys (14 dates) and road mortality surveys (19 dates). Potential use was also evaluated through supplemental observations during other surveys (e.g. drift fence / pitfall trapping, breeding birds, turtle basking / nesting), incl. many visits in spring, summer and fall. Results: 2 snake species were recorded, generally in small numbers: - Cover board surveys: (2) Dekay’s Brownsnake at one location; (1-20) E. Gartersnake at 4 locations - Road mortality surveys: small numbers (1-2) of E. Gartersnake - Pitfall surveys: moderate to high numbers of E. Gartersnake (max. 30) and low numbers of Dekay’s Brownsnake (max. 4) - No snake congregations near potential hibernacula were recorded; however, substantial numbers of snakes (primarily E. Gartersnake) were recorded in spring (early-mid April), possibly indicating presence of a hibernacula in the area – outside of areas covered by the detailed field surveys listed above Conclusion: criterion is not met
9. Colonially -Nesting Bird Breeding Habitat (Bank and Cliff) Rationale: Historical use and number of nests in a colony make this habitat significant. An identified colony can be very important to local populations. All swallow population are declining in Ontario^{cxix} .	Cliff Swallow Northern Rough-winged Swallow (this species is not colonial but can be found in Cliff Swallow colonies)	Eroding banks, sandy hills, borrow pits, steep slopes, and sand piles Cliff faces, bridge abutments, silos, barns. Habitat found in the following ecosites: CUM1 CUT1 CUS1 BLO1 BLS1 BLT1 CLO1 CLS1 CLT1	- Any site or areas with exposed soil banks, undisturbed or naturally eroding that is not a licensed/permitted aggregate area. - Does not include man-made structures (bridges or buildings) or recently (2 years) disturbed soil areas, such as berms, embankments, soil or aggregate stockpiles. - Does not include a licensed/permitted Mineral Aggregate Operation. Information Sources - Reports and other information available from Conservation Authorities. - Ontario Breeding Bird Atlas - Bird Studies Canada; NatureCounts http://www.birdscanada.org/birdmon/ - Field Naturalist Clubs.	Studies confirming: - Presence of 1 or more nesting sites with 8 or more cliff swallow pairs and/or rough-winged swallow pairs during the breeding season. - A colony identified as SWH will include a 50m radius habitat area from the peripheral nests - Field surveys to observe and count swallow nests are to be completed during the breeding season. Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”^{ccxi} - SWHMiST^{cxlix} Index #4 provides development effects and mitigation measures	Field survey results: - No suitable nesting habitat present where detailed field surveys were undertaken - Possible nesting habitat in the local landscape (active aggregate pits and cliffs along the Grand River) - No nesting sites recorded during field surveys - Cliff Swallow and Bank Swallow individuals and groups recorded foraging. Conclusion: criterion is not met

Wildlife Habitat	Wildlife Species	CANDIDATE SWH		CONFIRMED SWH	Evaluation
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
10. Colonially - Nesting Bird Breeding Habitat (Tree/Shrubs) Rationale: Large colonies are important to local bird population, typically sites are only known colony in area and are used annually.	Black-crowned Night-Heron Great Blue Heron Great Egret Green Heron	SWD1 SWD2 SWD3 SWD4 SWD5 SWD6 SWD7 FET1 SWM2 SWM3 SWM5 SWM6	- Nests in live or dead standing trees in wetlands, lakes, islands, and peninsulas. Shrubs and occasionally emergent vegetation may also be used. - Most nests in trees are 11 to 15 m from ground, near the top of the tree. <u>Information Sources</u> - Ontario Breeding Bird Atlas ^{ccv}, colonial nest records. - Ontario Heronry Inventory 1991 available from Bird Studies Canada or NHIC (OMNRF). - Natural Heritage Information Centre (NHIC) Mixed Wader Nesting Colony - Aerial photographs can help identify large heronries. - Reports and other information available from Conservation Authorities. - MNRF District Offices. - Field Naturalist Clubs	Studies confirming: - Presence of 5ⁱ or more active nests of Great Blue Heron or other listed species. - The edge of the colony and a minimum 300m radius or extent of the Forest Ecosite containing the colony or any island <15.0ha with a colony is the SWH ^{cc, ccvii} - Confirmation of active heronries are to be achieved through site visits conducted during the nesting season (April to August) or by evidence such as the presence of fresh guano, dead young and/or eggshells - SWHMiST^{cxlix} Index #5 provides development effects and mitigation measures.	No confirmed nesting of any of the listed species. No known nesting records on the subject property, study area or adjacent lands. Great Blue Herons were recorded regularly in small numbers (foraging in wetlands). Green Heron was recorded on several dates (foraging in wetlands). Conclusion: criterion is not met
11. Colonially - Nesting Bird Breeding Habitat (Ground) Rationale: Colonies are important to local bird population, typically sites are only known colony in area and are used annually.	Brewer's Blackbird Caspian Tern Common Tern Great Black-backed Gull Herring Gull Little Gull Ring-billed Gull	Any rocky island or peninsula (natural or artificial) within a lake or large river (two-lined on a 1:50,000 NTS map). Close proximity to watercourses in open fields or pastures with scattered trees or shrubs (Brewer's Blackbird) CUM CUT CUS MAS1-3; MAM1-6;	- Nesting colonies of gulls and terns are on islands or peninsulas associated with open water or in marshy areas. - Brewers Blackbird colonies are found loosely on the ground in or in low bushes in close proximity to streams and irrigation ditches within farmlands. <u>Information Sources</u> - Ontario Breeding Bird Atlas, rare/colonial species records. - Canadian Wildlife Service. - Reports and other information available from Conservation Authorities. - Natural Heritage Information Centre (NHIC) Colonial Waterbird Nesting Area - MNRF District Offices. - Field Naturalist Clubs.	Studies confirming: - Presence of > 25 active nests for Herring Gulls or Ring-billed Gulls, >5 active nests for Common Tern or >2 active nests for Caspian Tern[©]. - Presence of 5 or more pairs for Brewer's Blackbird[©]. - Any active nesting colony of one or more Little Gull, and Great Black-backed Gull is significant[©]. - The edge of the colony and a minimum 150m radius area of habitat, or the extent of the ELC ecosites containing the colony or any island <3.0ha with a colony is the SWH ^{cc,cvii} - Studies would be done during May/June when actively nesting. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"^{ccxi} - SWHMiST^{cxlix} Index #6 provides development effects and mitigation measures.	No suitable habitat present. Conclusion: criterion is not met

Wildlife Habitat	Wildlife Species	CANDIDATE SWH		CONFIRMED SWH	Evaluation
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
12. Migratory Butterfly Stopover Areas Rationale: Butterfly stopover areas are extremely rare habitats and are biologically important for butterfly species that migrate south for the winter.	Painted Lady Red Admiral <u>Special Concern</u> Monarch	Combination of ELC Community Series; need to have present one Community Series from each landclass: Field: CUM CUT CUS Forest: FOC FOD FOM CUP Anecdotally, a candidate site for butterfly stopover will have a history of butterflies being observed.	A butterfly stopover area will be a minimum of 10 ha in size with a combination of field and forest habitat present, and will be located within 5 km of Lake Ontario^{cxlix}. - The habitat is typically a combination of field and forest, and provides the butterflies with a location to rest prior to their long migration south^{xxxii, xxxiii, xxxiv, xxxv, xxxvi}. - The habitat should not be disturbed, fields/meadows with an abundance of preferred nectar plants and woodland edge providing shelter are requirements for this habitat^{cxlviii, cxlix}. - Staging areas usually provide protection from the elements and are often spits of land or areas with the shortest distance to cross the Great Lakes^{xxxvii, xxxviii, xxxix, xl, xli}. <u>Information Sources</u> - OMNRF (NHIC) - Agriculture Canada in Ottawa may have list of butterfly experts. - Field Naturalist Clubs - Toronto Entomologists Association - Conservation Authorities	Studies confirm: - The presence of Monarch Use Days (MUD) during fall migration (Aug/Oct)^{xliii}. MUD is based on the number of days a site is used by Monarchs, multiplied by the number of individuals using the site. Numbers of butterflies can range from 100-500/day^{xxxvii}, significant variation can occur between years and multiple years of sampling should occur^{xl, xliii}. - Observational studies are to be completed and need to be done frequently during the migration period to estimate MUD. - MUD of >5000 or >3000 with the presence of Painted Ladies or Red Admiral's is to be considered significant.^l - SWHMiST^{cxlix} Index #16 provides development effects and mitigation measures.	No suitable habitat is present – Subject Property not within 5 km of Lake Ontario. While a moderate - good diversity of butterflies was recorded, open field / meadow habitat is very limited. Monarch was recorded regularly, but in very small numbers (< 5 individuals); Red Admiral was recorded on multiple dates in low numbers (< 3 individuals) and Painted Lady was recorded once (3 individuals). Conclusion: criterion is not met
13. Landbird Migratory Stopover Areas Rationale: Sites with a high diversity of species as well as high numbers are most significant.	All migratory songbirds. Canadian Wildlife Service Ontario website: http://www.ec.gc.ca/nature/default.asp?lang=En&n=421B7A9D-1 All migrant raptors species: Ontario Ministry of Natural Resources: Fish and Wildlife Conservation Act, 1997. Schedule 7: Specially Protected Birds (Raptors)	All Ecosites associated with these ELC Community Series; FOC FOM FOD SWC SWM SWD	- Woodlots need to be >10 ha^l in size and within 5 km^{iv, v, vi, vii, viii, ix, x, xi, xii, xiii, xiv, xv} of Lake Ontario. - If multiple woodlands are located along the shoreline those Woodlands <2km from Lake Ontario are more significant^{cxlix}. - Sites have a variety of habitats; forest, grassland and wetland complexes^{cxlix}. - The largest sites are more significant^{cxlix} - Woodlots and forest fragments are important habitats to migrating birds^{ccxviii}, these features located along the shore and located within 5km of Lake Ontario are Candidate SWH^{cxlviii}. <u>Information Sources</u> - Bird Studies Canada - Ontario Nature - Local birders and field naturalist club - Ontario Important Bird Areas (IBA) Program	Studies confirm: - Use of the woodlot by >200 birds/day and with >35 spp with at least 10 bird spp. recorded on at least 5 different survey dates^l. This abundance and diversity of migrant bird species is considered above average and significant. - Studies should be completed during spring (Apr./May) and fall (Aug/Oct) migration using standardized assessment techniques. Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”^{ccxi} - SWHMiST^{cxlix} Index #9 provides development effects and mitigation measures.	No suitable habitat is present – Subject Property not within 5 km of Lake Ontario. While a good diversity of migrant songbirds was recorded, no specific areas were particularly notable and the study area has little in the way of concentrating structure for passerine migrants. As a result, it likely supports random and erratic migrant usage, most often dictated by weather and fallouts rather than site specific conditions. There are no areas that would be expected to produce consistent migration concentrations, year after year. This would not be considered ‘above average and significant’ in the local landscape. Conclusion: criterion is not met

Wildlife Habitat	Wildlife Species	CANDIDATE SWH		CONFIRMED SWH	Evaluation
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
14. Deer Yarding Areas Rationale: Winter habitat for deer is considered to be the main limiting factor for northern deer populations. In winter, deer congregate in “yards” to survive severe winter conditions. Deer yards typically have a long history of annual use by deer, yards typically represent 10-15% of an areas summer range.	White-tailed Deer	Note: OMNRF to determine this habitat. ELC Community Series providing a thermal cover component for a deer yard would include; FOM, FOC, SWM and SWC. Or these ELC Ecosites; CUP2 CUP3 FOD3 CUT	- Deer yarding areas or winter concentration areas (yards) are areas deer move to in response to the onset of winter snow and cold. This is a behavioural response and deer will establish traditional use areas. The yard is composed of two areas referred to as Stratum I and Stratum II. Stratum II covers the entire winter yard area and is usually a mixed or deciduous forest with plenty of browse available for food. Agricultural lands can also be included in this area. Deer move to these areas in early winter and generally, when snow depths reach 20 cm, most of the deer will have moved here. If the snow is light and fluffy, deer may continue to use this area until 30 cm snow depth. In mild winters, deer may remain in the Stratum II area the entire winter. - The Core of a deer yard (Stratum I) is located within the Stratum II area and is critical for deer survival in areas where winters become severe. It is primarily composed of coniferous trees (pine, hemlock, cedar, spruce) with a canopy cover of more than 60% ^{cxciiv}. - OMNRF determines deer yards following methods outlined in “Selected Wildlife and Habitat Features: Inventory Manual” ^{cxcv} - Woodlots with high densities of deer due to artificial feeding are not significant. <u>Information Sources</u> - MNRF District Offices - LIO/NRVIS	No Studies Required: - Snow depth and temperature are the greatest influence on deer use of winter yards. Snow depths > 40cm for more than 60 days in a typically winter are minimum criteria for a deer yard to be considered as SWH. ^{lvi,lvii,lviii,lix,lx, ©} - Deer Yards are mapped by OMNRF District offices. Locations of Core or Stratum 1 and Stratum 2 Deer yards considered significant by OMNRF will be available at local MNRF offices or via Land Information Ontario (LIO). - Field investigations that record deer tracks in winter are done to confirm use (best done from an aircraft). Preferably, this is done over a series of winters to establish the boundary of the Stratum I and Stratum II yard in an "average" winter. MNRF will complete these field investigations. ^{cxcv} - If a SWH is determined for Deer Wintering Area or if a proposed development is within Stratum II yarding area then Movement Corridors are to be considered as outlined in Table 1.4.1 of this Schedule. - SWHMiST ^{cxlix} Index #2 provides development effects and mitigation measures.	No Stratum 2 Deer Wintering Areas are present. Conclusion: criterion is not met

Wildlife Habitat	Wildlife Species	CANDIDATE SWH		CONFIRMED SWH	Evaluation
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
15. Deer Winter Congregation Areas Rationale: Deer movement during winter in the southern areas of Eco-region 6E are not constrained by snow depth, however deer will annually congregate in large numbers in suitable woodlands to reduce or avoid the impacts of winter conditions ^{cxlvi}.	White-tailed Deer	All Forested Ecosites with these ELC Community Series; FOC FOM FOD SWC SWM SWD Conifer plantations much smaller than 50 ha may also be used.	• Woodlots will typically be >100 ha in size[©]. Woodlots <100ha may be considered as significant based on MNRF studies or assessment. • Deer movement during winter in the southern areas of Eco-region 6E are not constrained by snow depth, however deer will annually congregate in large numbers in suitable woodlands. • If deer are constrained by snow depth refer to the Deer Yarding Area habitat within Table 1.1 of this Schedule. • Large woodlots > 100ha and up to 1500 ha are known to be used annually by densities of deer that range from 0.1-1.5 deer/ha . • Woodlots with high densities of deer due to artificial feeding are not significant[©]. • <u>Information Sources</u> • MNRF District Offices. • LIO/NRVIS	Studies confirm: • Deer management is an MNRF responsibility, deer winter congregation areas considered significant will be mapped by MNRF ^{cxlvi}. • Use of the woodlot by white-tailed deer will be determined by MNRF, all woodlots exceeding the area criteria are significant, unless determined not to be significant by MNRF ^Í. • Studies should be completed during winter (Jan/Feb) when >20cm of snow is on the ground using aerial survey techniques^{ccxxiv}, ground or road surveys. or a pellet count deer density survey^{ccxxv}. • If a SWH is determined for Deer Wintering Area or if a proposed development is within Stratum II yarding area then Movement Corridors are to be considered as outlined in Table 1.4.1 of this Schedule. • SWHMiST ^{cxlix} Index #2 provides development effects and mitigation measures.	No woodlots greater than 100 ha are present and no Stratum 1 Deer Wintering Areas are present. Conclusion: criterion is not met

1.2 RARE VEGETATION COMMUNITIES OR SPECIALIZED HABITAT FOR WILDLIFE

1.2.1 Rare Vegetation Communities

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

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

The setting of criteria for significant wildlife habitat (SWH) has incorporated this ranking system into its process of determining rare vegetation communities and as such, a rare vegetation community is defined to include areas that contain a provincially rare vegetation community and/or areas that contain a vegetation community that is rare within the planning area. SWH Table 1.2.1 contains a listing of rare vegetation communities that are considered SWH for the planning area contained within Ecoregion 6E.

Table 1.2.1 Rare Vegetation Communities.

Rare Vegetation Community	CANDIDATE SWH			CONFIRMED SWH	Evaluation
	ELC Ecosite Code	Habitat Description	Detailed Information and Sources	Defining Criteria	
16. Cliffs and Talus Slopes <u>Rationale:</u> Cliffs and Talus Slopes are extremely rare habitats in Ontario.	Any ELC Ecosite within Community Series: TAO CLO TAS CLS TAT CLT	A Cliff is vertical to near vertical bedrock >3m in height. A Talus Slope is rock rubble at the base of a cliff made up of coarse rocky debris	Most cliff and talus slopes occur along the Niagara Escarpment. <u>Information Sources</u> - The Niagara Escarpment Commission has detailed information on location of these habitats. - OMNRF Districts - Natural Heritage Information Centre (NHIC) has location information available on their website. - Field Naturalist Clubs - Conservation Authorities	- Confirm any ELC Vegetation Type for Cliffs or Talus Slopes lxxviii - SWHMiST^{cxlix} Index #21 provides development effects and mitigation measures.	No cliff habitat is present. Conclusion: criterion is not met
17. Sand Barren <u>Rationale:</u> Sand barrens are rare in Ontario and support rare species. Most Sand Barrens have been lost due to cottage development and forestry	ELC Ecosites: SBO1 SBS1 SBT1 Vegetation cover varies from patchy and barren to continuous meadow (SBO1), thicket-like (SBS1), or more closed and treed (SBT1). Tree cover always ≤ 60%.	Sand Barrens typically are exposed sand, generally sparsely vegetated and caused by lack of moisture, periodic fires and erosion. Usually located within other types of natural habitat such as forest or savannah. Vegetation can vary from patchy and barren to tree covered but less than 60%.	A sand barren area >0.5ha in size [Ⓢ] . <u>Information Sources</u> - OMNRF Districts. - Natural Heritage Information Centre (NHIC) has location information available on their website. - Field Naturalist Clubs - Conservation Authorities	- Confirm any ELC Vegetation Type for Sand Barrens lxxviii - Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics)^l. - SWHMiST^{cxlix} Index #20 provides development effects and mitigation measures.	No sand barren habitat is present. Conclusion: criterion is not met

Rare Vegetation Community	CANDIDATE SWH			CONFIRMED SWH	Evaluation
	ELC Ecosite Code	Habitat Description	Detailed Information and Sources	Defining Criteria	
18. Alvar Rationale: Alvars are extremely rare habitats in Ecoregion 6E. Most alvars in Ontario are in Ecoregions 6E and 7E. Alvars in 6E are small and highly localized just north of the Palaeozoic-Precambrian contact.	ALO1 ALS1 ALT1 CUM2 CUS2 CUT2-1 CUW2 FOC1 FOC2 Five Alvar Indicator Species: 1) Carex crawei 2) Panicum philadelphicum 3) Eleocharis compressa 4) Scutellaria parvula 5) Trichostema brachiatum These indicator species are very specific to Alvars within Ecoregion 6E^{cxlix}	An alvar is typically a level, mostly unfractured calcareous bedrock feature with a mosaic of rock pavements and bedrock overlain by a thin veneer of soil. The hydrology of alvars is complex, with alternating periods of inundation and drought. Vegetation cover varies from sparse lichen-moss associations to grasslands and shrublands and comprising a number of characteristic or indicator plant. Undisturbed alvars can be phyto- and zoogeographically diverse, supporting many uncommon or are relict plant and animals species. Vegetation cover varies from patchy to barren with a less than 60% tree cover^{lxxviii}.	An Alvar site > 0.5 ha in size^{lxxv}. <u>Information Sources</u> - Alvars of Ontario (2000), Federation of Ontario Naturalists . - Ontario Nature – Conserving Great Lakes Alvars. - Natural Heritage Information Centre (NHIC) has location information available on their website. - OMNRF Districts. - Field Naturalist Clubs. - Conservation Authorities.	- Field studies that identify four of the five[©] Alvar Indicator Species^{lxxv,cxlix} at a Candidate Alvar site is Significant. - Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics). - The alvar must be in excellent condition and fit in with surrounding landscape with few conflicting land uses^{lxxv} - SWHMiST^{cxlix} Index #17 provides development effects and mitigation measures.	No alvars are present. Conclusion: criterion is not met
19. Old Growth Forest Rationale: Due to historic logging practices, extensive old growth forest is rare in the Ecoregion. Interior habitat provided by old growth forests is required by many wildlife species.	Forest Community Series: FOD FOC FOM SWD SWC SWM	Old Growth forests are characterized by heavy mortality or turnover of over-storey trees resulting in a mosaic of gaps that encourage development of a multi-layered canopy and an abundance of snags and downed woody debris.	Woodland areas 30 ha or greater in size or with at least 10 ha interior habitat assuming 100 m buffer at edge of forest[©]. <u>Information Sources</u> - OMNRF Forest Resource Inventory mapping - OMNRF Districts. - Field Naturalist Clubs - Conservation Authorities - Sustainable Forestry Licence (SFL) companies will possibly know locations through field operations. - Municipal forestry departments	Field Studies will determine: - If dominant trees species of the ecosite are >140 years old, then the area containing these trees is Significant Wildlife Habitat^{cxlviii} - The forested area containing the old growth characteristics will have experienced no recognizable forestry activities^{cxlviii} (cut stumps will not be present) - The area of forest ecosites combined or an eco-element within an ecosite that contains the old growth characteristics is the SWH. - Determine ELC vegetation types for the forest area containing the old growth characteristics^{lxxviii} - SWHMiST^{cxlix} Index #23 provides development effects and mitigation measures.	Based on FRI mapping (1978) and field surveys, one area could be considered ‘older’ growth: a portion of WSU 4. In WSU 4, discontinuous older growth is found in a portion of upland deciduous forest at the east end. The estimated age of dominant trees (Sugar Maple, White Oak), based on projection from ages noted in the FRI mapping, is approximately 100 years old. However, some logging has occurred in the intervening years and canopy cover / age is not homogeneous throughout these areas. Conclusion: criterion is not met within the Subject Property, potentially met within the portion of WSU4 in the rare lands. No impacts are anticipated; WSU 4 will be retained in full, with development setbacks and other mitigation measures.

Rare Vegetation Community	CANDIDATE SWH			CONFIRMED SWH	Evaluation
	ELC Ecosite Code	Habitat Description	Detailed Information and Sources	Defining Criteria	
20. Savannah Rationale: Savannahs are extremely rare habitats in Ontario.	CUS2 TPS1 TPS2 TPW1 TPW2	A Savannah is a tallgrass prairie habitat that has tree cover between 25 – 60% lxxix, lxxx, lxxxi, lxxxii, lxxxiii	No minimum size to site ^Í Site must be restored or a natural site. Remnant sites such as railway right of ways are not considered to be SWH. <u>Information Sources</u> - Natural Heritage Information Centre (NHIC) has location data available on their website. - OMNRF Districts. - Field Naturalists Clubs. - Conservation Authorities.	Field studies confirm one or more of the Savannah indicator species listed in ^{lxxv} Appendix N should be present ^Í . Note: Savannah plant spp. list from Ecoregion 6E should be used ^{cxlviii} . - Area of the ELC Ecosite is the SWH. - Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics). - SWHMiST^{cxlix} Index #18 provides development effects and mitigation measures.	No savannah habitat is present. Conclusion: criterion is not met
21. Tallgrass Prairie Rationale: Tallgrass Prairies are extremely rare habitats in Ontario.	TPO1 TPO2	A Tallgrass Prairie has ground cover dominated by prairie grasses. An open Tallgrass Prairie habitat has < 25% tree cover. lxxix, lxxx, lxxxi, lxxxii, lxxxiii	No minimum size to site ^Í . Site must be restored or a natural site. Remnant sites such as railway right of ways are not considered to be SWH. <u>Information Sources</u> - OMNRF Districts. - Natural Heritage Information Centre (NHIC) has location information available on their website. - Field Naturalists Clubs. - Conservation Authorities.	Field studies confirm one or more of the Prairie indicator species listed in ^{lxxv} Appendix N should be present ^Í . Note: Prairie plant spp. list from Ecoregion 6E should be used ^{cxlviii} - Area of the ELC Ecosite is the SWH. - Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics). - SWHMiST^{cxlix} Index #19 provides development effects and mitigation measures.	No tallgrass habitat is present. Conclusion: criterion is not met
22. Other Rare Vegetation Communities Rationale: Plant communities that often contain rare species which depend on the habitat for survival.	Provincially Rare S1, S2 and S3 vegetation communities are listed in Appendix M of the SWHTG ^{cxlviii} . Any ELC Ecosite Code that has a possible ELC Vegetation Type that is Provincially Rare is Candidate SWH.	Rare Vegetation Communities may include beaches, fens, forest, marsh, barrens, dunes and swamps.	ELC Ecosite codes that have the potential to be a rare ELC Vegetation Type as outlined in appendix M ^{cxlviii} The OMNRF/NHIC will have up to date listing for rare vegetation communities. <u>Information Sources</u> - Natural Heritage Information Centre (NHIC) has location information available on their website. - OMNRF Districts. - Field Naturalists Clubs. - Conservation Authorities.	Field studies should confirm if an ELC Vegetation Type is a rare vegetation community based on listing within Appendix M of SWHTG ^{cxlviii} - Area of the ELC Vegetation Type polygon is the SWH. - SWHMiST ^{cxlix} Index #37 provides development effects and mitigation measures.	No provincially rare vegetation community types are present. Conclusion: criterion is not met

1.2.2 Specialized Habitat for Wildlife

Some wildlife species require large areas of suitable habitat for their long-term survival. Many wildlife species require substantial areas of suitable habitat for successful breeding. Their populations decline when habitat becomes fragmented and reduced in size^{cxlviii}. Specialized habitat for wildlife is a community or diversity-based category, therefore, the more wildlife species a habitat contains, the more significant the habitat becomes to the planning area. The largest and least fragmented habitats within a planning area will support the most significant populations of wildlife. The specialized habitats for wildlife that are considered as SWH are outlined in Table 1.2.2.

Table 1.2.2 Specialized Habitats of Wildlife considered SWH.

Specialized Wildlife Habitat	Wildlife Species	CANDIDATE SWH		CONFIRMED SWH	Evaluation
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
23. Waterfowl Nesting Area Rationale: Important to local waterfowl populations, sites with greatest number of species and highest number of individuals are significant.	American Black Duck Blue-winged Teal Gadwall Green-winged Teal Hooded Merganser Mallard Northern Pintail Northern Shoveler Wood Duck	All upland habitats located adjacent to these wetland ELC Ecosites are Candidate SWH: MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 SWT1 SWT2 SWD1 SWD2 SWD3 SWD4 Note: includes adjacency to Provincially Significant Wetlands	A waterfowl nesting area extends 120 m ^{cxlix} from a wetland (> 0.5 ha) or a wetland (>0.5ha) and any small wetlands (0.5ha) within 120m or a cluster of 3 or more small (<0.5 ha) wetlands within 120 m of each individual wetland where waterfowl nesting is known to occur ^{cxlix}. - Upland areas should be at least 120 m wide so that predators such as racoons, skunks, and foxes have difficulty finding nests. - Wood Ducks and Hooded Mergansers utilize large diameter trees (>40cm dbh) in woodlands for cavity nest sites. <u>Information Sources</u> - Ducks Unlimited staff may know the locations of particularly productive nesting sites. - OMNRF Wetland Evaluations for indication of significant waterfowl nesting habitat. - Reports and other information available from Conservation Authorities.	Studies confirmed: - Presence of 3 or more nesting pairs for listed species excluding Mallards^I, or; - Presence of 10 or more nesting pairs for listed species including Mallards^I. - Any active nesting site of an American Black Duck is considered significant. - Nesting studies should be completed during the spring breeding season (April - June). Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”^{ccxi} - A field study confirming waterfowl nesting habitat will determine the boundary of the waterfowl nesting habitat for the SWH, this may be greater or less than 120 m ^{cxlviii} from the wetland and will provide enough habitat for waterfowl to successfully nest. - SWHMiST^{cxlix} Index #25 provides development effects and mitigation measures.	Candidate CUM, CUT, CUW and FOD habitats are present adjacent to MAM / MAS / SWD / SWT / SAF wetland habitats in WSU 2, 3, 6 and 8. Generally, these adjacent upland habitats are very narrow, with portions ploughed regularly (typically less than 20 m wide). The following species were recorded in wetlands with adjacent upland habitat (maximum number in parentheses): - American Black Duck (2-probable) - Blue-winged Teal (2-probable) - Wood Duck (18-confirmed) - Hooded Merganser (4-confirmed) - Mallard (31-confirmed) Note: Blue-winged Teal would be considered uncommon local breeders (formerly common, pre 1980). Hooded Merganser would be considered uncommon / rare locally. The recorded numbers of Wood Duck and Mallard would not be considered unusual or locally / regionally significant as both species are common and widespread and expected to occur in most wetland habitat in southern Ontario. Conclusion: Confirmed SWH is present within narrow upland margins around WSU 2, WSU 3, WSU 6, and WSU 8 and within suitable upland portions of WSU 4. No impacts are anticipated; these areas, which are outside of the development envelope, will be retained in full, with enhancements through buffer management / naturalization.

Specialized Wildlife Habitat	Wildlife Species	CANDIDATE SWH		CONFIRMED SWH	Evaluation
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
24. Bald Eagle and Osprey Nesting, Foraging and Perching Habitat <u>Rationale:</u> Nest sites are fairly uncommon in Eco-region 6E and are used annually by these species. Many suitable nesting locations may be lost due to increasing shoreline development pressures and scarcity of habitat.	Osprey <u>Special Concern:</u> Bald Eagle	ELC Forest Community Series: FOD, FOM, FOC, SWD, SWM and SWC directly adjacent to riparian areas – rivers, lakes, ponds and wetlands	Nests are associated with lakes, ponds, rivers or wetlands along forested shorelines, islands, or on structures over water. - Osprey nests are usually at the top a tree whereas Bald Eagle nests are typically in super canopy trees in a notch within the tree’s canopy. - Nests located on man-made objects are not to be included as SWH (e.g. telephone poles and constructed nesting platforms). <u>Information Sources</u> - Natural Heritage Information Centre (NHIC) compiles all known nesting sites for Bald Eagles in Ontario. - MNR values information (LIO/NRVIS) will list known nesting locations. Note: data from NRVIS is provided as a point and does not represent all the habitat. - Nature Counts, Ontario Nest Records Scheme data. - OMNRF Districts. - Check the Ontario Breeding Bird Atlas ^{ccv} or Rare Breeding Birds in Ontario for species documented - Reports and other information available from Conservation Authorities. - Field Naturalists clubs	Studies confirm the use of these nests by: - One or more active Osprey or Bald Eagle nests in an area^{cxlviii}. - Some species have more than one nest in a given area and priority is given to the primary nest with alternate nests included within the area of the SWH. - For an Osprey, the active nest and a 300 m radius around the nest or the contiguous woodland stand is the SWH ^{ccvii}, maintaining undisturbed shorelines with large trees within this area is important ^{cxlviii}. - For a Bald Eagle the active nest and a 400-800 m radius around the nest is the SWH. ^{cvi}, ^{ccvii} Area of the habitat from 400-800m is dependant on sight lines from the nest to the development and inclusion of perching and foraging habitat ^{cvi} - To be significant a site must be used annually. When found inactive, the site must be known to be inactive for ≥ 3 years or suspected of not being used for >5 years before being considered not significant. ^{ccvii} - Observational studies to determine nest site use, perching sites and foraging areas need to be done from mid March to mid August. - Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”^{ccxi} - SWHMiST^{cxlix} Index #26 provides development effects and mitigation measures	Candidate woodland habitat is present adjacent to Barrie’s Lake and within the local landscape. Both Osprey and Bald Eagle are regular foragers (and breeders – for Osprey) along nearby reaches of the Grand River. Osprey and Bald Eagle were recorded during supplemental surveys (1 individual each), no nests were observed during field work and no evidence of breeding was recorded. Conclusion: criterion is not met

Specialized Wildlife Habitat	Wildlife Species	CANDIDATE SWH		CONFIRMED SWH	Evaluation
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
25. Woodland Raptor Nesting Habitat Rationale: Nests sites for these species are rarely identified; these area sensitive habitats are often used annually by these species.	Barred Owl Broad-winged Hawk Cooper’s Hawk Northern Goshawk Red-shouldered Hawk Sharp-shinned Hawk	May be found in all forested ELC Ecosites. May also be found in SWC, SWM, SWD and CUP3	All natural or conifer plantation woodland/forest stands >30ha with >10ha of interior habitat ^{lxxxviii, lxxxix, xc, xci, xciii, xciv, xcv,xcvi, cxxxiii}. Interior habitat determined with a 200m buffer^{cxlviii} - Stick nests found in a variety of intermediate-aged to mature conifer, deciduous or mixed forests within tops or crotches of trees. Species such as Coopers hawk nest along forest edges sometimes on peninsulas or small off-shore islands. - In disturbed sites, nests may be used again, or a new nest will be in close proximity to old nest. <u>Information Sources</u> - OMNRF Districts. - Check the Ontario Breeding Bird Atlas or Rare Breeding Birds in Ontario for species documented. - Check data from Bird Studies Canada. - Reports and other information available from Conservation Authorities.	Studies confirm: - Presence of 1 or more active nests from species list is considered significant^{cxlviii}. - Red-shouldered Hawk and Northern Goshawk – A 400m radius around the nest or 28 ha of suitable habitat is the SWH ^{ccvii}. (the 28 ha habitat area would be applied where optimal habitat is irregularly shaped around the nest) - Barred Owl – A 200m radius around the nest is the SWH ^{ccvii}. - Broad-winged Hawk and Coopers Hawk,– A 100m radius around the nest is the SWH^{ccvii}. - Sharp-Shinned Hawk – A 50m radius around the nest is the SWH^{ccvii}. - Conduct field investigations from mid-March to end of May. The use of call broadcasts can help in locating territorial (courting/nesting) raptors and facilitate the discovery of nests by narrowing down the search area. - SWHMiST ^{cxlix} Index #27 provides development effects and mitigation measures.	Suitable habitat is not present within the Subject Property or study area; may be present within the local landscape. Conclusion: criterion is not met

Specialized Wildlife Habitat	Wildlife Species	CANDIDATE SWH		CONFIRMED SWH	Evaluation
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
26. Turtle Nesting Areas Rationale: These habitats are rare and when identified will often be the only breeding site for local populations of turtles.	Midland Painted Turtle Special Concern Species: Northern Map Turtle Snapping Turtle	Exposed mineral soil (sand or gravel) areas adjacent (<100m) ^{cxlviii} or within the following ELC Ecosites: MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 BOO1 FEO1	• Best nesting habitat for turtles are close to water and away from roads and sites less prone to loss of eggs by predation from skunks, raccoons or other animals. • For an area to function as a turtle-nesting area, it must provide sand and gravel that turtles are able to dig in and are located in open, sunny areas. Nesting areas on the sides of municipal or provincial road embankments and shoulders are not SWH. • Sand and gravel beaches adjacent to undisturbed shallow weedy areas of marshes, lakes, and rivers are most frequently used. <u>Information Sources</u> • Use Ontario Soil Survey reports and maps to help find suitable substrate for nesting turtles (well-drained sands and fine gravels). • Check the Ontario Herpetofaunal Summary Atlas records or other similar atlases for uncommon turtles; location information may help to find potential nesting habitat for them. • Natural Heritage Information Centre (NHIC) • Field Naturalist Clubs	Studies confirm: • Presence of 5 or more nesting Midland Painted Turtles^I • One or more Northern Map Turtle or Snapping Turtle nesting is a SWH^I. • The area or collection of sites within an area of exposed mineral soils where the turtles nest, plus a radius of 30-100m around the nesting area dependant on slope, riparian vegetation and adjacent land use is the SWH. ^{cxlviii} • Travel routes from wetland to nesting area are to be considered within the SWH as part of the 30-100m area of habitat. • Field investigations should be conducted in prime nesting season typically late spring to early summer. Observational studies observing the turtles nesting is a recommended method. • SWHMiST Index #28 provides development effects and mitigation measures for turtle nesting habitat.	Candidate nesting habitat is present in WSU 2, WSU 3, WSU 6 and WSU 8 (Barrie's Lake). Based on targeted and supplemental field surveys, we recorded observations or evidence of two species: Midland Painted Turtle and Snapping Turtle. • Basking Midland Painted Turtles were widespread and abundant in the larger ponds during spring surveys (up to 40+ individuals observed in any one location on a single date). This species was also recorded incidentally in moderate numbers during road mortality and pitfall trapping surveys (10-15). Greatest abundances were recorded in WSU 2, WSU 3 and WSU 8 (Barrie's Lake). • Moderate numbers of Snapping Turtle were recorded (<10 individuals) during spring basking, road mortality and pitfall trapping surveys. • Evidence of turtle nesting was recorded at ponds within WSU 6 and WSU 3 and in gravel berms beside Blenheim Road. Nesting attempts were most common along Blenheim Road (5 nests), with 1-3 nests recorded in WSU 6 and WSU 3. Conclusion: Confirmed SHW is present in WSU 3, WSU 6 and WSU 8, based on possible nests and presence of many Midland Painted Turtles and at least one Snapping Turtle.
27. Seeps and Springs Rationale: Seeps/Springs are typical of headwater areas and are often at the source of coldwater streams.	Ruffed Grouse Salamander spp. Spruce Grouse White-tailed Deer Wild Turkey	Seeps/Springs are areas where ground water comes to the surface. Often they are found within headwater areas within forested habitats. Any forested Ecosite within the headwater areas of a stream could have seeps/springs.	Any forested area (with <25% meadow/field/pasture) within the headwaters of a stream or river system ^{cxvii, cxlix}. • Seeps and springs are important feeding and drinking areas especially in the winter will typically support a variety of plant and animal species ^{cxix, cxx, cxxi, cxxii, cxiii, cxiv}. <u>Information Sources</u> • Topographical Map. • Thermography. • Hydrological surveys conducted by Conservation Authorities and MOE. • Field Naturalists Clubs and landowners. • Municipalities and Conservation Authorities may have drainage maps and headwater areas mapped.	Field Studies confirm: • Presence of a site with 2 or more^I seeps/springs should be considered SWH. • The area of a ELC forest ecosite or an ecoelement within ecosite containing the seeps/springs is the SWH. The protection of the recharge area considering the slope, vegetation, height of trees and groundwater condition need to be considered in delineation of the habitat. • SWHMiST Index #30 provides development effects and mitigation measures	Forested areas with groundwater seepage / springs are present in the headwater forested area of Cruikston Creek (WSU 4). Wild Turkey and White-tailed Deer were recorded in both locations. Conclusion: Confirmed SWH is present in WSU 4.

Specialized Wildlife Habitat	Wildlife Species	CANDIDATE SWH		CONFIRMED SWH	Evaluation
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
28. Amphibian Breeding Habitat (Woodland) Rationale: These habitats are extremely important to amphibian biodiversity within a landscape and often represent the only breeding habitat for local amphibian populations	Blue-spotted Salamander Eastern Newt Gray Treefrog Spotted Salamander Spring Peeper Western Chorus Frog Wood Frog	All Ecosites associated with these ELC Community Series; FOC FOM FOD SWC SWM SWD Breeding pools within the woodland or the shortest distance from forest habitat are more significant because they are more likely to be used due to reduced risk to migrating amphibians	• Presence of a wetland, pond or woodland pool (including vernal pools) >500m² (about 25m diameter) within or adjacent (within 120m) to a woodland (no minimum size). Some small wetlands may not be mapped and may be important breeding pools for amphibians. • Woodlands with permanent ponds or those containing water in most years until mid-July are more likely to be used as breeding habitat^{cxlviii} <u>Information Sources</u> • Ontario Herpetofaunal Summary Atlas (or other similar atlases) for records • Local landowners may also provide assistance as they may hear spring-time choruses of amphibians on their property. • OMNRF Districts • OMNRF wetland evaluations • Field Naturalist clubs • Canadian Wildlife Service Amphibian Road Call Survey • Ontario Vernal Pool Association: http://www.ontariovernalpools.org	Studies confirm; • Presence of breeding population of 1 or more of the listed newt/salamander species or 2 or more of the listed frog species with at least 20 individuals (adults or eggs masses) or 2 or more of the listed frog species with Call Level Codes of 3Ⓢ. • A combination of observational study and call count surveys will be required during the spring (March-June) when amphibians are concentrated around suitable breeding habitat within or near the woodland/wetlands. • The habitat is the wetland area plus a 230m radius of woodland area ^{lxiii, lxv, lxvi, lxvii, lxviii, lxix, lxx, lxxi}. If a wetland area is adjacent to a woodland, a travel corridor connecting the wetland to the woodland is to be included in the habitat. • SWHMiST ^{cxlix} Index #14 provides development effects and mitigation measures.	Candidate wetland/pond habitats were surveyed using multiple methods from 2008-2011, 2014-2015 and 2019-2024 (i.e. spring calling amphibian surveys, road mortality surveys, pitfall and pond trapping surveys). Breeding populations of all of the listed species (except Eastern Newt) were recorded at numerous locations, typically in excess of 20 individuals. Some of these locations are within 120 m of woodlands (FOD, SWM): 1. Woodland ponds (within WSU 4) and larger pond / wetland mosaics (WSU 3). 2. AM 11 – Barrie’s Lake (WSU 8) Conclusion: Confirmed SWH is present in WSU2, WSU 3, WSU 4, WSU 6 and WSU 8 [Barrie’s Lake], No impacts are anticipated; features will be retained in full, with development setbacks and other mitigation / enhancement measures.SL
29. Amphibian Breeding Habitat (Wetlands) Rationale: Wetlands supporting breeding for these amphibian species are extremely important and fairly rare within Central Ontario landscapes.	American Toad Blue-spotted Salamander Bullfrog Eastern Newt Four-toed Salamander Gray Treefrog Green Frog Mink Frog Northern Leopard Frog Pickerel Frog Spotted Salamander Western Chorus Frog	ELC Community Classes SW, MA, FE, BO, OA and SA. Typically these wetland ecosites will be isolated (>120m) from woodland ecosites, however larger wetlands containing predominantly aquatic species (e.g. Bull Frog) may be adjacent to woodlands	• Wetlands>500m² (about 25m diameter),supporting high species diversity are significant; some small or ephemeral habitats may not be identified on MNRF mapping and could be important amphibian breeding habitats . • Presence of shrubs and logs increase significance of pond for some amphibian species because of available structure for calling, foraging, escape and concealment from predators. • Bullfrogs require permanent water bodies with abundant emergent vegetation. <u>Information Sources</u> • Ontario Herpetofaunal Summary Atlas (or other similar atlases) • Canadian Wildlife Service Amphibian Road Surveys and Backyard Amphibian Call Count. • OMNRF Districts and wetland evaluations. • Reports and other information available from Conservation Authorities.	Studies confirm: • Presence of breeding population of 1 or more of the listed newt/salamander species or 2 or more of the listed frog/toad species with at least 20 individuals (adults or eggs masses) or 2 or more of the listed frog/toad species with Call Level Codes of 3Ⓢ. or; Wetland with confirmed breeding Bullfrogs are significant. • The ELC ecosite wetland area and the shoreline are the SWH. • A combination of observational study and call count surveys ^{cviii} will be required during the spring (March-June) when amphibians are concentrated around suitable breeding habitat within or near the wetlands. • If a SWH is determined for Amphibian Breeding Habitat (Wetlands) then Movement Corridors are to be considered as outlined in Table 1.4.1 of this Schedule. • SWHMiST ^{cxlix} Index #15 provides development effects and mitigation measures.	Candidate wetland / pond habitats were surveyed using multiple methods from 2008-2011, 2014-2015 and 2019-2024 (i.e. spring calling amphibian surveys, road mortality surveys, pitfall and pond trapping surveys). Breeding populations of many of the listed species (except Eastern Newt, Pickerel Frog and Mink Frog) were recorded at numerous locations, typically in excess of 20 individuals. The following locations had confirmed breeding of 1 or more listed salamander species and/or 3 or more species with at least 20 individuals in suitable habitat (MAM, SAS, SAF, SWT): 1. WSU 4, WSU 6, WSU 2, WSU 3 2. Barrie’s Lake (WSU 8). Note that Bullfrog breeding was confirmed in Barrie’s Lake. Conclusion: Confirmed SWH is present in WSU2, WSU 3, WSU 4, WSU 6 and WSU 8 [Barrie’s Lake], No impacts are anticipated; features will be retained in full, with development setbacks and other mitigation / enhancement measures.

Specialized Wildlife Habitat	Wildlife Species	CANDIDATE SWH		CONFIRMED SWH	Evaluation
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
30. Woodland Area-Sensitive Bird Breeding Habitat <u>Rationale:</u> Large, natural blocks of mature woodland habitat within the settled areas of Southern Ontario are important habitats for area sensitive interior forest song birds.	Blackburnian Warbler Black-throated Blue Warbler Black-throated Green Warbler Blue-headed Vireo Northern Parula Ovenbird Red-breasted Nuthatch Scarlet Tanager Veery Winter Wren Yellow-bellied Sapsucker <u>Special Concern:</u> Canada Warbler Cerulean Warbler	All Ecosites associated with these ELC Community Series; FOC FOM FOD SWC SWM SWD	- Habitats where interior forest breeding birds are breeding, typically large mature (>60 yrs old) forest stands or woodlots >30 ha. cv, cxxxi, cxxxii, cxxxiii, cxxxiv, cxxxv, cxxxvi, cxxxvii, cxxxviii, cxxxix, cxi, cxli, cxlii, cxliii, cxliv, cxlv, cxlvi, cli, clii, cliii, cliv, clv, clvi, clvii, clviii, clix - Interior forest habitat is at least 200 m from forest edge habitat. clxiv <u>Information Sources</u> - Local birder clubs. - Canadian Wildlife Service (CWS) for the location of forest bird monitoring. - Bird Studies Canada conducted a 3-year study of 287 woodlands to determine the effects of forest fragmentation on forest birds and to determine what forests were of greatest value to interior species - Reports and other information available from Conservation Authorities.	Studies confirm: - Presence of nesting or breeding pairs of 3 or more of the listed wildlife species. © - Note: any site with breeding Cerulean Warblers or Canada Warblers is to be considered SWH.© - Conduct field investigations in spring and early summer when birds are singing and defending their territories. - Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects” ccxi - SWHMiST cxlix Index #34 provides development effects and mitigation measures.	Candidate habitat is found in WSU 4 (mature woodland with forest interior – assuming 100 m buffer). Evidence of breeding was recorded in WSU 4 for 3 of the listed species (abundance; breeding evidence): - Scarlet Tanager (4; probable) - Veery (1; confirmed) - Winter Wren (2; possible) Conclusion: Confirmed SWH is present in WSU 4 (assuming that any species recorded in suitable habitat during the breeding season should be considered a ‘breeding species’). No impacts are anticipated; features will be retained in full, with development setbacks and other mitigation / enhancement measures.

1.3 HABITAT FOR SPECIES OF CONSERVATION CONCERN (NOT INCLUDING ENDANGERED OR THREATENED SPECIES)

Habitats of Species of Conservation Concern include wildlife species that are listed as Special Concern or rare, that are declining, or are featured species. Habitats of Species of Conservation Concern do not include habitats of Endangered or Threatened species as identified by the Endangered Species Act 2007. Table 1.3 assists with the identification of SWH for Species of Conservation Concern.

Table 1.3. Habitats of Species of Conservation Concern considered SWH.

Wildlife	Species	CANDIDATE SWH		CONFIRMED SWH	Evaluation
		ELC Ecosite	Habitat Criteria and Information Sources	Defining Criteria	
31. Marsh Breeding Bird Habitat Rationale: Wetlands for these bird species are typically productive and fairly rare in Southern Ontario landscapes.	American Bittern American Coot Common Loon Common Moorhen Green Heron Marsh Wren Pied-billed Grebe Sandhill Crane Sedge Wren Sora Trumpeter Swan Virginia Rail Special Concern: Black Tern Yellow Rail	MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 SAS1 SAM1 SAF1 FEO1 BOO1 For Green Heron: All SW, MA and CUM1 sites.	- Nesting occurs in wetlands. - All wetland habitat is to be considered as long as there is shallow water with emergent aquatic vegetation present ^{cxixiv}. - For Green Heron, habitat is at the edge of water such as sluggish streams, ponds and marshes sheltered by shrubs and trees. Less frequently, it may be found in upland shrubs or forest a considerable distance from water. <u>Information Sources</u> - OMNRF District and wetland evaluations. - Field Naturalist clubs - Natural Heritage Information Centre (NHIC) Records. - Reports and other information available from Conservation Authorities. - Ontario Breeding Bird Atlas.	Studies confirm: - Presence of 5 or more nesting pairs of Sedge Wren or Marsh Wren or 1 pair of Sandhill Cranes; or breeding by any combination of 5 or more of the listed species ☺. - Note: any wetland with breeding of 1 or more Black Terns, Trumpeter Swan, Green Heron or Yellow Rail is SWH ☺. - Area of the ELC ecosite is the SWH. - Breeding surveys should be done in May/June when these species are actively nesting in wetland habitats. - Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects” - SWHMiST Index #35 provides development effects and mitigation measures	Candidate habitat is present within the wetland / pond areas (i.e., WSU 2, WSU 3, WSU 6 and WSU 8 (Barrie’s Lake)) Evidence of breeding was recorded for 9 of the listed species (with abundance; breeding evidence): - American Coot (2; probable) - Common Moorhen (7; confirmed) - Green Heron (1; probable) - Marsh Wren (3; probable) - Pied-billed Grebe (9; confirmed) - Sandhill Crane (3; probable) - Sora (4; probable) - Virginia Rail (5; probable) - Trumpeter Swan (6; confirmed) Conclusion: Confirmed SWH is present in WSU 2 (8 spp. + Trumpeter Swan), WSU 3 (7 spp. + Sandhill Crane + Trumpeter Swan), WSU6, and WSU 8 (5 spp. + Sandhill Crane + Trumpeter Swan). No impacts are anticipated; features will be retained in full, with development setbacks and other mitigation / enhancement measures.

Wildlife	Species	CANDIDATE SWH		CONFIRMED SWH	Evaluation
		ELC Ecosite	Habitat Criteria and Information Sources	Defining Criteria	
32. Open Country Bird Breeding Habitat Rationale: This wildlife habitat is declining throughout Ontario and North America. Species such as the Upland Sandpiper have declined significantly the past 40 years based on CWS (2004) trend records.	Grasshopper Sparrow Northern Harrier Savannah Sparrow Upland Sandpiper Vesper Sparrow Special Concern: Short-eared Owl	CUM1 CUM2	- Large grassland areas (includes natural and cultural fields and meadows) >30 ha ^{clx, clxi, clxii, clxiii, clxiv, clxv, clxvi, clxvii, clxviii, clxix}. Grasslands not Class 1 or 2 agricultural lands, and not being actively used for farming (i.e. no row cropping or intensive hay or livestock pasturing in the last 5 years) ^Í. - Grassland sites considered significant should have a history of longevity, either abandoned fields, mature hayfields and pasturelands that are at least 5 years or older. - The Indicator bird species are area sensitive requiring larger grassland areas than the common grassland species. Information Sources - Agricultural land classification maps, Ministry of Agriculture. - Local bird clubs. - Ontario Breeding Bird Atlas - EIS Reports and other information available from Conservation Authorities.	Field Studies confirm: - Presence of nesting or breeding of 2 or more of the listed species.^Í - A field with 1 or more breeding Short-eared Owls is to be considered SWH. - The area of SWH is the contiguous ELC ecosite field areas. - Conduct field investigations of the most likely areas in spring and early summer when birds are singing and defending their territories. - Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”^{ccxi} - SWHMiST ^{cxlix} Index #32 provides development effects and mitigation measures	Suitable grassland habitat is not present. Grassland / cultural meadow habitat is restricted to narrow strips abutting woodland / wetland. Two of the listed species were recorded: - Savannah Sparrow (4; probable); - Vesper Sparrow (2; probable). Conclusion: criterion is not met
33. Shrub/Early Successional Bird Breeding Habitat Rationale: This wildlife habitat is declining throughout Ontario and North America. The Brown Thrasher has declined significantly over the past 40 years based on CWS (2004) trend records ^{cxci} .	Indicator Spp: Brown Thrasher Clay-coloured Sparrow Common Spp.: Black-billed Cuckoo Eastern Towhee Field Sparrow Willow Flycatcher Special Concern: Golden-winged Warbler Yellow-breasted Chat	CUT1 CUT2 CUS1 CUS2 CUW1 CUW2 Patches of shrub ecosites can be complexed into a larger habitat for some bird species	Large field areas succeeding to shrub and thicket habitats>10ha ^{clxiv} in size. - Shrub land or early successional fields, not class 1 or 2 agricultural lands, not being actively used for farming (i.e. no row-cropping, haying or livestock pasturing in the last 5 years) ^Í. - Shrub thicket habitats (>10 ha) are most likely to support and sustain a diversity of these species ^{clxxiii}. - Shrub and thicket habitat sites considered significant should have a history of longevity, either abandoned fields or pasturelands. Information Sources - Agricultural land classification maps, Ministry of Agriculture. - Local bird clubs. - Ontario Breeding Bird Atlas - Reports and other information available from Conservation Authorities.	Field Studies confirm: - Presence of nesting or breeding of 1 of the indicator species and at least 2 of the common species.^Í - A habitat with breeding Yellow-breasted Chat or Golden-winged Warbler is to be considered as Significant Wildlife Habitat. ^Í - The area of the SWH is the contiguous ELC ecosite field/thicket area. - Conduct field investigations of the most likely areas in spring and early summer when birds are singing and defending their territories - Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”^{ccxi} - SWHMiST ^{cxlix} Index #33 provides development effects and mitigation measures.	Large fields of suitable shrub / early successional habitat are not present; habitat is restricted to narrow strips / edges, gaps and small blocks. Four of the listed species were recorded: - Black-billed Cuckoo (2; probable); - Brown Thrasher (1; probable); - Field Sparrow (2; possible); - Willow Flycatcher (5; probable). Conclusion: criterion is not met
34. Terrestrial Crayfish	Chimney or Digger Crayfish; (<i>Fallicambarus</i>)	MAM1 MAM2 MAM3 MAM4 MAM5	Wet meadow and edges of shallow marshes (no minimum size) should be surveyed for terrestrial crayfish.	Studies Confirm: Presence of 1 or more individuals of species listed or their chimneys	Potentially suitable habitat present along marsh margins. No terrestrial crayfish or burrows were recorded during field surveys.

Wildlife	Species	CANDIDATE SWH		CONFIRMED SWH	Evaluation
		ELC Ecosite	Habitat Criteria and Information Sources	Defining Criteria	
					○ Unicorn Clubtail (S2S3) and Amber-winged Spreadwing (S3): large, diverse wetlands (e.g. WSU 2, 3, 6 and 8). Based on more recent and thorough surveys, Unicorn Clubtail has proven to be not uncommon in Southern Ontario (pers. Obs.), using small mud bottomed ponds, often man-made, as well as various other, non-specialized wetland habitats. ○ Swamp Darner (S2S3) and Harlequin Darner (S3): mature mixed swamp woodland with standing dead trees (i.e. WSU 4 – the Rare ‘hogsback’). For both species, the large, intact <i>rare</i> woodland (WSU 4) is probably responsible for observations during the current study. These species likely breed within the swamp habitats in WSU 4, with occurrence elsewhere largely restricted to dispersing / foraging individuals. ○ The recorded butterflies are dependent on food plant presence, rather than specific habitat types. ● Mammals: none Conclusion: Confirmed SWH is present in / associated with: ● WSU 2 (Canada Warbler, Trumpeter Swan, Monarch, Snapping Turtle) ● WSU 3 (Hill’s Oak, Least Bittern, Trumpeter Swan, Common Sootywing, Monarch, Amber-winged Spreadwing, Snapping Turtle) ● WSU 4 (Butternut, Eastern Wood-pewee, Common Sootywing, Giant Swallowtail, Tawny Emperor, Monarch, Swamp Darner, Harlequin Darner) ● WSU 6 (Monarch, Snapping Turtle) ● WSU 8 (Trumpeter Swan, Hill’s Oak, Monarch, Spatterdock Darner, Unicorn Clubtail, Snapping Turtle) SWH can be delineated for those occurrences associated with a defined ELC vegetation type (i.e. flora within a distinct woodland / wetland habitat, breeding habitat for avifauna or insects). Where ELC vegetation communities cannot be classified / delineated, SWH does not apply (e.g. for Hill’s Oak hedgerow trees or insect foraging areas in active agricultural lands). No impacts are anticipated; features will be retained in full, with development setbacks and other mitigation / enhancement measures.

1.4 ANIMAL MOVEMENT CORRIDORS

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

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

Animal Movement Corridors should only be identified as SWH where:

Where a Confirmed or Candidate SWH has been identified by MNRF or the planning authority based on documented evidence of a habitat identified within these Criterion Schedules or the Significant Wildlife Habitat Technical Guide. The identified wildlife habitats Table 1.4.1 will have distinct passageways or rely on well defined natural features for movements between habitats required by the species to complete its life cycle.

Table 1.4.1 Animal Movement Corridors

Habitat	SPECIES	CANDIDATE SWH		CONFIRMED SWH	Evaluation
		ELC Eco-sites	Habitat Criteria and Information Sources	Defining Criteria	
36. Amphibian Movement Corridors <u>Rationale:</u> Movement corridors for amphibians moving from their terrestrial habitat to breeding habitat can be extremely important for local populations.	American Toad Blue-spotted Salamander Bullfrog Eastern Newt Four-toed Salamander Gray Treefrog Green Frog Mink Frog Northern Leopard Frog Pickeral Frog Spotted Salamander Western Chorus Frog	Corridors may be found in all ecosites associated with water. Corridors will be determined based on identifying the significant breeding habitat for these species in Table 1.1	Movement corridors between breeding habitat and summer habitat ^{clxxiv, clxxv, clxxvi, clxxvii, clxxviii, clxxix, clxxx, clxxxi}. Movement corridors must be determined when Amphibian breeding habitat is confirmed as SWH from Table 1.2.2 (Amphibian Breeding Habitat –Wetland) of this Schedule I. <u>Information Sources</u> - MNRF District Office. - Natural Heritage Information Centre (NHIC). - Reports and other information available from Conservation Authorities. - Field Naturalist Clubs.	- Field Studies must be conducted at the time of year when species are expected to be migrating or entering breeding sites. - Corridors should consist of native vegetation, with several layers of vegetation. Corridors unbroken by roads, waterways or bodies, and undeveloped areas are most significant ^{cxlix} - Corridors should have at least 15m of vegetation on both sides of waterway ^{cxlix} or be up to 200m wide ^{cxlix} of woodland habitat and with gaps <20m ^{cxlix}. - Shorter corridors are more significant than longer corridors, however amphibians must be able to get to and from their summer and breeding habitat ^{cxlix}. - SWHMiST ^{cxlix} Index #40 provides development effects and mitigation measures	Candidate habitat is present in WSU2, WSU 3, WSU 4, WSU 6 and WSU 8 [Barrie's Lake], where 'Amphibian Breeding SWH' was confirmed. Across all survey years, evidence of amphibian movement (anurans and salamanders) was recorded in several areas. All listed species were recorded, with the exception of Eastern Newt. In addition to assumed movement within contiguous natural areas (e.g. wetland – woodland – meadow), movement between the following areas was recorded: - Between Barrie's Lake and WSU 2 / 3 - Between WSU 2 / 3 and WSU 6 (radial dispersal) - Between WSU 4 and lands to the west In all cases, movement occurred across active croplands / roads and was not within a defined movement corridor. The most abundant species captured / recorded in those areas were (total # in parentheses): Blue-spotted Salamander (178), American Toad (291), Northern Leopard Frog (471) and Green Frog (54). Relatively small numbers of Bullfrog, Chorus Frog, Gray Treefrog, Spring Peeper, Wood Frog and Spotted Salamander were recorded (max. < 30). Conclusion: Criterion is met for the above listed areas, but not within a defined map-able corridor. No impacts are anticipated within implementation of the naturalized ecological corridor between WSU 3 and WSU 6.

Habitat	SPECIES	CANDIDATE SWH		CONFIRMED SWH	Evaluation
		ELC Eco-sites	Habitat Criteria and Information Sources	Defining Criteria	
37. Deer Movement Corridors <u>Rationale:</u> Corridors important for all species to be able to access seasonally important life-cycle habitats or to access new habitat for dispersing individuals by minimizing their vulnerability while travelling.	White-tailed Deer	Corridors may be found in all forested ecosites. A Project Proposal in Stratum II Deer Wintering Area has potential to contain corridors.	Movement corridor must be determined when Deer Wintering Habitat is confirmed as SWH from Table 1.1 of this schedule. ㉔ - A deer wintering habitat identified by the OMNRF as SWH in Table 1.1 of this Schedule will have corridors that the deer use during fall migration and spring dispersion cxxxxii, clxxxiii, cxlix, cxciv. - Corridors typically follow riparian areas, woodlots, areas of physical geography (ravines, or ridges). <u>Information Sources</u> - MNRF District Office. - Natural Heritage Information Centre (NHIC). - Reports and other information available from Conservation Authorities. - Field Naturalist Clubs.	- Studies must be conducted at the time of year when deer are migrating or moving to and from winter concentration areas . - Corridors that lead to a deer wintering habitat should be unbroken by roads and residential areas. - Corridors should be at least 200m wide cxlix with gaps <20m cxlix and if following riparian area with at least 15m of vegetation on both sides of waterway cxlix. Shorter corridors are more significant than longer corridors, cxlix. - SWHMiST cxlix Index #39 provides development effects and mitigation measures	No candidate wintering habitat is present and no deer movement corridors are present. Conclusion: criterion is not met

1.5 EXCEPTIONS FOR ECOREGION 6E

Exceptions are candidate wildlife habitats that will have different criteria than what is proposed in the above schedules for an area within the Eco-region. The Exceptions will be based on Eco-Districts and municipalities can apply the exception for the eco-district within their planning area

Table 1.5.1 Significant Wildlife Habitat Exceptions for Ecodistricts within EcoRegion 6E

EcoDistrict	Wildlife Habitat and Species	Candidate SWH			Confirmed SWH	Evaluation
		Ecosites	Habitat Description	Habitat Criteria and Information	Defining Criteria	
6E-14 <u>Rationale:</u> The Bruce Peninsula has an isolated and distinct population of black bears. Maintenance of large woodland tracts with mast-producing tree species is important for bears. clxxxvi, ccxvii	Mast Producing Areas Black Bear	All forested habitat represented by ELC Community Series: FOM FOD	Black bears require forested habitat that provides cover, winter hibernation sites, and mast producing tree species. Clxxxv, clxxxvii, clxxxviii, clxxxix, cxc, cxci, cxcii, cxcii, ccxvii	Woodland ecosites >30 ha with mast-producing tree species, either soft (cherry) or hard (oak and beech). <u>Information Sources</u> Important forest habitat for black bears may be identified by OMNRF.	- All woodlands > 30ha with a 50%composition of these ELC Vegetation© Types are considered significant: FOM1-1, FOM2-1, FOM3-1, FOD1-1, FOD1-2, FOD2-1, FOD2-2, FOD2-3, FOD2-4, FOD4-1, FOD5-2, FOD5-3, FOD5-7, FOD6-5 - SWHMiST cxlix Index #3 provides development effects and mitigation measures.	N/A
6E- 17 <u>Rationale:</u> Sharp-tailed grouse only occur on Manitoulin Island in Eco-region 6E, Leks are an important habitat to maintain their population	Lek Sharp-tailed Grouse	CUM CUS CUT	- The lek or dancing ground consists of bare, grassy or sparse shrubland. There is often a hill or rise in topography ccxix. - Leks are typically a grassy field/meadow >15ha with adjacent shrublands and >30ha with adjacent deciduous woodland. Conifer trees within 500m are not tolerated ccxix.	Grasslands (field/meadow) are to be >15ha when adjacent to shrubland and >30ha when adjacent to deciduous woodland ccxix. - Grasslands are to be undisturbed with low intensities of agriculture (light grazing or late haying) - Leks will be used annually if not destroyed by cultivation or invasion by woody plants or tree planting ccxix. <u>Information Sources</u> - OMNRF District Office - Bird watching clubs - Local landowners - Ontario Breeding Bird Atlas	Studies confirming lek habitat are to be completed from late March to June. - Any site confirmed with sharp-tailed grouse courtship activities is considered significant. - The field/meadow ELC ecosites plus a 200 m radius area with shrub or deciduous woodland is the lek habitat - SWHMist cxlix Index #32 provides development effects and mitigation measures.	N/A

APPENDIX G

TECHNIAL MEMO: EVALUATION OF VEGETATION UNIT 18

From: Ungar, Darren (MNRF) <Darren.Ungar@ontario.ca>
Sent: January 18, 2021 8:01 AM
To: Gross, Jeff
Subject: RE: Wetland assessment - Cambridge West
Attachments: C.West_TWP_Wetland VU18_Analysis_Memo_Sept 15, 2020.pdf; 2nd-rev-44719-114-NEWMAN-FIG1.0.pdf

Good morning Jeff,

The MNRF agrees with you assessment that Wetland Unit 18 in the Barrie’s Lake - Bauman Creek Wetland Complex should be removed from the evaluation. I will make the necessary changes to reflect this update in the evaluation and online with Land Information Ontario.

Thank you

Darren Ungar
Management Biologist
Ministry of Natural Resources & Forestry
Guelph District
© 226-962-6870

From: Gross, Jeff <Jeff.Gross@wsp.com>
Sent: September 15, 2020 12:59 PM
To: Buck, Graham (MNRF) <Graham.Buck@ontario.ca>
Cc: McPhee, Jennifer <Jennifer.McPhee@wsp.com>
Subject: Wetland assessment - Cambridge West

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Hi Graham

Following up on this, please see the attached memo. Recall that this was a very small feature in an agricultural field that was not recommended for retention in the Cambridge West MESP. We’re now proceeding with a development proposal for this parcel (in the Township of North Dumfries) and have completed an updated assessment, confirming the MESP conclusion, with a recommendation that it is declassified to non-wetland status and removed from the PSW. The memo summarizes previous work, with relevant mapping.

If you are in agreement, can you please reply via email or letter. We will include this in our forthcoming EIS report

Thanks

Jeff

Jeff Gross
Project Manager / Senior Ecologist
Ecology & Environmental Impact Assessment (EIA)



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From: McPhee, Jennifer
Sent: Tuesday, September 15, 2020 12:51 PM
To: Gross, Jeff <Jeff.Gross@wsp.com>
Subject: FW: Wetland assessment - Cambridge West

Cheers,
Jenn

Jennifer (McPhee) Dyson, M.Sc
Ecologist – Botanist & ISA Certified Arborist
Ecology & Environmental Impact Assessment (EIA)



From: Buck, Graham (MNRF) [<mailto:Graham.Buck@ontario.ca>]
Sent: March 19, 2020 2:06 PM
To: McPhee, Jennifer <Jennifer.McPhee@wsp.com>
Subject: RE: Wetland assessment - Cambridge West

Hi Jenn,

You can send the memo to me.

Graham

From: McPhee, Jennifer <Jennifer.McPhee@wsp.com>
Sent: March-19-20 11:18 AM
To: Buck, Graham (MNRF) <Graham.Buck@ontario.ca>
Subject: Wetland assessment - Cambridge West

Hello Graham,

Hope you're keeping healthy and sane with all of this craziness!

I was wondering who the right person would be to forward a PSW question for the Cambridge West project site off of Blenheim Rd. There is a small wetland (0.07 ha) with the ag field that is listed as part of the adjacent wetland complex that the developer was wondering about potentially removing. We have drafted a more detailed memo, but weren't sure who it should be sent to.

Cheers,
Jenn

Jennifer (McPhee) Dyson, M.Sc
Ecologist – Botanist & ISA Certified Arborist
Ecology & Environmental Impact Assessment (EIA)



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MEMO

TO: Graham Buck, MNRF

FROM: Jeff Gross, Project Manager, WSP

SUBJECT: Westwood Village Phase 2, Cambridge West. Wetland Analysis

DATE: September 15, 2020

WSP Canada Group Limited (WSP) has been retained to undertake a Scoped Environmental Impact Study in support of planning and development applications for Phase 2 of Westwood Village located in the Township of North Dumfries, Ontario (the Subject Property). As part of the EIS, WSP completed an updated delineation of wetland features on the Subject Property, revisiting the delineation of wetlands previously completed on the Subject Property. During an agency site walk to verify wetland limits on October 18, 2019, Grand River Conservation Authority (GRCA) staff requested that WSP verify the status of a small, isolated wetland on the Subject Property (identified as Vegetation Unit 18 in submitted reports for planning of the Cambridge West community). See relevant Figures in Attachment A for location.

This memo provides context, planning history, ecological characteristics and recommendations for that wetland feature.

1.0 PLANNING CONTEXT & HISTORY

WSP (formerly MMM Group / Ecoplans Ltd.) has a long history of involvement with planning for this area (the Cambridge West community), including completion of thousands of hours of field surveys on hundreds of dates from 2008 through 2020. WSP ecologists have prepared or contributed to many reports as input to planning for the Cambridge West community including:

- Cambridge West Community, Master Environmental Servicing Plan and Community Master Plan. Technical Work Plan (MHBC et.al.; November 2010)
- Cambridge West MESP, Natural Environment Study (NES). Final (Ecoplans; November 2013)
- Cambridge West Collector Road Network Class Environmental Assessment. Technical Memo – Natural Heritage Evaluation of Alternatives (MMM; February 2015)

- Technical Memorandum. Jefferson Salamander Sampling Survey Approach and Results on the Cambridge West and rare lands, Cambridge ON. (WSP/ MMM: August 31, 2016).
- Cambridge West Lands, Hallman Construction Limited & Cachet Developments, Draft Plan of Subdivisions, Cambridge, Ontario. Scoped Environmental Impact Study, EIS (MMM Group; December 2016)
- Collector Road Network Class Environmental Assessment. Environmental Study Report. Cambridge West, City of Cambridge. Natural Heritage Summary Report (WSP; April 2018)

The MESP process was guided by a Steering Committee which included staff from the City of Cambridge, Region of Waterloo, Township of North Dumfries, GRCA and Ministry of Natural Resources (MNR). The MESP included two levels of study: the General Study Area (GSA), encompassing the entire geographic area of the Cambridge West Subwatersheds (Devil's, Newman and Cruickston Creeks), predominantly outside the City of Cambridge; and the Development Study Area (DSA), an area of urban development interest entirely within City lands. Refer to Figure 1 of the MESP NES (Ecoplans 2013) for locations of the GSA and DSA.

Although the Subject Property is within the GSA, the MESP process explicitly considered the subject property as input to Community Planning, determination of a road network and a natural heritage system (NHS), the latter of which included lands on and adjacent to the Subject Property within the recommended NHS. As input to the above, a substantial amount of field survey and analysis was undertaken on the Subject Property during the MESP. The MESP was reviewed by agencies and considered by LPAT in approving Phase 1, Westwood Village in a decision issued on July 27, 2018 (Case Nos. PL170301 and PL170302).

Following approval of the MESP, WSP has continued to undertake ecological field surveys on the City lands and Subject Property (2014-2020), as input to development plans, refined road network analysis and biological monitoring associated with the approved developments on City lands adjacent to the Subject Property (i.e., Subdivisions 30T-16103 and 30T-16104).

2.0 VEGETATION UNIT 18

2.1 MESP ANALYSIS & RECOMMENDATIONS

At the time of MESP report preparation, the wetland in question was mapped as part of the *Barrie's Lake – Bauman Creek Provincially Significant Wetland* (PSW) Complex. In the policy analysis component of the NES, we considered the merits of retaining PSW status for this

small wetland (Vegetation Unit 18), which at that time, had been displaced by agriculture. Section 6.1.2.1 of the MESP NES (Ecoplans 2013), which documents that analysis, is included in Attachment B to this memo.

Refer to Figure 2, Figure 4 and Figure 5 of the MESP NES (Ecoplans 2013) for location.

2.1.1 Characteristics

Vegetation Unit 18 is a very small (0.07 ha), isolated feature located within a matrix of active agricultural cropland. At the time of MESP NES report preparation, it was characterized as an ephemeral feature (i.e., shallow standing water is typically present only during the wettest times of the year) under active crop cultivation during most of the growing year in dry years. Other key characteristics:

- No ELC vegetation community type applies
- Very little non-crop vegetation is typically present and it is dominated by early successional / upland 'weedy' species at the margins.
- Vegetation is typically ploughed before it reaches maturity.
- Appears to be primarily maintained by surface water run-off from the surrounding lands and there are no defined inlet or outlet surface drainage features.
- Botanical quality is very low (low diversity, weedy / adventive species dominate, no conservative species and no species of conservation concern present).

2.1.2 MESP Conclusion re; Wetland Status

As documented in Section 6.1.2.1 of the MESP NES, it was concluded that in 2013 Vegetation Unit 18 had been transformed by agriculture and no longer satisfied the Ontario Wetland Evaluation System (OWES) criteria for being classified as "wetland" and that it was not critical to ecological function of the broader landscape (per Section 6.4.1). As such, the MESP recommended that the wetland be declassified to non-wetland status and removed from the *Barrie's Lake – Bauman Creek PSW*. That is reflected on Figure 2 of the MESP NES. In addition, the wetland was not recommended for retention (in accordance with relevant GRCA policy – per Section 6.4.1 and Figure 14 of the NES), nor was it included in the recommended Natural Heritage System, per Figure 17 of the MESP NES.

The conclusion re; wetland status for Unit 18 was confirmed in the 2016 Scoped EIS for adjacent City lands (Draft Plans of Subdivision 30T-16103 and 30T-16104), wherein Figure 1 identifies this feature as ‘other wetland’ and not part of the PSW complex.

GRCA online mapping (March 2020) reflects the agency-confirmed and surveyed wetland limits as determined through the approved MESP.

Notwithstanding the recommendation for removal in the approved MESP, NHIC (LIO) mapping (Accessed March 23, 2020) still shows a wetland feature in the vicinity of Unit 18 as part of the PSW complex (not the confirmed / surveyed limit of Unit 18). Note, however, that the LIO wetland mapping does not accurately reflect agency-confirmed and surveyed wetland limits (per the approved MESP) in any area where wetlands were surveyed as part of the MESP.

2.1.3 MESP Linkage Recommendation

An additional key recommendation of the MESP was to establish ecological linkages to:

- restore connectivity between a currently isolated PSW wetland (the Central Wetland’ on adjacent City lands to the east, “WSU 6”) and nearby natural areas to provide a functional ecological link in a future urban context. Refer to MESP NES Figure 8 (2013) for WSU
- provide defined connections that facilitate wildlife movement between herpetofaunal breeding habitat (WSU 3, WSU 6), overwintering habitat (WSU 1, WSU 3 and WSU 6), foraging and juvenile dispersal areas (existing wetland/woodland and future buffer zones in WSU 1, WSU 3 and WSU 6)

These linkages, identified as Linkage 8a and 8b on Figure 16 of the MESP NES, are components of the broader NHS, shown on Figure 17 of the MESP NES.

Linkages 8a and 8b, under existing conditions, are in areas of active agricultural cropland. Based on MESP survey results, there is substantial herpetofaunal movement to / from the Central wetland, through this non-ideal movement habitat for herpetofauna. Specific design elements were presented in Section 7.3.3.3 of the MESP NES to establish a corridor suitable for herpetofaunal movement (e.g., width, ‘directness’, funnelling measures, habitat / native species plantings, eco-passages at road crossings, restricted access etc.).

Per specific direction under ‘Soil Moisture’ in Section 7.3.3.3. of the MESP, Vegetation Unit 18 was not recommended for retention within the linkage (as shown on Figure 17 of the MESP NES) – as this could be a ponded area which could act as a herpetofaunal breeding area sink.

The recommendation for linkages was confirmed in the 2016 Scoped EIS for adjacent City lands, with additional details provided for ecological enhancements in these areas, including design details for wildlife crossings at roads and specific planting recommendations.

Moreover, with approval of Draft Plans of Subdivision 30T-16103 and 30T-16104, as well as the Cambridge West Collector Road EA, the precise location of these linkages has been determined (per attached Consolidated Draft Plan dated September 10, 2020). Detailed design of the linkages is currently in process, with anticipated installation in 2021. The linkage location is shown on Figure 7 and Figure 8 of the EIS, and on the updated Plans of Subdivision currently being Registered (MHBC; July 16, 2019). In accordance with MESP recommendations, a preliminary design / grading for the portion of the ecological corridor on the Township lands has also been prepared (MTE; March 23, 2020).

2.2 UPDATED ANALYSIS

As noted, limit of Vegetation Unit 18 was revisited through an updated delineation in October 2019. Limits are consistent with previous delineations – see attached Figure 1 and MESP NES Figure 4.

Furthermore, the characterization of Vegetation Unit 18 presented above was confirmed through the field surveys undertaken subsequent to the MESP (from 2014 through 2020), with the feature exhibiting varying levels of ploughing and semi-natural vegetation / cropping across years. In 2019, VU18 was ploughed through, with a mix of remnant crops (corn, soybeans) and naturally regenerating vegetation. Naturally occurring species recorded during 2019 included Nodding Beggar's Ticks (*Bidens cernua*), Yellow Nutsedge (*Cyperus esculentus*), Barnyard Grass (*Echinochloa crus-galli*), and Small-flower Willow-herb (*Epilobium parviflorum*). Wetland species cover was slightly greater than 50% (based on in-season vegetation surveys on July 17, 2019 and September 13, 2019).

In consideration of updated field survey results, there is no new information that would suggest that this wetland warrants retention based on ecological or hydrological attributes. It exhibits the same characteristics and very limited ecological function as described in the approved studies referenced herein (i.e., isolated, very small, low botanical quality, low wildlife habitat value, no specialized habitat / locally unique attributes). Moreover, it is not critical to ecological or hydrological function of the broader landscape and would likely not be viable if retained in a future development scenario.

2.3 WETLAND COMPLEXING ANALYSIS

Vegetation Unit 18 is located less than 750 m from existing wetland areas in the Barrie's Lake – Bauman Creek PSW Complex, within the same watershed. However, it wetland is less than 2 ha in size and does not provide important ecological benefits to the larger PSW complex. In Vegetation Unit 18 there are no rare species, no groundwater seepage / discharge, no permanent hydrological connection, no significant wildlife habitat, and no linkage to wetlands to the east or west.

3.0 CONCLUSIONS & RECOMMENDATIONS

The removal of this small, highly disturbed feature would not cause a negative impact to the broader PSW, particularly in consideration of the substantive ecological enhancements to be undertaken on the City lands (through the approved Plans of Subdivision) and anticipated on the Township lands: conversion of significant areas of current agricultural cropland to naturalized buffer (30-50 m widths for much of the area); and establishment of naturalized ecological corridors / enhanced corridor function.

It is recommended that Vegetation Unit 18 be declassified to non-wetland status and removed from the *Barrie's Lake – Bauman Creek PSW Complex* and that LIO mapping be updated to reflect the agency-confirmed, surveyed limits within the Cambridge West community (City and Township lands).



Signatures

Prepared by

August 20, 2020

Jennifer McPhee, MSc.,
Ecologist

Date

Reviewed by

September 15, 2020

Jeff Gross, MSc.,
Project Manager / Senior Ecologist

Date

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ATTACHMENT A

Figures from Relevant Studies



ATTACHMENT B

Excerpts from Section 6.1.2.1 of the MESP NES (Ecoplans 2013)

6.1.2.1 Provincially Significant Wetland Evaluation

As noted, all wetlands contiguous to existing PSW within the DSA are recommended for inclusion in the PSWs (i.e., the adjusted wetland limits based on field flagging and agency confirmation, surveyed and shown on Figure 4.

In addition, we have considered the merits of: retaining PSW status for the small wetland in Vegetation Unit 18 that has been displaced by agriculture; and including the small wetland in Vegetation Unit 16 within the Barrie's Lake – Bauman Creek PSW Complex. The merits of reclassifying a third wetland feature to the south of Vegetation Unit 10 are also examined. This evaluation has been completed based on direction provided in the updated Ontario Wetland Evaluation System Southern Manual, 3rd Edition, Version 3.2 (2013), "OWES".

Vegetation Unit 18

Vegetation Unit 18 is a very small (0.07 ha), isolated wetland located in the GSA. It is currently identified as part of the Barrie's Lake – Bauman Creek Provincially Significant Wetland Complex. The wetland is located in an agricultural field at the bend in the farm lane that forms part of the boundary between the GSA and the DSA.

The boundaries of the PSW complex were last evaluated in April 2003. The status and boundaries of the PSW were verified by OMNR on 12 February 2008 (Grand River Watershed Viewer, GRCA Web – GIS Viewer).

GRCA established a wetland limit for the wetland in Vegetation Unit 18 on October 28, 2010, following site inspection of the wetland limit staked by Ecoplans. The wetland in Vegetation Unit 16, therefore, is regulated by the GRCA under the Development, Interference with Wetlands and Alterations to Shorelines and Watercourses, Ontario Regulation 150/06 (2013) and subject to the GRCA Wetlands Policy (2003).

Wetland History

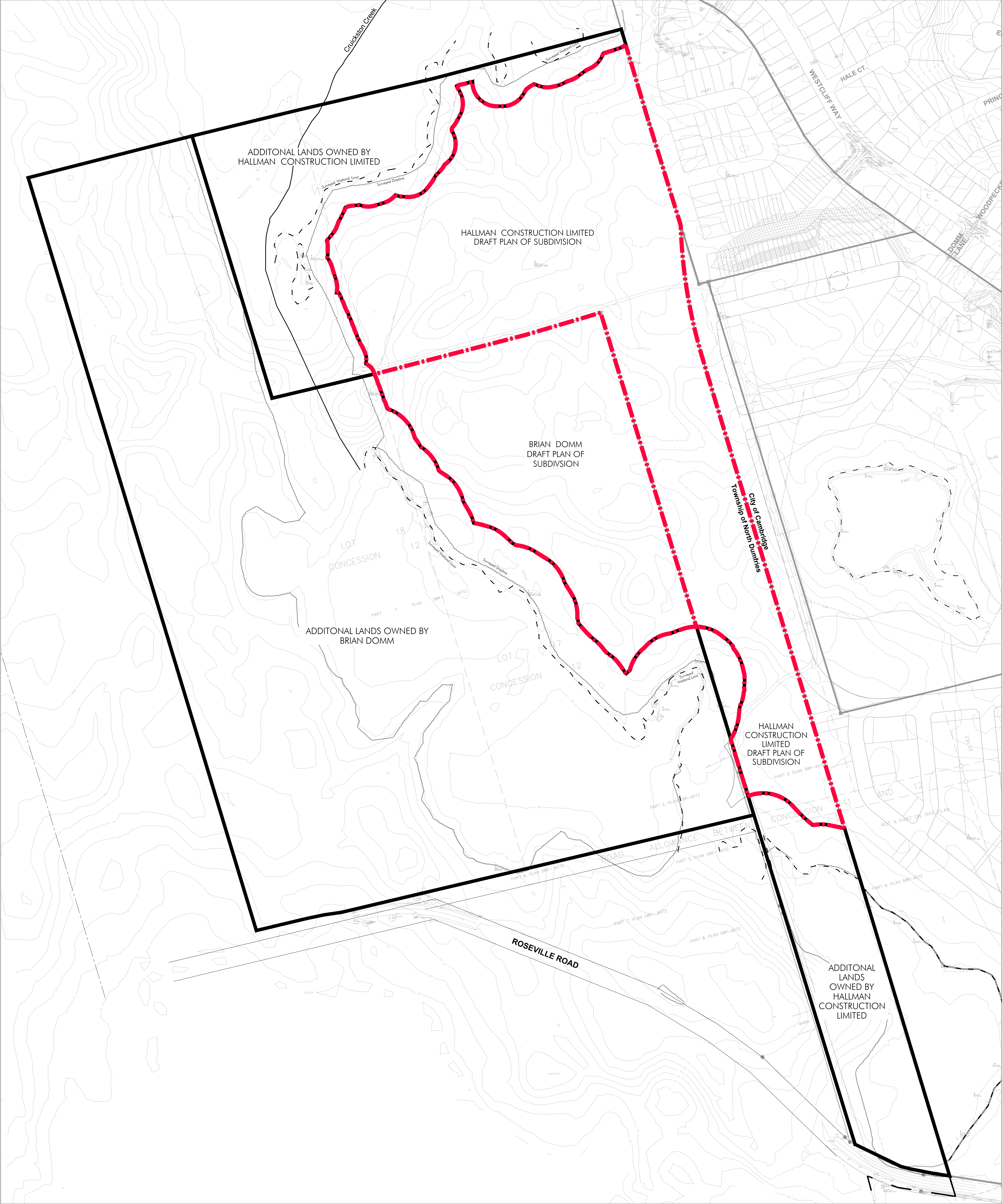
Inspection of historical aerial photography and satellite imagery reveals that during the period 1945 to 1963, the wetland in Vegetation Unit 18 was an apparent meadow marsh located in the front yard of a farmstead. In April 2006, the wetland was still present but there were signs of extensive earth movement on the margins of the wetland and the farmstead was no longer present. On April 26, 2006 (air photo date), the wetland contained several small patches of open water. In November 2012, however, the wetland had been planted through with corn and no open water was present. During a field visit on April 23, 2013, corn stubble was visible above the shallow ponded water that was present at the site of the former wetland. No visible remnants of wetland vegetation were apparent at that time.

Subject to verification during the growing season in 2013, it appears that the wetland vegetation in Vegetation Unit 18 has been displaced by agriculture and by modifications to the landform that are visible on the satellite imagery from 2006.



Conclusion

In its apparent present state, the wetland in Vegetation Unit 18 has been transformed by agriculture and no longer satisfies the “50% wetland vegetation” rule for classifying “wetland” (OWES 2013, p.26). The wetland should therefore be declassified to non-wetland status and removed from the Barrie’s Lake – Bauman Creek PSW Complex.



CONSOLIDATED DRAFT PLAN OF SUBDIVISION AND ADDITIONAL LANDS

Legal Description
PART OF LOTS 17 AND 18, CONCESSION 12
TOWNSHIP OF NORTH DUMFRIES
REGIONAL MUNICIPALITY OF WATERLOO

**PLANNING
URBAN DESIGN
& LANDSCAPE
ARCHITECTURE**

200-540 KING GEORGE CENTRE DR. KITCHENER, ON. N2B 3K1 | P: 519.576.3650 | F: 519.576.0121 | WWW.MHBCPLAN.COM

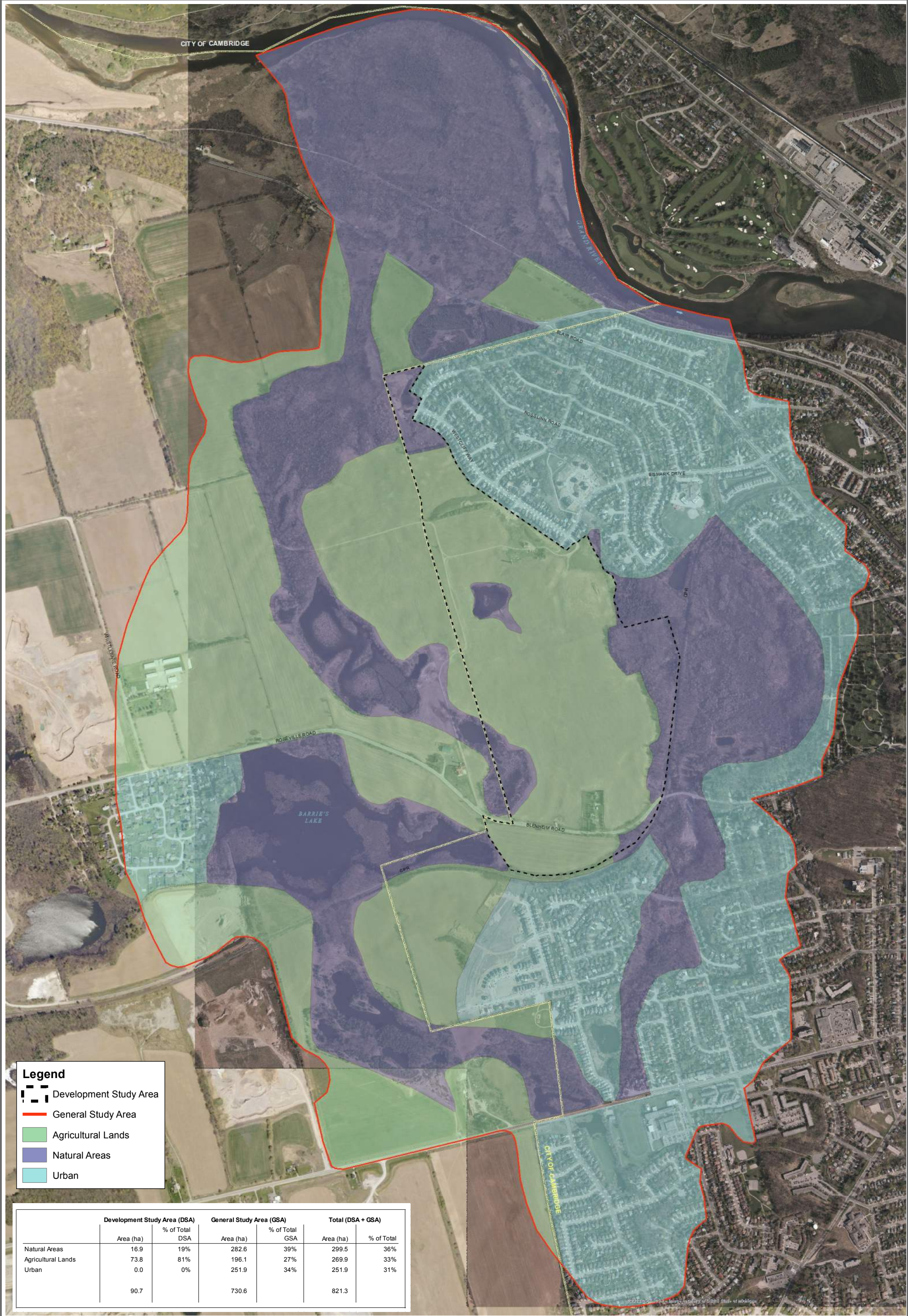
Approval Stamp	Date	September 10, 2020	
	File No.	0800C	
	Plan Scale	1:1,250 (30x30)	
	Drawn By	D.G.S.	
	Checked By	P.B.	
Project		Westwood Phase 2	Other
File Name		DRAFT PLAN	Dwg No. 1 of 1
Scale Bar			

K:\0800C-Gatestone Developments-North Dumfries Lands\DP\Consolidated Draft Plan September10 2020 for ES.dwg



ATTACHMENT A

Figures from Relevant Studies



Legend

Development Study Area

General Study Area

Agricultural Lands

Natural Areas

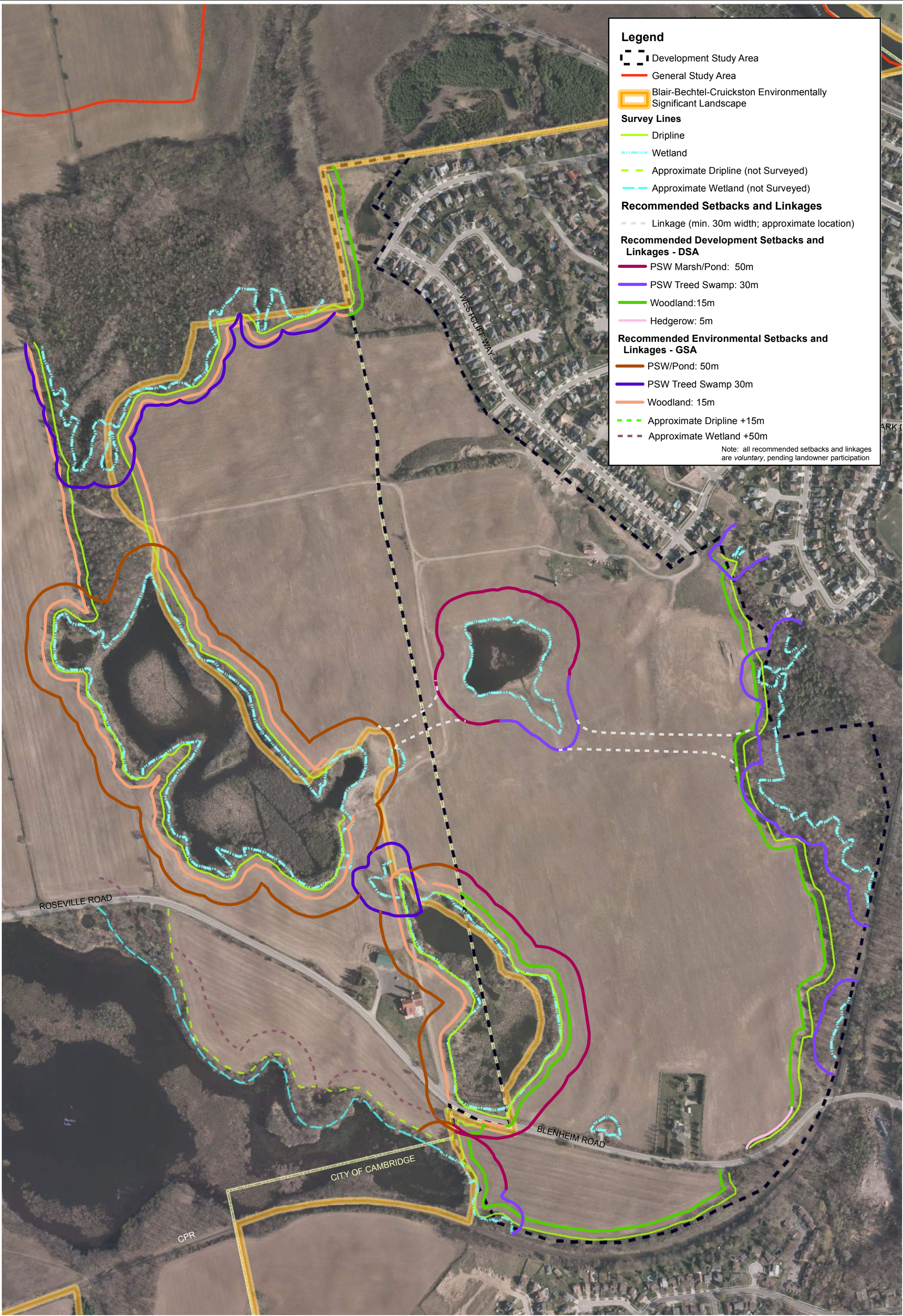
Urban

	Development Study Area (DSA)		General Study Area (GSA)		Total (DSA + GSA)	
	Area (ha)	% of Total DSA	Area (ha)	% of Total GSA	Area (ha)	% of Total
Natural Areas	16.9	19%	282.6	39%	299.5	36%
Agricultural Lands	73.8	81%	196.1	27%	269.9	33%
Urban	0.0	0%	251.9	34%	251.9	31%
	90.7		730.6		821.3	



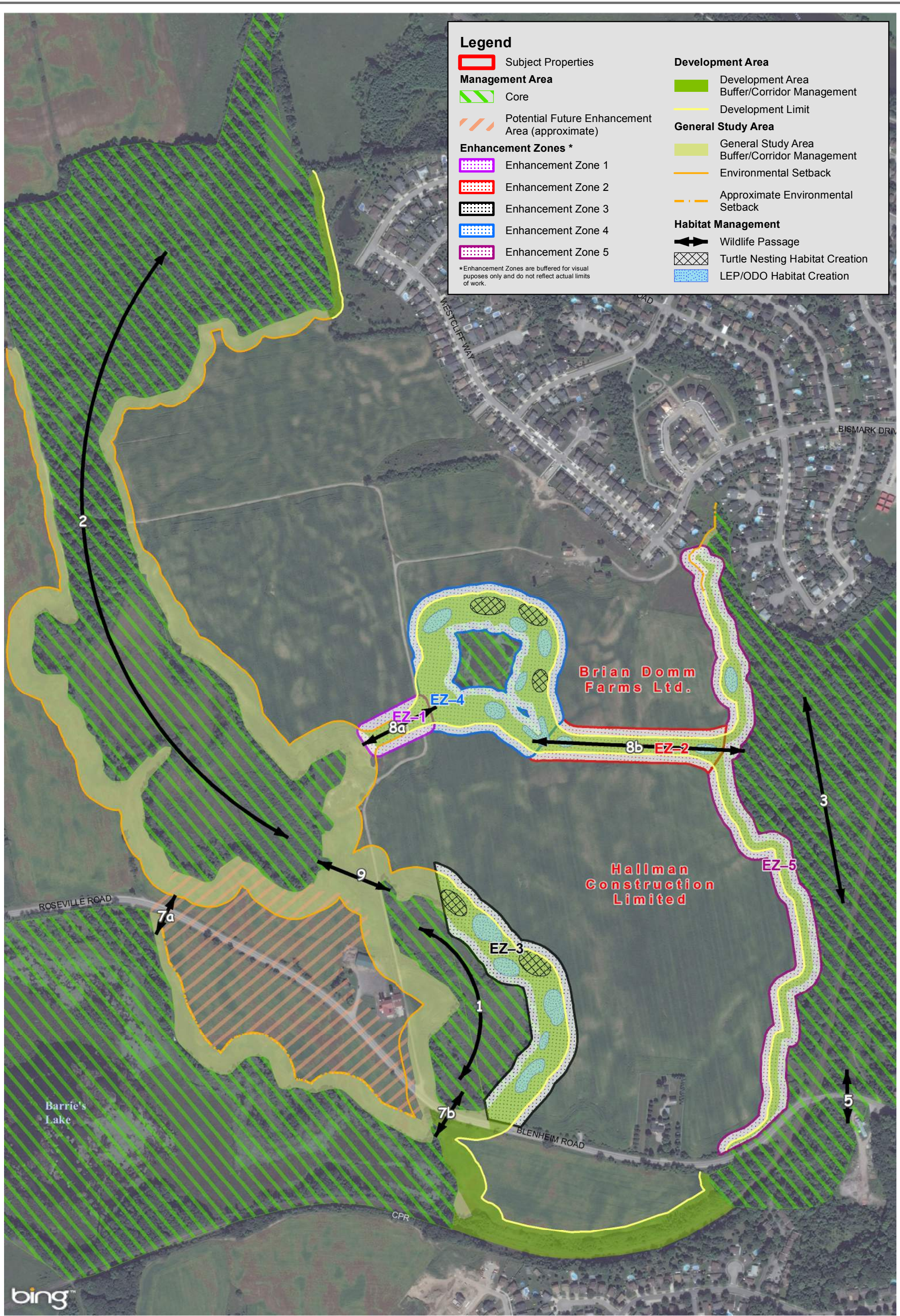


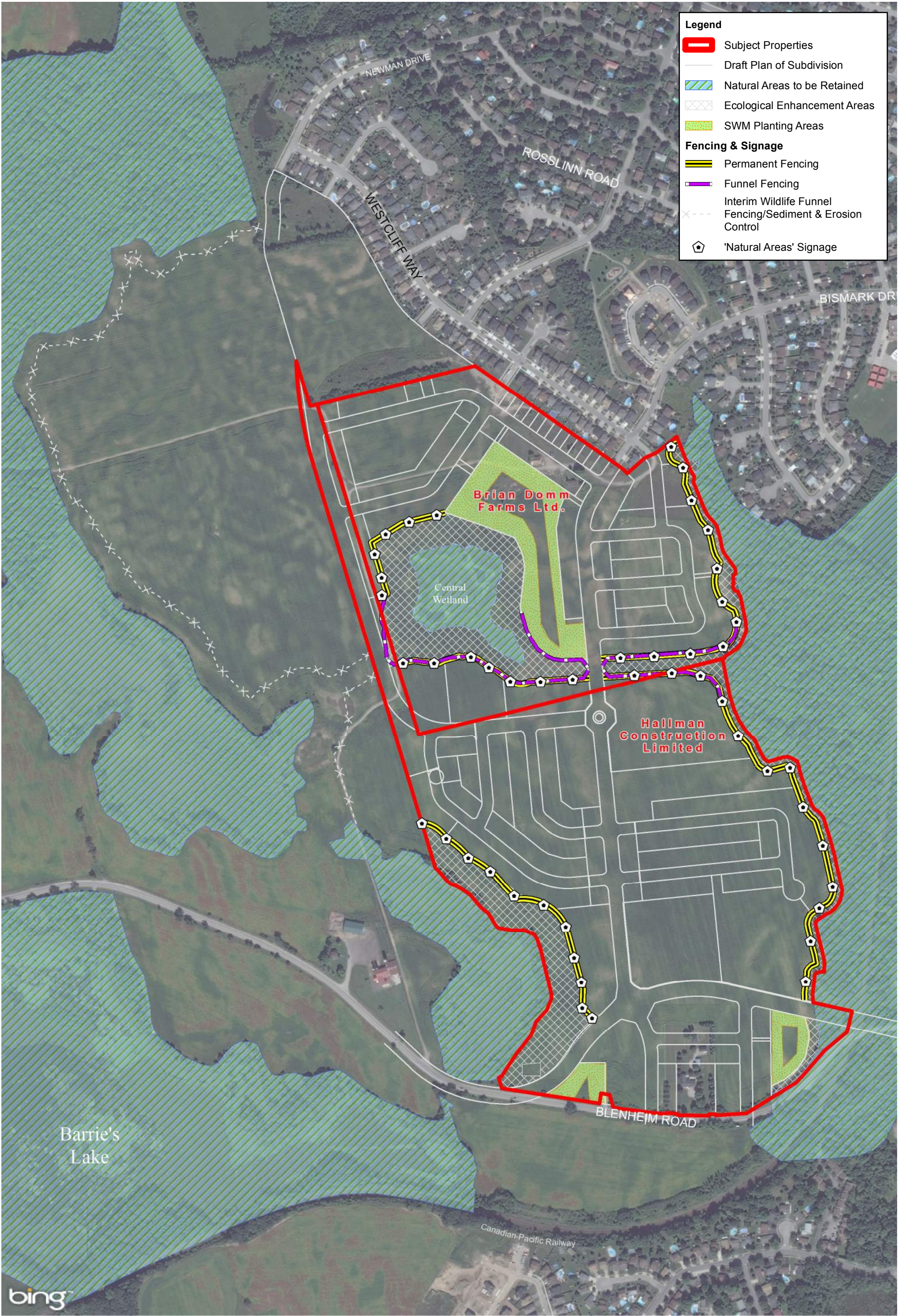














ATTACHMENT B

Excerpts from Section 6.1.2.1 of the MESP NES (Ecoplans 2013)

6.1.2.1 Provincially Significant Wetland Evaluation

As noted, all wetlands contiguous to existing PSW within the DSA are recommended for inclusion in the PSWs (i.e., the adjusted wetland limits based on field flagging and agency confirmation, surveyed and shown on Figure 4.

In addition, we have considered the merits of: retaining PSW status for the small wetland in Vegetation Unit 18 that has been displaced by agriculture; and including the small wetland in Vegetation Unit 16 within the Barrie's Lake – Bauman Creek PSW Complex. The merits of reclassifying a third wetland feature to the south of Vegetation Unit 10 are also examined. This evaluation has been completed based on direction provided in the updated Ontario Wetland Evaluation System Southern Manual, 3rd Edition, Version 3.2 (2013), "OWES".

Vegetation Unit 18

Vegetation Unit 18 is a very small (0.07 ha), isolated wetland located in the GSA. It is currently identified as part of the Barrie's Lake – Bauman Creek Provincially Significant Wetland Complex. The wetland is located in an agricultural field at the bend in the farm lane that forms part of the boundary between the GSA and the DSA.

The boundaries of the PSW complex were last evaluated in April 2003. The status and boundaries of the PSW were verified by OMNR on 12 February 2008 (Grand River Watershed Viewer, GRCA Web – GIS Viewer).

GRCA established a wetland limit for the wetland in Vegetation Unit 18 on October 28, 2010, following site inspection of the wetland limit staked by Ecoplans. The wetland in Vegetation Unit 16, therefore, is regulated by the GRCA under the Development, Interference with Wetlands and Alterations to Shorelines and Watercourses, Ontario Regulation 150/06 (2013) and subject to the GRCA Wetlands Policy (2003).

Wetland History

Inspection of historical aerial photography and satellite imagery reveals that during the period 1945 to 1963, the wetland in Vegetation Unit 18 was an apparent meadow marsh located in the front yard of a farmstead. In April 2006, the wetland was still present but there were signs of extensive earth movement on the margins of the wetland and the farmstead was no longer present. On April 26, 2006 (air photo date), the wetland contained several small patches of open water. In November 2012, however, the wetland had been planted through with corn and no open water was present. During a field visit on April 23, 2013, corn stubble was visible above the shallow ponded water that was present at the site of the former wetland. No visible remnants of wetland vegetation were apparent at that time.

Subject to verification during the growing season in 2013, it appears that the wetland vegetation in Vegetation Unit 18 has been displaced by agriculture and by modifications to the landform that are visible on the satellite imagery from 2006.



Conclusion

In its apparent present state, the wetland in Vegetation Unit 18 has been transformed by agriculture and no longer satisfies the “50% wetland vegetation” rule for classifying “wetland” (OWES 2013, p.26). The wetland should therefore be declassified to non-wetland status and removed from the Barrie’s Lake – Bauman Creek PSW Complex.

APPENDIX H

DRAFT PLAN OF SUBDIVISION

CONSOLIDATED
DRAFT PLANS OF SUBDIVISION

LEGAL DESCRIPTION

PART OF LOTS 13 AND 14, CONCESSION 11
PART OF LOTS 17 AND 18, CONCESSION 12
AND PART OF ROAD ALLOWANCE BETWEEN CONCESSIONS 11 & 12
TOWNSHIP OF NORTH DUMFRIES
REGIONAL MUNICIPALITY OF WATERLOO

OWNER'S CERTIFICATE

I HEREBY AUTHORIZE MACNAUGHTON HERMSEN BRITTON CLARKSON PLANNING LIMITED
TO SUBMIT THIS PLAN FOR APPROVAL.

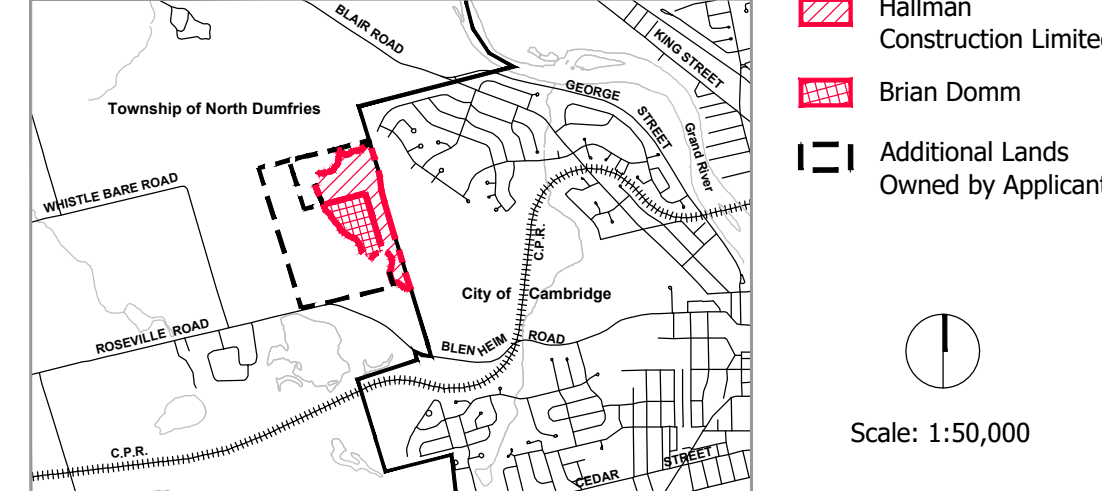
Date: _____ Paul Grespan, Authorized Signing Officer
(Hallman Construction Limited)

SURVEYOR'S CERTIFICATE

I HEREBY CERTIFY THAT THE BOUNDARIES OF THE LAND TO BE SUBDIVIDED ON THIS
PLAN AND THEIR RELATIONSHIP TO THE ADJACENT LANDS ARE ACCURATELY AND
CORRECTLY SHOWN.

Date: _____ Trevor D.A. McNeil, Surveyor, O.L.S.
MTE OLS LTD.

KEY PLAN



ADDITIONAL INFORMATION

Required Under Section 51 (17) of the Planning Act, R.S.O., 1990, c.P.13 as Amended

(a) As Shown	(e) As Shown	(i) Loam
(b) As Shown	(f) As Shown	(j) As Shown
(c) As Shown	(g) As Shown	(k) All Services as Required
(d) Residential, Multiple Residential,	(h) Municipal Water Supply	(l) As Shown

Park, Open Space, Wildlife Corridor

AREA SCHEDULE - Hallman Construction Limited		30T-	
DESCRIPTION	LOTS/BLOCKS	UNITS	AREA
Low Density Residential	1-18	263-369	10.552 ha
Low Density Residential (Consolidation Block)	19,20	26-43	0.644 ha
Multiple Residential	21	125-165	1.852 ha
Park	22		0.339 ha
Open Space	23-25		2.490 ha
Wildlife Corridor	26		0.245 ha
0.3m Reserve	27-32		0.006 ha
Roads			3.309 ha
Total	32	414-577	19.437 ha

AREA SCHEDULE - Brian Domm		30T-	
DESCRIPTION	LOTS/BLOCKS	UNITS	AREA
Low Density Residential	1-14	144-207	5.336 ha
Low Density Residential (Consolidation Block)	15,16		0.121 ha
Multiple Residential (Consolidation Block)*	17	60-75*	0.122 ha
Park	18		0.662 ha
Open Space	19,20		3.680 ha
Roads			2.144 ha
Total	20	204-282	12.065 ha

AREA SCHEDULE - Total		30T-	
DESCRIPTION	LOTS/BLOCKS	UNITS	AREA
Low Density Residential	32	407-576	15.888 ha
Low Density Residential (Consolidation Block)	4	26-43	0.765 ha
Multiple Residential	1	125-165	1.852 ha
Multiple Residential (Consolidation Block)*	1	60-75*	0.122 ha
Park	2		1.001 ha
Open Space	5		6.170 ha
Wildlife Corridor	1		0.245 ha
0.3m Reserve	6		0.006 ha
Roads			5.453 ha
Total	52	618-859	31.502 ha

*Due to multiple block configuration/size, some of the multiple residential units on the Domm
Draft Plan of Subdivision are accounted for on the adjacent Hallman Draft Plan of Subdivision

NOTES

- All dimensions are in metres unless otherwise shown.
- Topographic Survey Base prepared by MTE.
- Boundary information prepared by MTE (Plan 58R-22341 dated August 6, 2025)
- Dripline and Wetland Limits provided by WSP.

Revision No.	Date	Issued / Revision	By

Stamp	Date	March 26, 2026
	File No.	0800C
	Plan Scale	1:1,250 (30 x 36)
	Drawn By	D.G.S./SP
	Checked By	D.A.

Project	WESTWOOD PHASE 2	
	Applicant: Hallman Construction Limited 539 Riverbend Drive Kitchener, Ontario	

File Name	DRAFT PLAN OF SUBDIVISION	Dwg No.	1 of 1
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Scale Bar	0 10 25 50 75 100
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PLANNING
URBAN DESIGN
& LANDSCAPE
ARCHITECTURE

APPENDIX I

URBAN DESIGN GUIDELINES, WESTWOOD VILLAGE (PHASE 2) COMMUNITY

URBAN DESIGN GUIDELINES

WESTWOOD VILLAGE (PHASE 2) COMMUNITY



MARCH, 2026

3.8 BIRD-FRIENDLY DESIGN GUIDELINES

The Westwood Village (Phase 2) Community is adjacent to the Blair-Bechtel-Cruickston ESL and related core environmental features and habitat for a variety of avian species. To minimize potential bird strikes to buildings, the following guidelines will be applied through the site plan process for all adjacent cluster townhouse development. These guidelines have been developed as a result of the best practices review of specific sources such as FLAP Canada and the American Bird Conservancy (ABC).

WINDOWS:

There are two means of mitigating the danger glass poses to birds. The first and far more effective approach is to create visual markers. The second is to mute reflections in glass. The following guidelines apply to the design of windows using the two strategies:

- Appropriate window applications shall be applied to all floors above grade that are oriented towards adjacent environmental features. These applications shall be applied to 100% of the glass surface, however where views are imperative, treatments may be applied to 85% of the glass surfaces.
- As a first priority, windows are to be designed with visual markers which could include:
 - » Patterned or “fritted” glass—which is glass with an image or abstract pattern embedded in it; with a maximum spacing of 10 cm x 10 cm.
 - » Fenestration patterns including multiple paned glass and the use of mullions. The panes should be between 10 and 28 cm with smaller distances being more effective.
 - » Decorative grilles and louvres—exterior decorative grilles are effective within the range of 28 cm to 10 cm or less.
 - » Artwork installed on the interior or exterior of windows.



Examples of (from left): patterned glass, fenestration pattern (mullions) and decorative exterior grille.



Examples of exterior sunshades.

- The following window design strategies that mute reflections are also acceptable in minimizing bird strikes:
 - » Awnings and overhangs. This is particularly effective for ground floor windows.
 - » External sunshades.
- Where views are imperative such as for ground floor commercial or retail uses, the above strategies should be applied to 85% of the glass, allowing up to 15% of ground or ground floor glass to be left untreated.
- In addition to the strategies outlined above, the type of glass used is important. The following kinds of glass are encouraged for all windows:
 - » Opaque and translucent glass (opaque, etched, stained and frosted glass, as well as glass blocks)
 - » UV Glass (or similar products).
 - » Low Reflectance glass.
- For buildings within cluster townhouse blocks that are directly adjacent to natural features, the above strategies shall apply to all windows above ground level that interface directly with natural areas. Glass railings associated with deck structures are also to be treated by visual markers as indicated above.
- Ground level ventilation grates are encouraged to have a porosity of <20 mm x 20 mm (or 40 mm x 10 mm). This reduces risk of birds becoming entrapped within the grates.
- For ground related development (i.e. single detached, street fronting townhomes) adjacent to natural areas, the required Homeowners Brochure will outline measures that homeowners can take to reduce the occurrence of bird strikes.

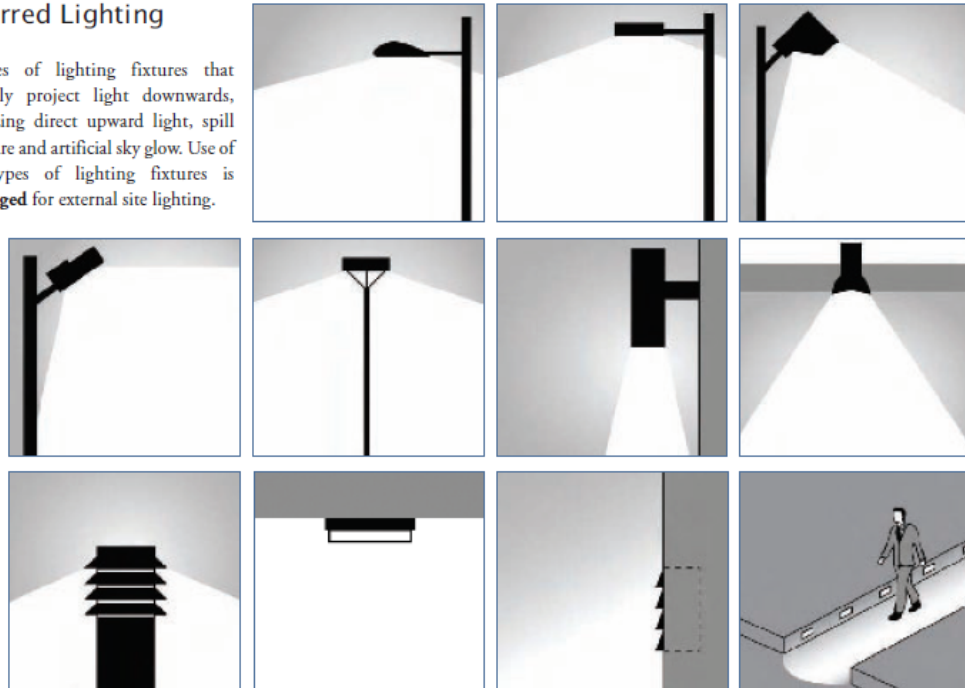
LIGHTING:

Light pollution creates “artificial sky glow” which can be an issue for birds because migrant bird species can be attracted to the lit buildings at night, increasing risk of collisions as well as interference with day-night cycles. Light pollution is caused by inefficient and poorly designed lighting fixtures that project lighting upward.

Implementation of the lighting guidelines contained herein will reduce the amount of light pollution caused by the proposed development. The following images illustrate preferred and discouraged types of lighting for cluster townhouse development located adjacent to core environmental features.

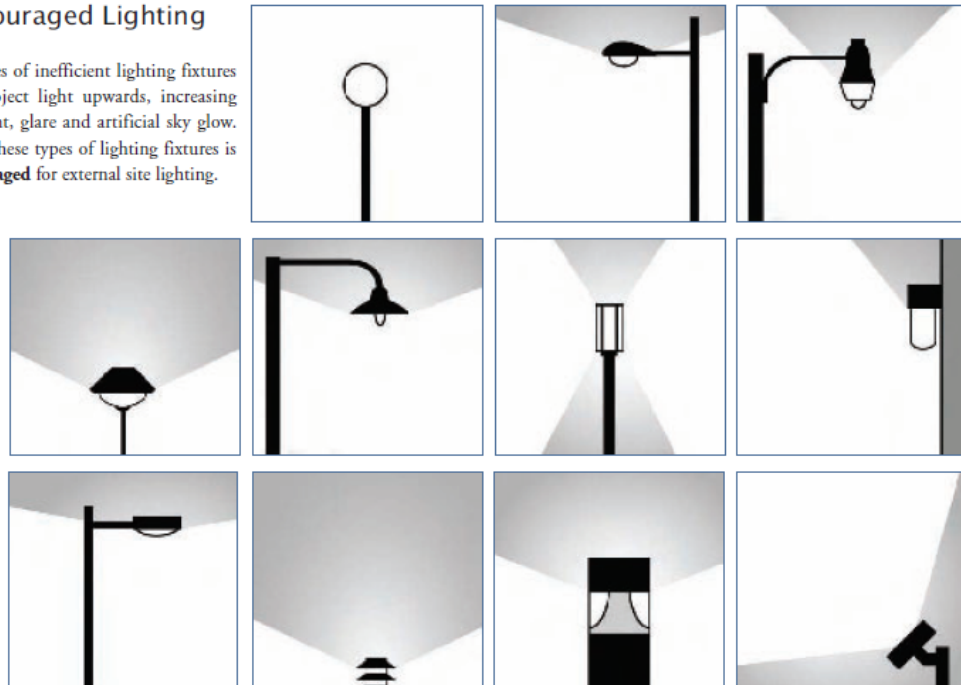
Preferred Lighting

Examples of lighting fixtures that effectively project light downwards, minimizing direct upward light, spill light, glare and artificial sky glow. Use of these types of lighting fixtures is **encouraged** for external site lighting.



Discouraged Lighting

Examples of inefficient lighting fixtures that project light upwards, increasing spill light, glare and artificial sky glow. Use of these types of lighting fixtures is **discouraged** for external site lighting.





PART 5

Implementation

5.1 IMPLEMENTATION

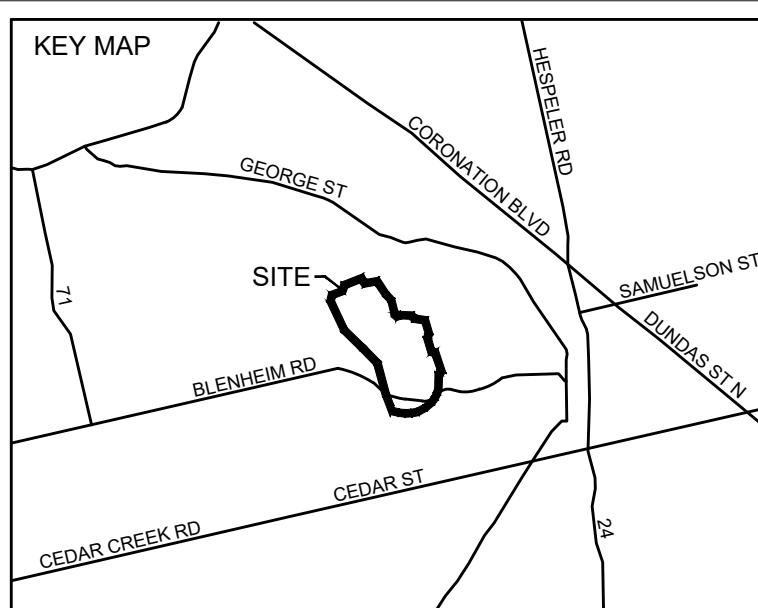
GENERAL IMPLEMENTATION RECOMMENDATIONS:

1. That the recommended Community Concept Plan be considered in preparing the land use schedule associated with the proposed Official Plan Amendment.
2. That the policy and design direction of these guidelines be considered in preparing official plan policies for the Westwood Village (Phase 2) Community and form part of the basis of the Official Plan Amendment.
3. That the recommended Community Concept Plan be considered in preparing draft plans of subdivision for each of the Hallman and Domm lands with necessary adjustments having regard to the scale and general nature of the Community Concept Plan.
4. That the policy and design direction of these guidelines be considered in preparing draft plan approval conditions and related zoning by-law amendments.
5. That the policy and design direction of these guidelines be considered in the design and review of site plans and building elevations.

APPENDIX J

WILDLIFE CROSSING DESIGN (MTE) AND WESTWOOD VILLAGE (PHASE 1) ECOLOGICAL CORRIDOR PLANTING PLANS

Note: Plant Quantities Indicated on the Planting Plan will Supercede the Quantities Listed Above

[illegible]

WSP

Landscape Architecture
582 Lancaster Street West
Kitchener, ON N2K 1M3
t. 519-743-8777
www.wsp.com

PROJECT TITLE:

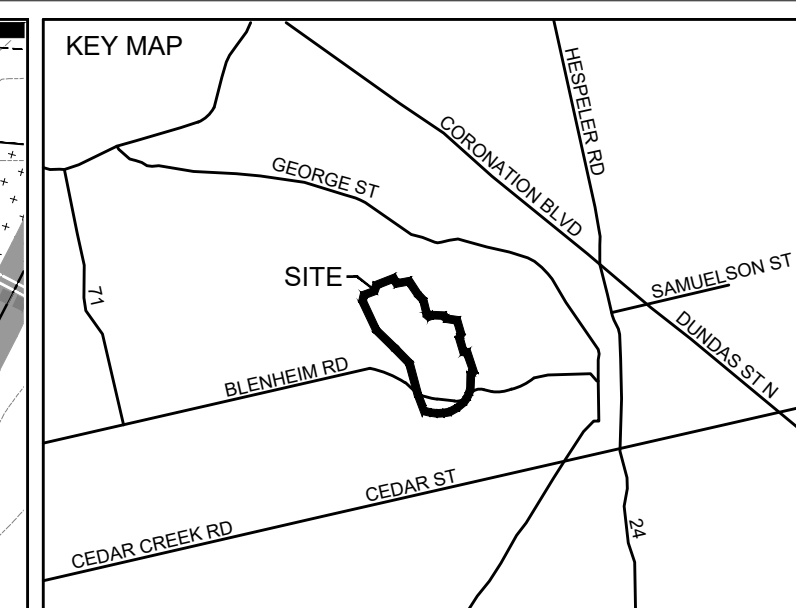
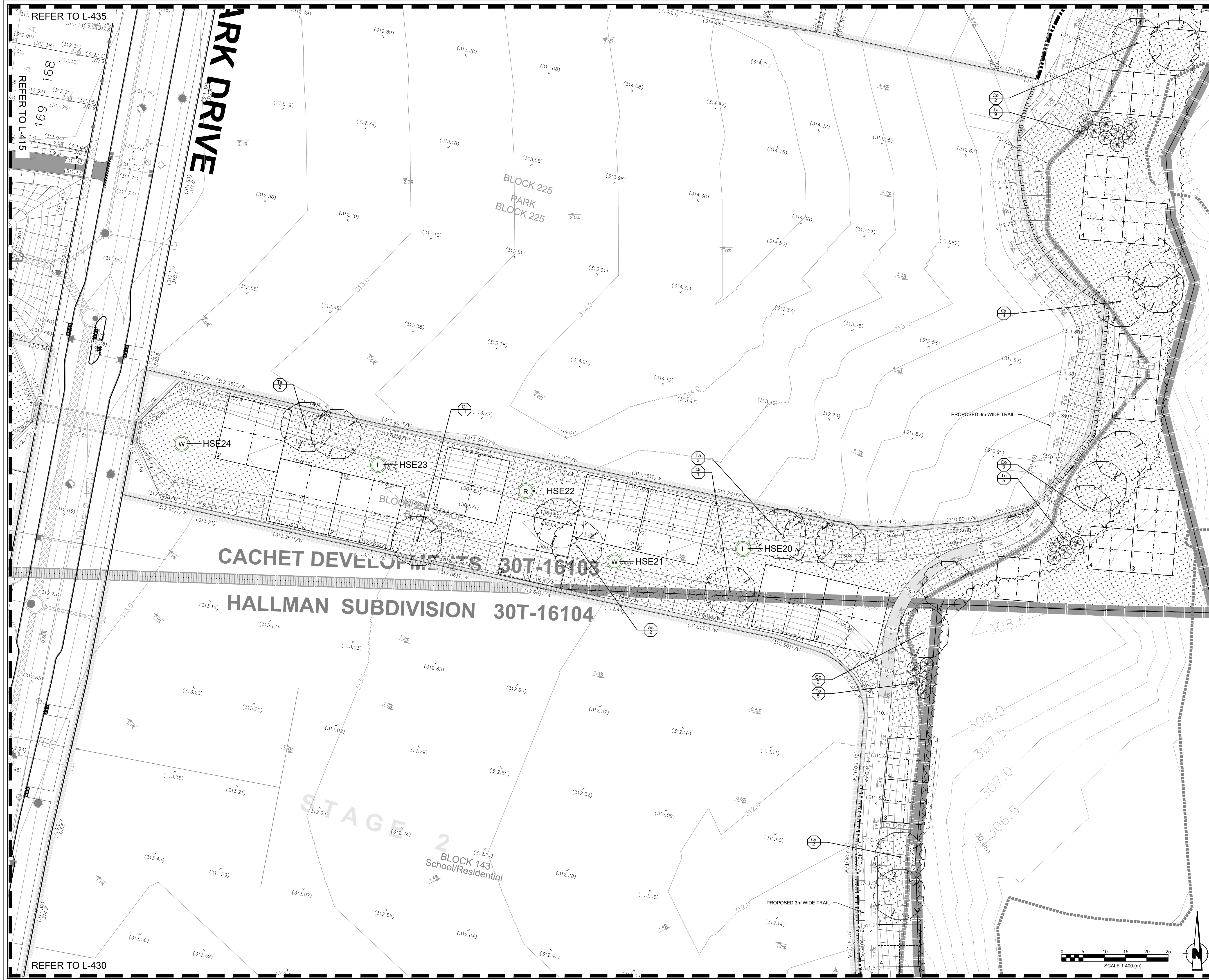
CAMBRIDGE WEST
BUFFER ENHANCEMENT PLANTING

SITE ADDRESS:
116-162 REGIONAL RD 46
CAMBRIDGE, ON N1R 5S3

DRAWING TITLE:

**BUFFER ENHANCEMENT
PLANTING PLAN**



[illegible]

wsp Landscape Architecture
582 Lancaster Street West
Kitchener, ON N2K 1M3
t. 519-743-8777
www.wsp.com

CLIENT:

HALLMAN CONSTRUCTION LIMITED
& CACHET DEVELOPMENTS

PROJECT TITLE:

CAMBRIDGE WEST
BUFFER ENHANCEMENT PLANTING

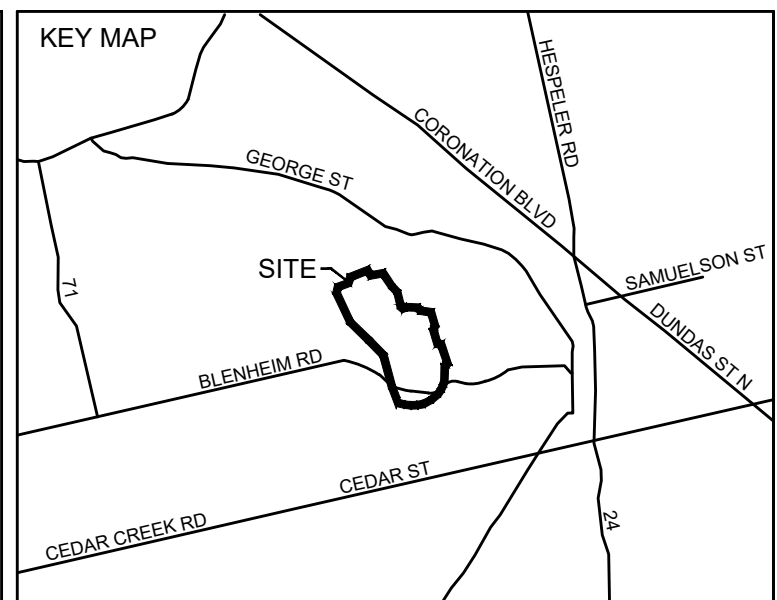
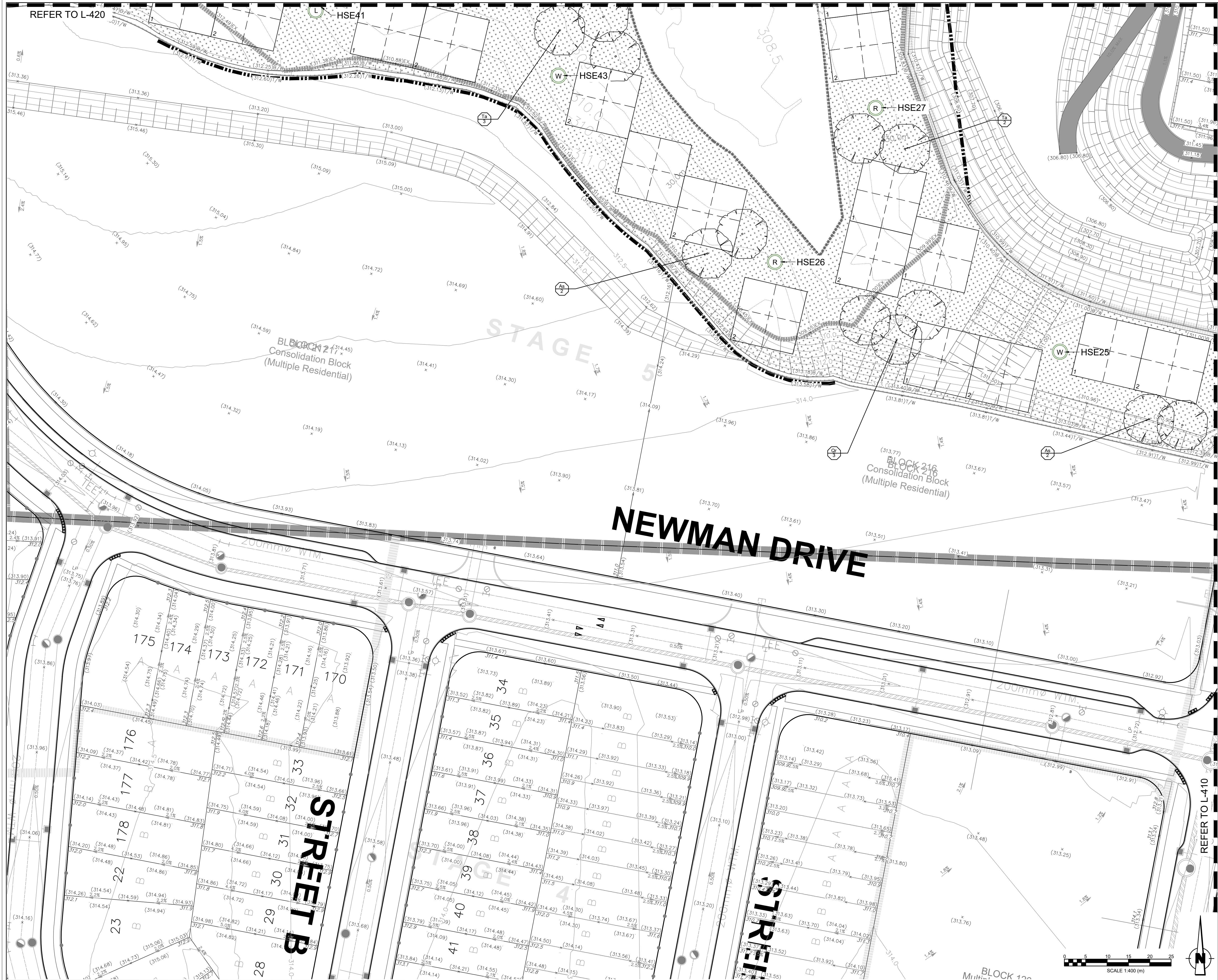
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116-162 REGIONAL RD 46
CAMBRIDGE, ON N1R 5S3

DRAWING TITLE:

**BUFFER ENHANCEMENT
PLANTING PLAN**

STAMP		STAMP	
			
DESIGNED	JB	DRAWN	JB
CHECKED	AG/BV		
SCALE	1:400	DATE	09-27-2018
PROJECT NUMBER	DWG. NUMBER		
18M-02101-00	L-410		

Y:\MMD\051810201_18.PW
L:\051810201\051810201-03 Cambridge West Buffer Enhancement Planting.dwg



LEGEND	
	PLANT KEY
	SUPPLY AND INSTALL PROPOSED DECIDUOUS TREE AS PER 182L-500
	SUPPLY AND INSTALL PROPOSED CONIFEROUS TREE AS PER 283L-500
	SUPPLY AND INSTALL HABITAT LOG AS PER 8/L-500
	SUPPLY AND INSTALL ROOT WAD AS PER 9/L-500
	SUPPLY AND INSTALL SHELTER ROCK PILE AS PER 10/L-500
	HABITAT STRUCTURAL ELEMENT IDENTIFIER
	SUPPLY AND INSTALL SCHEMATIC BUFFER ENHANCEMENT PLANTING AS PER L-400
	SUPPLY AND INSTALL UPLAND NATIVE MEADOW MIX SEEDING AS PER NOTES L-100
	SUPPLY AND INSTALL TURTLE NESTING HABITAT AS PER 7/L-500
	CHAIN LINK FENCE AS PER MTE DRAWINGS JANUARY 2020
	SITE BOUNDARY
	PROPOSED ELEVATION
	EXISTING ELEVATION
	EXISTING CONTOURS
	PROPOSED EMBANKMENT
	LIMIT OF GRADING
	WETLAND BUFFER
	MUNICIPAL LIMIT

1	11/06/2020	1st SUBMISSION	JB	AG/ST
NO	DATE	REVISION/ISSUED	BY	APPD

Landscape Architecture
582 Lancaster Street West
Kitchener, ON N2K 1M3
T. 519-743-8777
www.wsp.com

CLIENT:		HALLMAN CONSTRUCTION LIMITED & CACHET DEVELOPMENTS	
PROJECT TITLE:		CAMBRIDGE WEST BUFFER ENHANCEMENT PLANTING	
SITE ADDRESS:		116-162 REGIONAL RD 46 CAMBRIDGE, ON N1R 5S3	
DRAWING TITLE:		BUFFER ENHANCEMENT PLANTING PLAN	
STAMP		STAMP	
DESIGNED	JB	DRAWN	JB
SCALE	1:400	CHECKED	AG/BV
PROJECT NUMBER		DATE	
18M-02101-00		09-27-2018	
DWG. NUMBER		L-415	

GENERAL PLANTING NOTES

1. ALL PLANTING TO BE IN ACCORDANCE WITH CITY OF CAMBRIDGE STANDARDS
2. ALL PLANTING SHALL BE DONE UNDER THE DIRECTION AND SUPERVISION OF PERSONNEL WITH AT LEAST 5 YEARS HORTICULTURAL AND PLANTING EXPERIENCE AND CONFORM TO THE BEST HORTICULTURAL PRACTICES.
3. PLANTING OF PLANT MATERIAL PRIOR TO LANDSCAPE ARCHITECT APPROVAL WILL BE AT THE CONTRACTOR'S RISK. LANDSCAPE ARCHITECT RESERVES THE RIGHT TO REJECT PLANT MATERIAL THAT DOES NOT CONFORM TO PLANTING SPECIFICATIONS.
4. ONLY USE IMPORTED TOPSOIL WHEN TOPSOIL FROM SITE HAS BEEN DEPLETED OR IS DEEMED UNACCEPTABLE BY LANDSCAPE ARCHITECT. CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL NECESSARY SOIL TESTS AND SUBMITTING TO LA FOR APPROVAL PRIOR TO INSTALLATION.
5. PLANTS SHALL BE SOUND HEALTHY, VIGOROUS AND WELL BRANCHED. THEY SHALL BE FREE OF INSECT PESTS' EGGS AND LARVAE AND SHALL HAVE HEALTHY, WELL DEVELOPED ROOT SYSTEMS.
6. ALL SHRUBS TO BE INSTALLED IN CONTINUOUS PLANTING BEDS TO BE MOUNDED TO A HIGH POINT OF 100 mm
7. PLANT MATERIAL SHALL BE SET PLUMB IN THE CENTRE OF PIT/BED IN A STRAIGHT, VERTICAL POSITION.
8. KEEP ALL PLANTS WATERED FROM TIME OF PLANTING UNTIL ACCEPTANCE.
9. IF DISCREPANCIES IN THE PLANT QUANTITIES EXIST, THEN THE PLANTING PLANS SHALL OVERRIDE THE PLANTING SCHEDULE.
10. ALL DISTURBED AREAS WILL BE STABILIZED AND RESTORED UPON COMPLETION OF WORKS TO THE SATISFACTION OF THE LANDSCAPE ARCHITECT. ALL DISTURBED AREAS TO BE SEEDED PROMPTLY AFTER DISTURBANCE OR GRADING.

STOCK

1. ALL PLANT MATERIAL SHALL COMPLY WITH THE "CANADIAN NURSERY TRADES ASSOCIATION METRIC GUIDE SPECIFICATIONS AND STANDARDS". PLANT MATERIAL SHALL BE STRUCTURALLY SOUND, WELL FURNISHED WITH FOLIAGE, SHOWING VIGOROUS GROWTH AND FORMATION OF SHOOTS, AND BE FREE FROM BLIGHT AND DISEASE OF ANY DESCRIPTION. ANY SUBSTITUTIONS AS TO VARIETY OR GRADE MUST BE ACCEPTED BY LANDSCAPE ARCHITECT PRIOR TO INSTALLATION.
2. THE CONTRACTOR, UPON REQUEST, SHALL PROVIDE DOCUMENTATION FOR ALL PLANT MATERIAL INDICATING THE SPECIES, SIZE, AND SUPPLIER. CONTAINER GROWN PLANT MATERIALS MUST BE GROWN IN THE SAME CONTAINER FOR A MINIMUM PERIOD OF 6 MONTHS PRIOR TO INSTALLATION.
3. PLANT MATERIAL SHALL NOT BE COLLECTED OR DUG FROM NATIVE STANDS OR ESTABLISHED WOODLOTS.
4. ALL TREES TO BE OBTAINED FROM LOCALLY GROWN SOURCE.

SITE PREPARATION

1. SOILS SHALL BE FERTILE, FRIABLE, STONE-FREE AND NOT IN A FROZEN OR MUDDY CONDITION AT TIME OF GRADING AND PLANTING.

PLANTING

1. PLANT MATERIAL SHALL BE SET PLUMB IN THE CENTRE OF THE PIT AND IN A VERTICAL POSITION IN THE SAME RELATION TO GRADE AS ORIGINALLY GROWN.
2. THE POTTED HERBACEOUS VEGETATION SHALL BE REMOVED FROM THE POT TOGETHER WITH THE POTTING SOIL AND PLACED FIRMLY INTO THE PLANTING BED IN THE LOCATION INDICATED ON THE PLAN. ROOT RHIZOME, OR TUBER PLANTS SHALL BE BURIED TO THE SAME DEPTH AS THE NATURAL STATE OF THE PLANT.
3. BURLAP AND TIES SHALL BE REMOVED FROM THE TOP THIRD OF THE ROOTBALL. FIBER POTS SHALL BE REMOVED BY CUTTING THE SIDES AND FOLDING IT BACK FROM THE ROOT MASS. ANY PRESERVATIVE TREATED (GREEN) BURLAP SHALL BE REMOVED FROM THE ROOT BALLS OF ALL PLANT MATERIAL IN ITS ENTIRETY.
4. THE PLANTING PIT SHALL BE BACKFILLED WITH NATIVE SOIL IN LAYERS 200 mm DEEP, FIRMLY TAMPED INTO PLACE.
5. A SHALLOW SAUCER SHALL BE CREATED OVER THE PLANTING PIT AREA TO RETAIN WATER.
6. TREES SHALL BE PRUNED ONLY TO CORRECT ISSUES IN NATURAL FORM AND/OR TO REMOVE DEAD/BROKEN BRANCHED IN ACCORDANCE WITH GOOD ARBORICULTURAL PRACTICES.
7. PLANT MATERIAL SHALL BE THOROUGHLY WATERED AT THE TIME OF PLANTING.
8. INSTALL 600 mm HGT. PERFORATED FLEXIBLE VINYL RODENT PROTECTION/COLLAR AROUND THE BASE OF ALL TREES.
9. ALL OF THE TREES SHALL BE MULCHED WITH INDIVIDUAL SAUCERS IMMEDIATELY AFTER PLANTING AND WATERING TO A DEPTH OF 100 mm. SHRUBS ARE TO BE PLANTED IN CONTINUOUS MULCHED BEDS, UNLESS OTHERWISE NOTED.
10. ALL MULCH TO BE SHREDDED BARK MULCH. DEPTH AS SPECIFIED ON PLANTING DETAILS. DO NOT PLACE MULCH IN DIRECT CONTACT WITH TRUNKS. ALLOW 25 mm MULCH FREE RING AROUND TRUNKS. LANDSCAPE ARCHITECT RESERVES THE RIGHT TO REJECT ANY MULCH THAT DOES NOT CONFORM TO SPECIFICATIONS. PROVIDE SAMPLE PRIOR TO INSTALLATION.
11. TREES SHALL BE STAKED IMMEDIATELY FOLLOWING PLANTING OPERATIONS AS PER THE DETAILS SHOWN ON THESE PLANS.
12. THE CONTRACTOR IS RESPONSIBLE FOR ALL LOCATES FOR UNDERGROUND UTILITIES PRIOR TO DIGGING.
13. NO PLANTS ARE TO BE INSTALLED WHERE WATER PERMANENTLY FLOODS THE ROOT ZONE.
14. IT IS THE CONTRACTOR'S RESPONSIBILITY TO APPLY WEED AND GRASS CONTROL IN THE PLANTING BED AREAS AS REQUIRED (NO PESTICIDES IN ACCORDANCE WITH MUNICIPAL BY-LAWS AND PROVINCIAL LEGISLATION).

TIME CONSTRAINTS FOR PLANTING

1. BARE ROOT PLANTS - SPRING, FROST FREE CONDITIONS, TO MAY 31, AND SEPTEMBER 1 TO WINTER FREEZE UP.
2. BALLED AND BURLAPPED OR CONTAINER GROWN PLANTS - SPRING FROST FREE CONDITIONS TO NOVEMBER 15.

2. **BALLED AND BURLAPPED OR CONTAINER GROWN PLANTS - SPRING FROST FREE CONDITIONS TO NOVEMBER 15.**

ENVIRONMENTAL NOTES

1. THERE WILL BE NO WORKS PERMITTED BEYOND THE LIMIT OF CONSTRUCTION BOUNDARY UNDER ANY CIRCUMSTANCES. EQUIPMENT USE ON STEEP SLOPES (GREATER THAN 3:1) AND IN WET (SEEPAGE) AREAS WILL BE HELD TO THE MINIMUM NECESSARY TO COMPLETE THE NECESSARY LANDSCAPE WORKS.
2. CONTRACTOR TO ENSURE THAT ALL THE REASONABLE MEASURES ARE TAKEN TO LIMIT GROUND DISTURBANCE CAUSED BY HEAVY EQUIPMENT USAGE, AND EROSION AND SEDIMENT CONTROLS WILL BE INSTITUTED AS INSTRUCTED BY THE LANDSCAPE ARCHITECT. NO SUBSURFACE GROUND-DISTURBING EQUIPMENT WILL BE USED BY CONSTRUCTION FORCES EXCEPT ON ACCESS ROADS.
3. ALL DISTURBED AREAS WILL BE STABILIZED AND RESTORED UPON COMPLETION OF WORKS TO THE SATISFACTION OF THE LANDSCAPE ARCHITECT. ALL DISTURBED AREAS TO BE FINE GRADED AND SEEDED PROMPTLY AFTER DISTURBANCE.
4. ALL CONSTRUCTION ACTIVITIES WITHIN THE LIMIT OF CONSTRUCTION SHALL BE EXECUTED IN SUCH A MANNER SO AS TO PREVENT THE ENTRY OF CHEMICALS, PETROLEUM PRODUCTS, DEBRIS, RUBBLE, CONCRETE OR OTHER DELETERIOUS SUBSTANCES IN NATIVE SOILS OR GROUNDWATER
5. THE CONTRACTOR WILL BE RESPONSIBLE FOR DAILY INSPECTION, CLEANUP AND PROPER LABELING, STORAGE, AND DISPOSAL OF ALL REFUSE AND DEBRIS PRODUCED BY OPERATIONS AND EMPLOYEES. SUITABLE REFUSE COLLECTING FACILITIES WILL BE REQUIRED, ONLY THOSE DISPOSAL AREAS APPROVED BY THE LOCAL MUNICIPALITY SHALL BE USED. DISPOSAL CONTAINERS SUCH AS DUMPSTERS OR ROLL-OFF CONTAINERS SHALL BE OBTAINED FROM A PROPER WASTE DISPOSAL CONTRACTOR.
6. CONTRACTOR TO ENSURE THAT ALL EQUIPMENT IN OPERATION ON THE SITE IS IN GOOD WORKING CONDITION, AND SHALL MAINTAIN AND OPERATE EQUIPMENT TO LIMIT VEHICLE EXHAUST EMISSIONS. CORRECTIVE ADJUSTMENTS OR REPAIRS SHALL BE DONE ON EQUIPMENT AND VEHICLES THAT SHOW EXCESSIVE EMISSIONS OF EXHAUST AND/OR PARTICULATE MATTER DUE TO POOR ENGINE ADJUSTMENTS OR OTHER INEFFICIENT OPERATING CONDITIONS.
7. CONTRACTOR SHALL VISIT SITE PRIOR TO THE START OF CONSTRUCTION AND PHOTOGRAPH EXISTING CONDITIONS. CONTRACTOR TO NOTE ANY OVERHANGING BRANCHES THAT WILL REQUIRE PRUNING TO PERMIT VEHICULAR ACCESS AND ADVISE LANDSCAPE ARCHITECT. ALL PRUNING TO BE COMPLETED TO THE CURRENT ISA STANDARDS. AREAS OF DISTURBANCE TO BE KEPT AT A MINIMUM.

GENERAL NOTES

1. AS AN INSTRUMENT OF SERVICE, THIS DRAWING IS THE PROPERTY OF THE LANDSCAPE ARCHITECT. THIS DRAWING MUST BE RETURNED UPON REQUEST, AND MAY NOT BE REPRODUCED WITHOUT WRITTEN CONSENT OF THE LANDSCAPE ARCHITECT.
2. THE CONTRACTOR IS TO TAKE ALL NECESSARY PRECAUTIONS TO PROTECT EXISTING SITE FEATURES UNLESS IDENTIFIED FOR REMOVAL OR DEMOLITION, INCLUDING ALL SURVEY BARS, STAKES AND MONUMENTS. CONTRACTOR IS TO MAKE GOOD ANY DAMAGE.
3. THE CONTRACTOR IS RESPONSIBLE FOR FAMILIARIZING THEMSELVES WITH LIMITS OF CONSTRUCTION PRIOR TO THE COMMENCEMENT OF ANY WORK ON THE SITE. THE CONTRACTOR IS TO CONTACT LANDSCAPE ARCHITECT IN UNCERTAINTY.
4. THE CONTRACTOR IS RESPONSIBLE FOR LOCATION AND STAKING OF ALL UTILITIES PRIOR TO WORK COMMENCING ON THE SITE. CONTRACTOR IS NOT TO PLANT DIRECTLY ABOVE UNDERGROUND UTILITIES.
5. THE CONTRACTOR TO VISIT THE SITE TO CONFIRM ALL SITE CONDITIONS PRIOR TO SUBMITTING BIDS. AMBIGUITY OR DISCREPANCY TO BE REPORTED TO THE LANDSCAPE ARCHITECT FOR CLARIFICATION.
6. DRAWINGS MAY BE SCALED FOR APPROXIMATE PLANTING LAYOUT ONLY. ALL MEASUREMENTS ARE IN METRES (METRIC) UNLESS NOTED OTHERWISE. LAYOUT OF PLANT MATERIALS TO BE STAKED BY CONTRACTOR AND APPROVED BY LANDSCAPE ARCHITECT PRIOR TO PLANTING.
7. THE CONTRACTOR SHALL SUPPLY ALL MATERIALS IN QUANTITIES SUFFICIENT TO COMPLETE WORK SHOWN ON THESE DRAWINGS. ANY DISCREPANCIES BETWEEN QUANTITIES ILLUSTRATED ON THE PLAN AND THE PLANT LIST SHALL BE REPORTED TO THE LANDSCAPE ARCHITECT FOR DIRECTION.
8. THE CONTRACTOR MUST REMOVE ALL DEBRIS, GARBAGE AND SURPLUS MATERIALS FROM THE SITE AT THE END OF EACH DAY. THE SITE IS TO BE KEPT CLEAN AND USEABLE AT ALL TIMES.
9. AT THE TIME OF FINAL INSPECTION ALL SEEDED AND SODDED AREAS SHALL BE IN A HEALTHY, VIGOROUS GROWING CONDITION, UNIFORM ESTABLISHED, FREE OF RUTS, EROSION, BARE AND/OR DEAD SPOTS, FREE FROM WEEDS, IN FULL ACCORDANCE WITH DRAWINGS AND SPECIFICATIONS.
10. THESE DRAWINGS SHALL NOT BE USED FOR CONSTRUCTION PURPOSES UNLESS STAMPED AND SIGNED BY THE LANDSCAPE ARCHITECT. THE CONTRACTOR IS NOT TO PROCEED IN UNCERTAINTY.
11. ANY EXISTING SIGNAGE REQUIRING RELOCATION DUE TO CONSTRUCTION ACTIVITIES SHOULD BE STORED AND REINSTALLED AS PER INSTRUCTIONS FROM LANDSCAPE ARCHITECT.

TOPSOIL PLANTING BED PREPARATION:

- MIX TOPSOIL AS RECOMMENDED BY SOIL TEST RESULTS AND RECOMMENDATIONS OF SOIL TESTING AGENCY.
- TOPSOIL SHALL NOT BE USED TO CONSTRUCT PERMANENT BERMS.
- ALL TOPSOIL SHOULD BE FREE OF SUBSOILS, CLAY, STONES, ROOTS, EXCESS WATER, FROST AND OTHER EXTRANEOUS MATTER.
- PREPARE PLANTING BEDS PRIOR TO ARRIVAL OF PLANT MATERIAL ON SITE.

EXCAVATE PER PLANTING DETAILS. THE FOREGOING PROPORTIONS ARE SUBJECT TO CHANGE UPON RECEIPT OF TOPSOIL ANALYSIS.

- PREPARE PLANTING SOIL BY EVENLY MIXING:
- 5 PARTS NATIVE SOIL
- 1 PART SHARP SAND
- 2 PARTS $\frac{1}{4}$ " SCREENED COMPOST
- 500g OF BONE MEAL PER CUBIC METRE.
- MIX THOROUGHLY

PLANT MATERIAL ORDER, DELIVERY AND INSPECTION:

- CONTRACTOR TO CHECK ALL QUANTITIES AND REPORT ANY DISCREPANCIES TO THE CONTRACT ADMINISTRATOR IN WRITING. THE QUANTITIES INDICATED ON THE PLAN SUPERCEDE THE TOTALS OF THE PLANT LIST.
- OBTAIN CONTRACT ADMINISTRATOR'S APPROVAL ON ALL PLANT MATERIAL AT SOURCE OR UPON DELIVERY PRIOR TO COMMENCEMENT OF PLANTING WORK.
- APPROVAL OF PLANT MATERIAL PRIOR TO PLANTING SHALL NOT IMPAIR THE RIGHT OF THE CONTRACT ADMINISTRATOR TO REJECT PLANTS AFTER PLANTING, WHICH HAVE BEEN DAMAGED, OR WHICH IN ANY WAY DO NOT CONFORM TO THE SPECIFICATIONS.
- SUBSTITUTIONS OF SIZE, OR WITH OTHER PLANT MATERIAL WILL ONLY BE ALLOWED WITH THE WRITTEN APPROVAL OF THE CONTRACT ADMINISTRATOR.
- ALL MATERIAL MUST CONFORM TO THE SIZES SHOWN ON THE PLANT LIST, EXCEPT WHERE LARGER PLANT MATERIAL IS USED WHEN APPROVED BY THE CONTRACT ADMINISTRATOR. USE OF LARGER PLANTS WILL NOT INCREASE THE CONTRACT PRICE. UNDERSIZED MATERIAL WILL BE REJECTED.
- ALL SHRUBS AND TREES SHALL CONFORM TO THE PRESENT STANDARDS OF THE CANADIAN NURSERY TRADES ASSOCIATION FOR SIZE AND SPECIES.
- PLANTS ARE TO BE NURSERY GROWN UNDER PROPER CULTURAL CONDITIONS, IN PARTICULAR WITH RESPECT TO SPACING, PEST AND DISEASE CONTROL, AND BRANCH AND ROOT PRUNING.
- TREES ARE TO HAVE STRAIGHT STURDY TRUNKS.
- TREES SHALL BE WELL BRANCHED AND BALANCED WITH A STRONG CENTRAL LEADER.
- DECIDUOUS SHADE TREES SHALL BE FREE OF BRANCHES FROM GROUND LEVEL TO A HEIGHT OF 1.8M ABOVE THE GROUND.
- TREES WITH OPEN SCARS ARE NOT ACCEPTABLE.
- KEEP ALL ROOTS AND ROOTBALLS MOIST PRIOR TO PLANTING.

PLANT MATERIAL GUARANTEE AND FINAL INSPECTION:

- AT THE COMPLETION OF PLANTING OPERATIONS, REMOVE ALL SURPLUS MATERIAL FROM THE SITE AT NO EXTRA CHARGE TO THE PROJECT.
- MAKE GOOD ALL DAMAGE RESULTING FROM PLANTING OPERATIONS AT NO EXTRA CHARGE TO THE PROJECT.
- UPON FINAL COMPLETION OF THE PROJECT, ALL WORKSMANSHIP AND MATERIALS ARE TO BE GUARANTEED FOR TWO (2) FULL YEARS. ALL WORKSMANSHIP IS TO BE COMPLETED TO THE STANDARDS OF LANDSCAPE ONTARIO HORTICULTURAL TRADES ASSOCIATION.
- ALL PLANTS SHALL BE INSPECTED TWICE, ONCE HALFWAY THROUGH THE GUARANTEE PERIOD, AND AGAIN AT THE END OF THE GUARANTEE PERIOD. PLANTS WHICH, AT THAT TIME, ARE NOT IN HEALTHY VIGOROUS GROWING CONDITION, TO THE CONSULTANT'S APPROVAL, SHALL BE REPLACED AT NO EXTRA CHARGE TO THE PROJECT.
- CONTRACTOR TO CONTACT CONTRACT ADMINISTRATOR AND/OR APPROVAL AGENCY/MUNICIPALITY TO REVIEW PROJECT FOR GUARANTEE INSPECTIONS.

HYDRO-SEEDING:

HYDRO-SEEDING SHALL BE APPLIED TO ALL AREAS DISTURBED BY THE CONSTRUCTION OPERATION THAT WILL NOT BE COVERED WITH ASPHALT OR MULCH/OTHER PATHWAY SURFACING. AT TIME OF SEEDING, ALL SURFACE AREAS MUST BE UNIFORMLY GRADED AND SHALL BE FREE OF EROSION, STONES GREATER THAN 50mm IN DIAMETER, WEEDS AND ANY OTHER UNWANTED VEGETATION. EXISTING SURFACE SOIL SHALL BE UNIFORMLY CULTIVATED TO A MINIMUM DEPTH 50mm TO PROVIDE A LOOSE AND FRIABLE SEEDBED TO ACCELERATE GERMINATION OF SEED.

THE BLOWER TRUCK SHALL BE EQUIPPED WITH A COMPUTER-CALIBRATED SEED INJECTION SYSTEM AND SHALL BE CAPABLE OF UNIFORMLY APPLYING SLURRY AND SEED AT A RATE GREATER THAN 0.25 m3 PER MINUTE.

NOTE:

- ALL SEED TO BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS FOR MULCH, TACKIFIER, AND SPECIFIC SEEDING RATE AND TIMING OF APPLICATION.
- CONTRACTOR TO VERIFY SEEDING RATES RELATIVE TO SOIL TYPE PRIOR TO INSTALLATION OF SEED.
- ALL SEEDING ON SLOPES GREATER THAN 3 (HORIZONTAL) : 1 (VERTICAL) SHALL BE PROTECTED WITH 'SOIL GUARD FIBRE MATRIX' TO MANUFACTURER'S SPECIFICATIONS.
- AFTER SEDIMENT DRYING HAS TAKEN PLACE, SEDIMENT DRYING AREA SHOULD BE RE-SEED BY CITY OR OWNER WITH UPLAND NATIVE MEADOW MIX (CVC 7) TO REHABILITATE AREA.

<u>UPLAND NATIVE MEADOW MIX (CVC 7)</u>	<u>FACW WETLAND MEADOW MIX (CVC 1, OSC #8175)</u>	<u>CREEK BANK SEED MIX (OSC 8215)</u>
10% Black Eyed Susan (<i>Rudbeckia hirta</i>)	1% Bebb's Sedge (<i>Carex bebbii</i>)	30% Big Bluestem (<i>Andropogon gerardii</i>)
1% Heart Leaved Aster (<i>Aster cordifolius</i>)	1% Blue Lobelia (<i>Lobelia spicata</i>)	6% Black Eyed Sun (<i>Rudbeckia hirta</i>)
1% Canada Anemone (<i>Anemone canadensis</i>)	10% Blue Vervain (<i>Verbena hastata</i>)	5% Bottlebrush Grass (<i>Elymus hystris</i>)
2% Canada Goldenrod (<i>Solidago canadensis</i>)	1% Bonset (<i>Eupatorium perfoliatum</i>)	30% Fowl Bluegrass/Fowl Meadowgrass (<i>Poa palustris</i>)
2% Common Milkweed (<i>Asclepias syriaca</i>)	1% Dark Green Bulrush (<i>Scirpus atrovirens</i>)	2% Fowl Mannagrass (<i>Glyceria striata</i>)
25% Evening Primrose (<i>Oenothera biennis</i>)	27% Fox Sedge (<i>Carex vulpinoides</i>)	25% Fox Sedge (<i>Carex vulpinoides</i>)
1% Grass Leaved Goldenrod (<i>Euthamia graminifolia</i>)	2% New England Aster (<i>Aster novae-angliae</i>)	2% New England Aster (<i>Aster novae-angliae</i>)
15% Meadow/Open Field Sedge (<i>Carex granularis</i>)	1% Purpled Stemed Aster (<i>Aster paniculosus</i>)	
1% New England Aster (<i>Aster novae-angliae</i>)	20% Fowl Bluegrass (<i>Poa palustris</i>)	
40% Riverbank Wild Rye (<i>Elymus riparius</i>)	2% Soft Rush (<i>Juncus effusus</i>)	
1% Virginia Bower (<i>Clematis virginiana</i>)	1% Spotted Joe Wee Weed (<i>Eragrostis maculatum</i>)	
1% Wild Bergamot (<i>Monarda fistulosa</i>)	2% Square Stemmed Monkey Flower (<i>Mimulus ringens</i>)	
	2% Swamp Milkweed (<i>Asclepias incarnata</i>)	
	2% Tall Mannagrass (<i>Glyceria grandis</i>)	
	27% Virginia Wild Rye (<i>Elymus virginicus</i>)	
	1% Scirpus cypripinus (<i>Woodgrass</i>)	
		NATIVE ROADSIDE SEED MIX (OSC 8145)
		2% Black Eyed Sun (<i>Rudbeckia hirta</i>)
		2% Blue Vervain (<i>Verbena hastata</i>)
		1% Bonset (<i>Eupatorium perfoliatum</i>)
		Canada Wild Rye (<i>Elymus canadensis</i>)
		Dense Blazing Star (<i>Liatris scapula</i>)
		Forgive/Beard Tongue (<i>Pendemon digitalis</i>)
		Indian Grass (<i>Sorghastrum nutans</i>)
		Little Blue Stem (<i>Stachytarhia scoparium</i>)
		New England Aster (<i>Aster novae-angliae</i>)
		Showy Tick Trefoil (<i>Desmodium canadense</i>)
		Virginia Wild Rye (<i>Elymus virginicus</i>)
		1% Wild Bergamot (<i>Monarda fistulosa</i>)

SEED AT RATE OF 22KG/HA. SIMULTANEOUSLY SOW COVER CROP OF COMMON OATS (AVENA SATIVA) AND BUCKWHEAT (FAGOPYRUM ESCULENTUM) FOR EROSION CONTROL AT A RATE OF 22KG/HA. ALL SEED MIXTURE MANUFACTURED BY 'ONTARIO SEED COMPANY (OSC)' OR APPROVED EQUAL. ALL PACKING SLIPS MUST BE PROVIDED TO CLIENT PRIOR TO SEED PLACEMENT.

- NOTE:
- MINIMUM OF 300mm OF TOPSOIL TO BE PROVIDED FOR THE FIRST 2m IN DEPTH BELOW THE PERMANENT POOL LEVEL (MOISTURE ZONES 1 AND 2).
 - MINIMUM OF 200mm OF TOPSOIL TO BE PROVIDED FOR ALL AREAS TO BE SEEDD ABOVE PERMANENT POOL LEVEL.

KEY MAP

1	11/06/2020	1st SUBMISSION		JB	AG/ST
NO	DATE	REVISION/ISSUED		BY	APPD

WSP Landscape Architecture
582 Lancaster Street West
Kitchener, ON N2K 1M3
t. 519-743-8777
www.wsp.com

CLIENT:

HALLMAN CONSTRUCTION LIMITED
& CACHET DEVELOPMENTS

PROJECT TITLE:

CAMBRIDGE WEST BUFFER ENHANCEMENT PLANTING

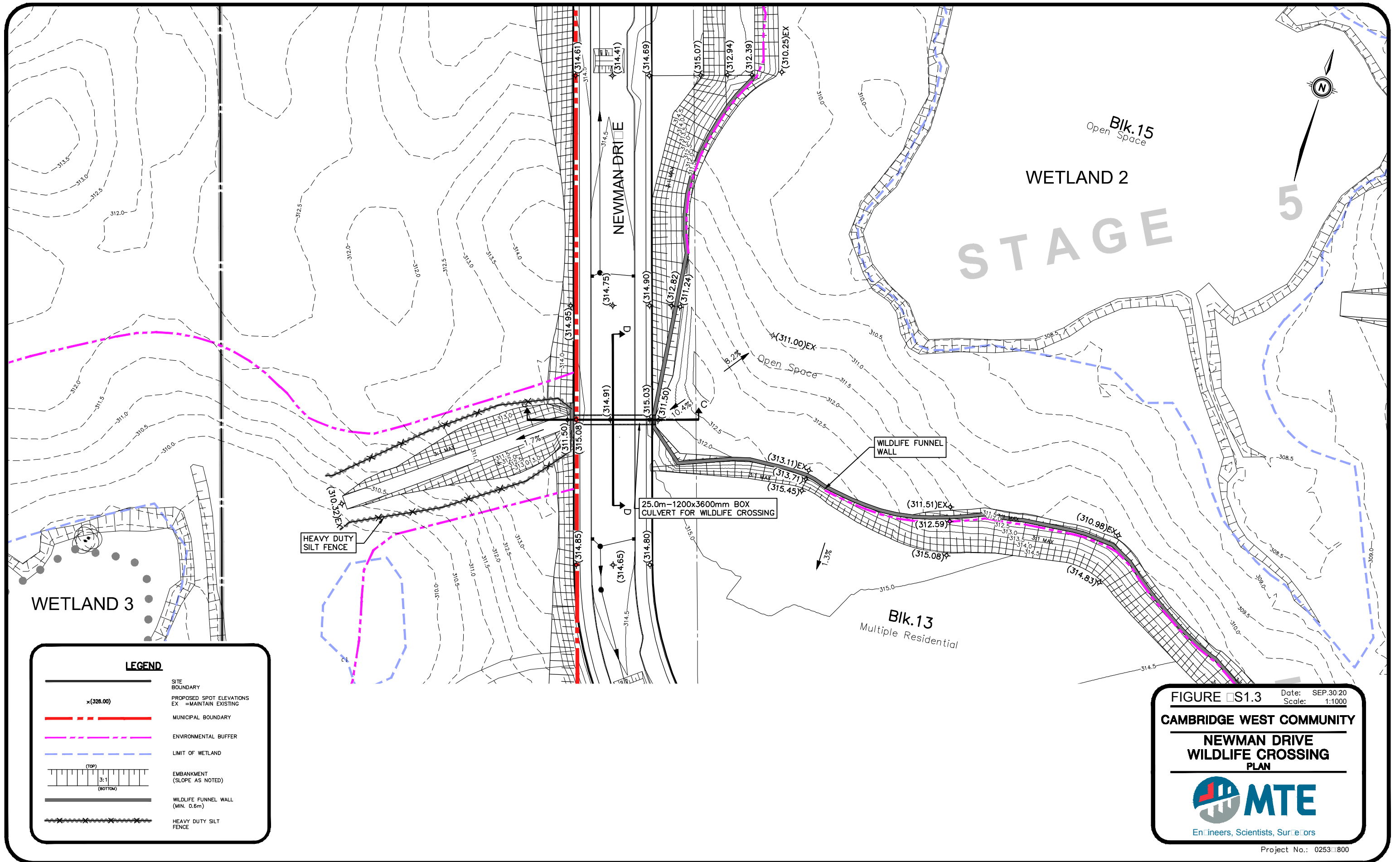
SITE ADDRESS:

116-162 REGIONAL RD 46
CAMBRIDGE, ON N1R 5S3

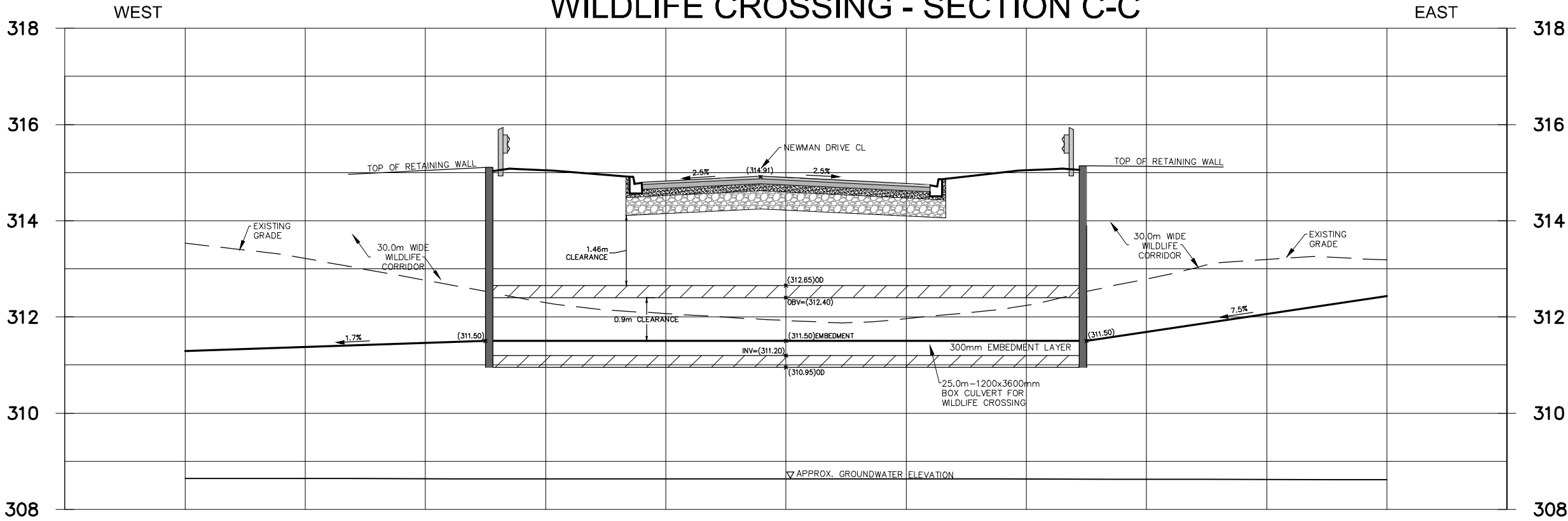
DRAWING TITLE

PLANTING NOTES

		STAMP	
DESIGNED	JB	DRAWN	JB
SCALE 1:xxx		DATE	09-27-2018
PROJECT NUMBER		DWG. NUMBER	
18M-02101-00		L-100	



WILDLIFE CROSSING - SECTION C-C



WILDLIFE CROSSING - SECTION D-D

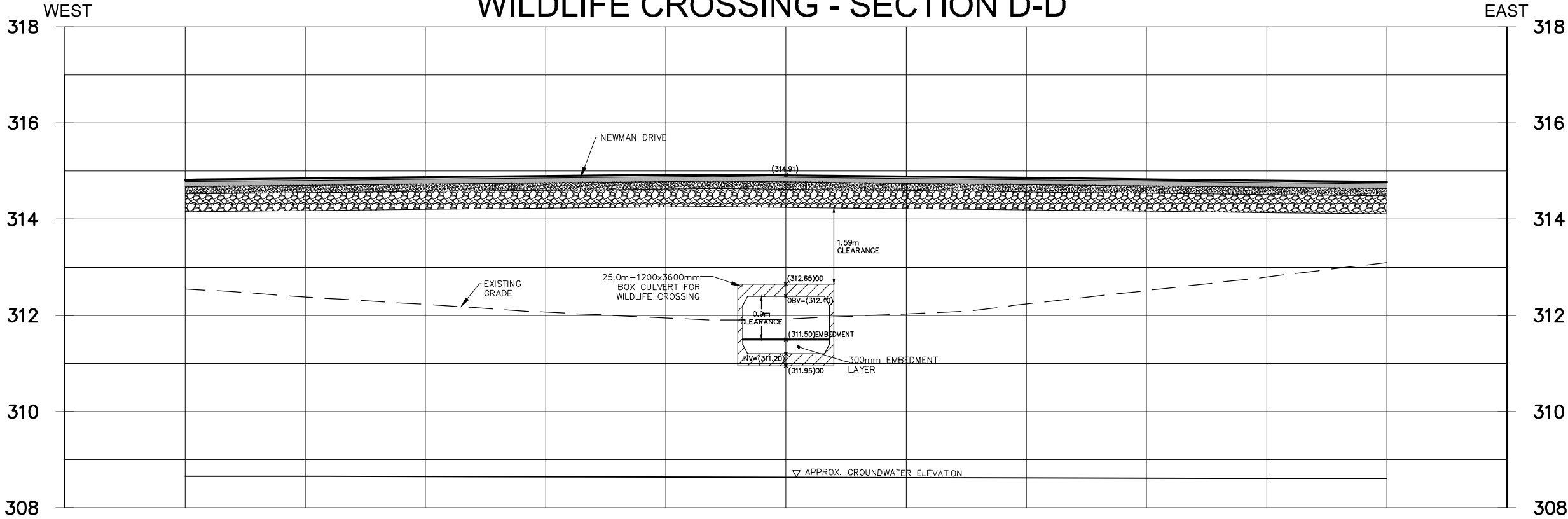


FIGURE S1. Date: SEP.30.20
Scale: H:1:200, V:1:100

WESTWOOD PHASE 2
NEWMAN DRIVE
WILDLIFE CROSSING
CROSS-SECTION


Engineers, Scientists, Surveyors

Project No.: 0253-800

APPENDIX K

JESA AWARENESS INFORMATION AND ENCOUNTER RESPONSE PLAN

JEFFERSON SALAMANDER

Awareness Information

Westwood Village

Cambridge West

Prepared by: WSP Canada Group Limited, April 2020



Recognizing Jefferson Salamander

- **Grey / brown above and lighter below**, sometimes with **blue flecks** on the sides and limbs.
- Adults are **12-20 cm long** – long tail (1/2 total length)
- Adults **live in deciduous forests** - in moist, loose soil, under logs or in leaf litter.
- **Live underground** (in rodent burrows, under rocks and stumps) for much of the year; **travel to woodland ponds** to breed in **early spring** (March-April).
- Lay eggs in clumps attached to underwater vegetation.
- Jefferson Salamanders (JESA) look very similar to Blue-spotted Salamander (BSSA) and Blue-spotted-Jefferson Complex Salamanders (BJCS)



Endangered Status and Threats

- Designated as “**Endangered**” – they live in the wild in Ontario but are facing imminent extinction or extirpation.
- Individuals and their habitat are protected under the Ontario Endangered Species Act (2007).



Minimizing Harm to JESA and Damage to JESA Habitat

- Review Amphibians excerpt from SAR Handling Memo (Ministry of Natural Resources and Forestry).
- Verify Erosion and Sediment Control (ESC) fencing is in working condition and installed adjacent to natural areas as per the Erosion and Sediment Control Plan prior to works taking place. Inspect fencing, perform necessary repairs (to maintain in working condition).
- Verify machinery access, parking and refueling locations per Spills Management Plan, ESC Plan or other relevant plans.
- Complete daily pre-activity searches for JESA along ESC fencing delineating grading / construction areas.
- Confirm no materials or equipment are within natural areas (except where previously isolated with fencing).
- If any salamander that is potentially a Jefferson Salamander is encountered:
 - Take close up photos for subsequent ID
 - Capture and release in closest appropriate natural area
 - Cease construction until animal is safely released and ESC fencing is confirmed in working condition
 - Notify MTE Consultants immediately for further direction
 - Notify WSP Canada Group Limited
- Conduct equipment refueling, washing and maintenance outside of natural areas in accordance with industry standard best management practices.
- Store construction equipment and materials at least 30 metres from natural areas. Operation and parking of equipment done in a manner that prevents any deleterious substances from entering natural areas.
- Confirm Spills Management Plan is accessible and required equipment / materials to implement plan are on site and easily accessible.

Contacts

MTE Consultants

Office tel.: 519-743-6500

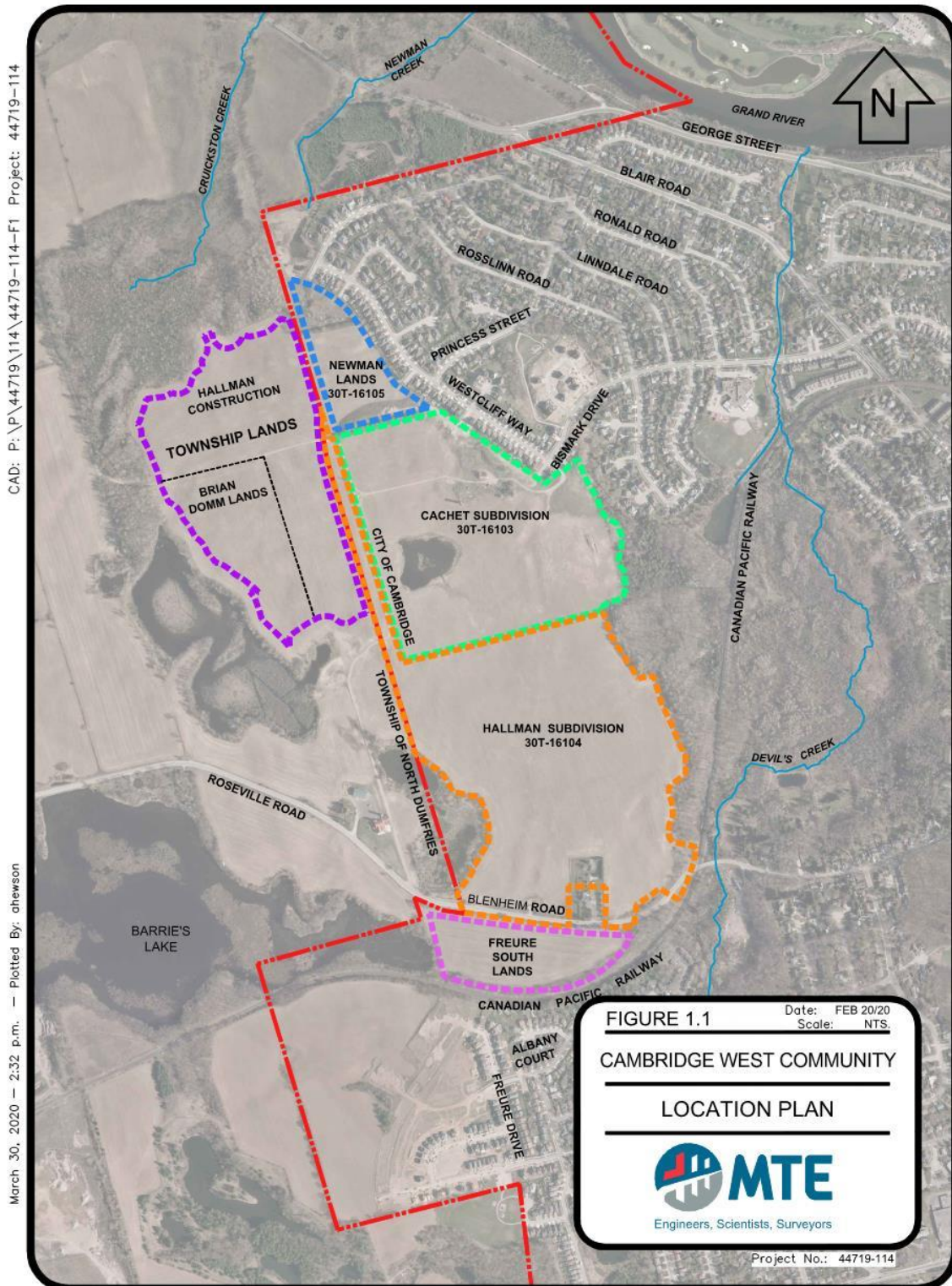
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WSP Canada Group Limited

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Figure 1. Key Plan



**ATTACHMENT A. “AMPHIBIANS” EXCERPT FROM THE SAR
HANDLING MANUAL**

4. Safe Handling of Amphibians

Important Note: Many amphibian species absorb oxygen through their skin as well as breathing with lungs; some species rely completely on their skin for respiration. If their skin dries out, they can suffocate. Therefore, careful handling of amphibians (especially salamanders) includes ensuring that their skin is kept moist.

4.1 Materials

a) The following materials are required for the handling, capture, temporary safe keeping and transport of amphibians:

- » A pail, bucket or large plastic bin with a lid that has air holes (for frogs). Ensure both the side of the container and the lid are well marked “live animal”.
- » Plastic kitchen-style container lined with paper towel (needs to be wet when used) with a lid that has air holes (for salamanders and toads). Ensure both the side of the container and the lid are well marked “live animal”.
- » Thermometer
- » SAR Notification/Contact Schedule
- » SAR Encounter Reporting Form
- » Net (optional)

b) Equipment must be acquired and maintained on each job site.

4.2 Capture and handling of salamanders, toads and frogs

Note: Eastern Newts have toxins in their skin and some salamanders may release a white, mildly toxic substance from their skin and tail. If ingested, these toxins may cause mild nausea. There is no risk associated with handling Ontario’s amphibians, provided you wash your hands afterwards. Toads will not give you warts.

Safely handle, move or capture a salamander, toad or frog by following these steps:

- a) Always make sure your hands are clean and free of insect repellent, antibacterial hand sanitizer, sunscreen, etc. Amphibians have very wet, porous skin through which they absorb oxygen and other compounds. Harmful chemicals (such as bug repellent) are quickly absorbed through an amphibian’s skin and can cause serious damage to the animal.
- b) If possible, wet your hands before picking up salamanders in order to avoid drying out their skin. Some species rely completely on their skin for respiration. If their skin dries out, they can suffocate and die. You can also ensure dampness is maintained by picking up some wet soil with the salamander.



- c) Keep handling times to a minimum as oil produced by human skin can easily clog amphibian pores, causing suffocation in some species.
- d) Always handle amphibians gently and slowly. Rough handling may cause injury or stress to the animal. Salamanders can drop their tail as an anti-predator defence, and may do so if they feel threatened (even if you are not holding them by the tail).

Amphibians

e) Never grab or pick up a salamander by the tail. This may cause the salamander to drop its tail (even if you are being gentle) and can be detrimental to the survival of the animal.

f) Capture a **frog or toad** using a net or pick it up with your hands by:



- I. Cupping your hands over the frog or toad while it is on the ground. (You have to be quick!)
- II. Closing your hand(s) to create a “cage” around the animal and picking it up. Note that they are slippery and can fit through small holes between your fingers.
- III. If it is necessary to identify the species after picking it up, carefully allow it to partially crawl out of your hand between your thumb and forefinger and then gently tighten your grip around its back legs (near its waist), holding onto both back legs. Support its front legs with your other hand.



g) Pick up a **salamander or newt** by scooping it up in one or two hands and then closing your hands to create a “cage”. Note that these animals are slippery and can fit through small holes between your fingers.



h) Use a net, container or your hands to catch frog tadpoles or salamander larvae. A net is easiest.

Amphibians

4.3 Moving amphibians out of harm's way (distance under 25 metres)

- a) If it is necessary to move an amphibian more than 25 metres, refer to section 4.5 on amphibian relocation.
- b) Amphibians should only be moved when they are in imminent, unavoidable danger.
- c) Salamanders do not move large distances and will tend to hide whenever possible. If there is the need to move a salamander, you will have to pick it up and move it (refer to section 4.2).
- d) If possible, allow a frog and a toad to move on its own by walking toward it in the direction that you want it to move. If the frog or toad does not move on its own, you will have to pick it up and move it (see section 4.2).
- e) When moving an amphibian out of harm's way, such as across a road, move it in the direction that it was heading, regardless of what the habitat looks like. These animals often make intentional movements to specific areas and if you put them back where they started they will simply turn around and start their journey again. If it is not clear which direction the animal was headed, move it to the closest suitable habitat that will not be disturbed. Suitable habitat includes: any shoreline habitat in the case of frogs; leaf litter, rocks or logs in a vegetated/forested area that the animal can hide under in the case of salamanders; any cover, such as rocks or vegetation, in the case of toads.

4.4 Temporary safe keeping and transportation of amphibians

- a) You are responsible for this animal. Remember, once you have put it in a container, it depends on you to keep it safe, moist and at the right temperature.
- b) Make sure that all containers that will be housing amphibians are thoroughly washed and rinsed and do not contain any soap or chemical residue.
- c) Keep **frogs** in a pail, bucket or large plastic bin with a lid that has adequate air holes. Always create the air holes before putting the animal in the container. Fill the container with less than one inch of water. Frogs should never be fully submerged, or they will drown.
- d) Keep **toads** in a pail, bucket, large plastic bin or plastic kitchen-style container with a lid that has adequate air holes. Always create the air holes before putting the animal in the container. Line the bottom of the container with wet paper towels.



Amphibians

e) Keep **salamanders** in a plastic kitchen-style container with a lid that has adequate air holes. Line the bottom of the container with wet paper towels.



f) Keep **newts and mudpuppies** in a pail, bucket, large plastic bin or plastic kitchen-style container with a lid, and fill the container with water. Replace water twice daily to ensure proper aeration, as these animals breathe through gills (like fish).

g) It is extremely important to monitor the air temperature regularly in the container to ensure it **never exceeds 25°C or drops below 5°C**. Never leave the container in direct sunlight or in a closed vehicle parked in the sun, as this will cause the animal to overheat and could be fatal.

h) **Never leave the container unattended** in an unsecured location (e.g., side of road).

4.5 Relocation of amphibians

a) Amphibians should only be relocated if the destruction of their habitat is unavoidable, or if it is not possible to release the animal at the capture location.

b) Transport and release it within one hour of capture in order to minimize stress on the animal.

c) Amphibians should not be relocated during their over-wintering season. This varies depending on the species and location, but is generally from October to May. If you are unsure whether you should relocate the animal or take it to a wildlife custodian, contact MNR for further direction using the SAR Notification/Contact Schedule.

d) If it is not possible to relocate the animal due to the time of year (October to May) or other conditions, transport it to a wildlife custodian per the SAR Notification/Contact Schedule.

e) **Amphibians should never be moved more than 100 metres** from the location where they were found. Only move the amphibian as far as necessary to avoid potential harm to the amphibian, and avoid moving amphibians more than 50 metres unless absolutely necessary. If it is not possible to relocate the animal within 100 metres of the capture location, contact MNR for further direction using the SAR Notification/Contact Schedule.

f) Release amphibians as close as possible to the capture site.

g) Always release frogs and larvae in the same water body where they were found, or in the same type of natural habitat as the capture site.

Amphibians

- h) Release salamanders and toads in the same type of natural habitat as the capture site.
- i) If possible, release frogs, toads and salamanders near a retreat site, which is somewhere the animal can seek shelter from the elements and avoid predators (vegetation, rocks, logs or leaf litter in the case of salamanders; water or vegetation in the case of frogs). Do not release them in the open where they could be exposed to inclement weather, extreme sunlight or predators.
- j) To release frogs, toads and salamanders, remove the lid and gently tip the container onto its side and allow the animal to leave on its own. If necessary, gently tip the container on an angle to slide the animal out of the container.

4.6 Injured amphibians

- a) Use the methods outlined in section 4.2 to handle injured amphibians whenever possible. If those methods are not applicable due to the animal's injuries, use a shovel or other thin, flat object to pick up the animal. Ensure that any injured areas are supported.
- b) Place the amphibian in a small container with a lid that has air holes and line the bottom of the container with wet paper towels. Always create the air holes before putting the animal in the container.
- c) Newspaper or paper towels may be added to the container to give the amphibian something to hide in. Do not place water, other animals, food or anything else in the container with the individual.
- d) Thoroughly wash your hands after handling injured amphibians.
- e) Immediately transport the injured animal to a veterinarian or wildlife custodian per the SAR Notification/Contact Schedule, in order to increase its chances of survival.

December 5 2016

Mr. Dave Marriot
Ministry of Natural Resources and Forestry, District Planner
1 Stone Road West, 1st Floor
Guelph, ON N1G 4Y2

Mr. Joe Crowley
Ministry of Natural Resources and Forestry, Species at Risk Herpetology Specialist
300 Water Street, 5th Floor
Peterborough, ON K9J 8M5

**RE: Cambridge West Lands – Jefferson Salamander (*Ambystoma jeffersonianum*)
Encounter Response Plan – Revised**

This letter addresses a condition imposed by the Ministry of Environment and Climate Change (MOECC) in a letter dated October 2, 2015 to April Souwand (former Senior Environmental Planner at the City of Cambridge) with respect to the proposed development of the Cambridge West lands, City of Cambridge.

The MOECC October 2, 2015 letter was prepared in response to three Part II Order requests made on the submission of the Cambridge West Lands Master Environmental Servicing Plan (City of Cambridge and Landowners 2013) which addressed Phases 1 & 2 of the Municipal Class Environmental Assessment (EA) process. Specifically, this included the following “Projects”:

- Establishment of new Stormwater Management Facilities.
- Establishment of new storm sewer – development lands to Princess Street.
- Extension of new sanitary services.

The Part II Order requests asked that a more comprehensive Individual Environmental Assessment (IEA) be undertaken. As identified in the letter, the MOECC decision was that an IEA would not be required given that certain conditions were met. One of these conditions, addressed herein, relates to Jefferson Salamander:

“In consultation with MNRF, the City will prepare a Response Plan for Jefferson Salamander, in the event that the species is encountered in the Plan area.”

To address the above noted commitment, MMM Group, with City of Cambridge staff, prepared a *draft* 'Response Plan' for encounters of Jefferson Salamander within the Draft Plan areas and circulated to MNRF on February 11, 2016. MNRF provided suggested edits via email on February 16, 2016, which were incorporated into a revised version re-circulated to MNRF on August 31, 2016. MNRF provided suggested revisions to the plan via email on October 18 2016, which have been incorporated verbatim in the current document.

Comprehensive, multi-year targeted Jefferson Salamander surveys were undertaken as part of the Cambridge West Master Environmental Servicing Plan (MESP) Study (City of Cambridge and Landowners 2013). Guelph district MNRF staff were consulted throughout the study including: determining survey methodology; obtaining collection permits; as well as discussion and interpretation of survey results. Substantial numbers of Ambystomid salamanders (Spotted Salamander, Blue-spotted Salamander and Blue-spotted dominant polyploids) were captured and sampled for genetic analysis; none was determined to be a Jefferson Salamander or Jefferson-dominant polyploid. Based on those results, Guelph district MNRF concluded that no habitat regulated under the ESA was present within the Development Study Area (DSA) lands. .

Subsequent to submission of the MESP, the *rare* Charitable Research Reserve (*'rare'*) undertook surveys for salamanders on lands adjacent to the draft plan lands, as described in a report entitled SAR Inventory: Jefferson Salamander. *rare* Charitable Research Reserve. 2014-2015 Report (*rare*, undated). In that study, 'cover board' and pond trapping surveys were undertaken in fall 2014 and spring 2015 in two woodlands: Indian Woods (1350 m or greater from the draft plan lands); and the 'hogsback' woods (290 m or greater from the draft plan lands). Based on results of collected DNA samples: no confirmed pure or Jefferson Salamander-dominated polyploids were recorded in the hogsback woods; and 8 Jefferson Salamander-dominated polyploids (i.e., LJJ genotype) were recorded in Indian Woods. The *rare* report, in so far as its relevance to the Development Study Area is concerned, is consistent with the conclusion reached by the MNRF with respect to the Development Area.

Although no regulated habitat for Jefferson Salamander was identified within the draft plan lands, landowners, in cooperation with *rare* and the MNRF, authorized additional salamander study of the MESP-sampled ponds and adjacent *rare* lands in the spring of 2016. Results of the 2016 trapping surveys and DNA analysis further support the previous conclusion that Jefferson Salamanders are not present within the Cambridge West DSA lands (Plan Area), including the adjacent *rare* 'hogsback' woodland.

Jefferson Salamander Encounter Response Plan:

Should a study of salamander breeding be undertaken on lands adjacent to the Plan Area prior to or during the time of construction, and Jefferson Salamander is documented, all construction activities will cease until the MNRF Guelph District Office has been contacted to discuss the potential implications of the ESA.

Yours truly,

MMM Group

A handwritten signature in black ink, appearing to read 'Jeff Gross', is positioned above the printed name.

Jeff Gross
Senior Ecologist/Project Manager
Ecology Department

cc: Graham Buck, Ministry of Natural Resources and Forestry

APPENDIX L

WESTWOOD VILLAGE (PHASE 1) HOMEOWNER STEWARDSHIP BROCHURE

Stewardship Brochure

Westwood Village

*Information on natural heritage features contiguous to Westwood Village
and advice about being a good neighbour and steward of these areas*



LIVING IN HARMONY WITH NATURE- A HOMEOWNERS GUIDE

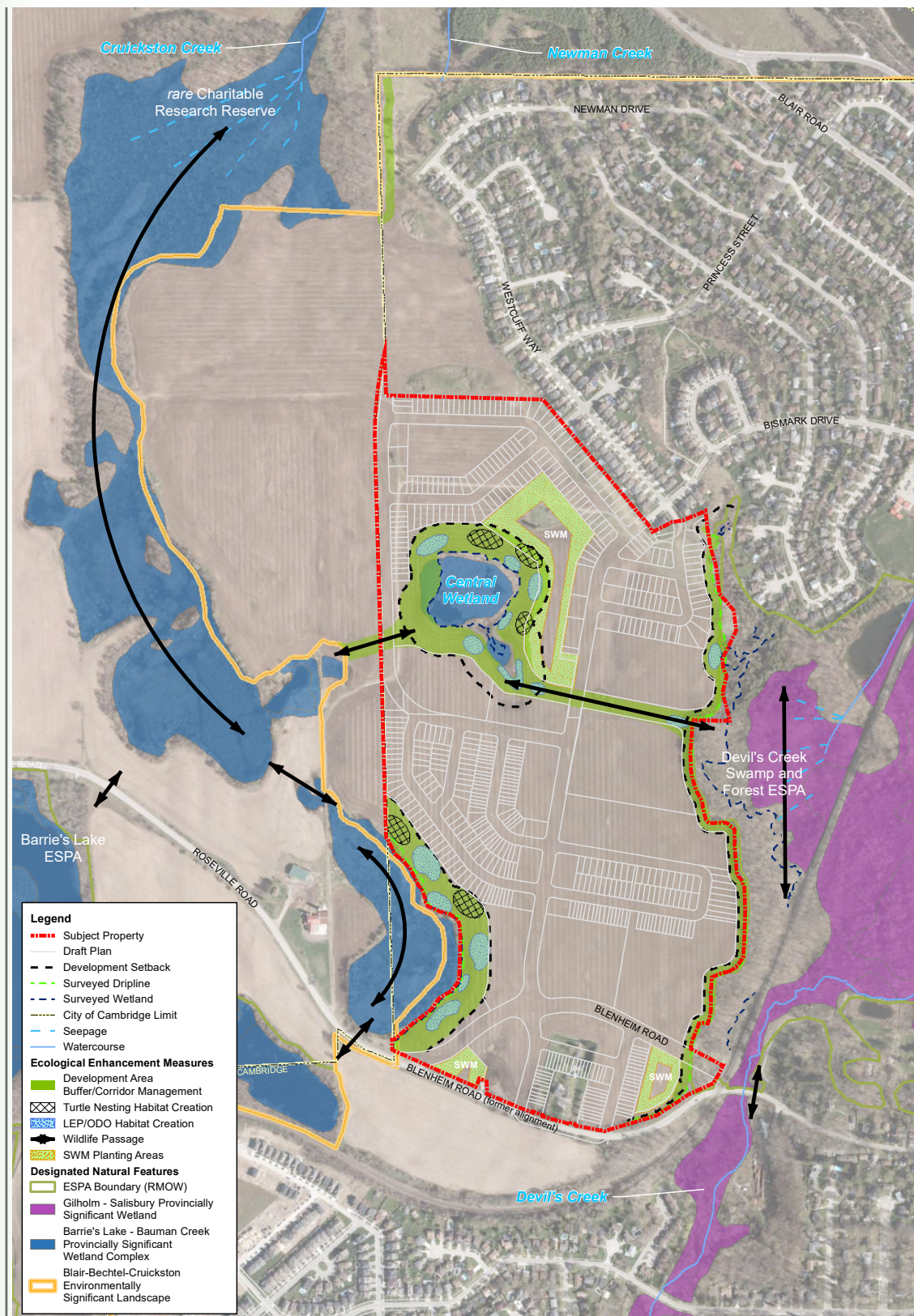
Westwood Village Community, Cambridge Ontario

Westwood Village is located between a portion of the Blair-Bechtel- Cruickston Environmentally Sensitive Landscape (ESL) and Devil's Creek Valley. Natural features in the area include a diverse mix of aquatic, wetland and upland habitats most with multiple environmental designations (ESL, Environmentally Sensitive Policy Area [ESPA; Devil's Creek Swamp and Forest], coldwater creek and Provincially Significant Wetland [PSW; Barrie's Lake - Bauman Creek]). There is also great botanical diversity in the area, with approximately 500 plant species recorded through field surveys conducted as part of the community planning. One particularly notable feature is the 'Central Wetland', a PSW pond / marsh with many sensitive ecological attributes

ENVIRONMENTAL PROTECTION & ENHANCEMENTS

Substantial field surveys, planning, and design has been undertaken to ensure that natural features and ecological – hydrogeological functions are maintained and preserved for future generations. Numerous protection and enhancement measures have been implemented through development of the Westwood Village Community including:

- All natural features (ESL, PSW, ESPAs, woodland) and Devil's Creek valley have been protected as part of the Cambridge West Natural Heritage System (NHS)
- Buffer areas (15 m to 50 m in width) between developed areas and natural areas have been naturalized and enhanced through native species plantings and wildlife habitat elements (e.g., nesting structures, foraging areas, target plant communities);
- Enhancement of the ecological linkage between the Central Wetland and natural areas to the east and west with a defined ecological corridor – see figure
- Groundwater recharge and protection measures, including 'at-source' infiltration measures and a 'winter-bypass' in the stormwater management (SWM) system (to direct salt-laden water away from sensitive wetlands)
- The SWM strategy to maintain surface and groundwater inputs to receiving wetlands and watercourses and treat water to reduce pollutants and contaminants.
- Plantings surrounding SWM facilities have been designed to create a natural appearance and filter sediment and surface runoff prior to treatment in the pond.
- **PLACEHOLDER FOR MHBC RE: LIGHTING**



Westwood Village Community and Natural heritage System

FLORA AND FAUNA YOU MAY SEE IN YOUR COMMUNITY

FLORA

Choke Cherry
Honeysuckle
Riverbank Grape
Red Pine
American Beech
American Basswood
Sugar Maple
White Ash

BIRDS

Eastern Wood-peewee
Blue Jay
Downy Woodpecker
Red-winged Blackbird
American Crow

MAMMALS

Grey Squirrel
Red Squirrel
Raccoon
White-tailed Deer
Red Fox

INVASIVE SPECIES

*(Species not native to this
area which can spread
quickly and cause
environmental harm)*

Garlic Mustard
Common Buckthorn

GIVE NATURE A HELPING HAND

Use Native Plants: When selecting plants for your garden, use native plant species where possible as they are usually easier to grow, require less water and are typically more resistant to local climate extremes, insects and some plant diseases. Recommended native groundcovers include Virginia Creeper, Wild Ginger, and Wild Strawberry. Local nurseries can suggest a number of environmentally responsible species you can use in your landscape and gardens.



Wild Ginger



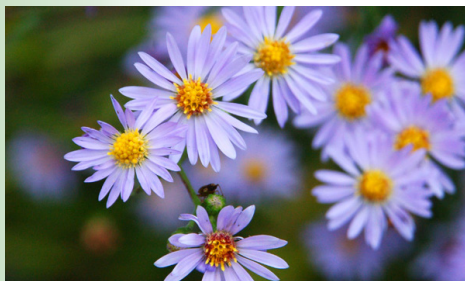
Wild Strawberry



Virginia Creeper

HOW TO HELP PROTECT YOUR LOCAL NATURAL FEATURES

- Allow the understory that exists in your woodland to remain undisturbed and regenerate.
- Please keep your dogs and cats under control. Free ranging pets can kill or harass wildlife.
- Please stay on the trail and do not use / create informal footpaths in the woodland.
- Leave Only Footprints – please don't remove plants from natural areas.
- Please do not dump yard waste, garbage, soil, branches, lawn clippings, or compost into the natural or public areas. These dumped materials can smother native plants.
- Use organic alternatives to pesticides and fertilizers: these can have direct and indirect effects on plants, animals, insects, and watercourses.
- Use alternatives such as sand or kitty litter on icy areas for traction
- Mulch planting beds and trees to help reduce evaporation and regulate the soil temperature.
- Follow the current pesticide regulations in Ontario and the City of Cambridge (<https://www.ontario.ca/page/pesticides-home-lawns-and-gardens>);



Sky Blue Aster
(*Symphyotrichum oolentangiense*)



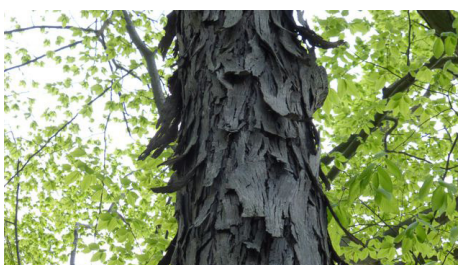
Eastern Cottonwood
(*Populus deltoides*)



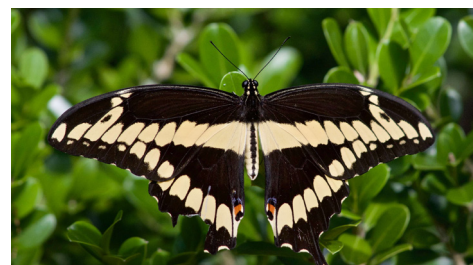
Midland Painted Turtle
(*Chrysemys picta*)



Jack-in-the-pulpit
(*Arisaema triphyllum*)



Shagbark Hickory
(*Carya ovata*)



Giant Swallowtail
(*Papilio cresphontes*)

THANK YOU FOR DOING YOUR PART.

Through your actions and good stewardship,
These natural areas can be enjoyed by future generations.

TEXT AND MAP REGARDING COMMUNITY PARKING PLACEHOLDER FOR MHBC

CONTACTS / INFORMATION



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Region of Waterloo

Region of Waterloo

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Web: www.regionofwaterloo.ca



Grand River Conservation Authority

400 Clyde Road, PO Box 729, Cambridge, Ontario, N1R 5W6
Phone: (519) 621-2761 | Toll free: 1-866-900-4722
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NORTH AMERICAN
NATIVE PLANT SOCIETY

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Web: www.nanps.org



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Carolinian Canada Coalition:

Web: www.caroliniancanada.ca