Development Assessment Report for the Bridle Path North Subdivision

Final Report

April 16, 2025

Prepared for:
York Development

Prepared by:
Stantec Consulting Ltd.
1305 Riverbend Road, #400
London, ON N6K 0J5

Project/File:
161414396

Stantec

Limitations and Sign-off

The conclusions in the Report titled Bridle Path North Subdivision are Stantec's professional opinion, as of the time of the Report, and concerning the scope described in the Report. The opinions in the document are based on conditions and information existing at the time the scope of work was conducted and do not take into account any subsequent changes. The Report relates solely to the specific project for which Stantec was retained and the stated purpose for which the Report was prepared. The Report is not to be used or relied on for any variation or extension of the project, or for any other project or purpose, and any unauthorized use or reliance is at the recipient's own risk.

Stantec has assumed all information received from Middlesex County (the "Client") and third parties in the preparation of the Report to be correct. While Stantec has exercised a customary level of judgment or due diligence in the use of such information, Stantec assumes no responsibility for the consequences of any error or omission contained therein.

This Report is intended solely for use by the Client in accordance with Stantec's contract with the Client. While the Report may be provided to applicable authorities having jurisdiction and others for whom the Client is responsible, Stantec does not warrant the services to any third party. The report may not be relied upon by any other party without the express written consent of Stantec, which may be withheld at Stantec's discretion.

Prepared by: Ellah, Mitch 2025.04.16 15:04:50 -04'00'
Signature

Mitch Ellah, Tech. Dipl., B.Sc. (Hons)
Aquatic Biologist
Printed Name and Title

Prepared by: Digitally signed by Straus, Melissa Date: 2025.04.17 10:26:50 -04'00'
Signature

Melissa Straus, M.Sc.
Senior Ecologist
Printed Name and Title

Reviewed by: Digitally signed by Spisani, Sean Date: 2025.04.16 19:40:33 -04'00'
Signature

Sean Spisani, B.Sc., ERGC
Senior Associate, Senior Ecologist
Printed Name and Title

Approved by: Keene, Joe Digitally signed by Keene, Joe Date: 2025.04.16 16:54:50 -04'00'
Signature

Joe Keene, B.Sc., M.Sc.
Aquatic Biologist
Printed Name and Title

Table of Contents

List of Tables

List of Appendices

Acronyms / Abbreviations

ANSI	Areas of Natural and Scientific Interest
ARU	Autonomous Recording Unit
C	Coefficient of Conservatism
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
COSSARO	Committee on the Status of Species at Risk in Ontario
DAR	Development Assessment Report
DBH	Diameter at Breast Height
DFO	Fisheries and Oceans Canada
ECCC	Environment and Climate Change Canada
ELC	Ecological Land Classification
ESA	Endangered Species Act
FWCA	Fish and Wildlife Conservation Act
HADD	Harmful Alteration, Disruption, or Destruction
HDFA	Headwater Drainage Feature Assessment
MBCA	Migratory Birds Convention Act
MBR	Migratory Birds Regulation
MECP	Ministry of Environment, Conservation and Parks
MMAH	Ministry of Municipal Affairs and Housing
MNHSS	Middlesex Natural Heritage Systems Study
MNR	Ministry of Natural Resources
NHIC	Natural Heritage Information Centre
NHRM	Natural Heritage Reference Manual
OBBA	Ontario Breeding Bird Atlas

OP	Official Plan
O. Reg	Ontario Regulation
PA	Planning Act
PPS	Provincial Planning Statement
PSW	Provincially Significant Wetlands
SAR	Species at Risk
SARA	Species at Risk Act
SARO	Species at Risk in Ontario List
SOCC	Species of Conservation Concern
SWH	Significant Wildlife Habitat
SWHTG	Significant Wildlife Habitat Technical Guide
UTRCA	Upper Thames River Conservation Authority

1 Introduction

Stantec Consulting Ltd. (Stantec) was retained by York Developments to complete a Development Assessment Report (DAR) for two properties in the Municipality of Middlesex Centre, located north and south of Medway Road, and west of Richmond Street in Arva Ontario, herein referred to as the Subject Lands. The DAR was completed for the Subject Lands plus adjacent lands within 120 metres (m) of the Subject Lands boundary, herein referred to as the Study Area (Appendix A, Figure 1, referenced as Figure A.1).

York Developments is proposing to build a subdivision within the Subject Lands (the Project). The proposed subdivision will be a mix of low-density, medium-density and high-density residential development with retail/office space, as well as open space, parks, stormwater management, roads and a water pumping station. The limit of development, herein referred to as the Project Development Boundary (PDB), is the Subject Lands minus open space blocks proposed for the development, extending north and south of Medway Road along the west side of Highway 4 (Figure A.1).

The Middlesex County and Middlesex Centre Official Plan (OP) identifies that development within or adjacent to a natural feature requires a DAR. Natural features identified in the OP may be impacted by the Project and, as such, a DAR is required for this Project.

The collection of information and data for the DAR was completed over the course of two years, from 2023 – 2024. A natural heritage assessment of the Study Area was completed to inform the DAR through the collection of background data, field data and correspondence with appropriate provincial and municipal agencies.

This DAR was prepared to provide natural heritage policy considerations, ecological survey results, an analysis of potential impacts on natural features and functions, recommendations for appropriate measures to avoid or reduce potential negative impacts, as well as proposed restoration and habitat compensation. Authorization and permitting requirements are also identified for the relevant natural heritage legislation.

The preparation of this DAR meets the requirement outlined in the Middlesex Centre and County OP and was prepared in consideration of the requirements provided in Section 3.8 of the OP. This DAR should be reviewed in conjunction with other reports prepared for the Project, including the Preliminary Geotechnical Investigation & Slope Stability Assessment (EXP 2023), Meander Belt Assessment (Stantec 2025), Hydrogeological Assessment and Water Balance Assessment (EXP 2024), and Functional Stormwater Management Report (Stantec 2025).

2 Natural Heritage Policy Overview

The following sections discuss the legislation and policy documents that establish the natural heritage context for the Study Area. These documents were used to identify natural features that require consideration through the DAR process. Legislation and policy are presented for the federal, provincial, and municipal planning context.

2.1 Federal Context

2.1.1 Species at Risk Act

The *Species at Risk Act, 2002* (SARA) provides a framework across Canada to prevent the extinction of wildlife species and to support actions for their recovery.

General SARA prohibitions include Section 32(1), which states that “no person shall kill, harm, harass, capture, or take an individual of a wildlife species that is listed as an extirpated species, an endangered species or a threatened species”, and Section 33, which states that “no person shall damage or destroy the residence of one or more individuals of a wildlife species that is listed as an endangered species or a threatened species, or that is listed as an extirpated species if a recovery strategy has recommended the reintroduction of the species into the wild in Canada.” In addition, critical habitat, defined as the habitat that is necessary for the survival or recovery of a listed wildlife species, may be defined and protected under Section 58. Only those species currently listed in Schedule 1 of SARA (i.e., those listed as extirpated, endangered, or threatened) are protected by the prohibitions of Sections 32 to 36 and 58 of SARA, and then only on federal lands, except for aquatic species and migratory birds which are protected throughout Canada by other acts and regulations. SARA-listed species designated as special concern are not protected by the prohibitions of Sections 32 to 36 or 58 of SARA; however, these species are protected under Section 79, which states that federal authorities must “identify adverse effects of the project on the listed wildlife species [including special concern species] and its critical habitat…and ensure that measures are taken to avoid or lessen adverse effects.” Furthermore, special concern species do require that provincial or regional management plans, including conservation measures, be developed to protect the species.

For this Project, the SARA applies to aquatic SAR (fish and freshwater mussels) known to occur in Medway Creek within the Study Area. Protected habitat for these species, identified as critical habitat, is identified in species-specific Recovery Strategies.

2.1.2 Fisheries Act

The *Fisheries Act, 1985* is the main federal law governing fisheries in Canada and is administered by Fisheries and Oceans Canada (DFO). *The Fisheries Act* provides for the management and control of fisheries, the conservation and protection of fish, the protection of fish habitat and pollution prevention. Projects that may impact fish, fish habitat, aquatic SAR and aquatic invasive species may be subject to

DFO review. The *Fisheries Act* prohibits causing the death of fish and the harmful alteration, disruption, or destruction (HADD) of fish habitat, unless authorized by the Minister of Fisheries, Oceans, and the Canadian Coast Guard. Conditions and circumstances for projects to be exempt from review are listed on DFO's Fish and Fish Habitat Protection Program web pages. Following guidance and criteria provided on DFO's website regarding mitigation, waterbody types and codes of practice, proponents determine whether their projects in or near water will require review by DFO. DFO review is requested through the submission of a 'Request for Review' (RfR) form. Following completion of their review, DFO can proceed in two ways: 1) issue a Letter of Advice indicating that the proposed work complies with the *Fisheries Act* or, 2) refer the project to the Regulatory Review Unit for site specific review. If the project can avoid impacts to fish and fish habitat, project approval is not required. If impacts that cause a HADD cannot be avoided, proponents must apply for a *Fisheries Act* Authorization and may be required to develop a habitat offsetting or compensation plan.

Fish habitat in the Study Area includes Medway Creek and tributaries to Medway Creek

2.1.3 Migratory Birds Convention Act

The *Migratory Birds Convention Act, 1994* (MBCA) prohibits the killing or capturing of migratory birds, as well as the damage, destruction, removal, or disturbance of their nests. The Migratory Birds Regulation, 2022 (MBR), further defines when nests of migratory bird species are protected, with special provisions in place for bird species that reuse their nests (e.g., Pileated Woodpecker, Great Blue Heron).

Most bird species in Canada are protected under the MBCA, as defined by Article I, which names the families and subfamilies of birds protected, and provides clarification of which species are included. In southern Ontario, migratory birds generally nest between April 1 and August 31. ECCC can issue permits allowing the destruction of nests for scientific, agricultural, or health and safety purposes. New development and site alterations do not qualify as a permitted activity under the MBCA and failure to comply with the MBCA/MBR could result in a charge.

2.2 Provincial Context

2.2.1 The Planning Act / Provincial Planning Statement

The Provincial Planning Statement (PPS, previously the Provincial Policy Statement; MMAH 2024) was issued under Section 3 of the *Planning Act*, 1990 (PA) and came into effect in 1996. The PPS has been updated several times since 1993. The 2024 PPS came into effect on October 20, 2024. The PA requires that decisions made by planning authorities are consistent with the policy statements, such as the PPS, which includes policies on development and land use patterns, resources and public health and safety. Section 4.1 of the PPS deals with natural heritage and requires that natural heritage systems are identified in certain ecoregions. This includes Ecoregion 7E, where the Study Area is located.

According to Section 4.1.4 of the PPS, development and site alteration shall not be permitted in the following natural features in Ecoregion 7E:

a) Significant wetlands; or,

b) Significant coastal wetlands.

According to Section 4.1.5 of the PPS, development and site alteration shall not be permitted in the following features, unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions in Ecoregion 7E:

a) Significant Woodlands

b) Significant Valleylands

c) Significant Wildlife Habitat

d) Significant Areas of Natural and Scientific Interest

e) Coastal wetlands that are not subject to policy 4.1.4(b).

According to Section 4.1.6 and 4.1.7 of the PPS, development and site alteration shall not be permitted in the following features, except in accordance with provincial and federal requirements:

a) Significant habitat of endangered or threatened species

b) Fish habitat.

Development and site alteration are not permitted on lands that are adjacent to the natural heritage features and areas identified above 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.

The PPS also requires natural heritage systems to be identified in various ecoregions, including Ecoregion 7E where the Study Area occurs. Furthermore, the diversity and connectivity of natural features in an area, and the long-term ecological function and biodiversity of natural heritage systems, should be maintained, restored or, where possible, improved, recognizing linkages between and among natural heritage features and areas, surface water features and ground water features.

Technical guidance documents have been prepared by the province to support the PPS, including the Natural Heritage Reference Manual (MNR 2010), the Significant Wildlife Habitat Technical Guide (MNR 2000), the Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E (MNR 2015), and the Ontario Wetland Evaluation System, Southern Manual (MNR 2022).

2.2.2 Conservation Authorities Act

The Conservation Authorities Act, 1990, was updated in late 2022 with the purpose to provide for the organization and delivery of programs and services that further the conservation, restoration, development, and management of natural resources in watersheds in Ontario.

The Project is within the Upper Thames River Conservation Authority (UTRCA) jurisdiction which administers *Ontario Regulation (O. Reg.) 41/24: Prohibited Activities, Exemptions and Permits* under Section 28 of the Conservation Authorities Act. As of April 1, 2024, the UTRCA will review and make

decisions on applications for permits in accordance with Part VI of the Conservation Authorities Act and O. Reg. 41/24. This regulation identifies prohibited activities, exemptions and permits for development activities within regulated areas which include hazardous lands (areas associated with flooding, erosion, dynamic beaches or unstable soil or bedrock), watercourses, wetlands, and other areas including within 30 m of a wetland. Development activities are defined in the regulation, and include construction, site grading, and temporary and permanent stock piling of material. Prior to undertaking development activities in regulated areas, written approval (i.e., a Permit or a Letter of Permission) from the UTRCA is required.

Medway Creek flows through the Study Area (Figure A.2). Medway Creek is regulated by the UTRCA, and the Regulation Limit boundary intersects with the Subject Lands (Figure A.2). Unidentified wetlands may also occur in the Study Area.

2.2.3 Endangered Species Act

The Ontario *Endangered Species Act, 2007* (ESA) protects species designated as threatened, endangered, or extirpated on the Species at Risk in Ontario (SARO) list. The ESA prohibits the killing, harming, harassing, or possessing protected species, as well as prohibiting damage or destruction to the habitat of the listed species. Listed species are referred to as species at risk (SAR) and are provided with general habitat protection under the ESA to protect areas that species depend on to carry out their life processes, such as reproduction, rearing, hibernation, migration or feeding. Some species are also protected by detailed habitat regulations that go beyond the general habitat protection to define the extent and character of protected habitats.

Activities that may impact a protected species or its habitat require the prior issuance of a permit from the Ministry of the Environment, Conservation and Parks (MECP), unless the activities are applicable under O. Reg. 242/08, O. Reg. 830/21, or O. Reg. 829/21. These regulations identify activities that are exempt from the permitting requirements of the ESA and are subject to rigorous controls outside the permit process, including registration of the activity and preparation of a mitigation plan. An overall benefit permit application, submitted to the MECP, may be required for activities that are not exempt under these regulations.

The type of activity associated with the Project is not exempt from ESA permitting requirements, although species-specific exemptions may still apply.

2.2.4 Fish and Wildlife Conservation Act

The provincial *Fish and Wildlife Conservation Act,* 1997 (FWCA) provides protection of wildlife in Ontario including fish, furbearing mammals, game wildlife and specially protected wildlife through regulations for hunting, trapping, and fishing practices. Game and specially protected mammals, birds, reptiles, amphibians, and invertebrates are listed on Schedules 1-11 of the FWCA. Definitions provided for hunting include capturing or harassing wildlife (Section 5) and would include activities that collect or handle wildlife for inventories or other scientific purposes, or to relocate wildlife out of harm's way (e.g., during construction activities), including individuals and eggs. Sections 7 and 8 also provide protection for nest

and eggs of specified bird species including raptors, and dens of bears and furbearing animals, and beaver dams. Under the FWCA, the Minister has the authority to authorize activities that would otherwise be prohibited such as the safe capture of wildlife and removal of nests, dens, and dams, and impose conditions on an authorization.

2.3 Municipal Context

2.3.1 Middlesex County Official Plan

The Middlesex County OP (Middlesex County 2023) Natural Heritage System policies in Section 2.3.10 are designed to address the appropriateness of development and restrict these activities to locations which do not adversely affect the sustainability of features within the Natural Heritage System and their ecological functions.

Schedule C of the OP identifies lands that have significant natural heritage features and ecological functions which should be considered when development proposals are reviewed. The natural heritage features shown on Schedule C are derived from the Middlesex Natural Heritage Systems Study (MNHSS) (UTRCA 2014) and make up the County's Natural Heritage System.

As per the OP (Middlesex County 2023), development and site alternation shall not be permitted within the following Natural Heritage System features:

- Provincially Significant Wetlands (PSW)
- Fish Habitat, except in accordance with provincial and federal requirements; and
- Habitat of Endangered and Threatened Species, except in accordance with provincial and federal requirements

The OP also states that "development and site alteration shall not be permitted within the following Natural Heritage System features unless it has been demonstrated that there will be no negative impacts on the Natural Heritage System features or their ecological functions":

- Significant Woodlands
- Significant Valleylands
- Significant Wildlife Habitat
- Significant Areas of Natural and Scientific Interest; and
- Significant Vegetation Groups and significant Vegetation Patches as defined in the MNHSS (UTRCA 2014).

Development and site alteration may be permitted on lands adjacent, within 120 m, to the Natural Heritage System if it does not result in any of the following:

- A loss of ecological functions
- Subsequent demand for future development which will negatively impact on existing ecological function of the Natural Heritage System
- Conflict with existing site-specific Natural Heritage System management practices; or
- Negatively impact ecological linkage functions which exist within adjacent lands.

Where development is proposed within 30 m of locally significant wetlands, a hydrogeological assessment shall be completed to the satisfaction of the conservation authority. Areas identified as Natural Heritage Features shall not be acceptable as part of the dedication for park purposed required under the Planning Act.

It is the policy of the County that the Natural Heritage System shall be designated in local Official Plans and permitted used shall generally be restricted to:

- Existing used, including limited expansion where it has been demonstrated that such expansion will have no negative impact upon the natural features or their ecological functioning
- Agricultural used and normal farm practices
- Conservation
- Forestry, fisheries and wildlife management
- Passive recreation
- Public parks and trails, and
- Horticulture

The OP policy states that “when development within a Natural Heritage Feature, or on the adjacent lands within 120 m to that feature, the applicant will be required to submit a Development Assessment Report (DAR) in accordance with policies of Section 2.2.1.” As the Subject Lands and Study Area contain features that make up the Natural Heritage System identified in Schedule C of the OP, a DAR is required for the Project.

2.3.2 Middlesex Centre Official Plan

The Middlesex Centre OP (Middlesex Centre 2024) identifies policies for natural areas and natural hazard areas in Section 3.0 of the OP. The goal of the policies is to identify, protect, conserve, and enhance, wherever possible, significant natural features and functions throughout the Municipality for the long term, and to be consistent with the PPS, the County of Middlesex OP and requirements and policies of Conservation Authorities. The policy aims to consider the Municipality’s natural heritage system as part of a larger system that should be considered at the watershed-level and consistent with adjacent municipalities.

The OP separates natural features into those where development is prohibited (areas designated Natural Environment Areas, Schedule A), those where development/alteration may be permitted subject to the conclusions of a DAR, and those where preservation is encouraged (e.g., woodlots, roadside, and fence

line plantings). The OP also separates Natural Hazard areas into floodplain areas (Schedule A) and additional Natural Hazard areas including steep slopes or fill line conditions (Schedule C).

2.3.2.1 Natural Environment Areas

The OP states that all development or site alteration (except for permitted uses outlined in Section 3.5 of the OP) shall be prohibited within the following types of natural areas:

- Wetlands
- Significant habitat of endangered or threatened species
- Floodplain and flood prone areas mapped and/or regulated by a Conservation Authority

These features, as shown on Schedule A of the OP, may be subject to boundary adjustments through detailed studies as part of a DAR, if to the satisfaction of the Municipality in consultation with appropriate agencies.

2.3.2.2 Greenland Features

The Greenland Features Overlay is shown on Schedule B of the OP and the areas identified on the schedule predominantly constitutes Significant Woodlands. These woodlands are of County significance and were identified through the MNHS (UTRCA 2014). Development or site alterations within or on lands adjacent to Greenland Features are subject to a DAR and are prohibited unless it can be shown that there will be minimal or no impacts on the form or function of the features. Permitted uses are outlined in Section 3.5 of the OP.

Natural features subject to a DAR and development permissibility are shown in Table 1.

Table 1 Areas Subject to Development Assessment Report (excerpt from Middlesex Centre 2024)

Natural Feature Type	Development adjacent to Natural Feature Type	Development within Natural Feature Type
wetlands and adjacent lands. Adjacent lands are those within 120 metres of an individual wetland area or land connecting individual wetlands within a wetland complex	DAR required within 120 m	Not Permitted
significant habitat of endangered or threatened species	DAR required within 100 m	Not Permitted
floodplains and flood prone areas mapped and/or regulated by a Conservation Authority	DAR required within 50 m	Not Permitted
significant woodlands and ANSI's as identified on Schedule 'B'	DAR required within 50 m	DAR Required
significant wildlife habitat	DAR required within 50 m	DAR Required
significant valley lands	DAR required within 50 m	DAR Required
fish habitat	DAR required within 30 m	Not Permitted

2.3.2.3 Floodplain and Natural Hazard Areas

Schedule A of the OP outlines land use related to floodplain areas while Schedule C identifies additional natural hazards (i.e., hazard or fill line conditions). As the Subject Lands are located within an identified settlement area (Schedule A-3: Arva Community Settlement Area), the policies associated with Section 3.6.2 apply. This includes an evaluation of the floodplain area, establishment of a "two-zone" floodplain distinction that identifies the floodway and the flood fringe. The development of amenity uses relating to development may be permitted within the flood fringe if considered appropriate. This may include accessory structures, rear yards of residential lots, parking areas, or other similar and acceptable uses. The DAR will include an evaluation of appropriate risk management to potential flood hazard and establish that there are no alternatives available to locate amenity uses on portions of land outside of the flood fringe.

Table 2 Natural Hazard Area (excerpt from Middlesex Centre 2024)

Natural Hazard Feature	Boundary Defined By:	Development and Site Alterations may be Permitted Where:
Flood plains and flood prone areas mapped and/or regulated by a Conservation Authority	regulations administer by, or mapping provided by, the Conservation Authorities.	DAR demonstrates no increased risk to life and property and no impact on flood conveyance, upstream or downstream flood levels or aggravation of existing natural hazard processes such as slope stability. DAR's should also demonstrate no negative impacts on natural features / functions.
Slope hazards	mapping provided by the Conservation Authorities	DAR demonstrates no increased risk to life and property and no impact on: slope stability; flooding; upstream or downstream properties; aggravation of existing natural hazard processes; or negative impacts on natural features / functions.

Two types of natural features identified in the Middlesex Centre OP are adjacent to and/or on the Subject Lands which meet the criteria requiring a DAR:

- Significant Woodland (adjacent lands; Middlesex Centre OP (2024) Schedule B); and
- Hazard Lands (on the Subject Lands; Middlesex Centre OP (2023) Schedule C)
- UTRCA regulated area (discussed in Section 2.2.2).

Current designations on the Subject Lands as shown on A-3 of the OP, Arva Community Settlement Area, is residential with a portion of the PDB contained within the floodplain. It is our understanding from the draft Planning Justification Report (MHBC, draft) that an Official Plan Amendment will be required.

2.3.3 Middlesex County Woodlands Conservation By-law No. 7314

The Middlesex County Woodlands Conservation By-law No. 7314 (Middlesex County 2025) regulates the destruction or injuring of trees within woodlands on private property to prevent deforestation, overharvesting and to promote good forestry practices. The County's Woodlands Conservation Officer administers and enforces the By-law.

Legislative exemption 5(a)(iv) states that: "The injuring or destruction of trees imposed as a condition to the approval of a site plan, a plan of subdivision, or a consent under Sections 41, 51, or 53, respectively, of the Planning Act, or as a requirement of a site plan agreement or subdivision agreement entered into under those sections."

3 Methods

The scope of the DAR was prepared in consultation with the UTRCA and Middlesex Centre. As part of the pre-consultation process, an Existing Conditions memo (dated March 15, 2024) along with a draft plan of subdivision, topographic survey, slope stability assessment, preliminary geotechnical assessment, and hydrogeological assessment were submitted to the UTRCA and Municipality for review. A pre-consultation meeting was held on April 11, 2024, with follow up feedback provided by the UTRCA on April 30, 2024. Pre-consultation meeting minutes and UTRCA comments are provided in Appendix B.

Methods used to complete the DAR's natural heritage assessment are provided in the sections below.

3.1 Background Review

A variety of background documents and sources of information were consulted during the initial stages of the Project review and field work planning. These information sources were used to identify records of natural heritage features, SAR and species of conservation concern (SOCC) in the Study Area. The following information sources were reviewed:

- Natural Heritage Information Centre (NHIC) database (MNR 2025a)
- Ontario GeoHub database (MNR 2025b)
- Species at Risk in Ontario List (SARO) (MECP 2025)
- Fisheries and Oceans Canada (DFO) Aquatic Species at Risk Map (DFO 2025a)
- Environment and Climate Change Canada Critical Habitat Database (ECCC 2024a)
- Middlesex County Online Mapping (Middlesex County N.D)
- Middlesex Natural Heritage Systems Study (UTRCA 2014)
- Middlesex Centre Official Plan (Middlesex Centre 2024)
- iNaturalist database (iNaturalist 2024)
- eBird database (eBird 2024)
- Ontario Butterfly Atlas (TEA 2024a)
- Ontario Moth Atlas (TEA 2024b)
- Ontario Reptile and Amphibian Atlas (Ontario Nature 2019)
- Ontario Mammal Atlas (Dobbyn 1994)
- Ontario Breeding Bird Atlas (OBBA; Cadman et al. 2007)
- Upper Thames River Conservation Authority (UTRCA) Regulated Area Screening Map (UTRCA 2024a)
- UTRCA Source Protection Planning (UTRCA 2024b)

The NHIC (MNRF 2025a), Ontario GeoHub (MNRF 2025b), Middlesex County online mapping (Middlesex County N.D) and Middlesex Natural Heritage Systems Study (UTRCA 2014) were used to determine the presence and extent of the designated natural features located in the Study Area.

Background data sources were reviewed to identify species with known ranges that overlap with the Study Area, including SAR and SOCC.

The bird, mammal, reptile and amphibian range maps are relatively coarse in nature and do not offer precise locations or information on concentrations / densities of records; for example, the Ontario Breeding Bird Atlas records are provided in 10 kilometre (km) by 10 km square grids. The NHIC database provides more precise mapping than the atlases (1 km by 1 km squares) and is a better indicator of occurrence of SAR and/or SOCC. The DFO Aquatic Species at Risk Map is based on records of the species in a specific watercourse/waterbody and displays if the watercourse in question provides Critical Habitat for aquatic SAR or occupied habitat for aquatic SAR.

3.2 Field Investigations

Background information was supplemented with a field program undertaken by Stantec in 2023 and 2024 to document existing natural heritage conditions and complete a biological inventory within the Study Area.

Field investigations occurred on six dates in 2023 and seven dates in 2024. Surveys conducted over the two years included vegetation community mapping through ecological land classification (ELC), a 3-season botanical inventory, breeding amphibian call surveys, bat maternity roost tree and bat community survey, breeding bird surveys, headwater drainage feature assessment and terrestrial and aquatic habitat assessments.

A summary of field investigations is shown in Table 3.

Table 3 Summary of Field Investigations

Type of Field Work	Date(s) of Field Work	Surveyors
Vegetation Surveys		
Spring Botanical Inventory and ELC	May 25 and 30, 2023	B. Miller
Summer Botanical Inventory and ELC	July 25 and 26, 2023	B. Miller
Fall Botanical Inventory and ELC	September 27, 2023	B. Miller
Wildlife Surveys		
Breeding Amphibian Survey Round 1	April 13, 2023	B. Miller
Breeding Amphibian Survey Round 2	May 25, 2023	B. Miller
Breeding Bird Survey Round 1	June 12, 2024	M. Ellah
Breeding Bird Survey Round 2	June 28, 2024	M. Ellah
Bat Maternity Roost Survey	April 1, 2024	M. Ellah
Bat Community Survey	June 18 – July 4, 2024	M. Ellah
Wildlife Habitat Assessment	Conducted concurrently with vegetation surveys	B. Miller
Incidental Wildlife Observations	During all field surveys	All Staff
Aquatic Surveys		
Medway Creek and tributaries Aquatic Habitat Assessment	November 2, 2023	M. Ellah
Headwater Drainage Feature Assessment Round 1	April 1, 2024	M. Ellah
Headwater Drainage Feature Assessment Round 2	June 12, 2024	M. Ellah
Headwater Drainage Feature Assessment Round 3	July 23, 2024	M. Ellah

3.2.1 Vegetation Surveys

Detailed botanical inventories and ELC assessments of the Study Area were conducted in May, July, and September 2023 on the north and south sides of Medway Road. Specific survey dates are shown in Table 3.

Identification and mapping of vegetation communities followed the protocols of the *Ecological Land Classification (ELC) field guide for Southern Ontario* (Lee et al., 1998). Updates to vegetation community names and codes followed the 2008 catalogue of ELC vegetation communities. Vegetation communities were delineated on aerial imagery and verified in the field. Feature boundary delineation for woodlands and wetlands were not undertaken with the applicable agencies. Vegetation assessments provided in this report include a general description of the community as well as lists of the dominant species in the canopy / sub-canopy, understory, and ground layers. The Study Area was systematically covered on foot to document plant species present over three seasons of observations. Targeted searches were

conducted for SAR and SOCC plants known to occur in the vicinity of the Study Area as well as within areas that could potentially be impacted by the Project.

Identification of potentially sensitive native plant species is based on their assigned coefficient of conservatism (CC) value, as determined by Oldham et al. (1995). This C value, ranging from 0 (low) to 10 (high), is based on a species' tolerance of disturbance and fidelity to a specific natural habitat. Species with a C value of 8, 9 or 10 generally exhibit a high degree of fidelity to a narrow range of habitat parameters.

Flora nomenclature and the provincial status of plant species is based on the Ontario vascular plant list available on the NHIC database (MNRF 2025a).

The provincial status of vegetation communities present in the Study Area is based on the Ontario plant community list available on the NHIC database (MNRF 2025a).

3.2.2 Amphibian Survey

Two amphibian surveys were conducted in the spring of 2023 using the protocols outlined in the Marsh Monitoring Program (MMP) Manual (Bird Studies Canada and Environment Canada 2008).

Amphibian breeding habitat was not previously documented in the Study Area, however, during a mid-April site visit in 2023, two areas of pooling surface water were observed in wetlands in the Study Area (in the MAMM3a and SWTM3-3a). These pools were identified as potential amphibian breeding habitat. An amphibian breeding survey station was created nearby both features (AMP01 and AMP02, Figure A.3).

One amphibian breeding survey was conducted at both stations on April 13, 2023. The second amphibian breeding survey occurred on May 23, 2023. Water was not present in either station during the second survey and there were no amphibians calling. As the stations were dry on the second survey, a third survey in June 2023 was not conducted.

Surveys were conducted at least one-half hour after sunset in conditions with calm winds (Beaufort scale of 0-3) and no precipitation (although light rain, fog or damp conditions provide suitable conditions for surveying). Surveys met the night-time temperature requirements for April (>5°C).

Each of the two survey stations (Figure A.3) consisted of a 100 m radius semicircle. The surveyor stood at the edge of the station and listened for three minutes for calling toads and frogs within and outside of the survey station boundary. Call levels were described using values of 1, 2, or 3. As per the MMP Protocol: Level 1 indicates that individuals can be counted and calls are not simultaneous, Level 2 indicates that calls are distinguishable with some simultaneous calling and Level 3 indicates a full chorus where calls are continuous and overlapping.

Survey time and weather conditions are provided in Table 4.

Table 4 Amphibian Survey Date, Time, and Weather Conditions

Survey	Date/Time	Temp. (°C)	Wind (Beaufort Scale)	Cloud (%)	Precipitation	Surveyors
1	April 13, 2023 20:40 – 21:00	21	1	5	None	B. Miller
2	May 23, 2023 21:20 – 21:25	18	1	5	None	B. Miller

3.2.3 Breeding Bird Surveys

Breeding bird surveys were conducted on two dates in June of 2024. Eight survey stations were created in the Study Area including two transects specifically for grassland breeding birds. A conservative approach to determining breeding status was taken; birds seen or heard in appropriate habitat during the breeding season were assumed to be breeding.

Surveys were conducted between a half an hour before sunrise and 9:00 am for the grassland transects and 10:00 am for the remainder of the Subject Lands. Weather conditions (i.e., precipitation and visibility) were within the parameters required by monitoring programs such as Environment Canada's Breeding Bird Survey (ECCC 2023).

Habitat suitable for grassland SAR birds was surveyed following the document *Survey Protocol for Eastern Meadowlark (Sturnella magna) in Ontario* (OMNR 2013a). The OMNR (2013a) survey protocol requires three surveys to detect grassland SAR birds, however, upon completion of the second bird survey, the suitable grassland SAR bird habitat had been removed as the hayfields were cut. Because the suitable habitat for grassland SAR birds was no longer present, a third survey was not completed for the Project.

Survey times, weather conditions, and observers are provided below in Table 5.

Table 5 Breeding Bird Survey Dates, Times, and Weather Conditions

Survey	Date/Time	Temp. (°C)	Wind (Beaufort Scale)	Cloud (%)	Precipitation	Surveyors
1	June 12, 2024 07:00 – 10:00	11-15	2	90	None	M. Ellah
2	June 28, 2024 07:10 – 09:50	11-16	2	100	None	M. Ellah

3.2.4 Bat Maternity Roost and Bat Community Surveys

3.2.4.1 Bat Roost Suitability Survey

3.2.4.1.1 Cavity Roosting Bats

Based on criteria in the *Survey Protocol for Species at Risk Bats Within Treed Habitats* (Ontario Ministry of Natural Resources and Forestry [OMNR] 2017), forest communities within the Study Area were considered potential bat maternity roost habitat. Additionally, a targeted survey was completed on April 1, 2024, to identify candidate bat maternity roost trees within the Subject Lands where tree removals were anticipated.

Maternity roost tree assessment for bats that roost in tree cavities trees at or above 10 cm diameter at breast height (DBH) with characteristics considered suitable for bat roosting (i.e., cavities, crevices, loose bark) were assessed, with the following information recorded:

- Geographic coordinates (UTM)
- DBH
- tree height
- presence of cavity, loose bark, crack or knot hole
- cavity height
- tree height and DBH relative to trees in the surrounding landscape
- canopy open/closed
- presence of other candidate roost trees in vicinity
- decay class category (early, category 1-3 or late, category 4 - 6)

There is no minimum threshold for number of maternity roost trees per hectare for an ELC ecosite to be considered suitable maternity roost habitat for SAR bats. Bat maternity roosts are also discussed in Section 3.2.6 under Significant Wildlife Habitat (SWH).

3.2.4.1.2 Foliage Roosting Bats

ELC was used to document potential roost habitat within the Study Area. All ELC communities with trees or shrubs are considered potential bat roosting habitat for tree foliage roosting bats.

3.2.4.1.3 Structure Roosting Bats

Some bats, (e.g., Big Brown Bat (*Eptesicus fuscus*), Little Brown Myotis and Northern Myotis), will roost in buildings. Habitat assessments and bat community surveys were not undertaken for the residences located in the Subject Lands along Richmond Street. These surveys are recommended to be undertaken prior to demolition, to confirm SAR bats are not utilizing these structures.

3.2.4.2 Bat Community Surveys

Bat community surveys took place using automatic recording units (ARU) from June 18 to July 4, 2024.

Two (2) bat ARU stations (Bat-01, Bat-02) were established in in proximity to suitable roost trees, including at the best snag trees identified in the Subject Lands and where tree removals are proposed (Figure A.3 – shown as Bat Community Survey Station).

The ARU surveys followed the survey methodology from OMNRF 2017, which recommends ten nights of surveys in June when air temperatures are >20°C starting at dusk for 5 hours.

The ARUs used for the survey was the SM4BAT FS Ultrasonic Recorder made by Wildlife Acoustics (Wildlife Acoustics 2024). The ARUs were programed to record bat activity from 30 minutes before sunset until 30 minutes past sunrise for 15 evenings from June 18 to July 4, 2024. This exceeds the OMNRF requirements, as all 15 nights for the full duration of the recordings were analyzed.

ARUs were collected after the survey period and recorded data were analyzed with Wildlife Acoustics Kaleidoscope Pro software. The data processing involves running the software's automatic identification, which screens out noise files and provides a suggested species for each bat call file. For each species of bat identified by the software, a subset of calls was manually reviewed to confirm the species identification. For calls where species identification was not possible (due to short call sequence recording), calls were classified as unidentified bats.

3.2.5 Incidental Wildlife

Observations of wildlife (birds, reptiles, mammals, amphibians, and insects) and signs of wildlife were recorded during field investigations, including species that were detected by sight and sound, dens, nests, burrows, browse, tracks, and scat. Surveyors searched areas where wildlife are likely to concentrate (e.g., along the creek bank, in woodlands or thickets, and open foraging and basking habitat) to improve the likelihood of encountering wildlife and evidence of wildlife, and recorded species, their respective numbers, and took notes on habitat and behavior.

3.2.6 Significant Wildlife Habitat

Wildlife habitat is defined as an area where plants, animals and other organisms live, including areas where species concentrate at a vulnerable point in their life cycle and that are important to migratory and non-migratory species. The Significant Wildlife Habitat Ecoregion 7E Criterion Schedule (Ontario Ministry of Natural Resources and Forestry 2015) groups wildlife habitat into four categories:

- Seasonal concentration areas of animals
- Rare vegetation communities or specialized habitat for wildlife
- Habitat for species of conservation concern
- Animal movement corridors

Assessments for SWH were conducted on all survey dates (Table 3). Features such as candidate snake hibernacula, vernal pools, seeps and springs, candidate turtle overwintering and nesting habitat, raptor nests, and terrestrial crayfish chimneys were recoded if encountered, and a description of the attributes and location of each feature identified was recorded.

Biological field data were evaluated to establish the significance of the observed natural heritage features. As per the Significant Wildlife Habitat Technical Guide (OMNR 2000) and the Ecoregion Criteria, targeted species-use surveys for breeding birds, amphibians and bats were also used to confirm the presence of SWH.

Desktop assessments were also conducted to identify candidate SWH features that have minimum area thresholds described in the Ecoregion Criteria, such as forests, wetlands and meadows that could support seasonal concentrations of animals or SOCC. The assessment of suitable habitat for SOCC addressed species with records for the Study Area identified during the background review.

3.2.7 Aquatic Features

The aquatic habitat assessment included headwater drainage feature assessments and a riverine habitat assessment of Medway Creek and two Medway Creek tributaries, within the Study Area.

3.2.7.1 Headwater Drainage Feature Assessment

A headwater drainage feature assessment (HDFA) was completed within the Subject Lands following the document entitled *Evaluation, Classification, and Management of Headwater Drainage Features Guidelines* (TRCA and CVC 2014), hereafter referred to as *the TRCA/CVC guidelines*.

The TRCA/CVC guidelines employ a multiple survey approach to HDFAs to capture seasonal variability in hydroperiod and identify other potential ecological functions of these features on the landscape. In general, the need for additional surveys and the timing of each visit is dictated by the results of the previous survey, as follows:

- Site Visit 1: conducted during a window of approximately two weeks, immediately after the snowpack has dissipated and the frost is out of the ground (typically late March – early April). This visit determines if a defined feature is present and if additional surveys are required.
- Site Visit 2: conducted after the freshet has ended when the melt/thaw related interflow has ceased and, preferably, after a few days with no precipitation (typically late April through mid-May). This visit assesses flow condition and fish presence. If the feature is dry, a third visit is not required.
- Site Visit 3: conducted if water was present in the feature during Site Visit 2. The timing of the third visit is from July to mid-September, preferably after several days without a significant (i.e., flow generating) amount of rain. This visit assesses flow condition and fish presence. The primary purpose is to determine where the upstream limits of flow, permanent aquatic habitat (which would include standing water upstream from where flow ceases) and fish utilization occur.

The data and observations collected from these site visits are used to inform a series of classifications of the feature in relation to its function concerning hydrology, riparian character, fish and fish habitat, and terrestrial habitat. These classifications are then used to navigate a flow chart that determines the most appropriate management approach for the feature. Management approaches can range from protection in situ, to no management requirements (i.e., removal is possible), with interim management approaches that include replicating form and function or replicating function alone.

Headwater drainage features (HDF) in the Study Area were assessed in April, June and July of 2024. The data collected during the assessment was used to classify HDF's so to provide management recommendations for the Project design. Dates, times and weather for each HDFA survey are provided in Table 6.

Table 6 DFA Dates, Times, and Weather Conditions

Date	Time	Temp. (°C)	Precipitation	Precipitation in the last 24 hours
April 1, 2024	12:30	9	None	None
June 12, 2024	07:00	16	None	None
July 23, 2024	13:00	16	None	< 1 mm

3.2.7.2 Riverine Habitat Assessment

A riverine habitat assessment of Medway Creek was conducted on November 2, 2023. The habitat assessment consisted of a reconnaissance review of the watercourse, (i.e., observations of dimensions, water depth, bank stability, morphology) and identification of features that contribute to fish and mussel habitat (i.e., water presence, in-water and riparian cover, substrate). The assessment was completed along the reach of Medway Creek within the Subject Lands. Fish sampling and water quality data were not collected as there is abundant background information available on the aquatic community of Medway Creek.

There are three other mapped watercourses in the Study Area, including McClary Drain, Colbert AWD Drain and an unnamed drain (herein referred to as the Unnamed Drain) (Figure A.2). All three watercourses are tributaries of Medway Creek. McClary Drain and the Unnamed Drain were field assessed on April 2, 2024.Colbert AWD Drain was assessed by desktop review due to property access restrictions.

3.2.7.3 Evaluation of Significance

Natural environment features identified during the field investigations were evaluated to determine significance using the definitions and criteria for natural heritage features, SAR or SOCC described below.

3.2.8 Natural Heritage Features

The following technical documents provide standard provincial guidance, and were used to identify natural heritage features and assess their significance:

- The PPS (Ministry of Municipal Affairs and Housing 2024)
- *The Significant Wildlife Habitat Technical Guide* (SWHTG) (Ontario Ministry of Natural Resources 2000) and Ecoregion Criteria Schedule for 7E (Ontario Ministry of Natural Resources and Forestry 2015)
- *Natural Heritage Reference Manual* for Natural Heritage Policies of the Provincial Policy Statement (NHRM) (Ontario Ministry of Natural Resources 2010)
- Middlesex Centre Official Plan (Middlesex Centre 2018) and Middlesex County Public Mapping (Middlesex County N.D)

The PPS and NHRM provide guidance for the identification of six categories of natural heritage features: Significant Wetlands and Significant Coastal Wetlands, Significant Woodlands, Significant Valleylands, SWH, Areas of Natural and Scientific Interest (ANSI), and Fish Habitat.

The SWHTG and Ecoregion Criteria Schedules defines four categories of SWH: Habitats of Seasonal Concentrations of Animals, Rare Vegetation Communities or Specialized Habitats for Wildlife, Habitats of Species of Conservation Concern, and Animal Movement Corridors.

Middlesex Centre OP maps the presence of Natural Heritage Features in the Study Area and the Middlesex County Public Mapping (Middlesex County N.D.) delineates the natural heritage system in the Study Area, including natural heritage feature components, as per the Middlesex Natural Heritage Systems Study (UTRCA 2014).

3.2.9 Species at Risk and Species of Conservation Concern

SAR protected under the ESA include species listed as threatened and endangered on the current Species at Risk in Ontario (SARO) list (O. Reg. 230/08). Federally protected species include those listed as threatened and endangered on current Schedules under the SARA.

SAR are classified provincially by the Committee on the Status of Species at Risk in Ontario (COSSARO) and federally by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). Classifications include:

- Extirpated – no longer occurs in the wild in Ontario
- Endangered – facing imminent danger of becoming extinct or extirpated
- Threatened – has the potential to become endangered
- Special concern – has the potential to become threatened

SOCC includes species that are listed as Special Concern (SC) on the SARO List, or terrestrial species listed on Schedule 1 of federal *Species at Risk Act* (SARA), or provincially rare (with a Provincial S-rank of S1 to S3).

Provincial sub-national ranks (S-ranks) are used by the NHIC to set protection priorities for rare species and vegetation communities. They are based on the number of factors such as abundance, distribution, population trends and threats in Ontario. S-ranks are not legal designations. Provincial S-ranks are defined as follows:

S1: Critically imperiled; usually fewer than 5 occurrences
S2: Imperiled; usually fewer than 20 occurrences
S3: Vulnerable; usually fewer than 100 occurrences
S4: Apparently secure; uncommon but not rare, usually more than 100 occurrences
S5: Secure, common, widespread and abundant

S-rank followed by a “?” indicates the rank is still uncertain

Targeted species-use surveys for amphibians, breeding birds, bats and vegetation were used to document presence absence of SAR and SOCC. Potential for SAR and SOCC with range overlap with the Study Area was addressed through habitat suitability assessments.

4 Results

The following section describes the results of the background review and field investigations completed in 2023 and 2024 and outlined in Section 3.

4.1 Background Review

4.1.1 Existing Conditions

The Subject Lands consists predominantly of actively managed row crop agricultural fields with natural areas comprising small linear patches of deciduous forest, shrub thicket and meadow. The adjacent lands in the Study Area to the north and west are farmland and lands to the east and south are residential neighborhoods.

4.1.2 Designated Natural Areas and Natural Hazard Lands

There were no records of Areas of Natural or Scientific Interest (ANSI), or PSW identified for the Study Area (MNR 2025a).

The Medway Creek channel is located in the north and western portions of the Study Area (flowing north to west) (Figure A.2). Portions of the Medway Creek corridor is designated Significant Woodland in the Middlesex Centre OP (Middlesex Centre 2024) and portions of the vegetated areas are identified as part of the Natural Heritage System (Middlesex County N.D) (Figure A.2.1).

There is a Hazard Lands designation bordering Medway Creek in the Study Area (Middlesex Centre 2023, Schedule C). Medway Creek and associated floodplain are within the UTRCA regulated area (UTRCA 2024a). Portions of the Subject Lands is within the UTRCA regulated area (Figure A.2).

Significant Valleylands are included in the Natural Heritage System, per the Middlesex County OP and are considered part of the Natural Hazards identified on Schedule C of the Middlesex Centre OP. Although Significant Valleylands are not explicitly identified in either of these plans, both these OPs rely on the MNHSS (UTRCA 2014) document as the basis upon which the Natural Heritage System and Natural Heritage Features are delineated. Medway Creek is identified in Appendix I-1 of the MNHSS identifies Medway Creek as a Significant Valleyland.

The entire tablelands of the Subject Lands overlay the Thames-Sydenham Source Protection Region and is designated a Significant Groundwater Recharge Area and a Highly Vulnerable Aquifer (UTRCA 2024b).

4.1.3 Landscape Context

The Study Area is in the Lake Erie – Lake Ontario Ecoregion (Ecoregion Code 7E) and within the Ecozone of the Mixedwood Plains (MNR 2025).

The Study Area is in the Niagara section of the Deciduous Forest Region (Rowe 1972), which occurs in the extreme southern portion of Ontario. This region is also known as the Carolinian Forest or Carolinian Zone and represents the maximum northern limit of this forest type in North America. Forests in this region are dominated by broadleaved trees including sugar maple, American beech, basswood, red maple, red oak, white oak, bur oak, shagbark hickory, bitternut hickory, black cherry, Freeman's (swamp) maple and blue beech. Species such as black walnut, sycamore, swamp white oak are also occasionally present. Species considered rare or uncommon in the province, such as butternut, pignut hickory, tulip-tree, chinquapin oak, pin oak, black oak, black gum, blue ash, cucumber-tree, paw paw, Kentucky coffee-tree, red mulberry and sassafras are sporadically present in the Carolinian Forest. Needle-leaved trees such as hemlock, white pine, tamarack, eastern white cedar, eastern red cedar, and black spruce may be found in isolated patches where soil conditions are favorable.

4.1.4 Physiography Context

The Study Area is within the physiographic region of the Stratford Till Plain (Ministry of Mines 2023). The Stratford Till Plain is described as "an area of ground moraine interrupted by several terminal moraines" and soils described as "heavy textured calcareous till" (Chapman and Putnam 1984). Soils within the Study Area are documented to be part of the Bryanston Soil Association and a Valley Complex (Hagerty and Kingston 1992).

The majority of the Subject Lands is composed of the Bryanston Association, which is described as a silt loam and loam till with well to imperfect drained soils and a gravel content greater than 10%. Cobbles and stones are common in the Bryanston Association. The Bryanston Association is on level to undulating topography (Hagerty and Kingston 1992).

Landscape units known as the Valley Complex are in the Study Area, which is associated with the Medway Creek corridor. The Valley Complex are described to have high and moderate to very steeply sloping with level to nearly level floodplains. Soil composition was not mapped in the Valley Complex (Hagerty and Kingston 1992). The Medway Creek Subwatershed Report Card (UTRCA 2022) describes the physiography of the watershed as primarily of undrumlinized till plain (67%), till moraine (Arva Moraine) (16%), and spillway (16%).

4.1.5 Surface Water

The Study Area is located within the Medway Creek subwatershed, which outlets to the North Thames River.

Surface water quality within the Medway Creek watershed has improved from a D grade to a C since the last watershed report card (UTRCA 2022). Phosphorus and bacteria (*Escherichia coli*) concentrations have shown improvement with levels lower than the Upper Thames River average. Chloride levels have shown an increasing trend but remain below the aquatic life guideline threshold. Nitrate levels have been decreasing but are still above the provincial aquatic guideline. Benthic invertebrate communities have shown the water quality and stream health have remained consistent to the Upper Thames River average since 1997 (UTRCA 2022).

4.1.6 Hydrogeology

A hydrogeology study for the Project was completed by EXP and includes data from 2023 and 2024 (EXP 2024). The purpose of the hydrogeology study was to examine the hydrogeological characteristics of the Subject Lands by reviewing the MECP Water Well Records (WWR), reviewing the soils and groundwater information under existing conditions based on a series of sampled boreholes and monitoring wells on the Subject Lands, compiling a site-wide water balance, collecting groundwater elevations to identify seasonal variations, and assess the natural heritage features on the property. The hydrogeology study, under separate cover, determined the following findings:

- Runoff on the Subject Lands is expected to flow towards Medway Creek
- The stratigraphy of the Subject Lands consists of surficial sand and gravel layer (unconfined aquifer) across most of the Subject Lands, underlaid by till (aquitard). The till overlies a deeper sand layer (confined to unconfined aquifer)
- Shallow groundwater levels (between 1 m and 2 m below ground surface [bgs]) were observed in three of the monitoring wells (BH2/MW south of Medway Road, BH8/MW-B near Medway Creek, and BH9/MW, just north of Medway Road, eastern edge of Subject Lands)
- Deepest groundwater was observed in BH4/MW (7.9 m bgs; southernmost central portion of the Subject Lands)
- Dry conditions on several occasions were observed at BH3/MW and BH5-MW-B (both south of Medway Road; central and southwest)
- Majority of the Subject Lands mapped as Significant Groundwater Recharge and Highly Vulnerable Aquifer
- Based on shallow groundwater, groundwater may be encountered during construction activities. Water management volumes will depend on excavation depths below the water table.
- Further information is required to complete dewatering calculations and will be completed at the detailed design stage.

4.1.7 Species at Risk and Species of Conservation Concern

The desktop review identified 22 SAR (Table 7) and 14 SOCC (Table 8) that have the potential to be present in the Study Area.

Habitat requirements and a habitat suitability assessment (determined by the presence of suitable habitat in the Study Area) for SAR and SOCC (considered under SWH) identified in Table 7 and Table 8 are provided in Appendix C and Appendix D, respectively. Aquatic species are discussed in Section 4.1.8.

Table 7 Species at Risk Identified as Potentially Present in the Study Area

Group	Common Name	Scientific Name	SARO Status	SARA Status Schedule 1	Provincial Status (S-rank)	Source of Record
Birds	Bank Swallow	*Riparia riparia*	THR	THR	S4B	SARO
	Bobolink	*Dolichonyx oryzivorus*	THR	THR	S4B	NHIC
	Chimney Swift	*Chaetura pelagica*	THR	THR	S4B, S4N	OBBA
	Eastern Meadowlark	*Sturnella magna*	THR	THR	S4B	OBBA
	Northern Bobwhite	*Colinus virginianus*	END	END	S1?	OBBA
	Red-headed Woodpecker	*Melanerpes erythrocephalus*	END	END	S3	NHIC
Mammals	Eastern Red Bat	*Lasiurus borealis*	END	Not listed	S3	SARO
	Eastern Small-footed Myotis	*Myotis leibii*	END	Not listed	S2S3	SARO
	Hoary Bat	*Lasiurus cinereus*	END	Not listed	S3	SARO
	Little Brown Myotis	*Myotis lucifugus*	END	END	S4	SARO
	Northern Myotis	*Myotis septentrionalis*	END	END	S3?	SARO
	Silver-haired Bat	*Lasionycteris noctivagans*	END	Not listed	S3	SARO
	Tricoloured Bat	*Perimyotis subflavus*	END	END	S3?	SARO
Plants	American Ginseng	*Panax quinquefolius*	END	END	S2	ECCC
	Butternut	*Juglans cinerea*	END	END	S2?	NHIC
	Purple Twayblade	*Liparis liliifolia*	THR	THR	S2S3	NHIC

Group	Common Name	Scientific Name	SARO Status	SARA Status Schedule 1	Provincial Status (S-rank)	Source of Record
Reptiles	Blandings Turtle	*Emydoidea blandingi*	THR	END	S3	ORRA
	Eastern Hog-nosed Snake	*Heterodon platirhinos*	THR	THR	S3	ORRA
	Queensnake	*Regina septemvittata*	END	END	S2	ORRA
	Spiny Softshell	*Apalone spinifera*	END	END	S2	NHIC
	Spotted Turtle	*Clemmys guttata*	END	END	S2	ECCC
	Wood Turtle	*Glyptemys insculpta*	END	THR	S2	ECCC

ECCC: Environment and Climate Change Canada Species at Risk Critical Habitat Mapping

NHIC: Natural Heritage Information Centre

OBBA: Ontario Breeding Bird Atlas

ORRA: Ontario Reptile and Amphibian Atlas

SARO: Species at Risk in Ontario List

Table 8 Species of Conservation Concern Identified as Potentially Present in the Study Area

Group	Common Name	Scientific Name	SARO Status	SARA Status Schedule 1	Provincial Status (S-rank)	Source
Amphibians	Western Chorus Frog	*Pseudacris triseriata*	NAR	THR	S3	ORRA
Birds	Barn Swallow	*Hirundo rustica*	SC	THR	S4B	SARO
	Common Nighthawk	*Chordeiles minor*	SC	THR	S4B	OBBA
	Eastern Wood-pewee	*Contopus virens*	SC	SC	S4B	NHIC
	Wood Thrush	*Hylocichla mustelina*	SC	THR	S4B	NHIC
Insects	Monarch	*Danaus plexippus*	SC	END	S4B, S2N	OBA
	Unicorn Clubtail	*Arigomphus villosipes*	Not listed	Not listed	S3	NHIC
Plants	Goldenseal	*Hydrastis canadensis*	SC	SC	S2	ECCC
	Rigid Sedge	*Carex tetanica*	Not listed	Not listed	S3?	NHIC
	Striped Cream Violet	*Viola striata*	Not listed	Not listed	S3	NHIC
Reptiles	Eastern Milksnake	*Lampropeltis triangulum*	NAR	SC	S3	ORRA
	Midland Painted Turtle	*Chrysemys picta marginata*	NAR	SC	S5	NHIC, ORRA
	Northern Map Turtle	*Graptemys geographica*	SC	SC	S3	ORRA
	Snapping Turtle	*Chelydra serpentina*	SC	SC	S3	NHIC

4.1.8 Fish and Fish Habitat

Background information available for the four watercourses in the Study Area are as follows:

Medway Creek: Medway Creek is located on the north end of the Study Area, flowing west and then south on the west end of the Study Area (Figure A.2). Medway Creek is a permanently flowing

watercourse with a coldwater thermal regime (MNRF 2024b) (Figure A.2) that supports a diverse fish community. Fish species documented within Medway Creek in the Study Area include Blackside Darter (*Percina maculata*), Black Redhorse (*Moxostoma duquesnei*), Bluntnose Minnow (*Pimephales notatus*), Central Stoneroller (*Campostoma anomalum*), Common Carp (*Cyprinus carpio*), Common Shiner (*Luxilus cornutus*), Creek Chub (Semotilus atromaculatus), Fantail Darter (*Etheostoma flabellare*), Golden Redhorse (*Moxostoma erythrurum*), Greenside Darter (*Etheostoma blennioides*), Johnny Darter (*Etheostoma nigrum*), Largemouth Bass (*Micropterus salmoides*), Mimic Shiner (*Notropis volucellus*), Northern Hog Sucker (*Hypentelium nigricans*), Pumpkinseed (*Lepomis gibbosus*), Rainbow Darter (*Etheostoma caeruleum*), Rock Bass (*Ambloplites rupestris*), Smallmouth Bass (*Micropterus dolomieu*), Spotfin Shiner (*Cyprinella spiloptera*), Striped Shiner (*Luxilus chrysocephalus*), White Sucker (*Catostomus commersonii*), and Yellow Perch (*Perca flavescens*) (MNRF2024b).

Medway Creek is mapped as providing habitat for aquatic SAR (DFO 2025a) (Figure A.2). Aquatic SAR found (or potentially found) in Medway Creek in the Study Area include Silver Shiner (*Notropis photogenis*), Black Redhorse and Wavy-rayed Lampmussel (*Lampsilis fasciola*) and one SOCC, Northern Sunfish (*Lepomis peltastes*) (DFO 2025a). Within the Study Area, Medway Creek is mapped as providing critical habitat for Black Redhorse and Silver Shiner (DFO 2025a).

Colbert AWD Drain: Colbert AWD Drain originates east of the Study Area and discharges into Medway Creek on the east side of the Richmond Street bridge (Figure A.2). Colbert AWD Drain is a permanently-flowing watercourse with a coldwater thermal regime (MNRF 2024b) (Figure A.2). The drain is known to support a fish community including Blacknose Dace (*Rhinichthys obtusus*), Brassy Minnow (*Hybognathus hankinsoni*), Brook Stickleback (*Culaea inconstans*) and White Sucker (MNRF 2024b). Colbert AWD Drain is mapped as providing habitat for aquatic SAR (DFO 2025a) (Figure A.2). Aquatic SAR found (or potentially found) in Colbert AWD Drain include Northern Sunfish and Black Redhorse (DFO 2025a). The Colbert AWD Drain has not been assigned a DFO drain classification (MNRF 2024b).

McClary Drain: McClary Drain is located on the west side of the Study Area and discharges into Medway Creek, north of Medway Road (Figure A.2). McClary Drain is a Class F constructed drain with an intermittent flow regime and a coldwater thermal regime (MNRF 2024b). Class F drains have an intermittent flow which are dry for at least 3 months of the year, and which may support seasonal fish habitat during periods of flow (DFO 2017). McClary Drain is mapped as providing habitat for aquatic SAR (DFO 2025a) (Figure A.2). Aquatic SAR/SOCC found (or potentially found) in McClary Drain in the Study Area include Northern Sunfish and Black Redhorse (DFO 2025a).

Unnamed Drain: The Unnamed Drain is located on the west side of the Study Area and discharges into Medway Creek, south of Medway Road (Figure A.2). The Unnamed Drain is a Class F constructed drain with an intermittent flow regime and a coldwater thermal regime (MNRF 2024b). The Unnamed Drain is mapped as providing habitat for aquatic SAR/SOCC (DFO 2025a) (Figure A.2). Aquatic SAR/SOCC found (or potentially found) in the Unnamed Drain include Northern Sunfish and Black Redhorse (DFO 2025a).

4.2 Field Investigations

Results of the field investigations are provided in the following sections. A photographic record of some of the features and areas discussed in this section are provided in Appendix E.

4.2.1 Vegetation

Significant Valleylands characterize the Study Area as Medway Creek flows south along the northern and western Study Area boundaries. Hayfields and open pasture occupy a large portion of the broad floodplains north and south of Medway Road. Natural vegetation is largely restricted to the banks of the creek and on steep valley slopes next to the floodplain. Narrow bands of meadow marsh and willow thicket swamp occur next to the creek edge. Narrow deciduous forests, cultural deciduous woodlands and thickets occur on the steep valley slopes.

Seepages occur on the valley slopes north and south of Medway Road. A gently sloping seepage area south of Medway Road contains a marsh (MAMO1-6) that is dominated by the provincially rare (S3) hairy-fruited sedge (*Carex trichocarpa*) (Figure A.3). This sedge is characteristic of floodplains and is locally common along the banks of the Thames River (MNRF 2024a).

4.2.1.1 Vegetation Classification

One provincially rare ELC community (FODM7-5) was observed in the Study Area on a steep valley slope north of Medway Road. The NHIC lists this community type (fresh – moist black maple lowland forest) as “S3?”, indicating that this community is rare to uncommon in Ontario. The FODM7-5 in the Study Area is dominated by mature black maples trees, but exotic invasive shrubs species are common (e.g. European buckthorn, common lilac, and multiflora rose). This is a likely a result of adjacent agricultural land uses and the narrowness of the forest community. However, at the east end of this forest slope, a seepage area is present and dominated by skunk cabbage (groundwater indicator) on the valley slope (Figure A.3).

Although MAMO1-6 is not considered a rare community by the NHIC, due to the dominance of a rare species (S3), the community may also be considered rare under further analysis for SWH, as detailed in Section 4.3.3.

Vegetation communities located in the Study Area are described in Table 9, divided geographically into north or south of Medway Road, and are displayed on Figure A.3. Common plant species names are used throughout Table 9 to describe vegetation communities. Both common and scientific names are provided in the plant species list (Appendix F). Anthropogenic communities (e.g., roads, businesses, residential areas, etc.) are found on Figure A.3 but are not described in Table 9.

Table 9 Ecological Land Classification (ELC) Vegetation Types

ELC TYPE	Community Description
NORTH OF MEDWAY ROAD	
Meadow Communities (MEM)	
MEMM3a Dry – Fresh Mixed Meadow	This narrow meadow occurs along the north side of Medway Road and extends along a portion of the slope to the floodplain. It is dominated by common meadow species such as smooth brome, wild carrot, Canada horseweed and smooth sow-thistle.
MEMM3b Dry – Fresh Mixed Meadow	This upland meadow is adjacent to Richmond Street. It is dominated by Kentucky bluegrass and Canada goldenrod. Other common species include smooth brome, common milkweed, Canada thistle and common mullein. A few mature sugar maple and black walnut occur sporadically.
MEFM4 Fresh - Moist Forb Meadow / MAMM3 Mixed Mineral Meadow Marsh	This meadow is situated on the north-facing slope and floodplain next to Medway Creek. This area is a mixture of upland meadow species such as Canada goldenrod, New England aster and grass-leaved goldenrod and wetland species a such as spotted Joe pye weed, common boneset and purple-stemmed Angelica.
Thicket Communities (THD)	
THDM5 Fresh – Moist Deciduous Thicket	This thicket is dominated by young regenerating eastern cottonwood with frequent black locust and occasional exotic tree willow. The ground layer is dominated by field horsetail, asters, bitter wintercress and garlic mustard.
Woodland Communities (WOD)	
WOD Deciduous Woodland	This community is located outside the Subject Lands, east of Richmond Street. It is an open woodland associated with the Colbert AWD Drain.
WODM4-4 Dry - Fresh Black Walnut Deciduous Woodland	This small grouping of trees is located on the banks of Medway Creek next to Richmond Street. It is dominated by an open canopy of black walnut. Riverbank grape and red ash are common in the understory.

ELC TYPE	Community Description
Forest Communities (FOD)	
FODM4 Dry – Fresh Upland Deciduous Forest	This community is located on a steep valley slope next to Medway Creek. This area contains a variety of tree species in the canopy with no clear dominant species. American beech, sweet cherry, basswood, sugar maple, yellow birch, bur oak and trembling and large-toothed aspens occur in varying amounts. The herbaceous ground layer is dominated by zigzag goldenrod, woodland sedge, and Enchanter's nightshade. Weedy invasive species such as dame's rocket, garlic mustard, and common burdock are also common.
FODM7 Fresh – Moist Lowland Deciduous Forest	This lowland moist forest is located next to Medway Creek. It is dominated by exotic tree willow with associates of common hackberry and balsam poplar. Manitoba maple and balsam poplar occur in the understory layers. The ground layer is dominated by a mixture of native and exotic species commonly found in floodplain woods such as goutweed, Canada wood nettle, panicled aster, giant goldenrod, Dame's rocket, cut-leaved coneflower and wild chervil.
FODM7-5 Fresh – Moist Black Maple Lowland Deciduous Forest	This forest community is located on a steep slope adjacent to the Medway Creek floodplain. Mature black maple is the dominant canopy tree. Occasional canopy trees of black cherry, bur oak, bitternut hickory, common hackberry, and basswood also occur. Choke cherry, hawthorn and European buckthorn are common in the shrub layer. The herbaceous ground layer contains woodland sedge, large false Solomon's seal, zigzag goldenrod, herb-Robert and enchanter's nightshade. A seepage area dominated by eastern skunk cabbage is present at the eastern extent of this community. This community type is rare in Ontario, ranked by the NHIC as "S3?"
Marsh Communities (MAM & MAS)	
MAMM2 Forb Mineral Meadow Marsh	Forb marsh located along the edge of Medway Creek dominated by common marsh and floodplain species such as spotted Joe pye weed, cut-leaved coneflower, tall meadow-rue and giant goldenrod. The exotic wild chervil is very common in this marshy area next to the creek.
MAMM3a Mixed Mineral Meadow Marsh	This low marsh area contained standing water in early spring. Dominant species include reed canarygrass, Canada anemone and spotted Joe pye weed. Panicled aster and small-spike false nettle occur frequently.
MAMM3b Mixed Mineral Meadow Marsh	This small seepage wetland is located on a valley slope next to Medway Creek. Dominant herbaceous species include spotted Joe pye weed, glossy-leaved aster, fox sedge, dark-green bulrush, yellow sedge and panicled aster. Other common species include Dudley's rush, soft rush and small-flowered hairy willowherb.

ELC TYPE	Community Description
MAS Shallow Marsh	Shallow marsh located on the north side of Medway Creek, outside of the Subject Lands.
Aquatic Communities (SA)	
SA Shallow Aquatic	This aquatic community consists of the Medway Creek watercourse and is discussed further in Section 4.6.2.1
Swamp Thicket Communities (SWT)	
SWTM3-**3a** Slender Willow Mineral Deciduous Thicket Swamp	This small thicket occurs along the south bank of Medway Creek. It is dominated by sandbar and cottony willow shrubs. The ground layer is dominated by reed canarygrass with associates of giant goldenrod, northern swamp buttercup, spotted jewelweed, and field horsetail.
Agricultural Fields (OAG)	
OAGM1 Annual Row Crop	The large agricultural field central to the Subject Lands and was planted with corn in 2023.
OAGM2 Perennial Cover Crops	This floodplain meadow is dominated typical pasture species such as orchard grass, Kentucky bluegrass, spike sedge and reed canarygrass. Wild chervil is common in the pasture closer to the creek. This area was cut for hay in the late spring or summer.
OAGM4 Open Pasture	This area is a fenced in horse pasture.
SOUTH OF MEDWAY ROAD	
Meadow Communities (MEM)	
MEGM3-4 Kentucky Blue Grass Graminoid Meadow	This roadside meadow is dominated by Kentucky bluegrass with occasional smooth brome. Less common associate plants include Canada goldenrod Canada thistle, common milkweed and butter-and-eggs.
MEFM1-1 Goldenrod Forb Meadow MEFM1-2 Aster Forb Meadow	This small creekside meadow is dominated by giant and Canada goldenrods. Panicled aster also occurs frequently. Common milkweed and slender stinging nettle occur less commonly.

ELC TYPE	Community Description
MEFM4 Fresh – Moist Forb Meadow	This narrow meadow occurs in an opening on the steep valley slope. It is dominated Canada goldenrod, New England aster, common teasel, reed canarygrass and panicled asters. European buckthorn regeneration occurs here occasionally.
MEMM3**c** Dry-Fresh Mixed Meadow	This meadow is situated on a valley slope. It is dominated by a mixture of old field grasses such as smooth brome and reed canarygrass and forbs such as Canada goldenrod, New England aster, common teasel, and various asters (*Symphyotrichum* spp.). Common milkweed was also noted in this community.
Thicket Communities (THD)	
THDM2 Dry - Fresh Deciduous Shrub Thicket THDM4 Dry - Fresh Deciduous Regeneration Thicket	This area is a dense thicket located on a steep valley slope. Young black walnut regeneration, hawthorns, young Manitoba maple and European buckthorn are common tree and shrub species.
THDM4-1 Native Deciduous Regeneration Thicket	A few large open-grown silver maple occur here. This area contains sporadic to crowded black walnut regeneration at the understory layer. The ground layer contains common meadow species such as orchard grass, New England aster and Canada goldenrod.
Woodland Communities (WOD)	
WODM5a Fresh - Moist Deciduous Woodland	This small woodland has a semi-open canopy of open-grown silver maple that appear to have been planted. A few white spruce, Norway spruce and Scots pine also occur in the canopy. Black walnut regeneration is common in the understory layer. The ground layer is dominated by great ragweed and frequent panicled aster.
WODM5b Fresh - Moist Deciduous Woodland	This woodland has a semi-open canopy of large open-grown silver maple, black walnut, and eastern cottonwood. The silver maple and black walnut were likely planted due to their planting configuration while the cottonwood appears to have regenerated naturally. The understory is dominated by dense regeneration of black walnut with great ragweed, European buckthorn and common hackberry also common.
Marsh Communities (MAM)	
MAMM2 Forb Mineral Meadow Marsh	This marsh occurs along the edge of Medway Creek. It is dominated by common marsh and floodplain species such as spotted Joe pye weed, cut-leaved coneflower, tall meadow-rue and giant goldenrod.

ELC TYPE	Community Description
MAMO1-6 Sedge Graminoid Organic Meadow Marsh	This marsh is also a large seepage area. It is dominated by a provincially rare wetland sedge (hairy-fruited sedge) that prefers seepage wetlands. Eastern skunk cabbage occurs frequently. Glossy-leaved aster, panicled aster, spotted jewelweed and awl-fruited sedge occur occasionally throughout the marsh.
Swamp Thicket Communities (SWT)	
SWTM3-**3b** Slender Willow Mineral Deciduous Thicket Swamp	These narrow swamp thickets occur along the banks of Medway Creek. They are dominated by dense growth of sandbar willow with occasional cottony willow.
Planted Fencerow Communities (TAGM5)	
TAGM5a Fencerow	This hedgerow feature is a row of mature Norway spruce that were planted close together next to the cemetery.
TAGM5b Fencerow	This hedgerow feature is dominated by young eastern white pine with occasional black walnut.
Open Agriculture (OAG)	
OAGM1 Annual Row Crops	This large agricultural field was planted with corn in 2023.
OAGM2 Perennial Cover Crops	This hay field is situated in the floodplain of Medway Creek. It is dominated by typical hay field species (e.g., smooth brome, red clover). Occasional wetland plants such as dark-green bulrush, spotted Joe pye weed and redtop grass occur in moist areas in the hay field.

4.2.1.2 Vascular Plant Species

The following is a floristic summary of the vascular plant species observed in the Study Area during field investigations in 2023. A detailed list with scientific plant names and species statuses is provided in Appendix F.

- A total of 205 species of vascular plants were recorded. This total includes taxa identified to species, subspecies (ssp.) and variation (var.) levels.
- 126 of the 205-recorded species are native to Ontario, while 79 or 38.5% are exotic species not native to Ontario.
- 111 native species have a provincial rank of S5, indicating they are common with a secure population in Ontario.
- 13 native species have a provincial rank of S4, indicating they are uncommon, but not rare in the province and populations are apparently secure.
- 1 SOCC plant species with a provincial S-rank of S3 (hairy-fruited sedge) was observed. Hairy-fruited sedge is abundant in the MAMO1-6 marsh community south of Medway Road. A small patch of hairy-fruited sedge was also observed at the base of the steep valley slope. The locations of hairy-fruited sedge are shown on Figure A.3.
- A.3 as *Carex trichocarpa*.
- 1 SAR species was observed. A single Butternut tree was observed north of Medway Road close to Medway Creek, outside of the Study Area. Butternut is listed as endangered on the SARO. The location of the Butternut tree and its 25 m protected habitat is shown on Figure A.3.
- 2 native species (common hackberry and hairy-fruited sedge) have a C value of 8 indicating these species have a high level of sensitivity to habitat disturbance. Common hackberry was observed in the FODM7 and FODM7-5 communities north of Medway Road (Figure A.3). It was also observed in the WODM5b community south of Medway Road (Figure A.3). The locations of hairy-fruited sedge are described above.

4.2.2 Amphibians

The first amphibian call survey detected three American Toads (*Anaxyrus americanus*) calling (i.e., call code 1) west of AMP01 in the MAMM3a ecosite (Figure A.3) on April 13, 2023. No other amphibians were recorded during call surveys at AMP01 or AMP02. American toad is secure in Ontario (S5).

4.2.3 Breeding Birds

Forty (40) bird species were recorded during the breeding bird surveys, including one SAR, the Chimney Swift (*Chaetura pelagica*) and one SOCC, and Barn Swallow (*Hirundo rustica*).

Chimney Swift was observed as a flyover during breeding bird surveys (Figure A.3). Breeding habitat for the chimney swift was not observed in the Subject Lands; however, a detailed assessment of the residences located in the PDB and Study Area was not undertaken.

Barn Swallow were observed in multiple locations in the Study Area, where they were observed in small flocks (3-5 individuals) foraging over Medway Creek, hayfields and row crop agricultural fields. Adult Barn Swallow were also observed providing food to young on the bank of Medway Creek in two locations during the second breeding bird survey. Barn Swallow breeding habitat was not observed in the Subject Lands, but suitable breeding habitat may be present in buildings in proximity to the Study Area.

Two species that are considered under SWH, Bald Eagle (*Haliaeetus leucocephalus*) and Osprey (*Pandion haliaetus*), were observed flying over Medway Creek on the north side of Medway Road during the June 28, 2024, breeding bird survey at stations BB-02 and BB-03, respectively. These birds of prey feed on fish and may use Medway Creek as hunting grounds. Osprey was observed incidentally hunting in Medway Creek during a site visit on July 25, 2023.

During the first bird survey a large stick nest was observed in a lone tree in the OAGM2/MEMM3 ecosite. A bird was not observed in this nest. During the second bird survey the tree had been uprooted and fallen from a recent storm event.

In exception to the Chimney Swift, all the birds identified in the Study Area are common species in Ontario and have S-Ranks of S4 or S5.

The full list of breeding birds observed in the Study Area is provided in Appendix G.

4.2.4 Bat Maternity Roost and Bat Community Surveys

4.2.4.1 Bat Maternity Roost

4.2.4.1.1 Cavity Roosting Bats

Twenty-two (22) trees were identified in the Study Area which may provide suitable habitat for maternity roosting for tree cavity roosting bats. The location of suitable bat maternity roost trees is shown on Figure A.3 (shown as Suitable Bat Maternity Roost Tree). Of these trees, 16 are within the Subject Lands, clustered along Richmond Street and within the THDM4-1 ecosite and Medway Road, and 6 are in the Study Area.

4.2.4.1.2 Foliage Roosting Bats

All treed ecosites in the Study Area (singly or forested area) and all ecosites with shrubs would be considered suitable habitat for bat SAR that roost in foliage. Within the PDB, the THDM4-1 ecosite provides both trees and shrubs and this ecosite is entirely within the PDB and is proposed to be overprinted.

4.2.4.1.3 Structure Roosting Bats

Further studies are required to confirm presence/absence of bats within the residences on the Subject Lands.

4.2.4.2 Bat Community Surveys

Bat community surveys documented the presence of a total of five bat species at Bat-01 and Bat-02. Four of the five species are SAR which include the Eastern Red Bat (*Lasiurus borealis*), Hoary Bat (*Lasiurus cinereus*), Silver-haired Bat (*Lasionycteris noctivagans*), and Little Brown Myotis. These bats are listed on the SARO as endangered and were documented at both survey stations.

Recordings of Big Brown Bat were the most common, followed by Hoary Bat, Silver-haired Bat, Eastern Red Bat, and low counts of Little Brown Myotis. A summary of bat calls recorded at each Bat Community Survey Station is provided in Table 10.

Table 10 Bat Species Recorded at Bat Community Survey Station

Station	Big Brown Bat	Eastern Red Bat	Hoary Bat	Silver-haired Bat	Little Brown Myotis	Unidentified Bat Calls	Total
Bat-01	1221	28	487	200	2	260	2809
Bat-02	1508	45	438	239	2	469	3660

4.3 Significant Wildlife Habitat Assessment

Results of the wildlife habitat assessments are provided below for each of the four categories described by the Ecoregion Criteria Schedule for 7E. A wildlife habitat assessment table describing each type of SWH, including habitat type, criteria, methods, and assessment results is provided in Appendix D.

4.3.1 Seasonal Concentration Areas

Seasonal concentration areas are those sites where large numbers of a species gather at one time of the year, or where several species congregate. Such areas include, but are not limited to, deer yards, snake and bat hibernacula, waterfowl staging and molting areas, raptor roosts, bird nesting colonies, shorebird staging areas, and passerine migration concentrations. Only the best examples of these concentration areas are usually designated as significant wildlife habitat. Areas that support a SAR, or areas where a large proportion of the population may be lost if the habitat is destroyed, are examples of seasonal concentration areas which should be designated as significant (OMNR 2000).

The following wildlife habitat for seasonal concentration may be present in the Study Area:

- **Candidate: Bat Maternity Colonies**: The deciduous forest (FODM7 and FODM7-5) located in the Medway Creek corridor may provide suitable habitat (and meet SWH criteria) for bat maternity colonies. Although maternity colony use is unconfirmed, results of the bat community survey identified Big Brown Bat and Silver-haired Bat species in the Study Area in proximity to identified woodland habitat.
- **Candidate: Turtle Wintering Areas:** Suitable overwintering habitat for turtles is assumed to be present in Medway Creek and the MAS community in the Study Area.

4.3.2 Rare Vegetation Communities

Rare vegetation communities are those with a vegetation community that is considered rare in the province or is dominated by a rare species. Two rare vegetation communities are present in the Subject Lands:

- **FODM7-5 - Fresh - Moist Black Maple Lowland Deciduous Forest Type**: The FODM7-5 vegetation community is located north of Medway Road and is found on the slope between the tablelands (OAGM1) and the Medway Creek floodplain. The FODM7 ecosite has been given an S3 provincial status ranking by the NHIC.
- **MAMO1-6 - Sedge Organic Meadow Marsh Type**: The MAMO1-6 vegetation community is located south of Medway Road in the Study Area. The community is dominated by a rare plant, the hairy-fruited sedge (*Carex trichocarpa*). The hairy-fruited sedge has been given an S3 provincial status ranking by the NHIC. The dominance of the rare sedge makes the ecosite rare.

4.3.3 Specialized Habitat for Wildlife

Specialized habitat for wildlife are areas that are critical to some wildlife species, such as nesting, foraging and breeding habitat. One candidate/confirmed specialized habitats for wildlife were documented in the Study Area.

- Candidate and Confirmed: Seeps and Springs
    - A single candidate seep was noted within the Study Area in MAMO1-6. This does not meet the criteria for SWH as it is not located within a forested area.
    - Seeps meeting criteria for SWH (i.e., 2, forested habitat) were present in the Study Area within the FODM7-5 ecosite. Three (3) seeps were observed in the FODM7-5 with an active upwelling of groundwater observed during site visits on May 25 and November 3, 2023, and September 20, 2024.

4.3.4 Habitat for Species of Conservation Concern

Habitat for SOCC includes four types of species: (a) those that are rare, (b) those whose populations are significantly declining, (c) those that have been identified as being at risk to certain common activities, and (d) those with relatively large populations in Ontario compared to the remainder of the globe.

- Confirmed: Habitat Supporting Special Concern and Rare Wildlife Species
    - Hairy-fruited sedge was the dominant plant in the MAMO1-6 ecosite located on the south side of Medway Road (Figure A.3). The hairy-fruited sedge has an S3 provincial rank, indicating the species is vulnerable. The presence of the hairy-fruited sedge in the MAMO1-6 provides a SWH designation to the ecosite.

- Monarch (3 individuals) were observed visiting common milkweed (*Asclepias syriaca*) plants on July 23, 2024, in the MEMM3c ecosite. Monarch was observed visiting these plants, which, at the time of observation were assumed to be using the plants for reproduction (Figure A.3). MEMM3b and MEFM1-1/MEFM1-2 communities also were noted as containing common milkweed during vegetation surveys.

A habitat suitability assessment determined candidate habitat was present in the Study Area for six (6) of the SOCC identified in the desktop background review. None of these SOCC were documented during field surveys, and suitable habitat for these species is located outside of the Subject Lands. The SWH assessment for SOCC is provided in Appendix D.

- Candidate: Habitat Supporting Special Concern and Rare Wildlife Species
  - Western Chorus Frog (*Pseudacris triseriata*)
  - Unicorn Clubtail (*Arigomphus villosipes)*
  - Eastern Milksnake (*Lampropeltis triangulum*)
  - Midland Painted Turtle (*Chrysemys picta marginata)*
  - Northern Map Turtle (*Graptemys geographica*)
  - Snapping Turtle (*Chelydra serpentina*)

4.3.5 Animal Movement Corridors

Migration corridors are areas that are traditionally used by wildlife to move from one habitat to another, typically to access different seasonal habitat requirements. Corridors requiring consideration in Ecoregion 7E include Amphibian Movement Corridors. Presence of these corridors is determined once significant amphibian breeding habitat (wetlands) is identified. Amphibian breeding habitat (wetlands) was not confirmed by amphibian call surveys; therefore, Animal Movement Corridors as defined SWH are considered absent.

4.4 Species at Risk

Targeted species-use surveys confirmed the presence of six (6) SAR in the Study Area, the Little Brown Myotis, Hoary Bat, Eastern Red Bat, Silver-haired Bat, butternut (*Juglans cinerea*), and Chimney Swift (*Chaetura pelagica*).

The SAR bats were documented with the bat ARU surveys at Bat Community Survey Station Bat-01 and Bat-02 (Figure A.3).

The butternut was located north of Medway Road and on the edge of the OAGM2/MEMM3 and FODM7 ecosites. The butternut is located outside of the Study Area, but its 25 m protected habitat intersects with the Study Area (Figure A.3).

Chimney Swift was observed as a flyover during breeding bird surveys. Breeding habitat for the Chimney Swift was not observed in the Subject Lands; however, a detailed assessment of potential breeding habitat within the residences in the PDB and Study Area was not undertaken.

Three aquatic SAR are assumed to be present in Medway Creek, based on habitat suitability and aquatic SAR mapping (DFO 2025a): Black Redhorse, Silver Shiner, and Wavy-rayed Lampmussel. Critical habitat for Black Redhorse and Silver Shiner is also mapped within and adjacent to Medway Creek within the Study Area (DFO 2025a).

The SAR habitat suitability assessment identified suitable habitat in the Study Area for 11 of the SAR identified in the desktop background review. Most of the suitable SAR habitat is within the Medway Creek corridor, however, any trees (singly or forested ecosite) and areas of shrubs and thicket are suitable for the SAR bats documented during the bat community surveys.

The SAR habitat suitability assessment is provided in Appendix C. The SAR habitat suitability assessment determined the following species and their habitat to be present (confirmed), assumed present (from background data and suitable habitat), or potentially present (candidate) in the Study Area:

Present – Confirmed:

- Little Brown Myotis (*Myotis lucifugus*)
- Eastern Red Bat (*Lasiurus borealis*)
- Hoary Bat (*Lasiurus cinereus*)
- Silver-haired Bat (*Lasionycteris noctivagans*)
- Butternut (*Juglans cinerea*)

Assumed Present:

- Black Redhorse (*Moxostoma duquesnei*) and their critical habitat
- Silver Shiner (*Notropis photogenis*) and their critical habitat
- Wavy-rayed Lampmussel (*Lampsilis fasciola*)

Potentially Present – Candidate:

- Chimney Swift (Chaetura pelagica)
- Red-headed Woodpecker (Melanerpes erythrocephalus)
- Eastern Spiny Softshell (Apalone spinifera)

4.5 Incidental Wildlife

Wildlife incidentally observed while conducting field surveys included White-tailed Deer (*Odocoileus virginianus*), Red-tailed Hawk (*Buteo jamaicensis*), Mallard (*Anas platyrhynchos*), Canada Goose (*Branta canadensis*), Monarch (*Danaus plexippus*), and Beaver (*Castor canadensis*). The list of wildlife identified during field surveys is provided in Appendix G.

4.6 Aquatic Habitat Assessment

4.6.1 Headwater Drainage Feature Assessment

One headwater drainage feature was observed within the PDB, located in the TDHM4-1 ecosite (HDF-1, Figure A.3). From the boundary of the TDHM4-1 ecosite with the tablelands, there is a gradual slope south, toward existing houses. HDF-1 is located at the bottom of this slope. Photographs of the HDF-1 are shown in Photo 14 – 19, Appendix E.

Flow is from east to west through the ecosite. The feature begins at an area of seepage at the eastern end of the ecosite. During each of the three assessments, the feature had a low flow rate with a discontinuous channel and interstitial flow characteristics. Most of the drainage pathway did not have a defined bed or banks. During each survey, the surface flow was observed to infiltrate underground through sump areas. Where a defined channel was observed, water depth was 1-3 cm and wetted width was 10 cm, however, during each assessment, water that was present was in the form of wet soil and isolated standing surface water along the flow path. The feature has surficial and subsurface flow, depending on the flow rate. At the western end of the ecosite, there was no standing water or channel scour observed during any assessment. Field observations outside of periods of high discharge (e.g., spring freshet) indicate the hydrology of this feature consists principally of flow though permeable soils. Surface water infiltration in this feature likely supports the groundwater table and features downstream, including the MAMO1-6 wetland and the rare sedge vegetation community it contains. The HDF-1 does not provide direct fish habitat or amphibian breeding habitat.

Headwater drainage features were not observed in the tablelands in the Study Area. This area (the cropped land) is assumed to have high infiltration rates, as evidenced by the presence of seeps on the slopes from the tablelands to the Medway Creek floodplain. Pooling of water was observed in the floodplain in the OAGM2/MEMM3 ecosite (north of Medway Road) and in the OAGM2 ecosite (south of Medway Road). Maintaining infiltration within the tablelands is important to maintain the seep conditions and water movement into the floodplain.

The Evaluation, Classification and Management of Headwater Drainage Features Guidelines (TRCA, CVC 2014) document was used to assess the HDF-1 feature to make management recommendations for the Project. For this feature, there are three relevant classifications as part of the assessment: Hydrology, Riparian and Terrestrial Habitat Classification. This assessment is provided below:

Hydrology Classification: Surface water was present during all three field assessments; however, the amount of surface water was very low (wet soils in small areas and short distances of surface flow in areas of increased gradient in all survey periods). Based on the ephemeral nature of the feature and the lack of a defined feature through much of the drainage path, and the fact that the feature does provide minor seepage in summer months which may support down gradient features (MAMO1-6), the hydrology classification is Contributing Functions – Ephemeral.

Riparian Classification: Because the riparian area surrounding the HDF-1 is a thicket, the riparian classification of HDF-1 is “Important Functions”.

Terrestrial Habitat Classification: Because the THDM4-1 ecosite is the only natural habitat east of the Medway Creek floodplain between the residential area and the cropped tablelands, this ecosite may provide a movement corridor for wildlife. Although there is no natural habitat farther east of the ecosite, high-mobility wildlife, such as deer, coyotes and turkey, may use the TDHM4-1 ecosite as a corridor. Based on this assessment, the terrestrial habitat classification of HDF-1 is “Contributing Functions”.

Based on the classifications described above, the HDF-1 receives a management recommendation of “Conservation”. The recommendations for Conservation from the (TRCA, CVC 2014) document are as follows:

- Maintain, relocate, and/or enhance drainage feature and its riparian zone corridor;
- If catchment drainage has been previously removed or will be removed due to diversion of stormwater flows, restore lost functions through enhanced lot level controls (i.e. restore original catchment using clean roof drainage), as feasible;
- Maintain or replace on-site flows using mitigation measures and/or wetland creation, if necessary;
- Maintain or replace external flows,
- Use natural channel design techniques to maintain or enhance overall productivity of the reach;
- Drainage feature must connect to downstream.

The development is planned to overprint the HDF-1 and THDM4-1 feature (Figure A.4). The main function of HDF-1 provides surface water infiltration and to transport water ephemerally down-slope toward the Medway Creek floodplain. Post-development, that function will be replicated using LID techniques utilizing infiltration and/or with an engineered vegetated swale or similar. Further description of methods proposed to maintain the hydrological function of HDF-1 are provided in Section 7.2.4.

4.6.2 Riverine Habitat Assessment

4.6.2.1 Medway Creek

During the November 2, 2023, assessment, Medway Creek was observed to have a meandering channel with a moderate flow and variable morphology, comprised of runs (80%), riffles (15%) and pools (5%). The average wetted width was 15 m, bankfull width was 18 m and average depth was 0.5 m. Coarse substrates were dominant, comprised of gravel (60%), cobble (20%), sand (15%), and boulder (5%). Most of the watercourse banks were vegetated with herbaceous plants, trees, and shrubs. As such, bank erosion was uncommon but was observed in two areas within the Subject Lands; at the toe of the slope to the FODM4 ecosite, and at the southern end of the Subject Lands, where the channel becomes more confined. The riparian area was mostly vegetated habitat of meadow, thicket, wetland, and forest. Instream cover was abundant, primarily provided by large, coarse substrate, organic debris such as logs, and pools.

Within the Study Area, Medway Creek provides suitable habitat for the three aquatic SAR identified in the background review – the Black Redhorse, Silver Shiner, and Wavy-rayed Lampmussel. The PDB does not intersect with Medway Creek, however, the PDB does encroach upon regulated habitat (riparian habitat) for the Silver Shiner and Wavy-rayed Lampmussel.

Mitigation measures to protect Medway Creek during construction are provided in Section 7.3 and Section 7.5.1. Further discussion of impacts to regulated habitat for Silver Shiner and Wavy-rayed Lampmussel are discussed in Section 7.4.4.

4.6.2.2 McClary Drain

On April 2, 2024, McClary drain had defined bed and banks with an average 1.2 m wetted width, 30 cm depth and sand, gravel, silt, and cobble substrates. The channel characteristics indicated a permanent flow regime. Minnows were observed in McClary Drain during the assessment. There was a direct connection to Medway Creek with unimpeded fish passage between the two watercourses. The PDB does not intersect with McClary Drain. Project related impacts to McClary Drain are not anticipated.

4.6.2.3 Unnamed Drain

On April 2, 2024, most of the drain was subsurface within a tile drain. At the discharge point of the tile drain into Medway Creek, there was a permanent barrier to fish migration. Fish habitat was not present in the Unnamed Drain. The PDB does not intersect with the Unnamed Drain (Figure A.3). Project related impacts to the Unnamed Drain are not anticipated.

5 Analysis of Significance

Both the Middlesex County OP (2023) and Middlesex Centre OP (2024) rely on the MNHSS (UTRCA 2014) document as the basis upon which the Natural Heritage System and Natural Heritage Features are delineated. The MNHSS identifies 15 criteria used for determining significance of the Natural Heritage Features. The significance criteria used for the natural feature evaluation is outlined in Table 9 of the MNHSS document. At the time of creating the MNHSS document, site level analysis was not feasible, so these criteria were applied at a landscape level. It is recommended in the MNHSS (2014) that "local municipalities are encouraged to conduct more in-depth studies and evaluate their natural heritage features at the site level." Criteria are applied to most vegetation communities, including woodlands, wetlands, thickets, and meadows.

As shown on Figure 2.1, most naturally vegetated features identified in the Study Area are included as part of the Natural Heritage System based on the analysis conducted as part of the MNHSS. As outlined in Section 4.1.2, the Study Area contains within this Natural Heritage System: Significant Woodlands, Significant Valleyland, Hazard Lands, Floodplain, UTRCA regulated area, and Significant Groundwater Recharge Area and a Highly Vulnerable Aquifer.

5.1.1 Woodlands

Woodlands identified in the Study Area (e.g., FODM4, FODM7, FODM7-5, WODM4-4, WODM5) are considered significant by the MNHSS and are therefore included in the Natural Heritage System as shown on Figure A.2.1. As detailed in Section 4.1.2. Significant Woodlands make up this portion of the Natural Heritage System.

One feature, WOD (east of Richmond Street), is not included in the Natural Heritage System and due to its location outside of the PDB, separated by Richmond Street, and therefore it was not further analyzed.

On Figure A.2.1, it appears that the PDB overlaps with the Natural Heritage System, particularly in proximity to FODM7-5. To confirm this, an agency boundary delineation and staking exercise is recommended.

5.1.2 Wetlands

Wetlands occur in the Study Area, including four (4) Slender Willow Mineral Deciduous Thicket Swamps (SWTM3-3), three (3) Mixed Mineral Meadow Marshes (MAMM3), one (1) Forb Mineral Meadow Marsh (MAMM2), one Shallow Marsh (MAS), and one (1) Sedge Graminoid Organic Meadow Marsh (MAMO1-6).

The Natural Heritage System identified on Figure A.2.1 includes:

- MAMM2
- MAMM3b-c
- MAS
- MAMO1-6
- SWT3-3a-b (3 separate occurrences of “b”)

Most of these wetlands are small (i.e., <0.5 ha) and are associated with Medway Creek. The MAMO1-6 wetland was confirmed as SWH (rare vegetation community). This wetland also has a seep which sustains the rare vegetation community. It is assumed that groundwater infiltration in the adjacent lands (OAGM1 and THDM4-1) support the seep in the MAMO1-6 wetland. The inclusion of these small wetland communities in the Natural Heritage System, to at least a certain degree, are related to criteria associated with the Medway Creek watercourse and Significant Valleyland.

One wetland, which is located along the slope at the perimeter of the PDB, is not included in the Natural Heritage System by the MNHSS:

- MAMM3a

Although this wetland does not meet the size criteria (the MAMM3a is approximately 0.3ha), which is less than the 0.5 ha minimum size outlined in the *Ontario Wetland Evaluation System* (MNRF 2022) as well as the MNHSS, there are additional criteria that require consideration. Criteria 13 indicates that a vegetation group can be significant if it contains SWH. Although amphibian surveys were conducted at this feature due to standing water in early spring, SWH was not identified in this feature.

Criteria 14 indicates that any vegetation group that contains a groundwater dependent wetland will be considered significant. In the MAMM3a feature, there were no seepages observed at surface, so no direct evidence of groundwater inputs. Monitoring well BH7/MW is the closest monitoring well to this feature, and the soils were not sand and gravel at surface (as in BH8/MW) but rather till at surface underlain by sand. The well that was installed into this underlying sand and manual groundwater elevations collected from 2021 to 2024 ranged from 2.98 to 3.79 m below ground surface. Assuming that the soil conditions are the same at MAMM3a as in monitoring well BH7/MW, it would appear this feature is surface fed and not groundwater dependent. Therefore, this wetland is not considered significant using the analysis from the MNHSS.

Despite this, policies existing governing development within wetlands (e.g., OPs, UTRCA) and therefore due to the proximity of this wetland to the PDB an agency boundary delineation is recommended.

5.1.3 Significant Wildlife Habitat

This analysis of significance, as it is primarily field based, has already been completed and is detailed in Section 3.2.6.

5.2 Summary of Natural Heritage Features

The following natural heritage features were identified in the Study Area and PDB.

Table 11 Summary of Natural Heritage Features

Natural Heritage Feature	Project Development Boundary	Study Area
Natural Heritage System (MNHSS)	Yes	Yes
UTRCA Regulated Habitat (Floodplain and Natural Hazards)	Yes	Yes
Significant Areas of Natural and Scientific Interest	No	No
Significant Valleylands	No	Yes
Significant Woodlands	Yes – boundary confirmation recommended	Yes
Significant Wetlands	No	No
Other Coastal Wetlands in Ecoregions 5E, 6E and 7E	No	No
Fish Habitat	No	Yes
Habitat of Endangered and Threatened Species	Yes (Little Brown Myotis, Hoary Bat, Eastern Red Bat, Silver-haired Bat)	Yes Confirmed (Little Brown Myotis, Hoary Bat, Eastern Red Bat, Silver-haired Bat Butternut, Silver Shiner Sliver, Black Redhorse, Wavy-rayed Lampmussel) Candidate (Chimney Swift, Red-headed Woodpecker, Spiny Softshell)
Significant Wildlife Habitat	Yes Confirmed • Rare Vegetation Community (FODM7-5)	Yes Candidate • Turtle Wintering Areas • Habitat for SOCC (Unicorn Clubtail, Eastern Milksnake, Midland Painted Turtle, Snapping Turtle, Northern Map Turtle)

Natural Heritage Feature	Project Development Boundary	Study Area
		Confirmed • Rare Vegetation Communities (FODM7-5, MAMO1-6) • Seeps and Springs (FODM7-5) • Habitat for SOCC (Barn Swallow, Monarch)

6 Project Description

The proposed Bridle Path North Subdivision consists of a broad range of residential development opportunities within the PDB, as well as complementary retail/service commercial uses along Richmond Street. The Subject Lands spans approximately 23.52 ha with the proposed development would yield up to an estimated 932 residential units within 17 development blocks including:

- Four streets in their entirety for dedication to the municipality
- Low Density Residential Blocks
- Medium Density Residential Blocks consisting of street townhouses, cluster townhouses, and mid- and high-rise apartments
- One park block
- Two stormwater management blocks
- One Utility and Pump Station Block.

The proposed development will direct stormwater runoff from the developed areas in both the southern and northern portions of the site to two SWM facilities. One facility will be in the southern portion while the other will be situated in the western part of the northern portion of the site. These facilities will be designed to accommodate runoff from the proposed multi-block townhomes, as well as from the surrounding residential and external land uses. SWM pond outlet easements are proposed which will convey SWM pond discharge into the Medway Creek floodplain (Appendix H).

The Study Area, Subject Lands, and PDB have changed since the submission of the Constraints Analysis on November 3, 2023. The site plan discussed in this DAR utilizes predominantly existing agricultural lands and was designed to adhere to the top of stable slope (or beyond, see Block 29; Appendix H) plus a 6.0 m setback to stay out of the erosion hazard limit as recommended in the Preliminary Geotechnical Investigation and Slope Stability Assessment (EXP 2023). The 6.0 m setback is to remain an Emergency Access Allowance post construction and will not be vegetated.

7 Assessment of Impacts and Mitigation Recommendations

The potential direct and indirect impacts to natural features and functions in the PDB and Study Area that might reasonably be expected to occur because of the proposed works have been identified and discussed in this section. Site specific mitigation measures are also recommended in this section. Standard mitigation recommendations that are typically required for all construction projects are presented under a separate header below.

7.1 Vegetation and Vegetation Communities

Potential impacts to vegetation and vegetation communities include:

- Direct loss of vegetation.
- Soil compaction which can affect growing conditions if replanting is proposed in those areas following construction.
- Injury to trees outside of the construction limits if the proposed works occur within the root zones.
- Edge tree effects within woodlands where tree removal occurs.
- Damage to vegetation due to fugitive dust suppression, salt spray effects, sedimentation, and accidental spills (e.g., fuel, oil, other hazardous materials).
- Changes to community structure due to changes in water availability and the introduction and spread of invasive species including *Phragmites*.
- Exposure of soils from vegetation clearing, grubbing and grading can result in sediment runoff discharging into nearby wetland communities.

Permanent loss of vegetation will occur where the PDB overlays natural areas and vegetation removal is required to facilitate construction. The calculation of vegetation loss is completed by overlaying the PDB onto delineated ELC ecosites in ArcGIS and if there is intersection with the two layers, vegetation loss is calculated where those intersections occur. At the time of writing this DAR, ecosites which are encroached upon in small proportion may be reduced to zero encroachment with refinement of the site plan during detailed design and onsite boundary delineations with agencies. However, encroachments based on the analysis of the current PDB and ELC mapping are included in this Section.

As the PDB was delineated at the time of writing this DAR, 1.55 hectares (ha) of natural vegetation will be displaced in ten (10) ELC ecosites, detailed in Table 12.

The PDB is predominantly within annual row crop agricultural fields (OAGM1) and the development will cover 19 hectares of this land use. The natural vegetation communities which intersect with the footprint of the PDB and where vegetation loss is anticipated is in the FODM7-5, MEGM3-4, THDM2, THDM4-1, MEMM3a, MEMM3b, MEMM3c, MAMM3a, TAG5a, and TAG5b communities (Figure A.4).

Table 12 Anticipated Vegetation Loss per Ecosite Associated with the Project

ELC Ecosite	ELC Code 2008/1998	Vegetation Loss (ha)	No Impact (ha)
Fresh – Moist Black Maple Lowland Deciduous Forest	FODM7-5	0.011	0.647
Kentucky Blue Grass Graminoid Meadow	MEGM3-4	**0.249**[1]	0.407
Dry - Fresh Deciduous Shrub Thicket Ecosite	THDM2	0.031	0.589
Native Deciduous Regeneration Thicket Type	THDM4-1	**0.492**	0.000
Dry – Fresh Mixed Meadow	MEMM3a	**0.164**	0.192
Dry – Fresh Mixed Meadow	MEMM3b	**0.463**	0.441
Dry – Fresh Mixed Meadow	MEMM3c	0.0262	0.483
Mixed Mineral Meadow Marsh	MAMM3a	0.0197	0.271
Fencerow - Treed	TAGM5a	0.062	0.048
Fencerow - Treed	TAGM5b	0.020	0.037
	Total	1.55	3.76

[1] – 0.217 ha of which is associated with the roadside ditch along the south side of Medway Road

The most significant vegetation loss will occur in four ecosites in the Subject Lands, including the Native Deciduous Regeneration Thicket Type (THDM4-1), the Kentucky Blue Grass Graminoid Meadow (MEGM3-4), and two ecosites of Dry – Fresh Mixed Meadow (MEMM3a and MEMM3b) which are bolded in Table 9. These ecosites are anticipated to be overprinted partially or completely by development.

Vegetation loss in the other ecosites listed in Table 12 is low, and it is anticipated that refinement of the site plan at detailed design and with onsite agency boundary delineation could eliminate encroachment into those ecosites. Although encroachment is shown into MAMM3a, this does not comply with wetland policies of the Middlesex Centre OP (Middlesex Centre 2024), where development within wetlands shall not occur as per the OP policy nor does it meet UTRCA recommendations for setbacks detailed in their pre-consultation correspondence (Appendix B). Impacts to wetlands are further discussed in Section 7.2.

7.1.1 Rare Vegetation Communities

7.1.1.1 Fresh – Moist Black Maple Lowland Deciduous Forest (FODM7-5):

This community is located adjacent to the PDB and minor encroachment resulting in vegetation loss (0.011 ha) has been calculated to occur.

The development may result in the current environmental conditions (i.e. water infiltration, soil moisture regime, soil type and level of compaction, sun, and wind exposure) to change surrounding the vegetation community. The form and function of this community to maintain SWH depends, to a certain degree, on the three (3) seeps identified in the feature.

The seeps present in the FODM7-5 ecosite are dependent on groundwater flows in the adjacent lands (in the OAGM1). The hydrogeological study (EXP 2024) documented coarse grain deposits on top of fine grain deposits in the OAGM1. The fine grain deposits create a shallow groundwater table in the OAGM1 adjacent to the FODM7-5. This water table is located 1.6 to 2.2 m below the surface.

As this area has a shallow groundwater table, development is anticipated to impact groundwater flows. Management of groundwater in this area will be important for building safety and to maintain the form and function of the seeps in the FODM7-5. If houses with basements and sump pumps are to be constructed adjacent to the FODM7-5, the potential effect of sump pumps on the groundwater table should be evaluated by a qualified professional.

Direct impacts to this feature are small, and further refinement of the boundaries in the field may alleviate these impacts.

7.1.1.2 Sedge Graminoid Organic Meadow Marsh (MAMO1-6)

The MAMO1-6 community is significant due to the presence and dominance of the Hairy-fruited Sedge in this ecosite. Hairy-fruited Sedge is dependent on the presence of water in the form of a high-water table or a groundwater seepage. This community is outside of the PDB. Development within the MAMO1-6 community is not proposed, therefore the form and function of the vegetation community is anticipated to be maintained. However, development of adjacent uplands including the OAGM1 agricultural field and the THDM4-1 may result in decreased flows of water or the loss of the seepage which is anticipated to support the MAMO1-6 ecosite. Wetlands are further discussed in Section 7.2.

7.1.2 Other Vegetation Types

7.1.2.1 Native Deciduous Regeneration Thicket Type (THDM4-1)

This ecosite will be entirely removed for development. This ecosite is predominantly a regeneration of black walnut with some large silver maple with a ground cover of grass and common wildflowers (asters and goldenrod) (described in Table 9).

The form and function of this ecosite is anticipated to be principally surface water infiltration and the transport of ephemeral surface water flows (from HDF-1). Groundwater and surface water flow through this feature may support the MAMO1-6 wetland (SWH). Bat SAR were documented utilizing the ecosite through the ARU surveys, which could therefore support habitat for bat SAR.

The ecosite is mapped as part of the Natural Heritage System on the Middlesex County OP (Figure A.2.1), however, it is mapped as Residential on Schedule A-3 of the Middlesex Centre OP (2024). This ecosite is not mapped as Significant Woodland in Schedule B of the Middlesex Centre OP (2024) and is not mapped as Hazard Lands in Schedule C of the Middlesex Centre OP (2024).

The overall form of this ecosite will be lost during development; however, the function to infiltrate and transport water flows will need to be maintained post development (see Section 7.2.3). Removal of this ecosite will require consultation with the MECP as it potentially supports bat SAR (see Section 8.2).

7.1.2.2 Kentucky Blue Grass Graminoid Meadow (MEGM3-4)

Most of the vegetation loss in this ecosite (i.e., 0.217 ha) is anticipated to occur on the south side of Medway Road in the road right-of-way (ROW). This ecosite is composed of non-native grasses with occasional flowering herbaceous plants (described in Table 9). This ecosite is common along roadways and within the Study Area and the ecological benefits of this ecosite are anticipated to be low.

As this ecosite is not mapped as a natural heritage feature on the Middlesex County (Figure A.2.1) and Middlesex Centre OP (2024) and is not within hazards lands (Middlesex Centre OP (2024), loss of the roadside ditch vegetation through development will not impact the form or function of the Natural Heritage System. Therefore, compensation for the loss of this roadside ditch vegetation community is not deemed necessary.

However, isolated maple trees are present in the ROW (Figure A.3) within this meadow community, which may be suitable for bat maternity roost habitat. Removal of these trees in conjunction with the other trees identified on the Subject Lands will be reviewed by the MECP to confirm approach regarding SAR bat permitting and is considered separately (see 7.4.4.3).

The remainder of this ecosite, where it is present in the Medway Creek corridor (Figure A.3), will be retained (0.407 ha) with only 0.032 ha removed outside of the roadside ROW.

7.1.2.3 Dry – Fresh Mixed Meadow (MEMM3a)

This meadow ecosite borders the MAMM3a (wetland) ecosite and extends in the Medway Road ROW, down to the Medway Creek floodplain (Figure A.3). This ecosite is composed of non-native grasses and flowering herbaceous plants (described in Table 9).

This ecosite and adjacent lands in the OAGM1 are likely to provide precipitation infiltration which may source groundwater flow and support the hydrology of the MAMM3a.

This ecosite is not mapped as part of the Natural Heritage System on the Middlesex County OP (Figure A.2.1) and is not part of the Greenlands System in the Middlesex Centre OP (2024). This ecosite is mapped as hazard lands in Schedule C of the Middlesex Centre OP (2024).

7.1.2.4 Dry – Fresh Mixed Meadow (MEMM3b)

This ecosite is in the northeast corner of the Subject Lands, west of Richmond Street (Figure A.3). The development proposes to remove approximately half of this feature (0.463 ha removed, 0.441 ha remain). It is composed of non-native grasses, flowering herbaceous plants and isolated maple trees (described in Table 9).

From the OAGM1, the ecosite slopes towards Medway Creek. In this ecosite, the development is partially within the UTRCA regulation limit (Figure A.4). The ecosite is mapped as part of the Natural Heritage System on the Middlesex County OP (Figure A.2.1), however, it is mapped as Residential on Schedule A-3 of the Middlesex Centre OP (2024). This ecosite is not mapped as part of the Greenlands System in

Schedule B of the Middlesex Centre OP (2024), and it is mapped as Hazard Lands in Schedule C of the Middlesex Centre OP (2024).

The ecological form and function of the MEMM3b is anticipated to include a buffer to Medway Creek, providing allochthonous (terrestrial organic matter) to Medway Creek, filtering runoff from Richmond Street, farm fields and surrounding developed land, and providing a potential movement corridor for wildlife to move across Richmond Street.

The form of the ecosite is anticipated to be maintained as half of the ecosite will be left intact which will maintain the vegetation community, habitat features and will continue to support interdependent ecosites (i.e. providing infiltration to support the MAMM3b). The function of the MEMM3b (riparian habitat function, filtration, infiltration) will also be maintained as the riparian buffer to Medway Creek will be maintained to at least an anticipated 50 m width. Connectivity (for wildlife movement) under the Richmond Street bridge will still be viable as there will be a buffer left intact on the south and north sides of Medway Creek. MEMM3b habitat is not limited in the Subject Lands, as similar habitat to what is provided in the MEMM3b is present to the west within the Subject Lands (see MEMM4/THDM5/SWTM4, OAGM2/MEMM3) (Figure A.3).

A portion of the MEMM3b ecosite receives legal protection under the ESA and SARA through regulated habitat for aquatic SAR: the Wavy-rayed Lampmussel and the Silver Shiner. Additionally, maple trees within the community have been identified as potential bat SAR roost habitat (Figure A.3). Further discussion of aquatic SAR is provided in Section 7.4.4.4 and bat SAR in Section 7.4.4.3, which recommends consultation with MECP.

7.1.3 Vegetation Mitigation

The following mitigation measures are recommended to reduce the likelihood of impacts to vegetation and vegetation communities (e.g., wetlands, woodlands, thickets, meadows):

- The boundaries of the project limits, vegetation clearing and retention zones within the project limits, and natural areas adjacent to the project limits, shall be clearly delineated in plans/drawings and in the field.
- The 6.0 m setback from the PDB to vegetation communities (where it is proposed), should provide indirect protection to vegetation communities (prevent accidental take, prevent/reduce damage to root structures, allowing infiltration).
- Vegetation removals shall be reduced to the extent feasible and limited to the construction footprint. Review opportunities to reduce grading limits for all areas of vegetation removal.
- Install tree protection fencing along the dripline to protect the root zone of trees adjacent to the work zone and project limits.
- Use appropriate vegetation clearing techniques and limit clearing, grubbing and grading to only includes areas necessary to complete the works.

- Vegetation removals shall adhere to the applicable timing windows. Generally, time vegetation removal to occur between November 1 to March 14 which will accommodate most species, unless otherwise specified for specific species, locations or as dictated through permits or approvals.
- Install surface protection measures to lessen soil compaction, particularly in areas where post-construction plantings are proposed.
- Implement dust control measures for the suppression of fugitive dust.
- In the case of unexpected vegetation removal or accidental damage to trees, vegetation shall be replaced and/or restored.
- Trees/shrubs that are felled within areas where active construction is being undertaken should be mulched or relocated to natural areas as soon as possible, especially during the breeding bird season to prevent birds from nesting and snakes from seeking refuge.
- Develop and implement a Rehabilitation Plan to restore and compensate disturbed areas, where required. This plan shall be consistent with any permit requirements.
- Temporarily disturbed areas shall be restored and vegetated to pre-construction conditions or better. Vegetation plantings shall include seed mixes that are appropriate for the area and include a mix of native species (including milkweed), that are appropriate to the site and conditions.

7.2 Wetlands

The development is anticipated to potentially directly or indirectly affect three (3) wetlands in the Study Area: the MAMM3a, MAMM3b and the MAMO1-6.

7.2.1 Wetland Loss

As described in Section 7.1, one (1) wetland (MAMM3a) may be encroached upon by the PDB, accounting for a total loss of 0.0197 ha of wetland vegetation community. This loss represents 7.2% of the wetland vegetation community in the MAMM3a. Feature boundary staking of the MAMM3a with UTRCA is recommended to confirm this overlap as well as mitigation and compensation considerations during detailed design.

It is possible that MAMM3b will be indirectly impacted due to development within the MEMM3b as the MAMM3b is small and a vegetation community dependent on a small groundwater upwelling. However, the PDB does maintain a minimum of 14.2 m setback on the MAMM3b, which may provide the necessary area to maintain current conditions such as infiltration and upwelling to maintain the MAMM3b.

Indirect impacts may also occur on the MAMO1-6 as field observations suggest this feature is dependent on a groundwater upwelling and development on adjacent lands may impact groundwater infiltration. Use of LID and maintaining an infiltration of 80% within the PDB is proposed to maintain the form and function of the MAMO1-6.

7.2.2 Wetland Degradation

Development of adjacent lands may result in the following potential indirect impacts:

- Source water impediment
- Increased salt from road applications
- Invasive species introduction
- Increase pollution and contamination from vehicles

These items could lead to a change in the form and/or function of the feature. For example, too little water could cause the feature to dry out and allow for other species of vegetation (including invasive species) to take over, while too much water could also result in a vegetation shift to a marsh ecosystem. The introduction of salt, invasive species and/or other contaminants may cause changes to the plant health and species composition.

7.2.3 Wetland Water Balance

Development is proposed to overprint most of the catchment areas for the MAMM3a and MAMM3b, as determined through the feature-based water balance study (EXP 2024). Development within the MEMM3b may impact the hydrology of the MAMM3b wetland, however a minimum 14.2 m setback will be maintained on the MAMM3b.

Development is not proposed within the MAMO1-6, however, the catchment area for HDF-1 and the HDF-1 drainage pathway is proposed to be overprinted by the development. Infiltration in the THDM4-1 and adjacent lands is anticipated to potentially provide source water for the MAMO1-6. A seep is also present in this community.

Without mitigation, the post-construction water balance will result in an increase of 191% runoff and decrease to 40% of infiltration of the pre-development volumes (EXP 2024).

7.2.4 Wetland Mitigation

LID techniques are proposed to achieve 80% infiltration in the Subject Lands post development so to maintain the hydrology of the wetlands in the Study Area (EXP 2024). The geology of the catchment areas is anticipated to be conducive to the application of the LID techniques to maintain groundwater infiltration (EXP 2024) although the specifics of the LID will be determined through detailed design. This will alleviate an unsustainable reduction of water inputs to the onsite features that could results in the loss of form and functions.

To protect the hydrologic function of the MAMM3b, construction of homes within the MEMM3b area, which is comprised of till substrate (EXP 2024), typical LID measures (i.e., infiltration galleries) may not be appropriate. Therefore, in this area an option that may be explored would be the implementation of rain garden LID techniques. The vegetated buffer may also be determined to be suitable to maintain the conditions (infiltration and groundwater upwelling) which support MAMM3b.

The underlying soils associated with the MEMM3a and OAGM1 are conducive to infiltration and traditional LID techniques such as infiltration galleries should be suitable to maintain the infiltration required to maintain the form and function of the MAMM3a.

Infiltration and conveyance of ephemeral surface water flows through the HDF-1 are proposed to be maintained with LID techniques, such as with an or infiltration gallery and/or engineered constructed swale channel. This will be required to maintain infiltration and/or surface water contribution to the rare vegetation community MAMO1-6.

A setback to wetlands as requested by the UTRCA in their pre-consultation correspondence (Appendix B) has been applied to the MAMM3b (minimum 14.2 m setback) and MAMO1-6 (approximately 40 m). Minor encroachment occurs to the MAMM3a, however, there will be a minimum 6.0 m setback from the MAMM3a, where the PDB is not encroaching on this ecosite. The 6.0 m setback will not be vegetated but will allow infiltration. Runoff from impervious surfaces such as roads and laneways will be directed into stormwater drains and into SWM ponds.

7.3 Aquatic Habitat

Direct impacts to fish and fish habitat (in Medway Creek) are not anticipated as the Project does not involve any proposed in-water work in fish habitat. The three tributaries to Medway Creek are also outside of the PDB and there are no anticipated direct or indirect impacts to these watercourses.

Development in the MEMM3b area will require removal of riparian meadow habitat, however, the naturally vegetated buffer which will remain post development is anticipated to be 50 m wide at a minimum m. This buffer is anticipated to maintain the function of the removed habitat (providing allochthonous inputs, runoff filtration and infiltration), and the buffer width exceeds the recommended shoreline buffer of 15 – 30 m as directed by the DFO (DFO 2010). However, additional considerations are required for Aquatic SAR as discussed in Section 7.4.4.4.

As both SWM facilities are proposed to outlet to Medway Creek, potential impacts and proposed mitigation to those impacts include:

- thermal impacts by adding warm water from the SWM pond to the system that could impact fish habitat downstream; however, no thermal impacts are expected from the north SWMF as it is a dry facility. The south SWMMF will be designed with a bottom draw outlet to minimize thermal impacts.
- increased sediment/nutrient load if facility malfunctions; however, an operations and maintenance manual will be provided to help keep the facilities operating as designed and minimize failures.
- potential erosion in Medway Creek due to increased flows; however, SWM pond facilities will be designed to reduce flow to below or equal to existing rates, along with having extended drawdown times for smaller event storms, minimizing the erosion risks.
- impacts to water volume inputs during construction through dewatering or post-construction through increased runoff, however, an erosion and sediment control plan will be developed at detail design to limit any uncontrolled flows to the Medway Creek.

- DFO Measures to Protect Fish and Fish Habitat (DFO 2025b) will be followed for Project activities near Medway Creek and works involving dewatering and discharges.

7.4 Wildlife and Wildlife Habitat

7.4.1 Direct Impacts

During construction, potential direct impacts to wildlife may include:

- Collisions with vehicles, machinery, or physical barriers may occur if wildlife are able to access the construction limits (e.g., improper design or installation of exclusionary measures). This could include mortality of species protected under specific legislation (e.g., MBCA, FWCA, ESA and SARA)
- Increases in wildlife road mortality are not anticipated post-development as the OAGM1 fields do not provide migration corridors for wildlife and the Medway Creek migration corridor is minimally encroached upon.
- Bats may be susceptible to injury and/or incidental take if habitat is removed during the active season for bats.
- Light pollution, including temporary and permanent lighting may cause disorientation or attract birds and bats to the area due to increased foraging potential, which may result in injury or mortality through collisions with vehicles or equipment.
- Migratory birds' nests and eggs could be damaged or destroyed during construction activities, especially during vegetation removal.
- Snake hibernaculum has the potential to be incidentally discovered during construction, particularly in areas where there are rock piles, bedrock outcrops, housing foundations, wetlands and woodlands.
- Snakes and other wildlife may use construction vehicles and other artifacts such as geotextile for thermoregulation and cover during the active season.
- There is potential for incidental discovery of turtles during overland movement.
- No direct impacts to aquatic species are anticipated.

7.4.1.1 Permanent Wildlife Habitat Loss

The OAGM1 lands where the development is to occur are not anticipated to directly support any of the SOCC as these lands are intensively farmed with annual row crops.

Direct permanent habitat loss is not proposed for most types of SWH identified in the Study Area. However, direct loss of the following wildlife habitat types is proposed:

- Candidate habitat for SWH for forest roosting bats (FODM4, FODM7-5; 0.023 ha)
- Candidate habitat for SOCC
    - Eastern Milksnake (all habitat types; 1.4 ha)
    - Monarch (MEMM3b, MEMM3c; 0.756 ha)

Three Monarch were observed during field investigations utilizing habitat with common milkweed plants. Most of the suitable Monarch habitat in the Study Area will not be impacted by the Project. Monarch habitat in the MEMM3b will be lost, however, there is abundant meadow habitat in the Study Area and significant impacts to habitat availability in the Study Area for the Monarch is not anticipated.

Mitigation for Monarch includes the recommendation to conduct vegetation clearing outside of the active season for Monarch (late May to late September), so to not impact the species during sensitive life history periods.

For Eastern Milksnake, wildlife exclusion fencing is recommended to be erected between the development and natural habitat of the Medway Creek corridor. Exclusion fencing is anticipated to provide protection to Milksnake and for low mobile wildlife (amphibians and reptiles), as a whole.

Direct habitat loss for SAR is described in Section 7.4.4.

7.4.2 Indirect Impacts

Permanent Project related impacts to wildlife utilizing habitat in the Medway Creek corridor may include increased noise, light, and environmental pollution (garbage, road salt, contaminants associated with vehicles), and invasive species introductions (garden exotic escapees).

7.4.3 Seeps and Springs

Indirect impacts to seeps and springs, and other groundwater fed features, which could be impacted by the development and result in a change in the form and function of the habitat is discussed in Section 7.2.3.

7.4.4 Species at Risk

7.4.4.1 Butternut

One plant SAR (butternut) was confirmed to occur outside of the Study Area in the Medway Creek corridor. Impacts to the butternut are not anticipated to occur from the Project due to its location outside the PDB and Study Area.

7.4.4.2 Birds SAR

Chimney Swift were recorded as flyovers and there is no suitable breeding habitat in the Subject Lands. No impacts are anticipated to this species. No other bird SAR were identified during the breeding bird

surveys. Suitable grassland bird SAR habitat (hayfields – OAGM2/MEMM3, OAGM4, OAGM2) will be maintained as development is not occurring within the floodplain. Impacts to bird SAR are not anticipated from the Project; however, species-specific Red-headed Woodpecker were not completed, which is now an MECP requirement where suitable habitat exists, even if they are not observed during breeding bird surveys.

7.4.4.3 Bat SAR

Four species of bat SAR (Little Brown Myotis, Eastern Red Bat, Hoary Bat, Silver-haired Bat) were identified to occur in the Subject Lands by ARU surveys. The four species may use any trees or shrubs (singly or grouping) within an ecosite in the Study Area.

Removal of trees and shrubs for the Project may result in loss of roosting habitat for SAR bats of approximately 0.623 ha (FOD, THD, and TAG communities). Larger areas of vegetation such as that in THDM4-1 may provide suitable maternity roost and foraging habitat for all the identified bat SAR. Removal of THDM4-1 will result in the loss of this potential bat maternity roost habitat. However, suitable bat maternity roost and foraging habitat is anticipated to present in the general landscape.

Impacts to suitable bat SAR habitat will require a review by the MECP as the presence of bat SAR and candidate roost habitat has been documented on the Subject Lands. To reduce or eliminate the risk of accidental harm to bats, removal of trees and shrubs will occur outside the period when bats use trees and shrubs for maternity roosts (cavity and foliage roosting bats). Ontario bat species typically give birth in late-May to early-June, and females fly with newborn young until they become excessively heavy. Young begin to fly in mid- to late-June, at age three to four weeks. Rearing is completed by August when the bats move to hibernacula (Broders et al. 2006, Cagle and Cockrum 1943, Gerson 1984). Therefore, tree and shrub removal should not be completed from April 1 to September 30 in any year.

Bats may also roost in buildings including the Little Brown Myotis (Humphrey et al. 2019). Buildings proposed for removal (such as the homes within the CVR_4 ecosite) will need to be surveyed for bat SAR roosting prior to demolition.

The loss of suitable bat SAR habitat may be mitigated with the installation of bat rocket boxes or other suitable bat maternity roost habitat compensation features, as/if required by the MECP upon their review of the Project. The requirements (if any) of this compensation will be determined through consultation with the MECP. Further discussion of bat SAR permitting is discussed in Section 8.2.

7.4.4.4 Aquatic SAR

There are three aquatic SAR assumed to be present in Medway Creek: the Black Redhorse, Silver Shiner and Wavy-rayed Lampmussel. Under the SARA and ESA, Medway Creek is protected habitat for the three species, however, protected habitat for Silver Shiner and Wavy-rayed Lampmussel also includes riparian habitat within natural vegetation communities.

Under the SARA and ESA, critical habitat for Black Redhorse is defined as run, riffle or pool areas in stream with slow to moderate flow for juveniles and moderate flow for adults within the Medway Creek (MECP 2023a) (other watercourses are also listed in this description).

Under the SARA and ESA, critical habitat for Silver Shiner is defined as the bankfull channel width, meander belt width and riparian vegetation within it, and associated riparian vegetation extending 30 m out from the meander belt width in Medway Creek (DFO 2022, MECP 2023b) (other watercourses are also listed in this description).

Wavy-rayed Lampmussel habitat, as described under O. Reg. 832/21 (Ontario 2021a), includes Medway Creek and the riparian habitat within 30 m of the relevant high-water mark.

Stantec completed a meander belt study for Medway Creek (Stantec 2025) to determine the extent of regulated habitat for Silver Shiner in the Study Area. The meander belt and 30 m buffer on the meander belt are shown on Figure A.4. Figure A.4 shows that the PDB is within the regulated habitat for Silver Shiner (see MEMM3b) as the PDB extends slightly into the 30 m meander belt buffer, excluding the active agricultural lands which do not qualify as habitat. The PDB may also be within Wavy-rayed Lampmussel habitat (would need further field assessment to delineate protected habitat). Direct impacts to Black Redhorse habitat are not anticipated.

Potential impacts to aquatic SAR habitat from the development may occur from the reduction of the current vegetated riparian area in the MEMM3b ecosite. A reduction of the riparian area may result in indirect impacts to the aquatic ecosystem such as reduction of allochthonous inputs and reduction of riparian area buffering/filtering capacity of adjacent land runoff.

An anticipated minimum 50 m buffer is to remain between the development and Medway Creek. The DFO Shore Primer (DFO 2010), recommends a 15 – 30 m buffer on warmwater and coldwater lakes, respectively, therefore, the buffer which will remain is anticipated to provide a suitable buffer to provide protection to the aquatic habitat.

Stormwater within the development will be managed by land infiltration and SWM pond facilities. Direct runoff from the development into Medway Creek is not proposed. SWM pond discharge into the Medway Creek corridor and/or direct discharge into Medway Creek is proposed, which will be considered by the DFO and MECP under their Project review.

Signage is recommended to be installed at public access points on Medway Creek within the Study Area. These signs will inform the public of the presence of aquatic SAR and provide other valuable information intended to protect Medway Creek and its ecological health.

Permitting requirements for development within regulated aquatic SAR habitat is discussed in Section 8.

7.4.5 Wildlife Mitigation Measures

The following general wildlife mitigation measures are to be considered in addition with the species-specific or targeted wildlife mitigation measures previously described for SAR and SOCC.

7.4.5.1 Migratory Birds

Migratory birds and their nests are protected from harm and disturbance under the MBCA. There is potential for nests to occur in vegetation that will be cleared for construction of the Project. To address the MBCA, a timing restriction for vegetation clearing and other work that may disturb nests is recommended.

The Primary Nesting Period (PNP) is the period when the percent of total nesting bird species is expected to be greater than 10%. The PNP for the Study Area is considered to fall between late March to late August, although nesting also infrequently occurs outside of this period (ECCC 2024b). Vegetation clearing should not be performed within the PNP unless a qualified biologist is retained to conduct nest sweeps of the area to be cleared a maximum of seven days prior to works. The biologist will search for nests or signs of nesting of migratory birds within and adjacent to the area. Where the sweep determines that no nests are present, the Project can commence within the searched area. If the work is delayed beyond the seven-day effective window for the nest sweep, a new sweep will be required.

If a migratory bird nest is located within the work area at any time, a no-disturbance buffer will be delineated. This buffer will be maintained for the entire duration of the nest activity, which will be determined using periodic checks by the qualified biologist. The radius of the buffer generally varies from 5 m – 60 m depending on the sensitivity of the nesting species. The Project will not resume within the nest buffer until the nest is confirmed to be no longer active.

7.4.5.2 Avoidance of Wildlife

The following mitigation measures are recommended to avoid impacts to wildlife during Project construction and operation:

- Conduct a visual search of the work area before work commences each day, particularly for the period when most wildlife is active (generally April 1 to October 31). Visual inspections will locate and avoid snakes, turtles and other ground dwelling wildlife such as small mammals. Visual searches will include inspection of machinery and equipment left in the work area overnight prior to starting equipment.
- If wildlife is encountered, work at that location will stop, and the animal(s) will be permitted reasonable time to leave the work area on their own.
- If there are repeat observations of wildlife in the active pit (e.g., turtle nesting), barrier fencing may be used to direct wildlife away from the active work area(s) and toward natural wetland areas outside the extraction limit. All fencing materials will be wildlife-friendly to prevent accidental entanglement.
- If snakes, turtles, SOCC, SAR, mammals (e.g., raccoon, fox) are encountered during construction, whenever possible, work shall be suspended until the species is out of harm's way.
- Any observations of SAR or SOCC will be reported to MECP and/or MNRF within 48 hours. SAR will not be handled, harassed, or moved in any way, unless they are in immediate danger
- If a snake hibernaculum is incidentally discovered, all work must cease, and a Qualified Biologist shall be contacted to discuss mitigation options

- If a turtle nest site or evidence of a turtle nest (i.e., areas of fresh digging in loose gravel or sandy material) are found within the work areas, all work in that area shall cease. The nests shall be left undisturbed, flagged and a setback applied to protect against construction activities. If avoidance is not possible, egg salvage may be completed by a Qualified Biologist.

7.4.5.3 Wildlife Exclusion

Temporary wildlife exclusion fencing is recommended between the Medway Creek valleylands and the construction area to exclude snakes, amphibians, and other ground-dwelling wildlife during construction. Fencing should be designed using best available science such as the *Best Management Practices for Mitigating the Effects of Roads on Amphibian and Reptile SAR in Ontario* (MNRF 2016) and *Reptile and Amphibian Exclusion Fencing: Best Practices* (OMNR 2013b). Exclusion fencing may be constructed using sediment fencing and should be 60 cm tall and the bottom edge should be buried 10-20 cm. If hardware mesh is used, it should be less than ¼ inch to prevent wildlife entanglement (i.e. snakes). Wildlife exclusion fencing as described can also perform as sediment and erosion control fencing.

7.5 Standard Mitigation Measures

7.5.1 Sediment and Erosion Control

Mitigation measures for sedimentation, erosion, and dust control should be implemented to prevent sediment and dust from entering sensitive natural features. The primary principles associated with sedimentation and erosion protection measures are to: (1) reduce the duration of soil exposure; (2) retain existing vegetation, where feasible; (3) encourage re-vegetation; (4) divert runoff away from exposed soils; (5) keep runoff velocities low; and to (6) trap sediment as close to the source as possible. To address these principles, the following mitigation measures are proposed:

- Sediment and erosion control measure (ESC)s (i.e. silt fencing) should be used along construction areas adjacent to any natural areas. ESC should be installed along the entirety of the Medway Creek valleyland boundary and the construction areas. ESC measures will of particular importance in the MEMM3b ecosite as development in this area is anticipated to require infilling due to the slope in the MEMM3b towards Medway Creek. Creation of a sediment and erosion control plan for the development is recommended during detailed design.
- Where construction is proposed within natural ecosites of the Medway Creek corridor, double robust silt fence with intervening staked straw bales should be used to provide additional protection to Medway Creek riparian areas.
- No equipment should be permitted to enter any natural areas beyond the ESC fencing.
- Exposed soil areas should be stabilized and re-vegetated, through the placement of seed and mulching or seed and an erosion control blanket, promptly upon completion of construction activities, if applicable.

- Equipment should be re-fueled a minimum of 30 m away from wetlands and/or Medway Creek to avoid potential impacts if an accidental spill occurs. Spill control materials, including absorbent barriers and mats, should be kept on site to quickly address any accidental spills.
- In addition to any specified requirements, additional silt fence should be available on site, prior to grading operations, to provide a contingency supply in the event of an emergency.
- ESC fencing should be monitored regularly and properly maintained, as required. ESC fencing is to be removed only after the soils of the construction area have been stabilized and adequately protected or until cover is re-established.
- Temporarily disturbed natural areas (if required) should be restored to pre-construction conditions, or better.
- Topsoil stripping piles should be enclosed with ESC on the downslope side of the pile.
- Dewatering in construction areas should be pumped into a sediment bag or similar device to filter sediment from the pumped water before release into the environment. Dewatering should not be pumped over exposed soils and should not be directly discharged into Medway Creek.
- In the event of an accidental spill, the MOECC Spills Action Centre should be contacted, and emergency spill procedures should be implemented immediately.

7.6 Re-vegetation, Ecological Compensation and Setbacks

7.6.1 Re-vegetation

Natural areas that are disturbed during construction will be stabilized and re-vegetated as soon as practicably possible with native seed mixes, and woody vegetation where appropriate. Re-vegetation plans will include only native species that are ecological appropriate for the site conditions, and are sourced locally, if possible, with the intent to restore natural areas to the pre-existing condition or better. SWM pond areas will be ecologically designed and revegetated with native vegetation species. Re-vegetation will be monitored to confirm compliance with the planting plans so that correct species are planted, and to track vegetation establishment. Deficiencies noted during monitoring such as poor vegetation cover, or presence of invasive species will be identified and corrected immediately.

7.6.2 Ecological Compensation and Setbacks

The total loss of vegetation communities in the Natural Heritage System is 0.966 ha (THDM4-1, MEMM3b, and FODM5-7). Ecological compensation will be undertaken in the agricultural field (OAGM1) adjacent to FODM4 (Figure A.5) to expand the Natural Heritage System in this area by contributing 0.173 ha of new habitat to be naturalized following ecological concepts in habitat restoration (e.g., native plantings suitable for the environmental conditions, site and application). This area is shown on Figure A.5.

A setback of 6.0 m between natural ecosites and the PDB will be applied to most areas along the Medway Creek corridor. This setback will not be vegetated as it will be used as an Emergency Access Allowance (Section 6). However, this setback is anticipated to allow infiltration, which is important for this

Study Area to maintain form and function of many natural heritage features. A setback from 3 – 20 m has been applied between the FODM4 and the PDB. This area (not including the 6.0 m setback), will be vegetated, as described above.

Two areas of Open Space (Block 2 and 29, total area of 0.94 ha) are within the Subject Lands (Appendix H). These areas are comprised of existing natural vegetation communities (Block 29: MAMM3b, MEMM3b, MEFM4/MAMM3; Block 2: MEFM1-1/MEFM1-2) which are not being directly impacted by the Project. These areas may be used for ecological enhancement, such as tree planting or feature creation for SAR (i.e. SAR bats), as required by regulatory agencies. These areas are not considered compensation lands as these areas are already naturalized but the areas could be enhanced with specific treatment or management. These areas are shown on Figure A.5.

8 Authorization Requirements

8.1 Fisheries Act

As the PDB encroaches upon regulated critical habitat for Silver Shiner, consultation with the DFO is required for the Project. Consultation with the DFO will begin through the submission of a Request for Review.

8.2 Endangered Species Act

Impacts to SAR bat habitat may occur through the removal of hedgerows, thicket, and forested habitat on the Subject Lands that were identified on acoustic detectors deployed in 2023. Impacts to SAR bat habitat may also occur through removal of buildings in the Subject Lands. Survey of buildings within the CVR_4 ecosite is recommended to support the documentation required for the Project review by the MECP.

Potential impacts may occur to Red-headed Woodpecker habitat. Red-headed Woodpecker surveys are recommended to support the documentation required for the Project review by the MECP. Red-headed Woodpecker surveys should follow the species survey protocol required by the MECP, published by the Wisconsin Department of Natural Resources (WDNR 2013).

As the PDB slightly encroaches into regulated habitat for Silver Shiner, consultation with MECP is required for the Project. A survey to delineate regulated habitat (riparian habitat) for the Wavy-rayed Lampmussel in the northeast corner of the Subject Lands is recommended to support the documentation required for the Project review by the MECP.

Consultation with the MECP is recommended through the submission of an Information Gathering Form to confirm regulatory requirements under the ESA for aquatic and terrestrial SAR.

8.3 Conservation Authority Regulated Areas

The Project is within the Upper Thames River Conservation Authority (UTRCA) jurisdiction which administers *Ontario Regulation (O. Reg.) 41/24: Prohibited Activities, Exemptions and Permits* under Section 28 of the Conservation Authorities Act.

Under O. Reg. 41/24 a permit is required for development or interference with wetlands and alterations to shorelines and watercourses. This may include the planned work within the UTRCA regulated area in the MEMM3b and within the regulated area where it occurs in the OAGM1. If required, a permit application package will need to be prepared and submitted to UTRCA that includes the following information:

- Maps and photographs showing the location of Project work relative to regulated features
- Environmental mitigation measures for sediment and erosion control, re-vegetation and seeding plan
- Other site-specific data as required

Consultation with UTRCA is recommended to confirm permit application requirements.

8.4 Fish and Wildlife Conservation Act

With appropriate mitigation measures (i.e., erosion control fencing / small animal exclusion fencing), no permitting or licences under the FWCA are anticipated to be required for the Project.

9 Summary

This DAR provides supporting documentation for the Bridle Path North Subdivision Project. The DAR describes applicable natural heritage policies, results of the natural heritage assessment, and an impact assessment and mitigation recommendations.

Medway Creek flows through the northern and western boundaries of the Study Area and natural heritage features are present along the creek's corridor. Fish and wildlife populations utilize the habitat present in Medway Creek and its naturally vegetated corridor. Most of the Subject Lands where development is proposed to occur is within actively managed agricultural fields.

The natural heritage assessment included background data collection and agency correspondence, site investigations and biological field surveys over the course of two years in 2023 and 2024. Surveys and assessments of vegetation communities, wildlife populations, significant wildlife habitat, SAR habitat and aquatic habitat were completed.

The natural heritage assessment determined the following summarized results:

- The Middlesex Centre OP identifies a Significant Woodland in the Study Area adjacent to the Subject Lands, and the Middlesex County OP identifies vegetation communities of the Natural Heritage System in the Study Area that intersect the PDB. Impacts to vegetation communities are proposed as the site plan overprints most of the area in two ecosites in the Natural Heritage System (THDM4-1 and MEMM3b). Parts of the Subject Lands are within the UTRCA regulated area and within areas designated as hazard lands in the Middlesex Centre OP. Most of the Subject Lands are designated as groundwater recharge area and highly vulnerable aquifer. Medway Creek is designated as Significant Valleyland in the MNHSS.
- Presence of two provincially rare vegetation communities in the Study Area (FODM7-5 and MAMO1-6), which meet criteria to confirm them as SWH. One SAR plant, the butternut, was observed outside of the Study Area.

- Very low counts of amphibian breeding were detected as the hydroperiod for wetlands in the Study Area was ephemeral and insufficient for amphibian breeding.
- Breeding bird surveys identified SAR and SOCC birds, however, suitable habitat for these species was not present in the Subject Lands. Overall, impacts to SAR and SOCC birds is not anticipated; however, additional surveys for Red-headed Woodpecker are recommended based on new guidance from MECP.
- Osprey and Bald Eagle foraging was observed in the Medway Creek. Foraging habitat is not anticipated to be impacted by the Project. No nesting of Osprey was observed, and therefore SWH was not present for Osprey foraging and nesting.
- Candidate SWH was determined present in the Study Area including bat maternity colonies, turtle overwintering areas, and habitat for SOCC. Most of these candidate habitats are in the Medway Creek corridor and impacts to these habitats are not anticipated, except for the bat maternity colonies.
- Feature boundary delineations with the appropriate agencies are recommended for woodlands and wetlands within or adjacent to the PDB to confirm overlapping and establish during detailed design.
- Two SOCC were documented present in the Study Area, the hairy-fruited sedge and the Monarch. The hairy-fruited sedge was found to dominate the MAMO1-6 wetland, which established the wetland as SWH. Development within the MAMO1-6 wetland is not proposed and mitigation measures are proposed. Monarch habitat is proposed to be overprinted by the development, however, an abundance of meadow habitat in the Study Area is anticipated to support Monarch post construction.
- The Medway Creek corridor is anticipated to provide an animal movement corridor for local wildlife populations, but did not meet the criteria for SWH. Impacts to this corridor preventing future use by wildlife are not anticipated.
- Wetlands occur in the Study Area, of which one wetland is anticipated to be directly impacted by the development (MAMM3a) and two wetlands may be indirectly impacted (MAMM3b and MAMO1-6). A 6.0 m buffer has been placed on most of the MAMM3a, a 14.2 m setback on the MAMM3b and a 40 m setback on the MAMO1-6. LID technique mitigation measures to maintain 80% infiltration for groundwater recharge in adjacent lands to all three wetlands have been proposed. The catchment areas for each wetland are anticipated to be developed.
- Mitigation measure to protect natural heritage features and functions include the establishment of a 6.0 m setback on natural heritage features (wetlands, woodlands) and the use of LID techniques to maintain 80% infiltration for groundwater recharge post construction.
- Four SAR bats were documented to utilize habitat in the Subject Lands, including along the THDM4-1 (proposed for removal) and along the FODM7-5. Consultation with the MECP will be required prior to potential SAR bat habitat removal. Survey of the buildings in the CVR_4 is recommended to support Project review by the MECP.
- An assessment of the residences within the PDB are recommended for bat SAR, Chimney Swift (SAR), and Barn Swallow (SOCC).

- Medway Creek is mapped to provide critical habitat for Silver Shiner, and Black Redhorse and habitat for Wavy-rayed Lampmussel. Silver Shiner critical habitat includes the creeks naturally vegetated riparian area. Wavy-rayed Lampmussel protected habitat under the ESA also includes part of the Medway Creek riparian area. Consultation with the MECP and the DFO will be required prior to removal of habitat in the MEMM3b ecosite and development within the meander belt 30 m buffer. Surveys to delineate regulated habitat for Wavy-rayed Lampmussel in the northwest corner of the Subject Lands are recommended to support Project review by the MECP.
- A headwater drainage feature (HDF-1) is present in the THDM4-1. This ecosite is proposed to be overprinted. The function of the HDF-1 (subsurface and ephemeral flow conveyance) is proposed to be maintained post construction via LID techniques such as infiltration gallery and/or engineered swale channel so to maintain water transport into the Medway Creek corridor and to the MAMO1-6 wetland.
- No direct impacts to fish habitat are anticipated. Potential indirect impacts (runoff and sedimentation into Medway Creek) will be mitigated with appropriate erosion and sediment control measures and appropriate stormwater management design. Proposed SWM pond discharge into Medway Creek require review by the DFO and MECP.
- Loss of vegetation communities will occur in ten (10) ecosites in the Subject Lands. Three of those ecosites (MEMM3b, THDM4-1, FODM7-5) are within the Natural Heritage System (Middlesex County 2023). MEMM3b and THDM4-1 are not mapped on the Middlesex Centre OP as within the Greenlands System (Middlesex Centre 2024) but the FODM7-5 is mapped within the Greenlands System. The Middlesex Centre OP maps the MEMM3b and THDM4-1 areas as residential and the FODM7-5 as floodplain. The form and function of the MEMM3b is anticipated to be maintained as only half of this feature is being removed and that which remains (anticipated minimum 50 m buffer) will continue to provide the important function of Medway Creek riparian habitat. The form of theTHDM4-1 is anticipated to be lost as all the ecosite is proposed for removal. The function of the THDM4-1 is principally infiltration and ephemeral water conveyance through HDF-1 from the tablelands to the Medway Creek floodplain. This feature may also support the MAMO1-6. The function of this feature will be maintained post construction via LID techniques such as infiltration gallery and/or constructed swale channel in rear yards. The minor vegetation removal calculated for the FODM7-5 are anticipated to be refined and potentially alleviated for no vegetation loss in this feature after a boundary delineation and site survey.
- Mitigation measures proposed for wildlife management include use of wildlife exclusion fencing and following vegetation clearing timing windows for birds and bats.
- Standard erosion and sediment control between the development and natural habitat is recommended. Extra measures to prevent runoff from entering Medway Creek during construction in the MEMM3b are recommended.
- A 6.0 m Emergency Access Allowance will be applied to most areas between the PDB and natural ecosites. A 3 – 20 m setback will be applied to the FODM4, and part (0.173 ha) will be revegetated as compensation for removed habitat in the Natural Heritage System.

- The development is proposed to occur outside of (6.0 m from) the calculated top of stable slope which is stated in the Preliminary Geotechnical Investigation and Slope Stability Assessment to be suitable for any structural footing as part of the development. The development is within the UTRCA regulation limit. Further consultation with the UTRCA to address development within the regulated area is recommended.

The Project is anticipated to have minimal impact to the natural habitat found within the Study Area. Most of the Medway Creek corridor will not be impacted directly by the Project. LID techniques will be developed at the detailed design stage with the goal to maintain 80% of pre-development infiltration in the table lands (development area), which is the basis (groundwater flows) for the significant features in the Study Area and, of which, is anticipated to maintain the function of those features.

10 References

Broders, H., G. Forbes, S. Woodley, I, Thompson. 2006. Range Extent and Stand Selection for Roosting and Foraging in Forest-Dwelling Northern Long-Eared Bats and Little Brown Bats in the Greater Fundy Ecosystem, New Brunswick. Journal of Wildlife Management. 70. 1174-1184.

Bird Studies Canada (BSC) and Environment Canada. 2008. Marsh Monitoring Program Manual.

Cadman, M.D., D.A. Sutherland, G.G. Beck, D. Lepage, A.R. Couturier. 2007. Atlas of the Breeding Birds of Ontario, 2001-2005. (eds) Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, Ontario Ministry of natural resources, and Ontario Nature, Toronto, xxii + 318pp.

Cagle, F.R., L. Cockrum. 1943. Notes on a Summer Colony of Myotis lucifugus lucifugus, Journal of Mammalogy, Volume 24, Issue 4, 17 November 1943, Pages 474–492, https://doi.org/10.2307/1374740

Chapman, L.J. and Putnam, D.F. 1984. The Physiography of Southern Ontario; Ontario Geological Survey, Special Volume 2, 270p. Accompanied by Map P.2715 (coloured), scale 1:600 000.

DFO [Fisheries and Oceans Canada]. 2017. Guidance for Maintaining and Repairing Municipal Drains in Ontario. Version 1.1. May 23, 2017. Central and Arctic Region. Fisheries and Oceans Canada. 867 Lakeshore Road, Burlington, ON L7S 1A1.

DFO. 2022. Recovery Strategy and Action Plan for the Silver Shiner (*Notropis photogenis*) in Canada. *Species at Risk Act* Recovery Strategy Series. Fisheries and Oceans Canada, Ottawa. vi + 51 p.

DFO. 2025a. Aquatic species at risk maps. Accessed March 10, 2025. Available online: https://www.dfo-mpo.gc.ca/species-especes/sara-lep/map-carte/index-eng.html

DFO. 2025b. Measures to Protect Fish and Fish Habitat. Government of Canada. Online: https://www.dfo-mpo.gc.ca/pnw-ppe/measures-mesures-eng.html#6. Accessed April 8, 2025.

Dobbyn, J. 1994. Atlas of the Mammals of Ontario. Federation of Ontario Naturalists.

eBird. 2024. eBird. Online: https://ebird.org/home. Accessed December 11, 2023.

ECCC [Environment and Climate Change Canada].2023. Breeding Bird Survey Instructions. Online: https//www.canada.ca/en/environment-climate-change/services/bird-surve

ECCC [Environment and Climate Change Canada]. 2024a. Critical Habitat for Species at Risk National Dataset – Canada. Online: https://data-donnees.az.ec.gc.ca/data/species/protectrestore/critical-habitat-species-at-risk-canada/. Accessed December 11, 2023.

ECCC [Environment and Climate Change Canada]. 2024b. Nesting Periods. Online: https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratory-birds/general-nesting-periods/nesting-periods.html. Accessed July 24, 2024.

EXP. 2023. Preliminary Geotechnical Investigation & Slope Stability Assessment. Bridle Path North Arva Inc. Proposed Residential Development. Medway Road and Richmond Street, Arva, Ontario. Project number: LON-21002400-AO

EXP. 2024. Hydrogeological Assessment. Final Report. York Developments. Medway Creek – Bridle Path Subdivision. Arva, Ontario. Project number: KCH-21002415-A0.

Gerson, H. 1984. Habitat Management Guidelines for Bats of Ontario. Ontario Ministry of Natural Resources.

Hagerty, T.P. and M.S. Kingston. 1992. The Soils of Middlesex County. Volume 1. Ministry of Agriculture and Food. Report No. 56 of the Ontario Centre for Soil Resource Evaluation.

Humphrey, Christy and H. Fotherby. 2019. Recovery Strategy for the Little Brown Myotis (Myotis lucifugus), Northern Myotis (Myotis septentrionalis) and Tri-colored Bat (Perimyotis subflavus) in Ontario. Ontario Recovery Strategy Series. Prepared by the Ministry of the Environment, Conservation and Parks, Peterborough, Ontario. vii + 35 pp. + Appendix. Adoption of the Recovery Strategy for the Little Brown Myotis (Myotis lucifugus), the Northern Myotis (Myotis septentrionalis), and the Tri-colored Bat (Perimyotis subflavus) in Canada (Environment and Climate Change Canada 2018).

iNaturalist. 2024. INaturalist. Online: https://www.inaturalist.org/. Accessed December 11, 2023.

Lee, H.T., W.D. Bakowsky, J. Riley, J. Bowles, M. Puddister, P. Uhlig and S. McMurray. 1998. Ecological land classification for Southwestern Ontario: first approximation and its application. Ontario Ministry of Natural Resources, South Central Region, Science Development and Transfer Branch. Technical Manual ELC 005.

MECP [Ministry of the Environment, Conservation and Parks]. 2023a. Recovery Strategy for Black Redhorse (*Moxostoma duquesnei*) in Ontario. Ontario Recovery Strategy Series. Prepared by the Ministry of the Environment, Conservation and Parks, Peterborough, Ontario. iv + 5 pp. + Appendix. Adoption of the Recovery Strategy and Action Plan for Black Redhorse (*Moxostoma duquesnei*) in Canada (Fisheries and Oceans Canada 2022).

MECP. 2023b. Recovery Strategy for Silver Shiner (*Notropis photogenis*) in Ontario. Ontario Recovery Strategy Series. Prepared by the Ministry of the Environment, Conservation and Parks, Peterborough, Ontario. iv + 6 pp. + Appendix. Adoption of the Recovery Strategy and Action Plan for Silver Shiner (*Notropis photogenis*) in Canada (Fisheries and Oceans Canada 2022).

MECP. 2025. Species at Risk in Ontario. Online: https://www.ontario.ca/page/species-risk-ontario.

Middlesex Centre. 2024. Official Plan of the Municipality of Middlesex Centre. September 2024. Online: https://www.middlesexcentre.ca/sites/default/files/2024-10/MIDC_OP_ConsolidationSept2024.pdf

Middlesex County. 2023. Middlesex County Official Plan. Amended by Official Plan Amendment No. 3 as approved and modified by the minister of municipal affairs and house, July 7, 2023. Online: https://www.middlesex.ca/sites/default/files/documents/Middlesex%20County%20Official%20Plan%20July%2007%202023%20consolidated%20FINAL.pdf

Middlesex County. N.D. Middlesex Maps. Middlesex County. Online: https://maps.middlesex.ca/viewer/Index.html?configBase=https://maps.middlesex.ca/Geocortex/Essentials/REST/sites/Testing_Site/viewers/HTML5/virtualdirectory/Resources/Config/Default. Accessed July 25, 2024.

Middlesex County. 2025. The Corporation of the County of Middlesex Woodlands Conservation By-law No. 7314. Online: https://www.middlesex.ca/sites/default/files/documents/7314%20-%20Woodland%20Conservation%20By-Law%20-%20Website.pdfhttps://www.middlesex.ca/sites/default/files/documents/Middlesex Complete OP for Web.pdf

MMAH [Ministry of Municipal Affairs and Housing]. 2024. Provincial Policy Statement. Issued under section 2 of the Planning Act. January 1, 2025.

MNR [Ministry of Natural Resources]. 2025a. Natural Heritage Information Centre (NHIC). Natural Heritage Information Centre database.

MNR [Ministry of Natural Resources]. 2025b. Ontario GeoHub Land Information Ontario database.

MNRF [Ministry of Natural Resources and Forestry]. 2017. Survey Protocol for Species at Risk Bats within Treed Habitats – Little Brown Myotis, Northern Myotis & Tri-Colored Bat. April 2017. MNRF Guelph District.

MNRF [Ministry of Natural Resources and Forestry]. 2016. Best Management Practices for Mitigating the Effects of Roads on Amphibians and Reptile Species at Risk in Ontario. Queen's Printer for Ontario. 112 pp.

MNRF [Ministry of Natural Resources and Forestry]. 2015. Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E. January 2015. MNRF Southern Region Resources Section, Peterborough, Ontario. 41 pp. Available online: https://www.ontario.ca/document/significant-wildlife-habitat-ecoregional-criteria-schedules-ecoregion-7e

MNRF. 2022. Ontario Wetland Evaluation System. Southern Manual, 4th Edition.

OMNR [Ontario Ministry of Natural Resources]. 2000. Significant Wildlife Habitat Technical Guide.

OMNR [Ontario Ministry of Natural Resources. 2013a. Survey Protocol for Eastern Meadowlark (*Sturnella magna*) in Ontario. Ontario Ministry of Natural Resources, Species at Risk Branch, Peterborough. ii + 20 pp.

OMNR [Ontario Ministry of Natural Resources. 2013b. Reptile and Amphibian Exclusion Fencing: Best Practices, Version 1.0. Species at Risk Branch Technical Note. Prepared for the Ontario Ministry of Natural Resources, Peterborough, Ontario. 11 pp.

OMNRF [Ontario Ministry of Natural Resources and Forestry]. 2014. Significant Wildlife Habitat Mitigation Support Tool. Version 2014.

OMNR [Ontario Ministry of Natural Resources]. 2015. Significant Wildlife Habitat Technical Guide (SWHTG) Decision Support System (On-line). www.mnr.gov.on.ca/en/Business/FW/Publication/MNR_E001285P.html

Oldham, M.J., W.D. Bakowsky and D.A. Sutherland. 1995. Floristic quality assessment for southern Ontario. OMNR, Natural Heritage Information Centre, Peterborough. 68 pp.

Ontario Nature. 2019. Ontario Reptile and Amphibian Atlas. Accessed March 2021. Available online: https://www.ontarioinsects.org/herp/

Rowe, J.S. 1972. Forest Regions of Canada. Canadian Forest Service Publication No. 1300. 172 pp.

TEA [Toronto Entomologist Association]. 2024a. Ontario Butterfly Atlas. Online: https://www.ontarioinsects.org/atlas. Accessed December 11, 2023.

TEA. 2024b. Ontario Moth Atlas. Online: https://www.ontarioinsects.org/moth/. Accessed December 11, 2023.

TRCA, CVC [Toronto and Region Conservation Authority and Credit Valley Conservation]. 2014. Evaluation, Classification and Management of Headwater Drainage Features Guideline.

UTRCA [Upper Thames River Conservation Authority]. 2014. Middlesex Natural Heritage Systems Study. A study to identify natural Heritage Systems in Middlesex County. Published by Middlesex County. October 28, 2014.

UTRCA [Upper Thames River Conservation Authority]. 2022. Watershed Report Card: Medway Creek. Online: chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://thamesriver.on.ca/wp-content/uploads/RC_Medway.pdf. Accessed February 27, 2025.

UTRCA. 2024a Regulated Area Screening Map. Upper Thames River Conservation Authority. Online: https://maps.thamesriver.on.ca/gvh/?viewer=regulations. Accessed July 25, 2024.

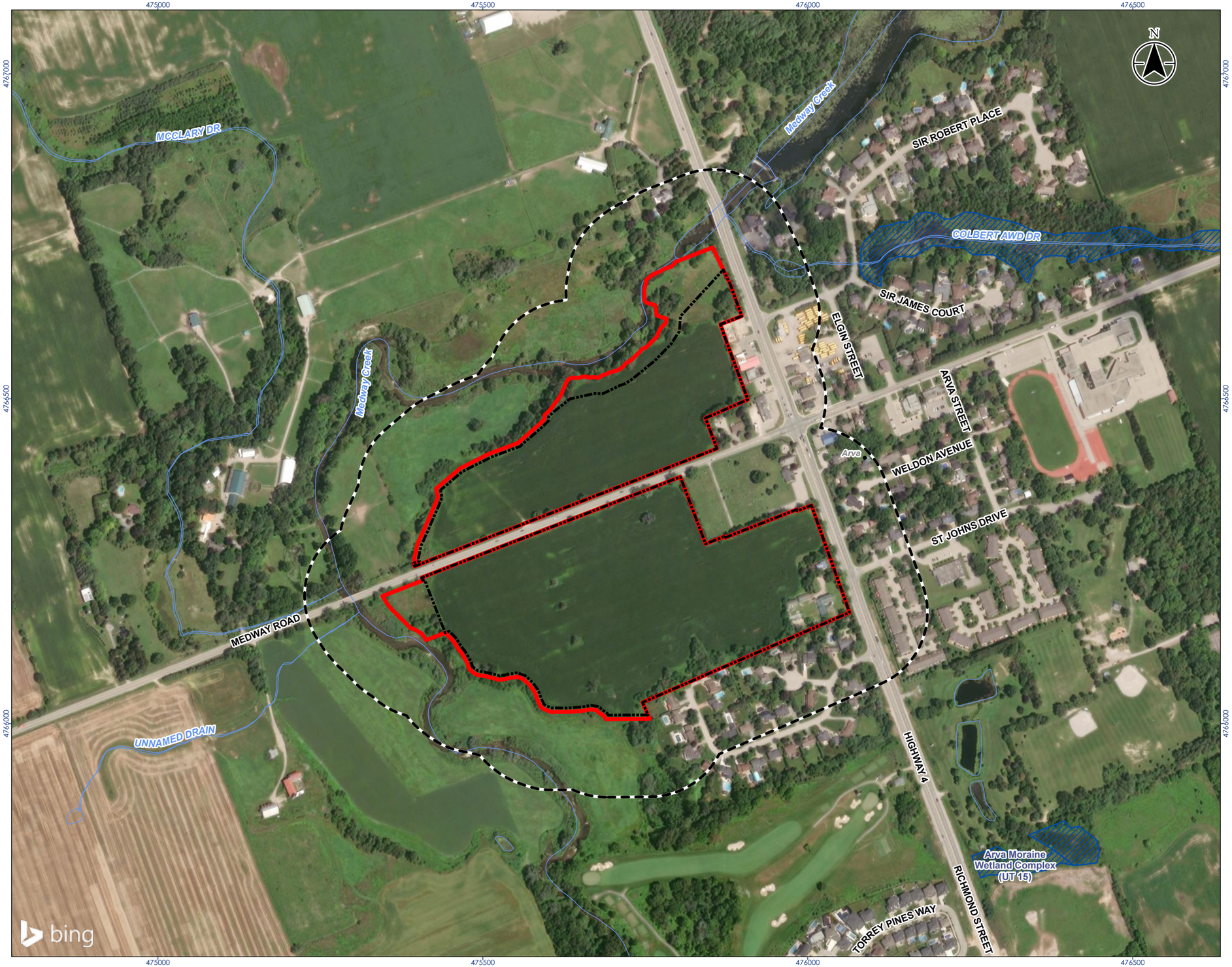
UTRCA. 2024b. Source Protection Planning. Upper Thames River Conservation Authority. Online: https://maps.thamesriver.on.ca/gvh/?viewer=tsrassessmentreport. Accessed July 25, 2024.

WDNR [Wisconsin Department of Natural Resources. 2013. Wisconsin Red-headed Woodpecker Species Guidance. Bureau of Natural Heritage Conservation, Wisconsin Department of Natural Resources, Madison, Wisconsin. PUB-ER-702.

Wildlife Acoustics. 2024. Song Meter SM4BAT FS Ultrasonic Recorder. Online: https://www.wildlifeacoustics.com/products/song-meter-sm4bat. Accessed July 17, 2024.

Appendices

Appendix A Figures



Stantec

Legend

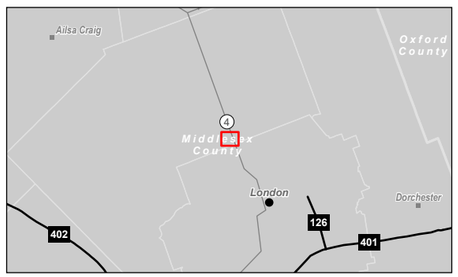
- Project Development Boundary
- Subject Lands
- Study Area
- Watercourse (Permanent)
- Wetland, Provincially Significant
- Waterbody
- Project Development Boundary
- Subject Lands

0 200 400 m

1:6,000 (At original document size of 11x17)

Notes

1. Coordinate System:NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © King's Printer for Ontario, 2024.
3. Orthoimagery: © 2025 Microsoft Corporation © 2025 Maxar ©CNES (2025) Distribution Airbus DS.



Project Location
County of Middlesex, ON

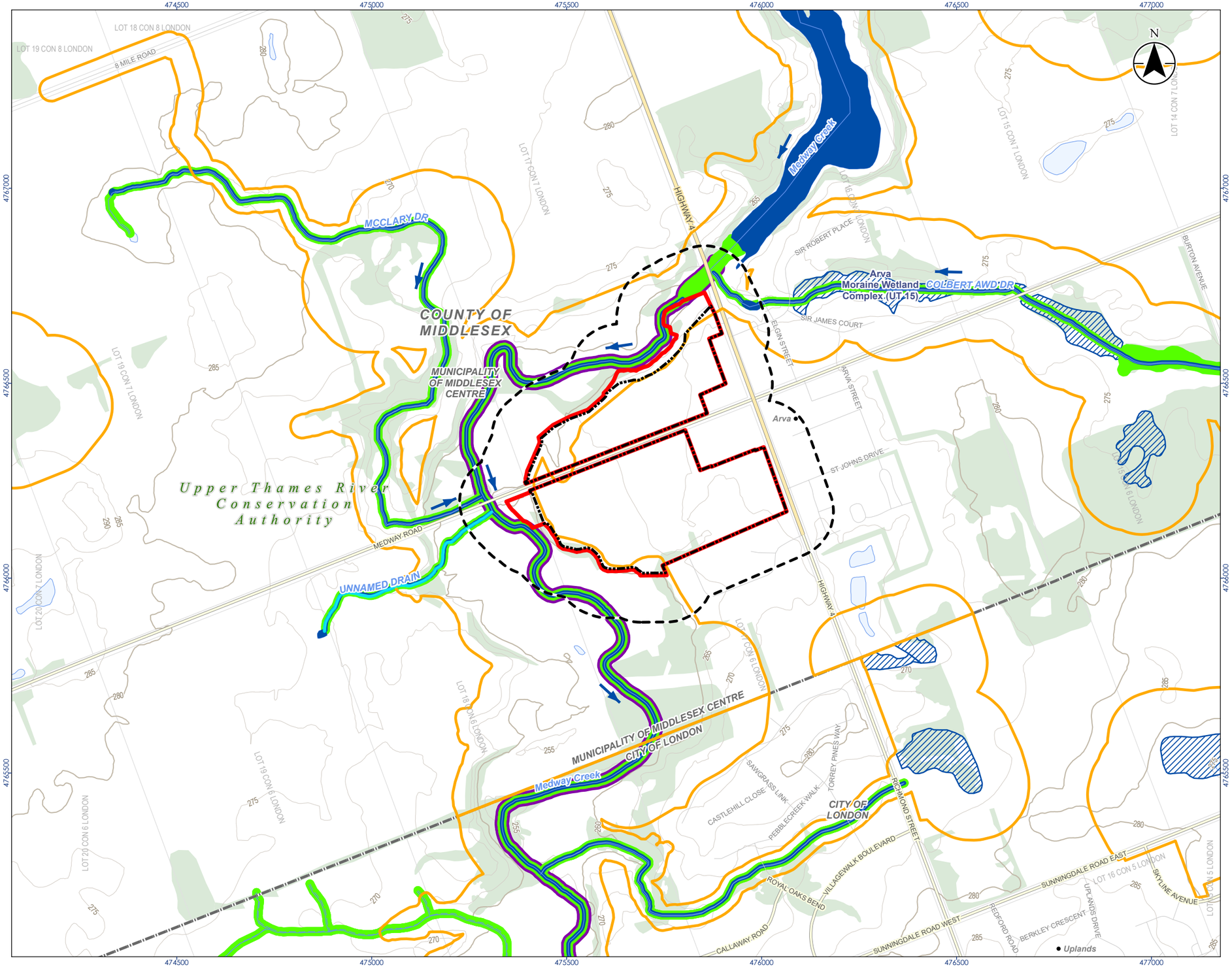
161414396 REV1
Prepared by bcowper on 2025-04-07

Client/Project
York Developments (London) Inc
Bridle Path North Subdivision
Development Assessment Report

Figure No.
1

Title
Study Area

\\cd0215-prfs01\work_group\01609\Active_other_pcs_1609_GIS\161414396\03_data\gis_cad\gis\maps\ecosystem\report_figures\DAR\161414396_DAR_2024072a.aprx\161414396_DAR_fig01_StudyArea Revised: 2025-04-07 By: bcowper



Stantec

Legend

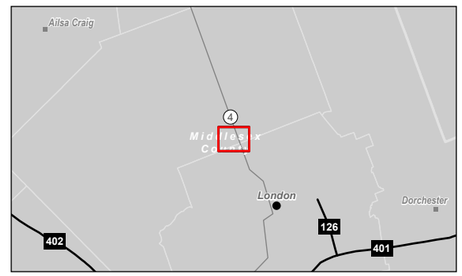
- Project Development Boundary
- Subject Lands
- Study Area
- Constructed Drain
- Thermal Regime, Cold
- Watercourse (Intermittent)
- Watercourse (Permanent)
- Water Flow Direction
- Conservation Authority Administrative Boundary
- Thermal Regime, Cold
- Aquatic Species at Risk Distribution
- Aquatic Species at Risk Critical Habitat
- Waterbody
- Wetland, Provincially Significant
- Wooded Area
- Lot
- Municipal Boundary, Upper
- Municipal Boundary, Lower
- Regulation Limit (UTRCA)

0 0.25 0.5 km

1:10,000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © King's Printer for Ontario, 2024.



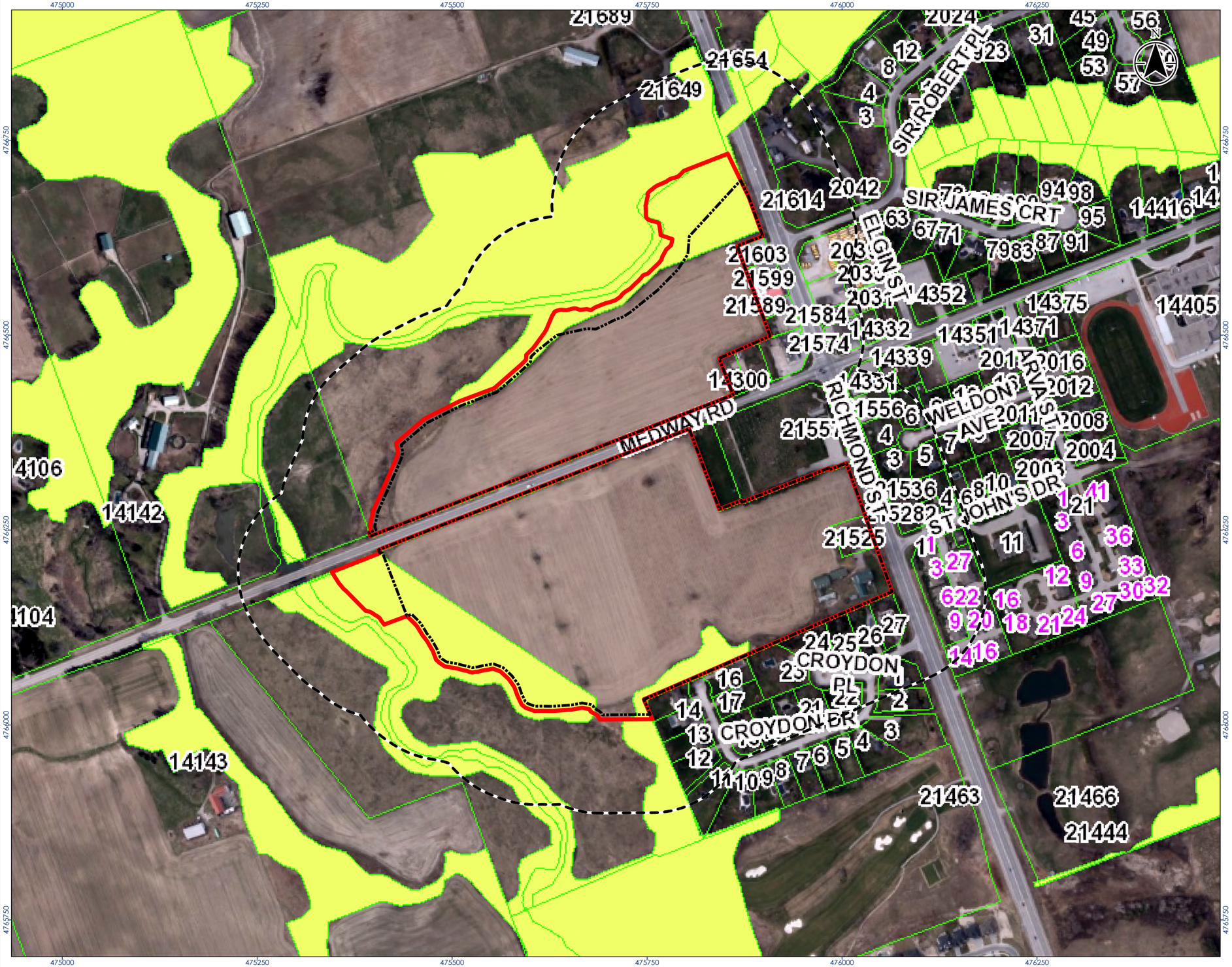
Project Location
County of Middlesex, ON

161414396 REV6
Prepared by bcowper on 2025-04-07

Client/Project
York Developments (London) Inc
Bridle Path North Subdivision
Development Assessment Report

Figure No.
2

Title
Background Data



Stantec

Legend

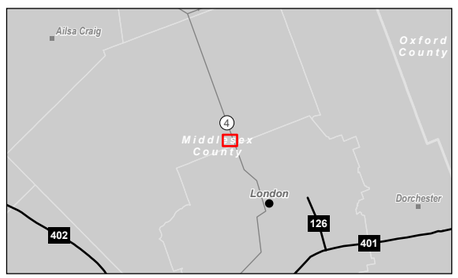
- Project Development Boundary
- Subject Lands
- Study Area
- Natural Heritage (MNHSS 2014)

0 100 200 m

1:5,000 (At original document size of 11x17)

Notes

1. Coordinate System:NAD 1983 UTM Zone 17N
2. Natural Heritage map accessed 2025-02-26 from: https://www.middlesex.ca/departments/mapping#interactive_mapping



Project Location
County of Middlesex, ON

161414396 REVA
Prepared by bcowper on 2025-04-07

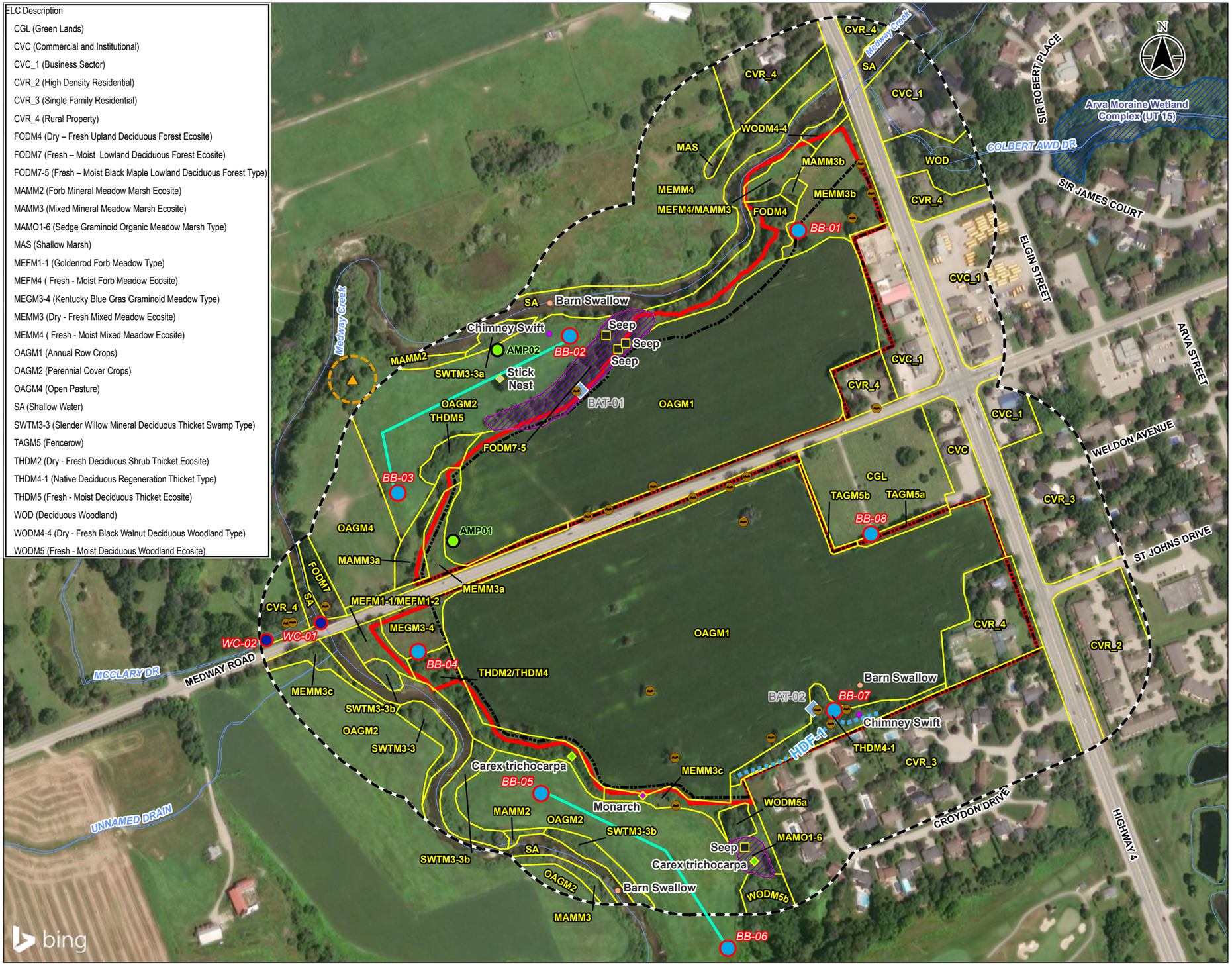
Client/Project
York Developments (London) Inc
Bridle Path North Subdivision
Development Assessment Report

Figure No.
2.1

Title
Natural Heritage Designations - Middlesex Centre Official Plan

ELC Description

- CGL (Green Lands)
- CVC (Commercial and Institutional)
- CVC_1 (Business Sector)
- CVR_2 (High Density Residential)
- CVR_3 (Single Family Residential)
- CVR_4 (Rural Property)
- FODM4 (Dry – Fresh Upland Deciduous Forest Ecosite)
- FODM7 (Fresh – Moist Lowland Deciduous Forest Ecosite)
- FODM7-5 (Fresh – Moist Black Maple Lowland Deciduous Forest Type)
- MAMM2 (Forb Mineral Meadow Marsh Ecosite)
- MAMM3 (Mixed Mineral Meadow Marsh Ecosite)
- MAMO1-6 (Sedge Graminoid Organic Meadow Marsh Type)
- MAS (Shallow Marsh)
- MEFM1-1 (Goldenrod Forb Meadow Type)
- MEFM4 (Fresh - Moist Forb Meadow Ecosite)
- MEGM3-4 (Kentucky Blue Gras Graminoid Meadow Type)
- MEMM3 (Dry - Fresh Mixed Meadow Ecosite)
- MEMM4 (Fresh - Moist Mixed Meadow Ecosite)
- OAGM1 (Annual Row Crops)
- OAGM2 (Perennial Cover Crops)
- OAGM4 (Open Pasture)
- SA (Shallow Water)
- SWTM3-3 (Slender Willow Mineral Deciduous Thicket Swamp Type)
- TAGM5 (Fencerow)
- THDM2 (Dry - Fresh Deciduous Shrub Thicket Ecosite)
- THDM4-1 (Native Deciduous Regeneration Thicket Type)
- THDM5 (Fresh - Moist Deciduous Thicket Ecosite)
- WOD (Deciduous Woodland)
- WODM4-4 (Dry - Fresh Black Walnut Deciduous Woodland Type)
- WODM5 (Fresh - Moist Deciduous Woodland Ecosite)



Stantec

Legend

- Project Development Boundary
- Subject Lands
- Study Area
- Constructed Drain
- Watercourse (Permanent)
- Wetland, Provincially Significant
- Waterbody

Survey Station Locations

- Headwater Drainage Feature
- Grassland Bird Transect
- SWH – Rare Vegetation Communities
- ELC

SAR and SOCC Observations

- Butternut Location
- Butternut Location 25m Buffer
- Carex trichocarpa (Hairy-fruited Sedge) - SOCC,S3
- Monarch
- Seep
- Stick Nest
- Barn Swallow
- Chimney Swift

Survey Station Locations

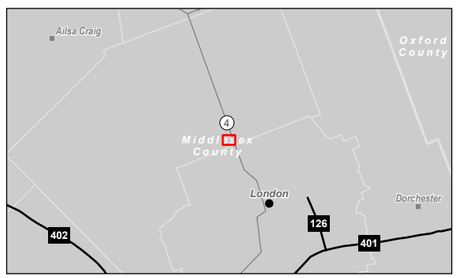
- Amphibian Call Station
- Breeding Bird Survey Station
- Aquatic Sampling Location
- Bat Community Survey Station
- Suitable Bat Maternity Roost Tree

0 125 250 m

1:4,250 (At original document size of 11x17)

Notes

1. Coordinate System:NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2023.
3. Orthoimagery: © 2025 Microsoft Corporation © 2025 Maxar ©CNES (2025) Distribution Airbus DS.



Project Location
County of Middlesex, ON

161414396 REVA
Prepared by bcowper on 2025-04-07

Client/Project
York Developments (London) Inc
Bridle Path North Subdivision
Development Assessment Report

Figure No.
3

Title
ELC and Field Study Results

Stantec

N

Legend

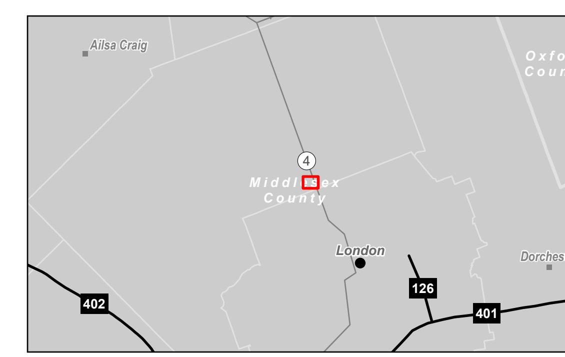
- Project Development Boundary
- Subject Lands
- Study Area
- Watercourse (Permanent)
- Constructed Drain
- Waterbody
- Wetland, Provincially Significant
- Meander Belt
- Erosion Hazard Limit
- Meander Belt 30 m Buffer
- Regulation Limit (UTRCA)
- Stantec Identified Wetlands (2023)
- ELC

0 100 200 m

1:4,100 (At original document size of 11x17)

Notes

1. Coordinate System:NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2023.
3. Orthoimagery: © 2025 Microsoft Corporation © 2025 Maxar ©CNES (2025) Distribution Airbus DS.



Project Location
County of Middlesex, ON

161414396 REVA
Prepared by bcowper on 2025-04-07

Client/Project
York Developments (London) Inc
Bridle Path North Subdivision
Development Assessment Report

Figure No.
4

Title
Policy and Setback Constraints

\\ca0215-ppfss01\work_group\01609\Active_other_pcs_1609_GIS\161414396\03_data\gis_cad\gis\maps\ecosystems\report_figures\DAR\161414396_DAR_20240726.aprx\161414396_DAR_fig04_Policy_Setbacks Revised: 2025-04-07 By: bcowper

Stantec

Legend

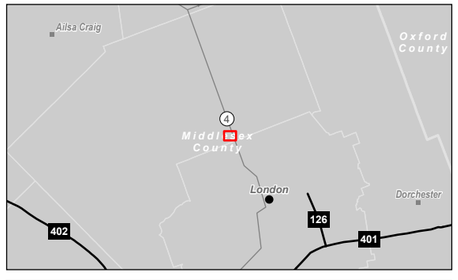
- Study Area
- Project Development Boundary
- Subject Lands
- Compensation Area
- Open Space

0 100 200 m

1:4,100 (At original document size of 11x17)

Notes

1. Coordinate System:NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2023.
3. Orthoimagery: © 2025 Microsoft Corporation © 2025 Maxar ©CNES (2025) Distribution Airbus DS.



Project Location
County of
Middlesex, ON

161414396 REVA
Prepared by bcowper on 2025-04-07

Client/Project
York Developments (London) Inc
Bridle Path North Subdivision
Development Assessment Report

Figure No.
5

Title
Compensation Areas and Open Space

\\ca0215-ppfs01\work_group\01169\Active_other_pcs_1169_GIS\161414396\03_data\gis_cad\gis\mxpd\ecosystems\report_figures\DAR\161414396_DAR_2024072a.aprx\161414396_DAR_fig05_Compensation_Area Revised: 2025-04-07 By: bcowper

Appendix B Agency Correspondence

MHBC PLANNING URBAN DESIGN & LANDSCAPE ARCHITECTURE

MHBC File: 1094'BE'

PROPOSED RESIDENTIAL **SUBDIVISION ('BRIDLE PATH')**
COMMUNITY OF ARVA; MUNICIPALITY OF MIDDLESEX CENTRE

NOTES FROM:
PRELIMIARY PRE-APPLICATION CONSULTATION MEETING

Details: April 11, 2024 (DRAFT)
Virtual Meeting

In Attendance: Applicant: Representatives of York Developments, Stantec and MHBC.

Review Agencies: Representatives of Municipality of Middlesex Centre, County of Middlesex, Upper Thames River Conservation Authority, Ministry of Transportation and Thames Valley District School Board.

Purpose: Review pre-submission consultation materials submitted by York Developments on March 15, 2023 for the proposed Bridge Path Subdivision situated on lands in Area north and south of Medway Road, west of Richmond Street. The Conceptual Draft Plan of Subdivision ('Draft Plan') discussed at the meeting is dated November 6, 2023 and enclosed for reference.

Matters Discussed:

- Preliminary Draft Plan of Subdivision
  - S. Allen (MHBC) provided a general overview of the preliminary Draft Plan, including a brief description of the design parameters, organizing road system, housing types planned for residential blocks, mixed-use development plans, servicing blocks and park layouts.
  - D. Ailles (York Developments) advised that pathways are no longer being considered adjacent to the Medway Creek corridor. Rather, 6.0 m wide maintenance blocks are planned adjacent to the corridor. In-boulevard multi-use pathways are proposed on Medway Road to provide connectivity to the Arva main street.
- Street Access/Setbacks
  - M. Cabral advised that the County's Roads Department is generally satisfied with the proposed connections to Medway Road and Croydon Drive.
  - R. Cascaden indicated that a TIS will be required to support the Medway Road access arrangement.

  - J. Johnston outlined that the MTO currently does not support any new connections to Highway 4 (Richmond Street) noting that the standard preferred Ministry separation distance between accesses is 1,600 m, with 800 m being the minimum permitted if there is a TIS. It was also noted that the Ministry is currently not supportive of the Croydon Drive connection; however further discussions can occur in relation to that linkage. Additionally, the TIS for the Draft Plan is to be approved by the MTO and performed by an MTO qualified consultant.
  - Middlesex Centre advised that two entrances would be required to the both sides of Medway Road.
- Richmond Street corridor
  - J. Johnston advised that the MTO requires a 14 m development setback from its road allowance to the building face and a 3 m setback for non-integrated parking.
  - Sidewalks are currently being evaluated between the Ministry and Middlesex Centre (with other servicing considerations).
- Servicing
  - R. Cascaden outlined that Middlesex Centre is in discussions with the City of London regarding available sanitary sewage capacity; noting that a subdivision phasing plan should be prepared to reflect available capacity. D. Ailles confirmed that a capacity calculation for the proposed subdivision is being prepared now.
  - D. FitzGerald indicated that a phasing plan would be required by the County as part of a complete Draft Plan application. D. Ailles advised that as part of the Draft Plan submission a phasing plan would be prepared and inclusive of sanitary and water servicing.
  - I. Shah requested clarification on the stormwater management strategy. D. Ailles advised that a hybrid system is planned, with on-site controls for large multi-unit blocks and conveyance of minor/major storm events primarily through the storm sewer system to the SWM facility. He noted that outlets may be established on the north and south sides. County staff added that any phasing plan be clear on the timing of any addition of amenity spaces. UTRCA suggested a scoped submission and meeting on SWM is likely to save time and iterations.
  - D. Ailles clarified that a full set of servicing reports would be prepared in conjunction with the Draft Plan application.
- Stable Slope Analysis
  - R. Cascaden indicated that a Slope Stability Analysis would be needed and would be peer reviewed for Middlesex Centre.
  - UTRCA staff added that the stable slope assessment would need to evaluate the meander belt setback in addition to flood and geotechnical setbacks. It was also noted that the Medway Creek corridor is a Ground Water Recharge Area, which needs to be considered as part of this analysis and the hydrogeological assessment.
  - D. Ailles advised that the Block 29 is recognized as being adjacent to the Medway Creek Hazard area and that, with the topography, this Block is intended to be open space.
- Ecology
  - D. Eusebi advised that consultation with DFO has occurred regarding the Silver Shiner, which has been inventoried within the Medway Creek. It was noted that if development occurs on tableland, as planned, the habitat impacts would be minimal and a formal HADD authorization would likely not be required. As project

planning advances, Stantec will prepare a submission package for DFO outlining a proposed mitigation strategy to protect Silver Shiner habitat.
    - S. Hodgkiss explained that the UTRCA is seeking to review the EIS and will scope its evaluation responsibilities with Middlesex Centre. County staff confirmed that an ecological consultant will peer review the EIS.
    - UTRCA mentioned the presence of seeps along parts of the Medway Creek banks due to groundwater. D. Eusebi confirmed that the EIS will address seeps and the preservation of sedges.
- Schools
    - C. Harms indicated that Centennial Central Public School would be the target school for students from Bridle Path and that the TVDSB is considering improvements to the school to potentially increase its capacity (e.g., upgrading sanitary system). It was also noted that another elementary school is being considered in north-central London, which may accommodate students from this development.

Future Action:

1. S. Allen and M. Cabral are to review meeting notes to generally confirm initial Departmental and Agency comments.
2. S. Allen is to forward an updated Draft Plan to M. Cabral which will be the basis for the issued Record of Pre-Application Consultation (detailing requirements for a complete planning application).

Meeting Notes prepared April 15, 2024

Encl.

UPPER THAMES RIVER
CONSERVATION AUTHORITY

"Inspiring a Healthy Environment"

Thames
Canadian Heritage River

April 30, 2024

Municipality of Middlesex Centre
10227 Ilderton Road
Ilderton, Ontario N0M 2A0

Attention: Marion Cabral, Planner (via email: mcabral@middlesex.ca)

Re: Pre-Consultation - Bridle Path Subdivision
Applicant: Bridle Path North Arva Incorporated c/o York Developments
0 Richmond St, Arva (Municipality of Middlesex Centre)

The Upper Thames River Conservation Authority (UTRCA) has reviewed this application with regard for the policies within the Environmental Planning Policy Manual for the Upper Thames River Conservation Authority (June 2006), Section 28 of the *Conservation Authorities Act,* the *Planning* Act, the Provincial Policy Statement (2020), and the Upper Thames River Source Protection Area Assessment Report.

BACKGROUND

The UTRCA was circulated on the pre-consultation request with the supporting preliminary draft plan of subdivision concept and studies for the Arva West 'Bridle Path Subdivision'. Staff from the UTRCA, the Municipality of Middlesex Centre and the County of Middlesex met with the Applicant and their consulting team on April 11, 2024 to discuss the submission and the supporting technical studies. This letter provides a formal record of pre-consultation from the UTRCA.

PROPOSAL

The subject lands are generally bound by the Medway Creek corridor to the north and west, the Sunningdale Golf and Country Club and a residential subdivision to the south, and a mix of commercial uses and the Richmond Street corridor (Hwy 4) to the east. The lands subject to the development proposal are approximately 23.5 ha in area with lot frontage along the south and north sides of Medway Road (County Road 28) as well as frontage along Richmond Street. The subject lands are designated as 'Settlement Areas' on Schedule A Land Use of the County of Middlesex Official Plan and as 'Residential' on Schedule A-3 Arva Community Settlement Area of the Municipality of Middlesex Centre Official Plan and zoned 'Existing Use (EU)' in the Municipality of Middlesex Centre Zoning By-law 2005-005. The subject lands are currently used for agricultural purposes (row crops and pasture).

The proposed Draft Plan of Subdivision includes a mix of low density, medium density and high density residential development with some retail/office space as well as blocks for open space, parks, stormwater management, roads and a utility/pumping station. The remaining of the subject lands, including the lands adjacent to Medway Creek, are not intended to be part of the development application. In addition to the application for Draft Plan of Subdivision, applications for an Official Plan Amendment and Zoning By-law Amendment will also be required to facilitate the proposed development.

As part of the pre-consultation submission the UTRCA has received the following documents:

- ***Proposed Draft Plan of Subdivision Application Summery Memo*****,** prepared by MHBC Planning Urban Design & Landscape Architecture, dated March 15, 2023;
- ***Existing Conditions Memo,*** prepared by Stantec, dated March 15, 2024;
- ***Slope Stability Assessment,*** prepared by EXP Services Inc., dated March 11, 2024;

- ***Preliminary Geotechnical Investigation,*** prepared by EXP Services Inc., dated January 30, 2024, updated March 15, 2024;
- ***Hydrogeological Assessment Summary,*** prepared by EXP Services Inc., dated November 2, 2022;
- ***Preliminary Draft Plan of Subdivision,*** prepared by MHBC Planning Urban Design & Landscape Architecture, dated February 28, 2024;
- ***Block 23 Concept,*** prepared by Agar Architect Inc., dated December 21, 2023;
- ***Topographic Survey,*** *no author, not dated;*

DELEGATED RESPONSIBILITY & STATUTORY ROLE

Provincial Policy Statement 2020

The UTRCA has the provincially delegated responsibility for the natural hazard policies of the PPS, as established under the "Provincial One Window Planning System for Natural Hazards" Memorandum of Understanding between Conservation Ontario, the Ministry of Natural Resources and Forestry (MNRF) and the Ministry of Municipal Affairs and Housing. Accordingly, the Conservation Authority represents the provincial interest in commenting on development applications with respect to natural hazards and ensures that applications are consistent with the PPS.

The UTRCA's role in the development process is comprehensive and coordinates our planning and permitting interests. Through the plan review process, we ensure that development applications meet the tests of the *Planning Act*, are consistent with the PPS, conform to municipal planning documents, and with the policies in the UTRCA's Environmental Planning Policy Manual (2006). Permit applications must meet the requirements of Section 28 of the *Conservation Authorities Act* and the policies of the UTRCA's Environmental Planning Policy Manual (2006).

This approach ensures that the principle of development is established through the *Planning Act* approval process and that a permit application can be issued under Section 28 of the *Conservation Authorities Act* once all of the planning matters have been addressed.

Section 28 Regulations - Ontario Regulation 41/24

The subject lands are regulated by the UTRCA in accordance with Ontario Regulation 41/24, made pursuant to Section 28 of the *Conservation Authorities Act*. The regulation limit is comprised of:

- A riverine erosion hazard associated with the Medway Creek;
- A riverine flooding hazard associated with the Medway Creek and
- Unevaluated wetland features and their associated area of interference.

The UTRCA has jurisdiction over lands within the regulated area and requires that landowners obtain written approval from the Authority prior to undertaking any site alteration or development within this area including filling, grading, construction, alteration to a watercourse and/or interference with a wetland.

The approximate extent of the erosion hazard limit and regulation limit are identified on the attached map titled Regulated Areas Map, dated April 30, 2024. The updated extent of the regulatory (250-year) floodplain is identified on the attached map titled, Medway Creek, dated March 9, 2021. For the precise location of the wetland features please refer to Figure 3 ELC and Field Study Results of the Existing Conditions Assessment. In cases where a discrepancy in the mapping occurs, the text of the regulation prevails and a feature determined to be present on the landscape may be regulated by the UTRCA.

NATURAL HAZARDS

Natural hazard planning involves planning for risks associated with naturally occurring processes. These risks include the potential for loss of life and property damage. In Ontario, prevention is the preferred

approach for managing hazards in order to minimize these risks. The UTRCA represents the provincial interest in commenting on *Planning Act applications* with respect to natural hazards. The UTRCA's policies are consistent with the PPS and the applicable policies include:

3.2.2 General Natural Hazard Policies

These policies ensure that new development and site alteration are directed away from hazard lands. No new hazards will be created and existing hazards will not be aggravated through new development. As well, the UTRCA does not support the fragmentation of hazard lands through lot creation which is consistent with the PPS.

3.2.3 Riverine Flooding Hazard Policies

These policies address matters such as the provision of detailed floodplain mapping, floodplain planning approach (one zone vs. two zones), and uses that may be allowed in the floodplain subject to satisfying UTRCA permit requirements.

The UTRCA's engineering staff have updated engineered floodplain modeling for Medway Creek. The attached map titled Medway Creek, dated March 9, 2021 identifies the updated limit of the regulatory (250-year) floodplain.

3.2.4 Riverine Erosion Hazard Policies

The Authority generally does not permit development and site alteration in the meander belt or on the face of steep slopes, ravines and distinct valley walls. The establishment of the hazard limit must be based upon the natural state of the slope, and not through re-grading or the use of structures or devices to stabilize the slope.

The erosion hazard limit for the Medway Creek is to be identified based on the greater of the confined and unconfined erosion hazards in accordance with the Technical Guide River & Stream Erosion Hazard Limit (MNR, 2002) as determined through site specific studies, completed by a qualified professional, to the satisfaction of the UTRCA. As part of the pre-consultation submission the Applicant has submitted a Slope Stability Assessment for the confined portion of the valley. Please note that a Meander Belt Assessment will also be required as part of the formal application.

3.2.6 Wetland Policies

New development is not permitted in wetlands. New development and site alteration may only be permitted in the area of interference and /or adjacent lands of a wetland if it can be demonstrated through the preparation of an Environmental Impact Study (EIS) that there will be no negative impact on the hydrological function of the wetland feature and no potential hazard impact on the development.

Various wetlands, including, four (4) Slender Willow Mineral Deciduous Thicket Swamps (SWTM3-3), three (3) Mixed Mineral Meadow Marshes (MAMM3), and one (1) Sedge Graminoid Organic Meadow Marsh (MAMO1-6) where identified on Figure 3 ELC and Field Study Results of the Existing Conditions Assessment that was submitted as part of the pre-consultation submission. The UTRCA's review focuses solely on the hydrological aspects of the wetland features. The UTRCA defers the review of the wetlands as a natural heritage feature to the Municipality.

3.5.2 Policies for Stormwater Management and Erosion & Sediment Control Measures

Generally discusses the requirements for SWM and the requirements for report submissions, while advocating for catchment area planning of SWM facilities. The UTRCA requires quantity controls to ensure that post-development flow rates are equal to or less than the pre-development rates for all storm events from the 2 year to the 250 year storms when discharging to open watercourses. Controls up to the 250-year storm will be required for the development on both the north and south sides of Medway Road.

DRINKING WATER SOURCE PROTECTION - *Clean Water Act*
The subject lands ***are*** located within a vulnerable area. For more information pertaining to drinking water source protection, please refer to the approved Source Protection Plan at:
https://www.sourcewaterprotection.on.ca/approved-source-protection-plan/

COMMENTS & REQUIREMENTS
As noted, the subject lands are regulated by the UTRCA. After reviewing the submission, we offer the following comments:

1. The UTRCA's policies do not support the fragmentation of hazard lands. The development limit for all lots and blocks, including blocks required for servicing, is to be based on the greater of the regulatory floodplain, erosion hazard, wetlands and any required setbacks.
    a. Floodplain Hazard - The UTRCA's engineering staff have updated engineered floodplain modeling for Medway Creek. The attached map titled Medway Creek, dated March 9, 2021 identifies the updated limit of the regulatory (250-year) floodplain.
    b. Erosion Hazard - The Medway Creek valley includes confined and unconfined slopes. Site specific studies are required to determine the extent of the long term stable top of slope and recommend setback requirements in accordance with the Technical Guide River & Stream Erosion Hazard Limit (MNR, 2002).
        i. For the confined portions of the valley, a Slope Stability Assessment is required to determine the extent of the long term stable top of slope plus the 6 m access allowance. The Applicant has submitted a Slope Stability Assessment as part of the pre-consultation. Comments on the Assessment are included below.
        ii. For the unconfined portions of the valley, the erosion hazard limit is to be based on the greater of the meander belt (as determined through the Meander Belt Assessment) and the regulatory flood hazard, plus a 6 m access allowance.
    c. Wetland – Figure 3 ELC and Field Study Results of the Existing Conditions Assessment identifies small wetland features within the subject lands. The EIS/DAR shall recommend a setback to ensure that the hydrological functions of the features are maintained.

2. Based on the discussions during the pre-consultation meeting it is our understanding that the pathways have been revised since the circulation of the conceptual draft plan. Please note that all pathways and any required grading must be located outside of the hazard lands.

3. The UTRCA has no concerns with a special policy area for the proposed non-residential uses and high-rise apartments if required. The UTRCA recommends a house keeping amendment to align the extent of the 'Flood Plain' overlay on Schedule A-3 Arva Community Settlement Area with the updated regulatory floodplain.

4. The UTRCA recommends that the hazard lands be rezoned to the Open Space 'OS' zone. The OS zone permits the continued use of the pasture lands as an agricultural use but prohibits any building and structures associated with the agricultural use.

5. In accordance with *Ontario Regulation 41/24* made pursuant to Section 28 of the *Conservation Authorities Act,* permits/approvals from the UTRCA will be required prior to undertaking any site alteration or development, including grading and servicing work, within the UTRCA Regulated Area including filling, grading, construction, site alteration to a watercourse and/or interference with a wetland.

EXISTING CONDITIONS MEMO
Related to the UTRCA's scope of review, please include the following details in the Environmental Impact Study/Development Assessment Report:

6. Detailed Description of Regulated Features: Describe features, and associated regulatory setbacks, present within the study area; confirm the size and extent (including those extending

beyond the study area). Please include a vegetation species list, separated by community, with groundwater indicator species noted.

7. Assessment of Hydrologic Function: Summary of hydrologic function (e.g. flood storage, flow attenuation, recharge area, etc.) of the features, noting any groundwater and surface water interactions (to be completed in conjunction with a hydrological assessment, completed by a qualified professional).
8. Impact Assessment: Discuss potential impacts of the proposal on the feature(s) and the associated hydrologic function. The temporary impacts during construction, permanent impacts, and direct, in-direct and cumulative impacts should be considered.
9. Mitigation Recommendations: Identify hazard avoidance or hazard mitigation strategies and, include how successful mitigation will be ensured for temporary and permanent protection.
10. Policy Analysis: Provide rationale on how the proposal conforms/complies with various policies concerning the Conservation Authority jurisdiction.
11. Monitoring Plan: may be required based on potential impacts and mitigation recommendations.
12. Please include the following Figures/Drawings:
    a. Site/Concept Plan: The general layout of subject lands and proposed development;
    b. Feature Delineation: The boundary of wetland features shall be determined using the Ecological Land Classification and the Ontario Wetland Evaluation System as appropriate. GIS shapefiles may be requested;
    c. Wetland Catchment Area: The existing catchment area, drainage patterns, inflow and outflow locations; and
    d. Development Constraints: Map showing all regulated features and applicable setbacks, noting the greatest extent of all setbacks in addition to each individual setback. Please include this map on a plan view drawing as well as on aerial imagery.

HYDROGEOLOGICAL ASSESSMENT SUMMARY

13. Given the presence of features located on site, including wetlands, seeps and Medway Creek, a complete hydrogeological investigation is required. The investigation should include the hydrogeological condition within the wetlands and the seeps and any surface water/groundwater interactions on site. The report should consider all of the site features and include the impact of development on those features. Additionally, water balance studies and post-development monitoring plan and mitigation measures should be completed for site features.

SLOPE STABILITY ASSESSMENT

Please address the following Technical Review comments in a response letter and revised Report:

14. Under section 2.2, the report mentioned the cross-sections on the site and the use of the topographic data to create the cross sections for establishing the erosion hazard limit/development limit. Please add more details regarding the selection of the cross-section locations and how it was determined that the cross-sections were at critical locations.
15. Please confirm if the toe, and existing top of the slope were identified through field survey.
16. The Medway Creek meanders within the valley corridor. The Slope Stability Assessment discusses the confined portions of the valley slope but not the unconfined portions. As discussed in comment 1, a Meander Belt Assessment is required for the unconfined portions of the valley. Please add a description of the meandering of Medway Creek to the Report and consider the findings of the Meander Belt Assessment.

17. Section 3.2.2, the report mentioned that fill layers were observed in Boreholes BH 3, BH 7, Test Pits TP 1, and TP 7. Borehole BH 7 is within the vicinity of cross-section EE. Please consider the effect of the fill in the stable slope analysis.
18. Section 3.2.3, the report mentioned observed groundwater seepage within the sand/sand gravel layer. Also, groundwater seepage was reported in the silt/sandy silt layers. Further, groundwater depths ranging between 1.2 to 1.3 m were observed and reported in Test pits 1, 3, 8, and 10, respectively. Test pit 7 is within the vicinity of cross section EE. Please consider and confirm that the seepage and high groundwater levels near the slope were considered in the FOS analysis for the stable slope.
19. Please provide justification for why the analysis, using the computer modelling software Slope/W, only considered four cross sections and not all the cross sections.
20. Please report any other conditions, such as local soil types, seepage, flooding, etc., that were considered for the worst-case scenario in the Slope/W analysis in addition to the slope height, inclination, and proximity to the watercourse.
21. Please provide the Slope/W cross sections for all the three types of failures and for all the cross sections. Please make sure that the soil types match with the local soil representing the cross sections.
22. Please include the 250-year flood elevation on Drawing 1 and all the Drawings showing cross-sections. Please confirm that the 250-year flood elevation was considered in the stable slope analysis.
23. The existing slope for cross section DD is 2.1H:1V, and the proposed stable slope is 2.2H:1V, which is almost the same as an existing slope. Keeping in view the groundwater seepage, groundwater recharge, shallow groundwater, the 250-year floodplain limit in the vicinity of the toe of the slope and the very flat area between the bank of the Medway Creek and the toe of the slope at this location, the UTRCA strongly recommends considering a flatter stable slope.
24. The existing slope for cross section EE is 1.9H:1V, and the proposed stable slope is 2.2H:1V, which is almost the same as an existing slope. Keeping in view the groundwater seepage, groundwater recharge, shallow groundwater, 250-year floodplain limit in the vicinity of the toe of the slope and very flat area between the bank of the Medway Creek and the toe of the slope at this location, the UTRCA strongly recommends considering a flatter stable slope. Further, please confirm the height of the slope at cross section EE.
25. The 250-year floodplain extends into the flat area between cross-sections DD and EE. Within this area please consider the greater of the meander belt and regulatory (250-year) floodplain limit to be the erosion hazard, and the 6 m erosion access allowance to be the development limit. Please identify extent of the erosion hazard and development limit in this area in the Slope Stability Assessment.
26. Similar to comment 14, the erosion hazard downstream of the cross-section GG is to be based on the greater of the meander belt and regulatory (250-year) floodplain limit, with the 6 m erosion access allowance to be the development limit. Please identify the extent of the erosion hazard and development limit in this area in the Slope Stability Assessment.

PROPOSAL SUMMERY MEMO – B. STORMWATER MANAGEMENT

Please address the following Technical Review comments in the Functional Servicing Brief/Stormwater Management Report:

27. The UTRCA recommends considering only clean runoff for infiltration.

28. The UTRCA requires quantity controls to ensure that post-development flow rates are equal to or less than the pre-development rates for all storm events from the 2 year to the 250 year storms when discharging to open watercourses/drains. Controls up to the 250-year storm will be required for the development on both the north and south sides of Medway Road.

29. The UTRCA will require a Feature-based Water Balance Assessment, taking into account the four components of the water balance (precipitation, infiltration, runoff, and evapotranspiration), along with the existing and proposed conditions, using the local soil and site characteristics. This assessment shall focus on the catchment areas that contribute to the wetland features. Please refer to Figure 3 ELC and Field Study Results of the Existing Conditions Assessment for the location of the wetland features. The Stormwater Management Report shall:
    a. Consider the Water Balance Assessment, include infiltration targets for catchment areas and include details as to how the infiltration deficit will be compensated; and
    b. Include conceptual locations and designs of the infiltration measures for each block.

30. Please consider the effects of shallow groundwater.

31. Please consider the effects of the proposed SWM strategy on the neighbouring properties.

COMPLETE APPLICATION REQUIREMENTS

Please ensure the following information is submitted to the UTRCA as part of the complete application:

i. Slope Stability Assessment, completed to the satisfaction of the UTRCA;
ii. Meander Belt Assessment, completed to the satisfaction of the UTRCA;
iii. Functional Servicing Brief/Stormwater Management Report;
iv. Preliminary Feature-based Water Balance Analysis;
v. Preliminary Hydrogeological Assessment; and
vi. Concept Plan/Draft Plan that identifies the updated regulatory floodplain limit, erosion hazard limit. wetland features and all required setbacks.

We recommend that all technical reports are scoped with UTRCA staff and any other relevant agencies. As this application is still in the pre-consultation stage, the UTRCA requirements are subject to change pending further consultation and revisions to the proposed development concept.

UTRCA REVIEW FEES

Consistent with UTRCA Board of Directors approved policy, Authority Staff are authorized to collect fees for the review of *Planning Act* applications and the peer review of technical studies. Our fee for the review of this Pre-Consultation request is **$320.00**, which will be invoiced to the applicant under separate cover. Upon submission of the formal application, the applicant may be invoiced as follows:

Planning Act Application Review Fees	
Draft Plan of Subdivision	$170 per lot to a maximum of $14,300.00
Official Plan Amendment (minor)	$ 580.00
Zoning By-Law Amendment (minor)	$ 580.00
Technical Review Fees*	
Preliminary Stormwater Management Report	$1,270.00
Development Assessment Report (minor)	$ 795.00
Hydrogeological Assessment	$1,700.00

*Our technical review fees include one (1) initial and one (1) subsequent review of the reports. Additional reviews may be subject to additional fees. Fees associated with the **Section 28 Permit Applications** will be determined upon submission.

Thank you for the opportunity to comment. Please contact the undersigned if you have any questions.

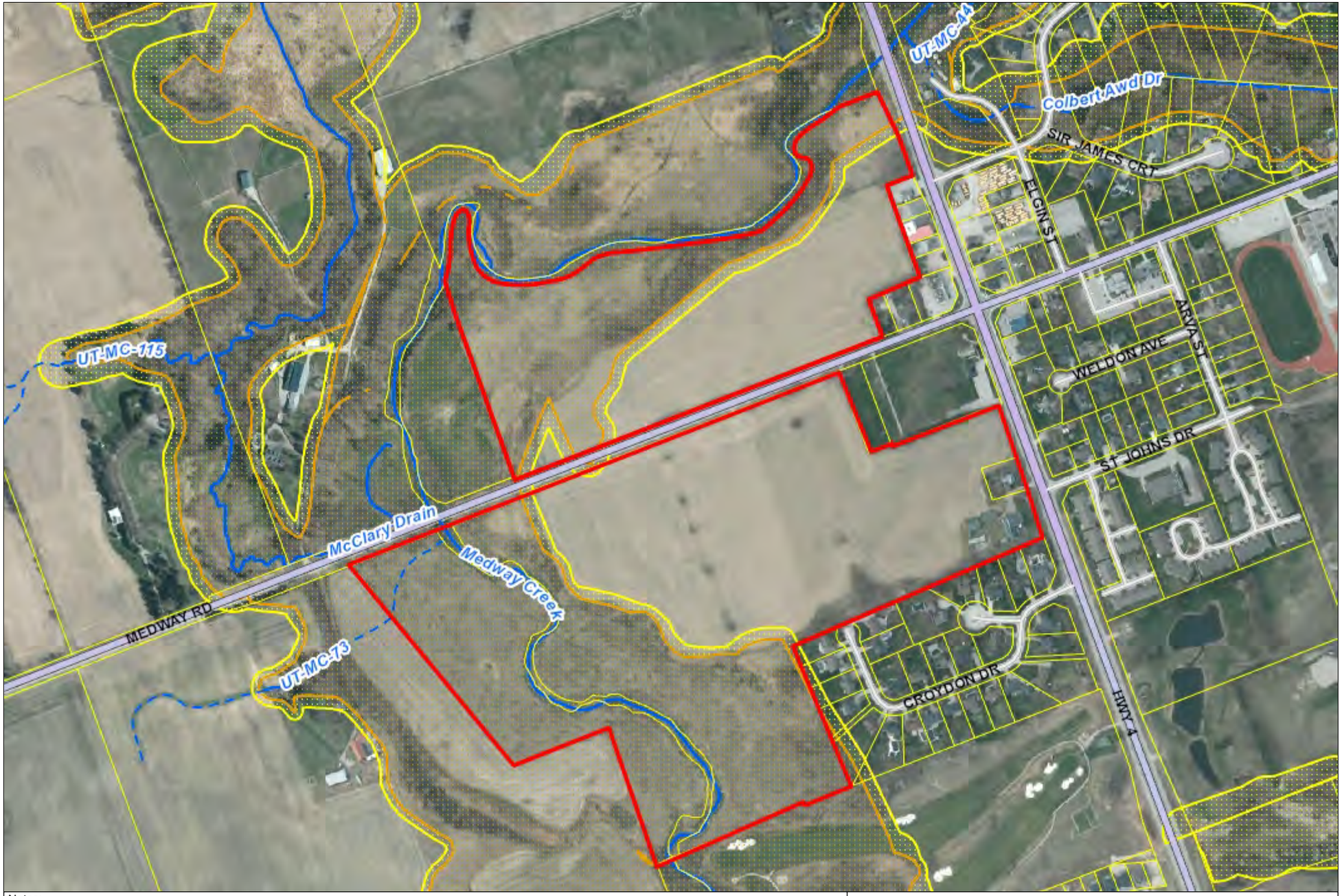
Yours truly,
UPPER THAMES RIVER CONSERVATION AUTHORITY

Laura Biancolin
Land Use Planner II

Enclosure: Regulated Areas Map (2024)*
Medway Creek Updated Regulatory Floodplain Map (2021)*

**please print on legal size paper for accurate scales*

Cc. York Developments - David Ailles
UTRCA - Cari Ramsey, Land Use Regulations Officer
UTRCA - Imtiaz Shah, Senior Environmental Engineer
UTRCA - Sarah Hodgkiss, Planning Ecologist
UTRCA – Naghmeh Sharifi, Hydrogeologist
UTRCA - Olivia Orsini, Source Protection Policy and Risk Management Advisor



Regulated Areas

Regulation under s.28 of the *Conservation Authorities Act*

Development, interference with wetlands, and alterations to shorelines and watercourses. O.Reg 157/06, 97/04.

Legend

- UTRCA Watershed (2017 LiDAR)
- Assessment Parcel (MPAC)
- Watercourse (UTRCA, 2020)
  - Open
  - Closed Design/Tiled
- Erosion Hazard Limit
- Regulation Limit 2024

The mapping is for information screening purposes only, and shows the approximate regulation limits. The text of Ontario Regulation 157/06 supersedes the mapping as represented by this data layer. This mapping is subject to change. A site specific determination may be made by the UTRCA.

This layer is the approximate limit for areas regulated under Ontario Regulation 157/06 - Upper Thames River Conservation Authority: Development, Interference with Wetlands and Alterations to Shorelines and Watercourses, which came into effect May 4, 2006.

The UTRCA disclaims explicitly any warranty, representation or guarantee as to the content, sequence, accuracy, timeliness, fitness for a particular purpose, merchantability or completeness of any of the data depicted and provided herein.

The UTRCA assumes no liability for any errors, omissions or inaccuracies in the information provided herein and further assumes no liability for any decisions made or actions taken or not taken by any person in reliance upon the information and data furnished hereunder.

This map is not a substitute for professional advice. Please contact UTRCA staff for any changes, updates and amendments to the information provided.

This document is not a Plan of Survey.

UPPER THAMES RIVER CONSERVATION AUTHORITY

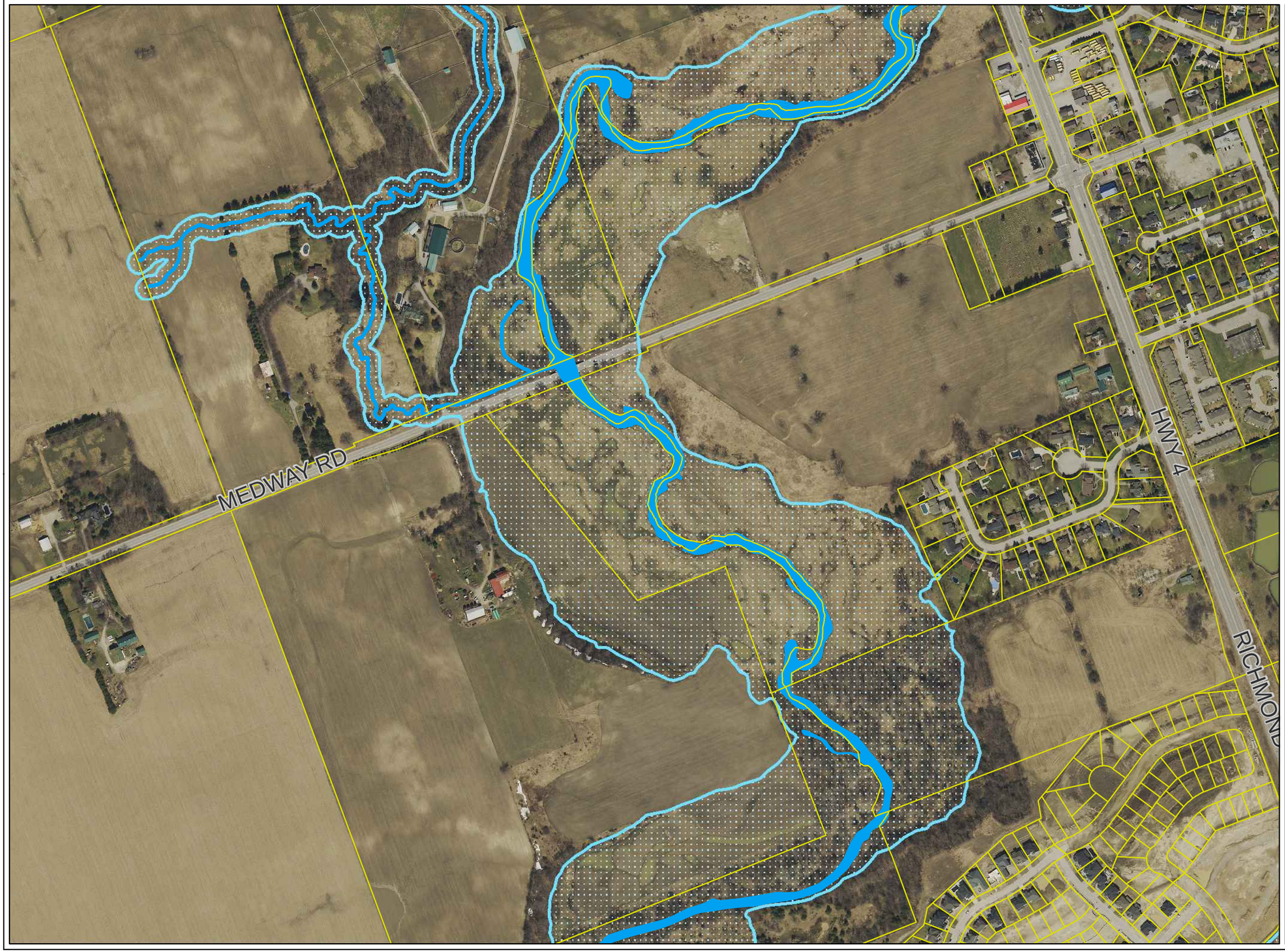
Notes:
0 Richmond Street, Middlesex Centre (2024)

Created By: LB April 30, 2024

* Please note: Any reference to scale on this map is only appropriate when it is printed landscape on legal-sized (8.5" x 14") paper.

0 120 240 480
metres
1:6,000

N



Medway Creek

Middlesex Centre, ON

Legend

- Assessment Parcel (MPAC)
- Watercourse (UTRCA)
- Flood Hazard (UTRCA)

Map Created by UTRCA
Mar 09, 2021

Notes:

Flood model and mapping updates are ongoing. Updated information may need to be considered for your project as it becomes available.

Please note: Any reference to scale on this map is only appropriate when it is printed landscape on Tabloid-sized (11"x17") paper.

Horizontal Datum : NAD83 UTM Zone 17
Vertical Datum: CGVD 1928

N

0 25 50 100 150 200
metres

Data Sources:
Parcels, 2015 Aerial Photography

UPPER THAMES RIVER CONSERVATION AUTHORITY

Appendix C Species at Risk Habitat Assessment

Appendix C Habitat Potential in the Bridle Path North Subdivision Study Area for Species at Risk

Species	Habitat Preference	Suitable Habitat in the Study Area (Yes/No)	Species Observed During Field Investigations (Yes/No)
PLANTS			
American Ginseng (*Panax quinquefolius*)	Ginseng requires rich, moist, undisturbed and relatively mature sugar maple-dominated deciduous woods in areas of circumneutral soil such as over limestone or marble bedrock (White, 1988). Colonies are often found near the bottom of gentle slopes facing south-east to south-west. This microhabitat is warm, usually well-drained and particularly diverse in species (COSEWIC 2000).	**No** – Suitable habitat was not present in the Study Area.	**No –** American Ginseng was not identified during botanical field surveys.
Butternut (*Juglans cinerea*)	Found in a variety of habitats throughout Southern Ontario, including woodlands and hedgerows (Farrar 1995).	**Yes** – Suitable habitat (i.e., riparian and other hedgerows) was present in the Study Area.	**Yes -** One butternut was observed during field visit just outside of the Study Area boundary, north of Medway Road. The protected habitat (i.e., 25 m) intersects with the outer limit of the Study Area. The Butternut is located outside the Project Development Boundary (PDB).
Purple Twayblade (*Liparis liliifolia*)	Purple Twayblade can be found in a variety of habitats including oak woodland and savannah, mixed deciduous forests, thicket, shrub alvar, deciduous swamp and coniferous plantations (COSEWIC 2010a).	**Yes** – Suitable habitat was present. Mixed deciduous forest and thicket communities present in the Study Area.	**No -** Purple twayblade was not identified during botanical field surveys.
BIRDS			
Bank Swallow (*Riparia riparia*)	The Bank Swallow breeds on a variety of sites with vertical banks, including riverbanks, bluffs, aggregate pits and stockpiles of sand and soil (COSEWIC 2013a). Sand-silt substrates are preferred (COSEWIC 2013a). Nesting sites are often near open habitats used for aerial foraging (COSEWIC 2013). Large wetlands are used as communal roosts during post-breeding, migration, and wintering periods (COSEWIC 2013a).	**No** – Suitable habitat was not present in the Study Area.	**No -** Bank Swallow were not recorded during breeding bird surveys.
Bobolink (*Dolichonyx oryzivorus*)	Nests primarily in forage crops with a mixture of grasses and broad-leaved forbs, predominantly hayfields and pastures (COSEWIC 2010b).	**Yes** – Suitable habitat was present in hayfields.	**No -** Bobolink were not observed during breeding bird surveys conducted in the Study Area.
Chimney Swift (*Chaetura pelagica*)	Chimney Swift use chimneys for roosting and breeding, as well as walls, rafters, or gables of buildings and, less frequently, natural structures such as hollow trees, tree cavities and cracks in cliffs (Cadman et al., 2007).	**Yes** –Residential areas occur on the Subject Lands and in the Study Area that may provide suitable chimney habitat. Known to only use trees for roosting in large areas of mature forest (COSEWIC 2018), which are absent from the Study Area.	**Yes -** Chimney Swift was observed during breeding bird surveys conducted in the Study Area. Breeding habitat was not identified in the PDB; however, a detailed assessment of the residences located in the Study Area was not undertaken.
Eastern Meadowlark (*Sturnella magna*)	Meadows, hayfields and pastures; also, other open habitat types including mown lawn (COSEWIC 2011a). Prefers large (~5 ha), low-lying wet grasslands with abundant litter (COSEWIC 2011a).	**Yes** – Suitable habitat was present in hayfields.	**No -** Eastern Meadowlark was not observed during breeding bird surveys conducted in the Study Area.
Northern Bobwhite (*Colinus virginianus*)	In Ontario it is now usually associated with cultivated lands, rather than native prairie fringes. They require grasslands for summer nesting, some feeding and limited roosting, croplands during summer and autumn for feeding, dusting, loafing and some roosting, and dense brushy cover for escape and roosting year-round, and for feeding during autumn and winter (COSEWIC 2003).	**Yes** – Suitable habitat was present in the Medway Creek corridor.	**No -** Northern Bobwhite were not observed during breeding bird surveys conducted in the Study Area.
Red-headed Woodpecker (*Melanerpes erythrocephalus*)	Lives near open woodland and woodland edges, often found in parks, golf courses, and cemeteries. Typically, many dead snags, which are used for nesting and perching (SARO 2023).	**Yes** – Suitable habitat was present in the Medway Creek corridor and in forested/treed areas in the Study Area and on the Subject Lands.	**No -** Red-headed Woodpecker was not observed during the breeding bird surveys conducted in the Study Area.

Species	Habitat Preference	Suitable Habitat in the Study Area (Yes/No)	Species Observed During Field Investigations (Yes/No)
MAMMALS			
Small-footed Myotis (*Myotis leibii*)	Small-footed myotis hibernate in caves and abandoned mines in winter. Maternity roosting habitat is described as: open, sunny rocky habitats, including cracks and crevices in cliffs and boulders, in talus slopes, beneath stones on rock barrens and in rock outcrops containing crevices (Humphrey 2017). Is typically associated with rocky areas or buildings/other structures (MNRF 2017).	**No** – Suitable habitat was not present in the Study Area. No rocky habitat was observed.	**No –** Small-footed Myotis were not documented during the bat acoustic surveys.
Little Brown Myotis (*Myotis lucifugus*)	Trees, buildings and bridges for roosting; trees for nesting; caves and mines for hibernation (COSEWIC 2013b).	**Yes** – Suitable habitat was present in forested areas in the Study Area. Suitable habitat was present on the Subject Lands in the FODM7-5, FODM4, MEMM3b (individual trees), in the THDM2/THDM4 and in the THDM4-1 and in individual trees along Medway Road and in the OAGM1 fields.	**Yes –** Little Brown Myotis were documented (2 recordings at each station) at Bat-01 and Bat-02 acoustic monitoring stations.
Northern Myotis (*Myotis septentrionalis*)	Caves provide overwintering habitat (COSEWIC 2013b). Rarely uses human-made structures for roosting (COSEWIC 2013b).	**Yes** – Suitable habitat was present in forested areas in the Study Area. Suitable habitat was present in the Subject Lands in the FODM7-5, FODM4, MEMM3b (individual trees), in the THDM2/THDM4 and in the THDM4-1 and in individual trees along Medway Road and in the OAGM1 fields.	**No –** Northern Myotis were not documented during the bat acoustic surveys.
Tri-colored Bat (*Perimyotis subflavus*)	The Tri-coloured Bat roosts in colonies in tree cavities (COSEWIC 2013b) in a wide variety of deciduous and coniferous forest stands. Little is known about the effect of stand composition on maternity roost selection for this species, but it is strongly associated with forest watercourses and streamside vegetation (COSEWIC 2013b).	**Yes** – Suitable habitat was present in forested areas in the Study Area. Suitable habitat was present in the Subject Lands in the FODM7-5, FODM4, MEMM3b (individual trees), in the THDM2/THDM4 and in the THDM4-1 and in individual trees along Medway Road and in the OAGM1 fields.	**No –** Tricolored Bat were not documented during the bat acoustic surveys.
Hoary Bat (*Lasiurus cinereus*)	Hoary Bats roost during the day in primarily treed habitats. Hoary Bats typically roost among the foliage of trees and occasionally shrubs, in both deciduous and coniferous trees of various age classes (COSEWIC 2023). Maternity roosts tend to be large diameter and tall trees, reaching or exceeding the height of the surrounding canopy.	**Yes** – Suitable habitat was present in forested areas in the Study Area. Suitable habitat was present in the Subject Lands in the FODM7-5, FODM4, MEMM3b (individual trees), in the THDM2/THDM4 and in the THDM4-1 and in individual trees along Medway Road and in the OAGM1 fields.	**Yes –** Hoary Bat were documented (487 and 438 recordings) at Bat-01 and Bat-02 acoustic monitoring stations, respectively.
Eastern Red Bat (*Lasiurus borealis*)	Eastern Red Bats roost during the day in primarily treed habitats. Eastern Red Bats typically roost among the foliage of trees and occasionally shrubs, in both deciduous and coniferous trees of various age classes (COSEWIC 2023). Maternity roosts tend to be large diameter and tall trees, reaching or exceeding the height of the surrounding canopy.	**Yes** – Suitable habitat was present in forested areas in the Study Area. Suitable habitat was present in the Subject Lands in the FODM7-5, FODM4, MEMM3b (individual trees), in the THDM2/THDM4 and in the THDM4-1 and in individual trees along Medway Road and in the OAGM1 fields.	**Yes –** Eastern Red Bat were documented in (28 and 45 recordings) at Bat-01 and Bat-02 acoustic monitoring stations, respectively.
Silver-haired Bat (*Lasionycteris noctivagans*)	Silver-haired Bats roost during the day in primarily treed habitats. Silver-haired Bats roost primarily under bark and in the cavities of large diameter trees, and are therefore reliant on habitats where large, decaying trees are available (COSEWIC 2023). Reproductive females generally roost in small groups within tree cavities or under bark.	**Yes** – Suitable habitat was present in forested areas in the Study Area. Suitable habitat was present in the Subject Lands in the FODM7-5, FODM4, MEMM3b (individual trees), in the THDM2/THDM4 and in the THDM4-1 and in individual trees along Medway Road and in the OAGM1 fields.	**Yes –** Silver-haired Bat were documented in (200 and 239 recordings) at Bat-01 and Bat-02 acoustic monitoring stations, respectively.
REPTILES			
Blanding's Turtle (*Emydoidea blandingii*)	Blanding's Turtles frequent lakes, ponds, and marshes, and prefer shallow water with abundant aquatic vegetation and a soft bottom (MacCulloch, 2002). They prefer shallow water that is rich in nutrients, organic soil and dense vegetation. Adults usually occupy open or partially vegetated sites, whereas juveniles occupy areas with thick aquatic vegetation including sphagnum, water lilies and algae. Nesting occurs in dry conifer or mixed hardwood forests, up to 410 m from any body of water, in loose substrates including sand, organic soil, gravel and cobblestone, nesting may also occur along gravel roadways (COSEWIC 2005).	**No** – Suitable habitat was not present in the Study Area due. Suitable habitat features (i.e. soft bottom and abundant aquatic vegetation) were not observed in Medway Creek.	**No –** not observed incidentally during field studies conducted.

Species	Habitat Preference	Suitable Habitat in the Study Area (Yes/No)	Species Observed During Field Investigations (Yes/No)
Eastern Hog-nosed Snake (*Heterodon platirhinos*)	The Eastern hog-nosed snake requires a number of factors including well-drained loose or sandy soil; open vegetative cover such as open woods; brushland or forest edge; relatively close proximity to water; and climatic conditions typical of the eastern deciduous forest, they are also a wide-ranging species, often with home ranges up to 100ha (COSEWIC, 2007c). Eastern Hognose requires habitat that contains an abundance of toads as prey for adults as well an adequate supply of small amphibians such as salamanders or spring peepers, to sustain hatchlings and juveniles (Schueler 1996). In Canada the Eastern hognose snake is only found in southern Ontario. It occurs in two separate areas, the Carolinian zone and in south-central Ontario, mostly on the southern part of the Canadian Shield (COSEWIC, 2007).	**No** – Suitable habitat was not present in the Study Area.	**No -** not observed incidentally during field studies conducted.
Queensnake (*Regina septemvittata*)	The Queensnake is an aquatic snake found in rocky, gravelly, or slate stream-bed substrates, with a swift to moderate current and woodland surroundings (COSEWIC 2010d). The Queensnake is very rare in the province and is restricted to relatively small sections of a few rivers and wetlands in southwestern Ontario. In addition, the habitat of this species is highly specialized, and it is rarely found more than 3 m from water. Wood (1949) noted the following three conditions necessary to support a large population of Queensnakes: permanent area of water, flowing or still, with a temperature at or above 18.3°C throughout most of the active season; abundant cover, such as flat rocks submerged and/or on the bank; and an abundance of crayfish.	**No** – Suitable habitat was not present in the Study Area. The species has been documented in Medway Creek near the Thames River with the last sighting in 1997 (COSEWIC 2010). Yearly surveys from 2002 to 2010 revealed no Queensnake observations and the population in Medway Creek is considered historic (COSEWIC 2010).	**No -** not observed incidentally during field studies conducted.
Eastern Spiny Softshell (*Apalone spinifera*)	Spiny Softshell sub-populations in Ontario occur in the east, associated with the Ottawa and St. Lawrence River, and south, associated with Lake Erie, especially the Sydenham and Thames Rivers (COSEWIC 2002a). Spiny Softshells require sandy beaches and riverbanks for nesting, shallow soft-bottomed water bodies to function as nurseries and refugia, basking areas and deep pools for thermoregulation, and riffle areas for foraging, habitat features may occur over a large area, as long as the intervening habitat doesn't prevent the turtles from travelling between them (COSEWIC 2002).	**Yes** – Suitable habitat was present in Medway Creek.	**No -** not observed incidentally during field studies conducted. However, suitable habitat is outside of the PDB.
Spotted Turtle (*Clemmys guttata*)	Spotted Turtles inhabit unpolluted habitats of slow-moving, shallow waters of ponds, bogs, fens, marshes, vernal pools and sedge meadows. Vegetation structures such as sphagnum moss, sedge tussocks, cattails, water lilies and hydrophilic shrubs, as well as soft-bottom substrates, are important components of aquatic habitats. Hibernation and breeding grounds of the Spotted Turtle are often communal, and they exhibit high fidelity to these sites. Some populations of spotted turtles will bury themselves under ground and enter a state of dormancy to avoid the heat and aridity of summer. This generally occurs in a terrestrial site and lasts from July to September, when hibernation begins (COSEWIC 2004).	**No** – Suitable habitat was not present in the Study Area.	**No –** not observed incidentally during field studies conducted.

Species	Habitat Preference	Suitable Habitat in the Study Area (Yes/No)	Species Observed During Field Investigations (Yes/No)
Wood Turtle (*Glyptemys insculpta*)	Wood Turtles are highly terrestrial for a freshwater turtle but are still greatly dependent on aquatic habitats (COSEWIC 2018). Wood Turtles are strongly associated with meandering, shallow rivers with sand, gravel, and/or cobble bottoms; these rivers are typically clear, with moderate current and frequent oxbows. Secondary tributaries (brooks) that feed these rivers may also support Wood Turtles; these tributaries can be used to access resource patches and may also provide subpopulation rescue when episodic events disrupt the subpopulation on the main river. Still water or slow water habitats, such as vernal pools, oxbows, marshes, and beaver ponds are also used, though less frequently than are riverine habitats (COSEWIC 2018b).	**No** – Suitable habitat was not present in the Study Area.	**No -** not observed incidentally during field studies conducted.
FISH			
Black Redhorse (*Moxostoma duquesnei*)	The Black Redhorse generally inhabits moderately sized, clear, warmwater rivers. It generally prefers pools in the summer and over-winters in deeper pools. It is suggested that suitable habitat for Black Redhorse includes clean coarse bed material (gravel and cobble), stable channels, and well-developed riffles. Adult Black Redhorse are rarely associated with submerged aquatic vegetation (COSEWIC 2015).	**Yes** – Suitable habitat was present in Medway Creek. DFO Aquatic Species at Risk map shows Medway Creek within the Study Area to provide Critical Habitat for Black Redhorse (DFO 2025). Suitable habitat is outside of the PDA.	**No** – fish sampling was not completed as part of the field investigations. Species assumed present as per DFO Aquatic Species at Risk Map (DFO 2025)
Silver Shiner (*Notropis photogenis*)	The Silver Shiner is found primarily in medium or large streams with moderate gradients with alternating pools and riffles, or in turbulent waters below dams (COSEWIC 2011b).	**Yes** – Suitable habitat was present in Medway Creek. DFO Aquatic Species at Risk map shows Medway Creek within the Study Area to provide Critical Habitat for Silver Shiner (DFO 2025). Suitable habitat is outside of the PDA.	**No** – fish sampling was not completed as part of the field investigations. Species assumed present as per DFO Aquatic Species at Risk Map (DFO 2025)
MOLLUSCS			
Wavy-rayed Lampmussel (*Lampsilis fasciola*)	Wavy-rayed Lampmussel live mainly in gravel or sand bottoms of riffle areas in medium-sized streams (COSEWIC 2010c).	**Yes** – Suitable habitat was present in Medway Creek. DFO Aquatic Species at Risk map shows Medway Creek within the Study Area to provide habitat for Wavy-rayed Lampmussel (DFO 2025). Suitable habitat is outside of the PDA.	**No** – mussel sampling was not completed as part of the field investigations. Species assumed present as per DFO Aquatic Species at Risk Map (DFO 2025)

References

Cadman, M. D., D.A. Sutherland, G.G. Beck, D. Lepage, A.R. Couturier. 2007. Atlas of the Breeding Birds of Ontario, 2001-2005. (eds) Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, Ontario. Ministry of natural resources, and Ontario Nature, Toronto, xxii + 134pp

COSEWIC 2000. COSEWIC assessment and update status report on the American Ginseng *Panax quinquefolius* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 17 pp.

COSEWIC. 2002. COSEWIC assessment and update status report on the spiny softshell turtle *Apalone spinifera* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 17 pp.

COSEWIC. 2003. COSEWIC assessment and update status report on the Northern Bobwhite *Colinus virginianus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 20 pp.

COSEWIC. 2004. COSEWIC assessment and update status report on the spotted turtle *Clemmys guttata* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 27 pp. (www.sararegistry.gc.ca/status/status_e.cfm).

COSEWIC. 2005. COSEWIC assessment and update status report on the Blanding's Turtle *Emydoidea blandingii* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. viii + 40 pp

COSEWIC. 2007. COSEWIC assessment and update status report on the Eastern Hog-nosed Snake *Heterodon platirhinos* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. viii + 36 pp

COSEWIC. 2010a. COSEWIC assessment and status report on the Purple Twayblade *Liparis liliifolia* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 25 pp.

COSEWIC. 2010b. COSEWIC assessment and status report on the Bobolink Dolichonyx oryzivorus in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 42 pp. www.registrelep-sararegistry.gc.ca/default_e.cfm.

COSEWIC. 2010c. COSEWIC assessment and status report on the Wavy-rayed Lampmussel Lampsilis fasciola in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 60 pp. (www.sararegistry.gc.ca/status/status_e.cfm).

COSEWIC. 2010d. COSEWIC assessment and status report on the Queensnake *Regina septemvittata* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 34 pp.

COSEWIC. 2011a. COSEWIC assessment and status report on the Eastern Meadowlark Sturnella magna in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. x + 40 pp. www.registrelep-sararegistry.gc.ca/default_e.cfm.

COSEWIC. 2011b. COSEWIC assessment and status report on the Silver Shiner in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 45 pp.

COSEWIC. 2013a. COSEWIC assessment and status report on the Bank Swallow *Riparia riparia* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. ix + 48 pp.

COSEWIC. 2013b. COSEWIC Assessment and Status Report on the Little Brown Myotis (*Myotis lucifugus*), Northern Myotis (*Myotis septentrionalis*), Tri-colored Bat (*Perimyotis subflavus*) in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa, Ontario.

COSEWIC. 2015. COSEWIC assessment and status report on the Black Redhorse *Moxostoma duquesnei* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xii + 50 pp. (Species at Risk Public Registry).

COSEWIC. 2018a. COSEWIC assessment and status report on the Chimney Swift *Chaetura pelagica* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xii + 63 pp.

COSEWIC. 2018b. COSEWIC Assessment and Status Report on the Wood Turtle (*Glyptemys insculpta*) in Canada 2018. Ottawa.

Farrar, J.L. 1995. Trees in Canada. Fitzhenry & Whiteside Limited and the Canadian Forest Service. Canada. 168 pp.

Humphrey, C. 2017. Recovery Strategy for the Eastern Small-footed Myotis (*Myotis leibii*) in Ontario. Ontario Recovery Strategy Series. Prepared for the Ontario Ministry of Natural Resources and Forestry, Peterborough, Ontario. vii + 76 pp.

MacCulloch, R.D. 2002. The ROM Field Guide to Amphibians and Reptiles of Ontario. Royal Ontario Museum: Toronto, ON. 168 p.

MNRF [Ontario Ministry of Natural Resources and Forestry]. 2017. Survey Protocol for Species at Risk Bats within Treed Habitats, Little Brown Myotis, Northern Myotis & Tri-Coloured Bat. April 2017.

SARO (Species at Risk Ontario). 2023. Government of Ontario. Species at Risk List. Online: https://www.ontario.ca/page/species-risk-ontario

Appendix D Significant Wildlife Habitat Assessment

Appendix D Significant Wildlife Habitat Assessment in the Bridle Path North Subdivision Study Area

Candidate Wildlife Habitat	Criteria	Methods	Habitat Assessment of Features Found Within the Study Area
Seasonal Concentration Areas			
Waterfowl Stopover and Staging Area (Terrestrial)	Fields with sheet water or utilized by tundra swans during spring (mid-March to May), or annual spring melt water flooding found in any of the following Community Types: Meadow (CUM1), Thicket (CUT1). Agricultural fields with waste grains are commonly used by waterfowl, and these are not considered SWH unless used by Tundra swans in the Long Point, Rondeau, Lake St. Clair, Grand Bend and Point Pelee Areas.	ELC assessment was used to assess features within the Study Area that may support waterfowl stopover and staging areas (terrestrial).	**No candidate habitat** for Waterfowl Stopover and Staging Areas (Terrestrial) occurred within the Study Area.
Waterfowl Stopover and Staging Area (Aquatic)	The following Community Types: Meadow Marsh (MAM), Shallow Marsh (MAS), Shallow Aquatic (SA), Deciduous Swamp (SWD). Ponds, marshes, lakes, bays, coastal inlets, and watercourses used during migration. The combined area of the ELC ecosites and a 100 m radius area is the SWH. 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.	ELC assessment was used to assess features within the Study Area that may support waterfowl stopover and staging areas (aquatic).	**No candidate habitat** for Waterfowl Stopover and Staging Areas (Aquatic) occurred within the Study Area.
Shorebird Migratory Stopover Area	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 amour 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 significant wildlife habitat. The following community types: Meadow Marsh (MAM), Beach/Bar (BB), or Sand Dune (SD).	ELC assessment was used to assess features within the Study Area that may support migratory shorebirds.	**No candidate habitat** for Shorebird Migratory Stopover Area occurred within the Study Area.
Raptor Wintering Area	At least one of the following Forest Community Types: Deciduous Forest (FOD), Mixed Forest (FOM) or Coniferous Forest (FOC), in combination with one of the following Upland Community Types: Meadow (CUM), Thicket (CUT), Savannah (CUS), Woodland (CUW) (<60% cover) that are >20 ha and provide roosting, foraging and resting habitats for wintering raptors. Upland habitat (CUM, CUT, CUS, CUW), must represent at least 15 ha of the 20 ha minimum size.	ELC assessment was used to assess features within the Study Area that may support wintering raptors.	**No candidate habitat** for Raptor Wintering Area occurred within the Study Area.
Bat Hibernacula	Hibernacula may be found in caves, mine shafts, underground foundations and karsts. May be found in these Community Types: Crevice (CCR), Cave (CCA).	ELC assessment was used to assess features within the Study Area that may support bat hibernacula.	**No candidate habitat** for Bat Hibernacula occurred within the Study Area.
Bat Maternity Colonies	Maternity colonies considered significant wildlife habitat are found in forested ecosites. Either of the following Community Types: Deciduous Forest (FOD) or Mixed Forest (FOM), that have>10/ha wildlife trees >25 cm diameter at breast height (dbh). Maternity colonies can be found in tree cavities, vegetation and often in buildings (buildings are not considered to be SWH). Female Bats prefer wildlife tree (snags) in early stages of decay, class 1-3 or class 1 or 2. Northern Myotis prefer contiguous tracts of older forest cover for foraging and roosting in snags and trees. 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.	ELC assessment was used to assess features within the Study Area that may support bat maternity colonies.	**Candidate habitat** for Bat Maternity Colonies occurred within the Study Area in the FODM7 and FODM7-5 ecosites.

Candidate Wildlife Habitat	Criteria	Methods	Habitat Assessment of Features Found Within the Study Area
Turtle Wintering Areas	Snapping and Midland Painted turtles utilize ELC community classes: Swamp (SW), Marsh (MA) and Open Water (OA). Shallow water (SA), Open Fen (FEO) and Open Bog (BOO). Northern Map turtle- open water areas such as deeper rivers or streams and lakes can also be used as over-wintering habitat. Water has to be deep enough not to freeze and have soft mud substrate. Over-wintering sites are permanent water bodies, large wetlands, and bogs or fens with adequate dissolved oxygen.	ELC assessment was used to assess features within the Study Area that may support areas of permanent standing water but not deep enough to freeze.	**Candidate habitat** for Turtle Wintering Areas occurred in the Study Area within Medway Creek and MAS community.
Snake Hibernacula	Hibernation occurs in sites located below frost lines in burrows, rock crevices, broken and fissured rock and other natural features. 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. Any ecosite in southern Ontario other than very wet ones may provide habitat. The following Community Types may be directly related to snake hibernacula: Talus (TA), Rock Barren (RB), Crevice (CCR), Cave (CCA), and Alvar (RBOA1, RBSA1, RBTA1).	ELC surveys and wildlife assessments were used to assess features within the Study Area that may support snake hibernacula.	**No candidate habitat** for Snake Hibernacula occurred within the Study Area.
Colonial-Nesting Bird Breeding Habitat (Bank and Cliff)	Eroding banks, sandy hills, borrow pits, steep slopes, sand piles, cliff faces, bridge abutments, silos, or barns found in any of the following Community Types: Meadow (CUM), Thicket (CUT), Bluff (BL), Cliff (CL). 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.	ELC assessment was used to assess features within the Study Area that may support colonial bird breeding habitat. Breeding bird surveys were used to confirm use.	**No candidate habitat** for Colonial-Nesting Bird Breeding Habitat occurred in the Study Area. Bank Swallow were not identified in the breeding bird surveys.
Colonial-Nesting Bird Breeding Habitat (Tree/Shrubs)	Identification of stick nests in any of the following Community Types: Mixed Swamp (SWM), Deciduous Swamp (SWD), Treed Fen (FET). The edge of the colony and a minimum 300 m area of habitat or extent of the Forest Ecosite containing the colony or any island <15.0 ha with a colony is the SWH. Nests in live or dead standing trees in wetlands, lakes, islands, and peninsulas. Shrubs and occasionally emergent vegetation may also be used.	ELC assessment was used to assess features within the Study Area that may support colonial bird breeding habitat (Trees/Shrubs). Breeding bird surveys were used to confirm use.	**No candidate habitat** for Colonial-Nesting Bird Breeding Habitat (Tree/Shrubs) occurred within the Study Area. Breeding bird surveys did not identify tree/shrub nesting birds. Although a Great Blue Heron was observed flying over the Study Area as an incidental observation, no Great Blue Heron nests were observed in the Study Area.
Colonial-Nesting Bird Breeding Habitat (Ground)	Any rocky island or peninsula within a lake or large river. For Brewer's Blackbird close proximity to watercourses in open fields or pastures with scattered trees or shrubs found in any of the following Community Types: Meadow Marsh (MAM1-6), Shallow Marsh (MAS1-3), Meadow (CUM), Thicket (CUT), Savannah (CUS).	ELC assessment was used to assess features within the Study Area that may support colonial bird breeding habitat (Ground). Breeding bird surveys were used to confirm use.	**No candidate habitat** for Colonial-Nesting Bird Breeding Habitat (Ground) occurred within the Study Area. Breeding bird surveys did not identify tree/shrub nesting birds.
Migratory Butterfly Stopover Areas	Located within 5 km of Lake Erie or Ontario. A combination of ELC communities, one from each land class is required: Field (CUM, CUT, CUS) and Forest (FOC, FOM, FOD, CUP). Minimum of 10 ha in size with a combination of field and forest habitat present.	ELC assessment and proximity to Lake Erie/Ontario was used to assess features within the Study Area that may support migratory butterfly stopover areas.	**No candidate habitat** for Migratory Butterfly Stopover Areas occurred within the Study Area.
Landbird Migratory Stopover Areas	The following community types: Forest (FOD, FOM, FOC) or Swamp (SWC, SWM, SWD). Woodlots must be >5 ha in size and within 5 km of Lake Ontario or Lake Erie – woodlands within 2 km of Lake Ontario and Lake Erie are more significant.	ELC surveys and GIS analysis were used to assess features within the Study Area that may support landbird migratory stopover areas.	**No candidate habitat** for Landbird Migratory Stopover Areas occurred within the Study Area.
Deer Winter Congregation Areas	Woodlots typically > 100 ha in size unless determined by the MNR as significant. (If large woodlots are rare in a planning area >50 ha.) All forested ecosites within Community Series: FOC, FOM, FOD, SWC, SWM, SWD. Conifer plantations much smaller than 50 ha may also be used.	No studies required as the MNR determines this habitat.	**No candidate habitat** for Deer Winter Congregation Areas occurred within the Study Area.

Candidate Wildlife Habitat	Criteria	Methods	Habitat Assessment of Features Found Within the Study Area
Rare Vegetation Communities			
Cliffs and Talus Slopes	A Cliff is vertical to near vertical bedrock >3 m in height. A Talus Slope is rock rubble at the base of a cliff made up of coarse rocky debris. Any ELC Ecosite within Community Series: TAO, TAS, TAT, CLO, CLS, CLT. Most cliff and talus slopes occur along the Niagara Escarpment.	ELC assessment was used to assess features within the Study Area that would be considered cliffs or talus slopes.	**No candidate habitat** for Cliffs and Talus Slopes occurred within the Study Area.
Sand Barrens	Sand barrens typically are exposed sand, generally sparsely vegetated and cause by lack of moisture, periodic fires and erosion. Vegetation can vary from patchy and barren to tree covered but less than 60%. Any of the following Community Types: SBO1 (Open Sand Barren Ecosite), SBS1 (Shrub Sand Barren Ecosite), SBT1 (Treed Sand Barren Ecosite).	ELC assessment was used to assess features within the Study Area that would be sand barrens.	**No candidate habitat** for Sand Barrens occurred within the Study Area.
Alvars	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. 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 animal species. Vegetation cover varies from patchy to barren with a less than 60% tree cover. Any of the following Community Types: ALO1(Open Alvar Rock Barren Ecosite), ALS1 (Alvar Shrub Rock Barren Ecosite), ALT1 (Treed Alvar Rock Barren Ecosite), FOC1 (Dry-Fresh Pine Coniferous Forest), FOC2 (Dry-Fresh Cedar Coniferous Forest), CUM2 (Bedrock Cultural Meadow), CUS2 (Bedrock Cultural Savannah), CUT2-1 (Common Juniper Cultural Alvar Thicket), or CUW2 (Bedrock Cultural Woodland). An Alvar site > 0.5 ha in size.	ELC assessment was used to assess features within the Study Area that would be alvar communities.	**No candidate habitat** for Alvars occurred within the Study Area.
Old-growth Forest	Old-growth forests tend to be relatively undisturbed, structurally complex, and contain a wide variety of trees and shrubs in various age classes. These habitats usually support a high diversity of wildlife species. No minimum size criteria t in any of the following Community Types: FOD (Deciduous Forest), FOM (Mixed Forest), FOC (Coniferous Forest). Forests greater than 120 years old and with no historical forestry management was the main criteria when surveying for old-growth forests.	ELC assessment was used to assess features within the Study Area that would be considered to be old-growth forest communities.	**No candidate habitat** for Old-growth Forest occurred within the Study Area.
Savannahs	A Savannah is a tallgrass prairie habitat that has tree cover between 25 – 60%. In Ecoregion 7E, known Tallgrass Prairie and savannah remnants are scattered between Lake Huron and Lake Erie, near Lake St. Clair, north of and along the Lake Erie shoreline, in Brantford and in the Toronto area (north of Lake Ontario). Any of the following Community Types: TPS1 (Dry-Fresh Tallgrass Mixed Savannah Ecosite), TPS2 (Fresh-Moist Tallgrass Deciduous Savannah Ecosite), TPW1 (Dry-Fresh Black Oak Tallgrass Deciduous Woodland Ecosite), TPW2 (Fresh-Moist Tallgrass Deciduous Woodland Ecosite), CUS2 (Bedrock Cultural Savannah Ecosite).	ELC assessment was used to assess features within the Study Area that would be considered to be savannah communities.	**No candidate habitat** for Savannahs occurred within the Study Area.
Tall-grass Prairies	A Tallgrass Prairie has ground cover dominated by prairie grasses. An open Tallgrass Prairie habitat has < 25% tree cover. In Ecoregion 7E, known Tallgrass Prairie and savannah remnants are scattered between Lake Huron and Lake Erie, near Lake St. Clair, north of and along the Lake Erie shoreline, in Brantford and in the Toronto area (north of Lake Ontario). Any of the following Community Types: TPO1 (Dry Tallgrass Prairie Ecosite), TPO2 (Fresh-Moist Tallgrass Prairie Ecosite).	ELC assessment was used to assess features within the Study Area that would be considered to be tall-grass communities.	**No candidate habitat** for Tall-grass Prairies occurred within the Study Area.

Candidate Wildlife Habitat	Criteria	Methods	Habitat Assessment of Features Found Within the Study Area
Other Rare Vegetation Communities	Provincially Rare S1, S2 and S3 vegetation communities are listed in Appendix M of the SWHTG.	ELC assessment was used to assess features within the Study Area that would be considered to be other rare vegetation communities.	**Confirmed.** Two rare vegetation communities were present in the Study Area. Both communities are outside of the PDB. FODM7-5 - Fresh - Moist Black Maple Lowland Deciduous Forest Type. This ecosite is on the slope between the OAGM1 tablelands and the Medway Creek floodplain on the north side of Medway Road. This community is given an S3 provincial status rank. MAMO1-6 - This community is dominated by a rare sedge, the Hair-fruited Sedge (*Carex trichocarpa*). This ecosite is on the south side of Medway Road and is located to the east of the OAGM2 hayfield. This species is given an S3 provincial status rank, making the MAM01-6 community rare.
Specialized Habitat for Wildlife			
Waterfowl Nesting Area	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. Upland areas should be at least 120 m wide. Note: includes adjacency to Provincially Significant Wetlands.	ELC assessment was used to assess features within the Study Area that may support nesting waterfowl. Habitats adjacent to wetlands without standing water were not considered candidate SWH. Breeding bird surveys conducted in the Study Area.	**No candidate habitat** for Waterfowl Nesting Area occurred within the Study Area and waterfowl were not identified during breeding bird surveys.
Bald Eagle and Osprey nesting, Foraging, and Perching Habitat	Nests are associated with lakes, ponds, rivers or wetlands along forested shorelines, islands, or on structures over water. Nests located on man-made objects are not to be included as SWH (e.g., telephone poles and constructed nesting platforms). ELC Forest Community Series: FOD, FOM, FOC, SWD, SWM and SWC directly adjacent to riparian areas – rivers, lakes, ponds, and wetlands.	ELC surveys and Woodland Assessments were used to assess features within the Study Area that may support nesting, foraging, and perching habitat for large raptors. Breeding bird surveys conducted in the Study Area.	**No candidate habitat** for Bald Eagle and Osprey nesting, Foraging, and Perching Habitat occurred within the Study Area. An Osprey was observed foraging in Medway Creek during a site visit on July 25, 2023, and a Bald Eagle was also observed flying over the Medway Creek during the breeding bird survey that occurred on June 28, 2024. Although a large stick nest was identified in the Study Area on June 12, 2024, that potentially could support Osprey nesting, it was never confirmed active prior to falling over in a storm (by June 28, 2024. No Bald Eagle nests were observed in the Study Area.
Woodland Raptor Nesting Habitat	All natural or conifer plantation woodland/forest stands combined >30 ha and with >4 ha of interior habitat. Interior habitat determined with a 200 m buffer. 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. May be found in all forested ELC Ecosites. May also be found in SWC, SWM, SWD and CUP3.	ELC surveys, Woodland Assessments and GIS analysis were used to assess features within the Study Area that may support nesting habitat for woodland raptors. Breeding bird surveys conducted in the Study Area.	**No candidate habitat** for Woodland Raptor Nesting Habitat occurred within the Study Area. One unoccupied stick nest was identified in the Study Area (Figure A.3) that may have been a Red-tailed Hawk nest, but it subsequently fell over.
Turtle Nesting Areas	Exposed mineral soil (sand or gravel) areas adjacent (<100 m) or within the following ELC Ecosites: MAM1, MAM2, MAM3, MAM4, MAM5, MAM6, SAS1, SAM1, SAF1, BOO1, FEO1 Best nesting habitat for turtles is close to water, 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.	ELC surveys and GIS analysis were used to assess features within the Study Area that may support turtle nesting areas.	**No candidate habitat** for Turtle Nesting Areas occurred within the Study Area.

Candidate Wildlife Habitat	Criteria	Methods	Habitat Assessment of Features Found Within the Study Area
Seeps and Springs	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	ELC surveys and GIS analysis were used to assess features within the Study Area that may support Seeps and Springs.	**Confirmed habitat** for Seeps and Springs was present in the Study Area within the FODM7-5 ecosite. Candidate habitat for Seeps and Springs was identified in the MAMO1-6 community but lack of forested habitat and the presence a single seep does not meet the criteria for SWH.
Amphibian Breeding Habitat (Woodland)	All Ecosites associated with these ELC Community Series; FOC, FOM, FOD, SWC, SWM, SWD Presence of a wetland, lake, or pond within or adjacent (within 120 m) 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	ELC assessment was used to assess features within the Study Area that may support woodland breeding amphibians.	**No candidate habitat** for Amphibian Breeding Habitat (Woodland) occurred within the Study Area.
Amphibian Breeding Habitat (Wetland)	ELC Community Classes SW, MA, FE, BO, OA and SA. Wetland areas >120 m from woodland habitats. Wetlands and pools (including vernal pools) >500 m^2 (about 25 m diameter) supporting high species diversity are significant; some small or ephemeral habitats may not be identified on MNR 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.	ELC assessment was used to identify wetland habitat features within the Study Area including those that may support bullfrogs (i.e., natural open aquatic and marsh habitats greater than 1 ha in size). Amphibian surveys were completed where areas of pooling water were identified as shown on Figure A.3.	**No candidate habitat** for Amphibian Breeding Habitat (Wetland) occurred within the Study Area.
Habitat for Species of Conservation Concern (*Not including Endangered or Threatened Species*)			
Marsh Bird Breeding Habitat	All wetland habitats with shallow water and emergent aquatic vegetation. May include any of the following Community Types: Meadow Marsh (MAM), Shallow Aquatic (SA), Open Bog (BOO), Open Fen (FEO), or for Green Heron: Swamp (SW), Marsh (MA) and Meadow (CUM) Community Types.	ELC assessment was used to identify marshes with shallow water and emergent vegetation that may support marsh breeding birds. Breeding bird surveys were conducted in the Study Area.	**No candidate habitat** for Marsh Bird Breeding Habitat occurred within the Study Area.
Woodland Area-sensitive Bird Breeding Habitat	Habitats >30ha where interior forest is present (at least 200 m from the forest edge); typically, >60 years old. These include any of the following Community Types: Forest (FO), Treed Swamp (SW)	ELC surveys and GIS analysis were used to determine whether woodlots that occurred within the Study Area that were >30 ha with interior habitat present (>200 m from edge). Breeding bird surveys were conducted in the Study Area.	**No candidate habitat** for Woodland Area-sensitive Bird Breeding Habitat occurred within the Study Area.
Open Country Bird Breeding Habitat	Grassland areas > 30 ha, not Class 1 or Class 2 agricultural lands, with no row-cropping or hay or livestock pasturing in the last 5 years, in the following Community Type: Meadow (CUM).	ELC surveys and GIS analysis were used to identify grassland communities within the Study Area that may support area-sensitive breeding birds. Breeding bird surveys were conducted in the Study Area.	**No candidate habitat** for Open Country Bird Breeding Habitat occurred within the Study Area.
Shrub/Early Successional Bird Breeding Habitat	Oldfield areas succeeding to shrub and thicket habitats >10 ha, not Class 1 or Class 2 agricultural lands, with no row-cropping or intensive hay or livestock pasturing in the last 5 years, in the following Community Types: Thickets (CUT), Savannahs (CUS), or Woodlands (CUW).	ELC surveys and GIS analysis were used to identify large CUT, CUS or CUW communities that may support shrub/early successional breeding birds. Breeding bird surveys were conducted in the Study Area.	**No candidate habitat** for Shrub/Early Successional Bird Breeding Habitat occurred within the Study Area.
Terrestrial Crayfish	Meadow marshes and edges of shallow marshes (no minimum size). Vegetation communities include MAM1, MAM2, MAM3, MAM4, MAM5, MAM6, MAS1, MAS2, MAS3. Construct burrows in marshes, mudflats, meadows Can be found far from water	ELC assessment was used to identify shallow marsh and meadow marsh communities that occurred within the Study Area.	**No candidate habitat** for Terrestrial Crayfish occurred within the Study Area.

Candidate Wildlife Habitat	Criteria	Methods	Habitat Assessment of Features Found Within the Study Area
Special Concern and Rare Wildlife Species (i.e. all special concern and S1-S3 species)			
Amphibians			
Western Chorus Frog (Great Lakes/St. Lawrence) (*Pseudacris triseriata)*	The western chorus frog inhabits forest openings around woodland ponds but can also be found in or near damp meadows, marshes, bottomland swamps and temporary ponds in open country, or even urban areas. This frog breeds in almost any fishless pond with at least 10 centimeters of water, including quiet, shallow, usually temporary waterbodies with vegetation that is submerged or protrudes from the water, and especially in rain-flooded meadows and ditches, and in temporary ponds on floodplains. The western chorus frog overwinters underground or under surface cover, such as fallen logs (ORAA 2023).	ELC assessment was used to assess features within the Study Area that may support this species.	**No candidate habitat.** Suitable habitat was present in the Study Area within areas that are seasonally flooded such as wetlands and low-lying areas in the OAGM2 hayfields. Western Chorus Frog was not documented during amphibian breeding call surveys or incidentally during early spring surveys (i.e., April 2024).
Birds			
Barn Swallow (*Hirundo rustica*)	Live in close association with humans, building their cup-shaped mud nests almost exclusively on human-made structures such as open barns, under bridges and in culverts. Attracted to open structures that include ledges where they can build their nests (SARO 2023).	ELC assessment was used to assess features within the Study Area that may support this species.	**Candidate habitat** occurred within the Study Area. Barn Swallow were documented during breeding bird surveys as flyovers on June 28, 2024. Breeding habitat was not identified; however, a detailed assessment of the residences located in the PDB was not undertaken.
Common Nighthawk (*Chordeiles minor)*	Traditional Common Nighthawk habitat consists of open areas with little to no ground vegetation, such as logged or burned-over areas, forest clearings, rock barrens, peat bogs, lakeshores, and mine tailings. Although the species also nests in cultivated fields, orchards, urban parks, mine tailings and along gravel roads and railways, they tend to occupy natural sites (SARO 2023).	ELC assessment was used to assess features within the Study Area that may support this species.	**No candidate habitat** occurred within the Study Area.
Eastern Wood-Pewee (*Contopus virens*)	Associated with deciduous and mixed forests. Within mature and intermediate age stands it prefers areas with little understory vegetation as well as forest clearings and edges (SARO 2023).	ELC assessment was used to assess features within the Study Area that may support this species. Breeding bird surveys were conducted in the Study Area.	**No confirmed habitat** in the Study Area. Eastern Wood-pewee was heard calling from outside the Study Area.
Wood Thrush (*Hylocichla mustelina*)	Nests mainly in second growth and mature deciduous and mixed forests, with saplings and well-developed understory layers. Prefers large forest mosaics but may also nest in small forest fragments (SARO 2023).	ELC assessment was used to assess features within the Study Area that may support this species. Breeding bird surveys were conducted in the Study Area.	**No candidate habitat** was present in forested areas As Wood Thrush was not observed during breeding bird surveys.
Insects			
Monarch (*Danaus plexippus*)	Meadows where milkweed grows, variety of wildflowers for nectar collection (SARO 2023).	ELC assessment was used to assess features within the Study Area that may support this species.	**Confirmed habitat** occurred in the MEMM3c meadow ecosite in the Study Area. Candidate habitat is present in other meadow ecosites including MEMM3b and MEFM1-1/MEFM1-2. A portion of the habitat is located within the PDB.
Unicorn Clubtail (*Arigomphus villosipes)*	Prefers stillwater habitats, like ponds, lakes, or slow sections of creeks, with a mud substrate and generally without dense aquatic vegetation. It is usually found perched on the banks, or on floating plants or algae (Maryland Biodiversity Project N.D).	ELC assessment was used to assess features within the Study Area that may support this species.	**Candidate habitat** occurred within the Study Area in Medway Creek. The Unicorn Clubtail was not observed during field surveys. Suitable habitat for the Unicorn Clubtail is outside of the PDB.
Plants			
Goldenseal *(Hydrastis canadensis*)	Goldenseal grows in rich, moist semi-open to closed areas of deciduous forests. It is found at periodically flooded upland sites and in moist lowlands near floodplains. It is associated with Red Oak, Sugar Maple, Hawthorns, Shagbark Hickory, Ironwood and Basswood. The species typically grows in disturbed areas where trees have fallen, or next to recreational paths or woodland edges. It prefers sandy loam, loam soils or clay soils depending on whether it is growing in an upland or lowland area (SARO 2023).	ELC assessment was used to assess features within the Study Area that may support this species.	**No candidate** habitat. Potential habitat occurred within the Study Area in lowland deciduous forest (FODM7) along Medway Creek. Goldenseal was not observed during botanical surveys.

Candidate Wildlife Habitat	Criteria	Methods	Habitat Assessment of Features Found Within the Study Area
Hairy-fruited Sedge (*Carex trichocarpa*)	Hairy-fruited sedge is a sedge of marshes, wet meadows, and floodplains. It often forms pure stands of vegetative shoots with few flowering plants (Minnesota Wildflowers 2023).	ELC assessment was used to assess features within the Study Area that may support this species.	**Confirmed habitat** was present in the MAMO1-6 ecosite. The hairy-fruited sedge was the dominant plant in this community. This ecosite is outside of the PDB. Hairy-fruited sedge was also observed in the THDM2/THDM4 ecosite.
Rigid Sedge (*Carex tetanica)*	Rigid sedge grows in mainly calcareous fens and wet meadows (Native Plant Trust 2023)	ELC assessment was used to assess features within the Study Area that may support this species.	**No candidate habitat.** Suitable habitat was present in the Study Area in wet meadows (MAMM3, MAMO1-6). Rigid sedge was not observed during botanical surveys.
Striped Cream Violet (*Viola striata)*	Floodplain (river or stream floodplains), forests, shores of rivers or lakes (Native Plant Trust 2023).	ELC assessment was used to assess features within the Study Area that may support this species.	**No candidate habitat. Suitable habitat** was present in the Study Area along the Medway Creek corridor. Striped cream violet was not observed during botanical survey.
Reptiles			
Eastern Milksnake (*Lampropeltis triangulum*)	Milksnakes can be found in a variety of habitats but tend to use open habitats such as rocky outcrops, fields and forest edge. In rural areas this snake may be common, especially around barns where they thrive on the abundant mice. The milksnake hibernates underground, in rotting logs or in the foundations of old buildings (ORAA 2023).	ELC assessment was used to assess features within the Study Area that may support this species.	**Candidate habitat** occurs within the Study Area. Open pasture, OAGM2 agricultural fields, forest edge THDM4-1 and the MEMM3b may provide habitat for Eastern Milksnake. Eastern Milksnake was not observed during site visits.
Midland Painted Turtle (*Chrysemys picta marginata)*	Painted turtles inhabit waterbodies, such as ponds, marshes, lakes and slow-moving creeks, that have a soft bottom and provide abundant basking sites and aquatic vegetation. These turtles often bask on shorelines or on logs and rocks that protrude from the water. The midland painted turtle hibernates on the bottom of waterbodies (ORAA 2023).	ELC assessment was used to assess features within the Study Area that may support this species.	**Candidate habitat** occurred in the Study Area within Medway Creek. Midland Painted Turtle was not observed during site visits.
Northern Map Turtle (*Graptemys geographica*)	Inhabits rivers and lakeshore basking on emergent rocks and fallen trees through spring and summer. Hibernate on the bottom of deep, slow moving sections of river. Require high-quality water that supports mollusc prey (SARO 2023).	ELC assessment was used to assess features within the Study Area that may support this species.	**Candidate** habitat occurred in the Study Area within Medway Creek. Northern Map Turtle was not observed during site visits.
Snapping Turtle (*Chelydra serpentina*)	Generally, inhabit shallow waters where they can hide under the soft mud and leaf litter. Nesting sites usually occur on gravely or sandy areas along streams. Snapping Turtles often take advantage of man-made structures for nest sites, including roads (especially gravel shoulders), dams and aggregate pits (SARO 2023).	ELC assessment was used to assess features within the Study Area that may support this species.	**Candidate** habitat occurred in the Study Area within Medway Creek. Snapping Turtle was not observed during site visits.
Animal Movement Corridors			
Amphibian Movement Corridor	Corridors may be found in all ecosites associated with water. Determined based on identifying significant amphibian breeding habitat (wetland).	Identified after Amphibian Breeding Habitat - Wetland is confirmed. Movement corridors should be considered when amphibian breeding habitat is confirmed as SWH from Amphibian Breeding Habitat (Wetland).	**No candidate** habitat occurred within the Study Area. Amphibian breeding activity documented in the Study Area did not meet SWH criteria, therefore amphibian movement corridor habitat was not present.

References

Eakins, R.J. 2023. Ontario Freshwater Fishes Life History Database. Online: https://www.ontariofishes.ca/home.htm. Accessed December 18, 2023.

Maryland Biodiversity Project. N.D. Online: https://www.marylandbiodiversity.com/view/637

Minnesota Wildflowers. 2023. Carex trichocarpa (Hairy-fruited sedge). Online: https://www.minnesotawildflowers.info/grass-sedge-rush/hairy-fruited-sedge. Accessed December 20, 2023.

Native Plant Trust. 2023. Go Botany Program. Online: https://gobotany.nativeplanttrust.org/

ORAA (Ontario Reptile and Amphibian Atlas. 2023. Online: https://ontarionature.org/programs/community-science/reptile-amphibian-atlas/species/

SARO (Species at Risk Ontario). 2023. Government of Ontario. Species at Risk List. Online: https://www.ontario.ca/page/species-risk-ontario

Appendix E Photographic Record

Photo 1 May 25, 2023. Seep in the FODM7-5. Dominant skunk cabbage at seepage location.

Photo 2 July 23, 2024: MAMO1-6 rare sedge community. Looking north.

Photo 3 June 12, 2024: MEMM3b vegetation community. Looking north.

Photo 4 June 12, 2024: THDM4-1 vegetation community. Looking east.

Photo 5 June 12, 2024: Breeding Bird Station BB-03. Looking south.

Photo 6 June 18, 2024: Overlooking hayfield between BB-02 and BB-03. Cut during breeding bird window. Looking west from BB-02.

Photo 7 June 12, 2024: Hayfield between BB-05 and BB-06. Looking southeast from BB-05.

Photo 8 June 18, 2024: Overlooking hayfield between BB-05 and BB-06. Cut during breeding bird window. Looking south from edge of OAGM1.

Photo 9 June 28, 2024: Large tree with unused stick nest observed fallen. Looking west.

Photo 10 July 4, 2024: Bat-01. Looking northeast along edge of OAGM1 and FODM7-5.

Photo 11 July 4, 2024: Bat-02. Looking northeast along edge of OAGM1 and THDM4-1.

Photo 12 April 1, 2024: Example of a potential bat roosting tree. Looking south

Photo 13 November 3, 2023: Evidence of beaver eating corn crop and using Medway Creek bank for access to OAGM1 lands.

Photo 14 April 1, 2024: HDF-1. Standing water (2 cm depth) / moist soil in upper reach (eastern extent in the THDM4-1). No defined channel. Looking west.

Photo 15 April 1, 2024: Minor water and flow observed in channel flow path (close to centroid of the THDM4-1). Looking down.

Photo 16 April 1, 2024: HDF-1. No defined feature, no surface water at western extent within the THDM4-1. Looking west.

Photo 17 July 23, 2024: HDF-1. Moist soils and minor seepage in upper reach (eastern extent in the THDM4-1). No defined channel. Looking east.

Photo 18 July 23, 2024: Minor water and flow observed in channel flow path (close to centroid of the THDM4-1). Looking down.

Photo 19 July 23, 2024: HDF-1. Observable flow path through debris and vegetation positioning observation. Dry. Western extent of feature in the THDM4-1.

Photo 20 November 3, 2023: Medway Creek near MEMM3b, facing Richmond St Bridge. Looking northeast.

Photo 21 April 2, 2024: Medway Creek from Medway Road bridge, spring conditions. Looking north.

Photo 22 April 2, 2024: Medway Creek from Medway Road bridge, spring conditions. Looking south.

Appendix F Vegetation

BOTANICAL INVENTORY FORM	PROJECT: PROPERTY NORTH OF MEDWAY ROAD, ARVA, ONTARIO		
	SURVEY AREA: FLOODPLAIN AREA		
		UTM:	
	1st Survey: May 25, 2023	2nd Survey: July 25, 2023	3rd Survey: Sept. 27, 2023
	SURVEYOR(S): B. Miller	SURVEYOR(S): B. Miller	SURVEYOR(S): B. Miller

VASCULAR PLANT SPECIES	CANOPY	SUB-CANOPY	UNDERSTORY	GROUND LAYER
TREES, SHRUBS & WOODY VINES				
Juglans nigra		x	x	x
Tilia amer.	x		x	
Celtis occ.	x		x	
Acer negundo			x	x
Acer - sugar	x			
Malus pomila			x	
Salix - exotic		x	x	
Robinia pseudo.		x	x	
Populus delt.			x	
Populus bals.		x	x	
Juglans cinerea			x	
Acer negund	x			
Amelanchier sp.			R	
Rosa mult.			x	
Lonicera tatarica				
Crataegus			x	
Rhamnus cath.			x	x
Viburnum opul.			x	
Vitis ripa.			x	x
Ribes amer.				x
Ligustrum vulg.			x	
Cornus race.				x
Frangula alnus			x	
Rubus strig.				x
Rhus typh.			x	x
Euonymus europaeus				
Salix interior.			x	x
Salix erioc.			x	x
Crataegus mono.			x	
Acer x freemanii		x		
Rhus typh.			x	
Viburnum lantana			x	
Zanth. amer.				

VASCULAR PLANT SPECIES	GROUND LAYER
HERBACEOUS FLORA	
Anemone cana.	
Equisetum arve.	
Hesperis matron.	
Solidago [illegible].	
Barbarea vulg.	
Thalictrum cf. pube.	
Glechoma heder.	
Urtica dioica - native	
Sang. cana.	
Symplo. [illegible] foet.	
Vinca minor	
Symphyotrichum puni.	
Phalaris arun.	
Carex pellita	
Ranunculus cari.	
Solidago giga.	
Tarax. offi.	
Dactylis glom.	
Alliaria petio.	
Arctium minus	
Carex spicata	
Carex alopicoidea	
Leonurus card.	
Chelidonium majus	
[illegible] Geum cana.	
Poa prat.	
Anthriscus sylv.	
Goutweed	
Clematis virg.	
Circaea. cana.	
Galium aparine	
Arisaema triph.	
Viola cf. sororia	

VASCULAR PLANT SPECIES	GROUND LAYER
Myosotis scirp.	
Cuscuta	
Persicaria hydropiperoides	
Ranunculus acris	
Laportea cana.	
Rudbeckia lacin.	
Impatiens cape.	
Solidago flex.	
Ambrosia trif.	
Eupatorium macu.	
Cirsium arvense	
Rumex obtus.	
Angelica atrop.	
Plantago ruge.	
Cattha palu.	
Lysimachia cili.	
Alopecurus prat.	
Agrostis giga.	
Verbascum thap.	
Phleum prat.	
Eutrochium macu.	
Lotus corn.	
Dipsacus full.	
Scotch Thistle	
Saponaria offi.	
Potentilla recta	
Verbena hast.	
Lysimachia cili.	
Scirpus atrovirens	
Poa palustris	
BOEH. CYLIN.	
Carex vulpinoidea	
Echino. lobata	
Cicuta macu.	
Elymus repens	
Verbena urtic.	
Asclepias syri.	
Monarda fist.	
Bromus iner.	

Clematis virg.

Signature: _____ (Field Personnel)

Signature: _____ (Project Manager)

Relative Species Abundance: D = Dominant; A = Abundant; O = Occasional; R = Rare

Vegetation Height: Canopy = > 20m; Sub-canopy = 10 – 20m; Understory = 2 – 10m; Ground Layer = < 2m

BOTANICAL INVENTORY FORM

PROJECT: PROPERTY NORTH OF MEDWAY ROAD, ARVA, ONTARIO

SURVEY AREA: FLOODPLAIN AREA

UTM:

1st Survey:	2nd Survey:	3rd Survey: Sept. 27, 2023
SURVEYOR(S):	SURVEYOR(S):	SURVEYOR(S): B. Miller

VASCULAR PLANT SPECIES	CANOPY	SUB-CANOPY	UNDERSTORY	GROUND LAYER
TREES, SHRUBS & WOODY VINES				
Rubus occi.				
Fraxinus amer.			*	
Ulmus pumila			X	
Solanum dulc.				

VASCULAR PLANT SPECIES	GROUND LAYER
HERBACEOUS FLORA	
Symphyo. nova.	
Erigeron cana.	
Symphyo. lanc.	
Symphyo. later.	
Leersia virg.	
Elymus virg.	
Cryptotaenia cana.	
Setaria pumila	
Bidens frondosa	
Bidens vulgata	
Pilea	
Amphicarpea bract.	
Symphyo. firmum	
Monarda fist.	
Fallopia scandens	
Melilotus albus	
Ranunculus caricetorum	
Xanthum strum.	
Lythrum sali.	
Panicum capillare	
Plantago ruge.	
Euthamia gram.	
Chelone glabra	
Eupatorium perf.	
Typha angust.	

VASCULAR PLANT SPECIES	GROUND LAYER
SEEPAGE MARSH-MAMM3:	
EUTROCHIUM MACU.	
Symphyo. firmum	
Symphyo. lanc.	
Carex vulpinoidea	
Carex flava	
Juncus effusus	
Juncus dudleyi	
Scirpus atrovirens	
Epilobium parv.	
Carex hystericina	

Signature: _____ (Field Personnel)

Signature: _____ (Project Manager)

Relative Species Abundance: D = Dominant; A = Abundant; O = Occasional; R = Rare

Vegetation Height: Canopy = > 20m; Sub-canopy = 10 – 20m; Understory = 2 – 10m; Ground Layer = < 2m

BOTANICAL INVENTORY FORM	PROJECT: PROPERTY NORTH OF MEDWAY ROAD, ARVA, Ontario		
	SURVEY AREA: FOREST SLOPE – BLACK MAPLE FOREST SLOPE		
		UTM:	
	1st Survey: May 25, 2023	2nd Survey: July 25, 2023	3rd Survey:
	SURVEYOR(S): B. Miller	SURVEYOR(S): B. Miller	SURVEYOR(S):

VASCULAR PLANT SPECIES	CANOPY	SUB-CANOPY	UNDERSTORY	GROUND LAYER	VASCULAR PLANT SPECIES	GROUND LAYER	VASCULAR PLANT SPECIES	GROUND LAYER
TREES, SHRUBS & WOODY VINES					HERBACEOUS FLORA			
Acer nigrum.	xD			x	Saug. cana.			
Prunus sero.	x	x	x		Carex blanda			
Carya cord.	x			x	Geranium robert.			
Frax. amer.				x	Circaea cana.			
Ostrya virg.		x			Solidago flex.			
Celtis occi.		x	x		Ranunculus recurve.			
Tilia amer.	x				Ranunculus abort.			
Dead Ash.	x				Chelidonium majus			
Quercus macro.	x				MAIA. RACE.			
					Nepeta cataria			
					Euonymus obov.			
					Alliaria petio.			
					Silene latifolia			
Prunus virg.			x	x	Symplocarpus foet.			
Lonicera xbella			x	x	Solidago giga.			
Rhamnus cath.			X	x	Sonchus arve. ulig.			
Syringia vulg.				x	Apocynum andros.			
Rosa mult.				x	Verbena urtic.			
Cornus altern.				x	Leonurus caard.			
Crataegus sp.			x	x	Nepeta cataria			
Toxico radi.				x	Vicia cracca			
Ribes cynos.				x	Melilotus albus			
Rubus occi.				x				
Vitis ripa.				x				

Signature: _____ (Field Personnel)

Signature: _____ (Project Manager)

Relative Species Abundance: D = Dominant; A = Abundant; O = Occasional; R = Rare
Vegetation Height: Canopy = > 20m; Sub-canopy = 10 – 20m; Understory = 2 – 10m; Ground Layer = < 2m

BOTANICAL INVENTORY FORM	PROJECT: PROPERTY NORTH OF MEDWAY ROAD, ARVA, ONTARIO		
	SURVEY AREA: FOREST / THICKET SLOPE		
		UTM:	
	1st Survey: May 25, 2023	2nd Survey: July 25, 2023	3rd Survey: Sept. 27, 2023
	SURVEYOR(S): B. Miller	SURVEYOR(S): B. Miller	SURVEYOR(S): B. Miller

VASCULAR PLANT SPECIES	CANOPY	SUB-CANOPY	UNDERSTORY	GROUND LAYER
TREES, SHRUBS & WOODY VINES				
Fagus grand.	x			x
Prunus avium	x		x	
Tilia amer.	x	x	x	
Acer - sugar	x		x	x
Quercus macro.	xR			R
Betula alle.		xR		
Fraxinus pens.			R	
Populus trem.		xR		xR
Populus grand.		x		
Ostrya virg.		x		
Crataegus sp.			x	
Juglans nigra		R		
Acer negundo.		R		
Carpinus caro.			R	
Diervilla loni.				x
Cornus altern.			x	
Berberis vulg.				x
Prunus virg.			x	x
Parthenocissus				x
Rhamnus cath.			x	x
Lonicera				
Rosa mult.				xo
Cornus race.				x
Rubus strig.				x
Viburnum lent.			x	x
Quercus rubra			xR	
Vitis riparia				x
FRAXINUS AMER.			x	

VASCULAR PLANT SPECIES	GROUND LAYER
HERBACEOUS FLORA	
Solidago flex.	A
Hesperis matron.	
Circaea cana.	
Carex blanda	
Arctium minus	
Alliaria petio.	
Chelidonium majus	
Geum	
Tarax. offi.	
Clematis virg.	
Sang. cana.	
Symplocarpus foet.	
Tussilago farf.	
Epipactis helle.	
Carex spicata	
Poa comp.	
Bromus inermis	
Erigeron annu.	
MANA. RACE.	
Verbena urtic.	

VASCULAR PLANT SPECIES	GROUND LAYER
Ag. Field Edge Weeds:	
Setaria pumila	
Erigeron cana.	
Physalis hetero.	
Echinochloa cf. crus.	
Panicum dich.	
Sonchus arvensis	

Signature: _____ (Field Personnel)

Signature: _____ (Project Manager)

Relative Species Abundance: D = Dominant; A = Abundant; O = Occasional; R = Rare

Vegetation Height: Canopy = > 20m; Sub-canopy = 10 – 20m; Understory = 2 – 10m; Ground Layer = < 2m

BOTANICAL INVENTORY FORM

PROJECT:

SURVEY AREA: PROPERTY SOUTH OF MEDWAY ROAD, ARVA, ONTARIO

UTM:

1st Survey: May 30, 2023	2nd Survey: July 26, 2023	3rd Survey: Sept. 27, 2023
SURVEYOR(S): B. Miller	SURVEYOR(S): B. Miller	SURVEYOR(S): B. Miller

VASCULAR PLANT SPECIES	CANOPY	SUB-CANOPY	UNDERSTORY	GROUND LAYER
TREES, SHRUBS & WOODY VINES				
Acer negundo		x		
Juglans nigra		x	x	x
Pinus sylv.		R		
Malus pumi.		x		
Fraxinus pens.		x		
Fagus grand.		R		
Picea glauca	x			
Acer - silver - planted	x			
Salix amyg.			x	
Celtis occi.				x
Picea abies	x			
Salix interior			xA	
Salix erio.				x
Vitis riparia				
Lonicera x bella			x	
Crataegus sp.			x	
Rubus occi				x
Crataegus mono.			x	
Frangula alnus				x
Rhamnus cath.			x	x
Cornus race.				x
Parth. vita.				x
Viburnum opul.			x	
Rosa mult.			x	
Solanum dulc.				
Clematis virg.				x
Autumn olive				x
Euonymus				x

VASCULAR PLANT SPECIES	GROUND LAYER
Iris pseudo.	
Solidago cana./alti.	
HERBACEOUS FLORA	
Poa prat.	
Barbarea vulg.	
Solidago giga.	
Hesperis matro.	
Anthyscus sylv.	
Cirsium arve.	
Equisetum arve.	
Phalaris arun.	
Urtica dioica - native	
Impatiens cape.	
Thalictrum pube.	
Ambrosia trif.	
Rudbeckia lacin.	
Laportea cana.	
Amphicarpea bract.	
Symplocarpus foet.	
Angelica atro.	
Eleocharis	
Anemone cana.	
Glechoma heder.	
Medicago lupu.	
Symphyo. ~~pani~~. FIRMUM	
Arctium minus	
Dipsacus full.	
Galium aparine	
Ranunculus cari.	
Ranunculus acris	
Carex blanda	
Plantago lanc.	
Leonurus card.	
Dactylis glom.	
Taraxacum offi.	
Alopecurus prat.	
Nepeta cataria	

VASCULAR PLANT SPECIES	GROUND LAYER
VERB. THAP.	
Lythrum sali.	
Carex cristatella	
Carex alopicoidea	
Asclepias incar.	
Tragopogon - prat.	
Carex stipata	
Carex trichocarpa	
Sonchus arve. ulig.	
Elymus repens	
Verbena urtic.	
Geum cana.	
Symphyo. lance.	
Circaea cana.	
Erigeron annu.	
Bromus iner.	
Carex vulpinoidea	
Hypericum perf.	
Cirsium vulg.	
Symphyo. nova.	
~~[illegible]~~ Inula helle	
Geum urbanum	
Elymus virg.	
Persicaria pens.	
Poa palu.	
Pilea fontana	
Scirpus atrovirens	
Agrostis giga.	
Cicuta macu.	
Eutrochium macu.	
Monarda fist.	
Oenothera	
Lotus corn.	
Vicia crac. TRIF. PRAT.	
RANU. ACRIS TRIF. REPE.	
Phleum prat. ASCL. SYRI.	
Lactuca bien? LACT. SERR	
Calystegia sepium	
Verbena hast.	
Scotch Thistle	

Signature: _____ (Field Personnel)

Signature: _____ (Project Manager)

Relative Species Abundance: D = Dominant; A = Abundant; O = Occasional; R = Rare

Vegetation Height: Canopy = > 20m; Sub-canopy = 10 – 20m; Understory = 2 – 10m; Ground Layer = < 2m

BOTANICAL INVENTORY FORM	PROJECT:		
	SURVEY AREA: PROPERTY SOUTH OF MEDWAY ROAD, ARVA, ONTARIO		
		UTM:	
	1st Survey:	2nd Survey:	3rd Survey: Sept. 27, 2023
	SURVEYOR(S):	SURVEYOR(S):	SURVEYOR(S): B. Miller

VASCULAR PLANT SPECIES	CANOPY	SUB-CANOPY	UNDERSTORY	GROUND LAYER	VASCULAR PLANT SPECIES	GROUND LAYER	VASCULAR PLANT SPECIES	GROUND LAYER
TREES, SHRUBS & WOODY VINES					HERBACEOUS FLORA			
					Linaria vulg.			
					Echium vulg.			
					Convolvulus arve.			
					Urtica dioica - native			
					Euthamia gram.			
					Echinocystis lobata			
					Schoenoplectus taber.			
					BOEH. CYLIN.			
					Sagittaria latifolia			
					Xanthum strum.			
					Symphyo. firmum			
					Setaria pumila			
					Chicory			
					Leersia oryz.			
					Lythrum sali.			
					Epilobium cf. color.			
					Lolium multiflorum			

Signature: _____ (Field Personnel)

Signature: _____ (Project Manager)

Relative Species Abundance: D = Dominant; A = Abundant; O = Occasional; R = Rare

Vegetation Height: Canopy = > 20m; Sub-canopy = 10 – 20m; Understory = 2 – 10m; Ground Layer = < 2m

VASCULAR PLANT LIST - North Bridlewood Subdivision, Arva Ontario

Plant species observed in 2023

NORTH OF MEDWAY ROAD	SOUTH OF MEDWAY ROAD	SCIENTIFIC NAME	COMMON NAME	PROVINCIAL STATUS (S-RANK)	SARO STATUS	COSEWIC STATUS	COEFFICIENT OF CONSERVATISM	COEFFICIENT OF WETNESS
		PTERIDOPHYTES (FERNS & FERN ALLIES)						
x	x	Equisetum arvense	Field Horsetail	S5			0	0
		GYMNOSPERMS (CONIFERS)						
	x	Picea abies	Norway Spruce (PLANTED)	SE3				5
	x	Picea glauca	White Spruce (PLANTED)	S5			n/a	3
	x	Pinus sylvestris	Scots Pine	SE5				3
		ANGIOSPERMS (DICOTS)						
x	x	Acer negundo	Manitoba Maple	S5			0	0
x		Acer nigrum	Black Maple	S4?			7	3
	x	Acer saccharinum	Silver Maple (PLANTED)	S5			n/a	-3
x		Acer saccharum	Sugar Maple	S5			4	3
x		Acer x freemanii	Freeman's (Swamp) Maple	S5			6	-5
x		Aegopodium podagraria	Goutweed	SE5				0
x		Alliaria petiolata	Garlic Mustard	SE5				0
x	x	Ambrosia trifida	Great Ragweed	S5			0	0
x		Amelanchier sp.	Serviceberry Species	S5				
x	x	Amphicarpaea bracteata	American Hog-peanut	S5			4	0
x	x	Anemonastrum canadense	Canada Anemone	S5			3	-3
x	x	Angelica atropurpurea	Purple-stemmed Angelica	S5			6	-5
x	x	Anthriscus sylvestris	Wild Chervil	SE4?				5
x		Apocynum androsaemifolium	Spreading Dogbane	S5			3	5
x	x	Arctium minus	Common Burdock	SE5				3
	x	Asclepias incarnata	Swamp Milkweed	S5			6	-5
x	x	Asclepias syriaca	Common Milkweed	S5			0	5
x	x	Barbarea vulgaris	Bitter Wintercress	SE5				0
x		Berberis vulgaris	Common Barberry	SE5				3
x		Betula alleghaniensis	Yellow Birch	S5			6	0
x		Bidens frondosa	Devil's Beggarticks	S5			3	-3
x		Bidens vulgata	Tall Beggarticks	S5			5	0
x	x	Boehmeria cylindrica	Small-spike False Nettle	S5			4	-5
x		Caltha palustris	Yellow Marsh Marigold	S5			5	-5
	x	Calystegia sepium	Hedge False Bindweed	S5			2	0
x		Carpinus caroliniana	Blue-beech	S5			6	0

VASCULAR PLANT LIST - North Bridlewood Subdivision, Arva Ontario

Plant species observed in 2023

NORTH OF MEDWAY ROAD	SOUTH OF MEDWAY ROAD	SCIENTIFIC NAME	COMMON NAME	PROVINCIAL STATUS (S-RANK)	SARO STATUS	COSEWIC STATUS	COEFFICIENT OF CONSERVATISM	COEFFICIENT OF WETNESS
x		Carya cordiformis	Bitternut Hickory	S5			6	0
x	x	Celtis occidentalis	Common Hackberry	S4			8	0
x		Chelidonium majus	Greater Celandine	SE5				5
x		Chelone glabra	White Turtlehead	S5			7	-5
	x	Cichorium intybus	Wild Chicory	SE5				5
x	x	Cicuta maculata	Spotted Water-hemlock	S5			6	-5
x	x	Circaea canadensis	Enchanter's Nightshade	S5			2	3
x	x	Cirsium arvense	Canada Thistle	SE5				3
	x	Cirsium vulgare	Bull Thistle	SE5				3
x	x	Clematis virginiana	Virginia Clematis	S5			3	0
	x	Convolvulus arvensis	Field Bindweed	SE5				5
x		Cornus alternifolia	Alternate-leaved Dogwood	S5			6	3
x	x	Cornus racemosa	Grey Dogwood	S5			2	0
x	x	Crataegus monogyna	English Hawthorn	SE4				3
x	x	Crataegus sp.	Hawthorn Species					
x		Cryptotaenia canadensis	Canada Honewort	S5			5	0
x		Cuscuta cf. gronovii	Swamp Dodder	S5			4	-3
x		Diervilla lonicera	Northern Bush-honeysuckle	S5			5	5
x	x	Dipsacus fullonum	Common Teasel	SE5				3
x	x	Echinocystis lobata	Wild Cucumber	S5			3	-3
	x	Echium vulgare	Common Viper's Bugloss	SE5				5
	x	Elaeagnus umbellata	Autumn Olive	SE3				3
	x	Epilobium cf. coloratum	Purple-veined Willowherb	S5			3	-5
x		Epilobium parviflorum	Small-flowered Hairy Willowherb	SE4				3
x	x	Erigeron annuus	Annual Fleabane	S5			0	3
x		Erigeron canadensis	Canada Horseweed	S5			0	3
x	x	Euonymus europaeus	European Euonymus	SE2				5
x		Euonymus obovatus	Running Strawberry-bush	S4			6	5
x		Eupatorium perfoliatum	Common Boneset	S5			2	-3
x	x	Euthamia graminifolia	Grass-leaved Goldenrod	S5			2	0
x	x	Eutrochium maculatum	Spotted Joe Pye Weed	S5			3	-5
x	x	Fagus grandifolia	American Beech	S4			6	3
x		Fallopia scandens	Climbing False Buckwheat	S4S5			3	0
x	x	Frangula alnus	Glossy Buckthorn	SE5				0

VASCULAR PLANT LIST - North Bridlewood Subdivision, Arva Ontario

Plant species observed in 2023

NORTH OF MEDWAY ROAD	SOUTH OF MEDWAY ROAD	SCIENTIFIC NAME	COMMON NAME	PROVINCIAL STATUS (S-RANK)	SARO STATUS	COSEWIC STATUS	COEFFICIENT OF CONSERVATISM	COEFFICIENT OF WETNESS
x		Fraxinus americana	White Ash	S4			4	3
x	x	Fraxinus pennsylvanica	Red Ash	S4			3	-3
x	x	Galium aparine	Common Bedstraw	S5			4	3
x		Geranium robertianum	Herb-Robert	S5			2	3
x	x	Geum canadense	Canada Avens	S5			3	0
	x	Geum urbanum	Wood Avens	SE3				5
x	x	Glechoma hederacea	Ground-ivy	SE5				3
x	x	Hesperis matronalis	Dame's Rocket	SE5				3
	x	Hypericum perforatum	Common St. John's-wort	SE5				5
x	x	Impatiens capensis	Spotted Jewelweed	S5			4	-3
	x	Inula helenium	Elecampane	SE5				3
x		**Juglans cinerea**	**Butternut**	**S2?**	**END**	**END**	**6**	**3**
x	x	Juglans nigra	Black Walnut	S4?			5	3
	x	Lactuca biennis	Tall Blue Lettuce	S5			6	0
	x	Lactuca serriola	Prickly Lettuce	SE5				3
x	x	Laportea canadensis	Canada Wood Nettle	S5			6	-3
x	x	Leonurus cardiaca	Common Motherwort	SE5				5
x		Ligustrum vulgare	European Privet	SE5				3
	x	Linaria vulgaris	Butter-and-eggs	SE5				5
x		Lonicera tatarica	Tatarian Honeysuckle	SE5				3
x	x	Lonicera x bella	(Lonicera morrowii X Lonicera tatarica)	SE				3
x	x	Lotus corniculatus	Garden Bird's-foot Trefoil	SE5				3
x		Lysimachia ciliata	Fringed Yellow Loosestrife	S5			4	-3
x	x	Lythrum salicaria	Purple Loosestrife	SE5				-5
x	x	Malus pumila	Common Apple	SE4				5
	x	Medicago lupulina	Black Medick	SE5				3
x		Melilotus albus	White Sweet-clover	SE5				3
x	x	Monarda fistulosa	Wild Bergamot	S5			6	3
x		Myosotis scorpioides	True Forget-me-not	SE5				-5
x	x	Nepeta cataria	Catnip	SE5				3
	x	Oenothera cf. biennis	Common Evening-primrose	S5			0	3
x	x	Onopordum acanthium	Scotch Thistle	SE4				5
x		Ostrya virginiana	Eastern Hop-hornbeam	S5			4	3

VASCULAR PLANT LIST - North Bridlewood Subdivision, Arva Ontario

Plant species observed in 2023

NORTH OF MEDWAY ROAD	SOUTH OF MEDWAY ROAD	SCIENTIFIC NAME	COMMON NAME	PROVINCIAL STATUS (S-RANK)	SARO STATUS	COSEWIC STATUS	COEFFICIENT OF CONSERVATISM	COEFFICIENT OF WETNESS
	x	Parthenocissus vitacea	Thicket Creeper	S5			4	3
x		Persicaria hydropiperoides	False Waterpepper	S5			4	-5
	x	Persicaria pensylvanica	Pennsylvania Smartweed	S5			3	-3
x		Physalis heterophylla	Clammy Ground-cherry	S4			3	5
	x	Pilea fontana	Lesser Clearweed	S4			5	-3
	x	Plantago lanceolata	English Plantain	SE5				3
x		Plantago rugelii	Rugel's Plantain	S5			1	0
x		Populus balsamifera	Balsam Poplar	S5			4	-3
x		Populus deltoides	Eastern Cottonwood	S5			4	0
x		Populus grandidentata	Large-toothed Aspen	S5			5	5
x		Populus tremuloides	Trembling Aspen	S5			2	0
x		Potentilla recta	Sulphur Cinquefoil	SE5				5
x		Prunus avium	Sweet Cherry	SE4				5
x		Prunus serotina	Black Cherry	S5			3	3
x		Prunus virginiana	Chokecherry	S5			2	3
x		Quercus macrocarpa	Bur Oak	S5			5	3
x		Quercus rubra	Northern Red Oak	S5			6	3
x		Ranunculus abortivus	Kidney-leaved Buttercup	S5			2	0
x	x	Ranunculus acris	Common Buttercup	SE5				0
x	x	Ranunculus caricetorum	Northern Swamp Buttercup	S5			5	-5
x		Ranunculus recurvatus	Hooked Buttercup	S5			4	-3
x	x	Rhamnus cathartica	European Buckthorn	SE5				0
x		Rhus typhina	Staghorn Sumac	S5			1	3
x		Ribes americanum	American Black Currant	S5			4	-3
x		Ribes cynosbati	Eastern Prickly Gooseberry	S5			4	3
x		Robinia pseudoacacia	Black Locust	SE5				3
x	x	Rosa multiflora	Multiflora Rose	SE5				3
x		Rubus idaeus ssp. strigosus	North American Red Raspberry	S5			2	3
x	x	Rubus occidentalis	Black Raspberry	S5			2	5
x	x	Rudbeckia laciniata	Cut-leaved Coneflower	S5			7	-3
x		Rumex obtusifolius	Bitter Dock	SE5				-3
	x	Salix amygdaloides	Peach-leaved Willow	S5			6	-3
x	x	Salix eriocephala	Cottony Willow	S5			4	-3
x	x	Salix interior	Sandbar Willow	S5			1	-3

VASCULAR PLANT LIST - North Bridlewood Subdivision, Arva Ontario

Plant species observed in 2023

NORTH OF MEDWAY ROAD	SOUTH OF MEDWAY ROAD	SCIENTIFIC NAME	COMMON NAME	PROVINCIAL STATUS (S-RANK)	SARO STATUS	COSEWIC STATUS	COEFFICIENT OF CONSERVATISM	COEFFICIENT OF WETNESS
x		Salix sp.	Exotic Tree Willow	SE				
x		Sanguinaria canadensis	Bloodroot	S5			5	3
x		Saponaria officinalis	Bouncing-bet	SE5				3
x		Silene latifolia	White Campion	SE5				5
x	x	Solanum dulcamara	Bittersweet Nightshade	SE5				0
	x	Solidago canadensis	Canada Goldenrod	S5			1	3
x		Solidago flexicaulis	Zigzag Goldenrod	S5			6	3
x	x	Solidago gigantea	Giant Goldenrod	S5			4	-3
x	x	Sonchus arvensis ssp. uliginosus	Smooth Sow-thistle	SE5				3
x	x	Symphyotrichum firmum	Glossy-leaved Aster	S4?			4	-3
x	x	Symphyotrichum lanceolatum	Panicled Aster	S5			3	-3
x		Symphyotrichum lateriflorum	Calico Aster	S5			3	0
x	x	Symphyotrichum novae-angliae	New England Aster	S5			2	-3
x		Syringa vulgaris	Common Lilac	SE5				5
x	x	Taraxacum officinale	Common Dandelion	SE5				3
x	x	Thalictrum pubescens	Tall Meadow-rue	S5			5	-3
x		Tilia americana	Basswood	S5			4	3
x		Toxicodendron radicans	Poison Ivy	S5			2	0
	x	Tragopogon pratensis	Meadow Goatsbeard	SE5				5
	x	Trifolium pratense	Red Clover	SE5				3
	x	Trifolium repens	White Clover	SE5				3
x		Tussilago farfara	Coltsfoot	SE5				3
x		Ulmus pumila	Siberian Elm	SE3				3
x	x	Urtica gracilis	Slender Stinging Nettle	S5				
x	x	Verbascum thapsus	Common Mullein	SE5				5
x	x	Verbena hastata	Blue Vervain	S5			4	-3
x	x	Verbena urticifolia	White Vervain	S5			4	0
x		Viburnum lantana	Wayfaring Viburnum	SE2				5
x		Viburnum lentago	Nannyberry	S5			4	0
x	x	Viburnum opulus var. opulus	Cranberry Viburnum	SE4?				-3
x	x	Vicia cracca	Tufted Vetch	SE5				5
x		Vinca minor	Lesser Periwinkle	SE5				5
x		Viola sororia	Woolly Blue Violet	S5			4	0
x	x	Vitis riparia	Riverbank Grape	S5			0	0

VASCULAR PLANT LIST - North Bridlewood Subdivision, Arva Ontario

Plant species observed in 2023

NORTH OF MEDWAY ROAD	SOUTH OF MEDWAY ROAD	SCIENTIFIC NAME	COMMON NAME	PROVINCIAL STATUS (S-RANK)	SARO STATUS	COSEWIC STATUS	COEFFICIENT OF CONSERVATISM	COEFFICIENT OF WETNESS
x	x	Xanthium strumarium	Rough Cockleburr	S5			2	0
x		Zanthoxylum americanum	Common Prickly-ash	S5			3	3
		ANGIOSPERMS (MONOCOTS)						
x	x	Agrostis gigantea	Redtop	SE5				-3
x	x	Alopecurus pratensis	Meadow Foxtail	SE5				-3
x		Arisaema triphyllum	Jack-in-the-pulpit	S5			5	-3
x	x	Bromus inermis	Smooth Brome	SE5				5
x	x	Carex alopecoidea	Foxtail Sedge	S4			6	-3
x	x	Carex blanda	Woodland Sedge	S5			3	0
	x	Carex cristatella	Crested Sedge	S5			3	-3
x		Carex flava	Yellow Sedge	S5			5	-5
x		Carex hystericina	Porcupine Sedge	S5			5	-5
x		Carex pellita	Woolly Sedge	S5			2	-5
x		Carex spicata	Spiked Sedge	SE5				3
	x	Carex stipata	Awl-fruited Sedge	S5			3	-5
	x	**Carex trichocarpa**	**Hairy-fruited Sedge**	**S3**			**8**	**-5**
x	x	Carex vulpinoidea	Fox Sedge	S5			3	-5
x	x	Dactylis glomerata	Orchard Grass	SE5				3
x		Echinochloa cf. crus-galli	Large Barnyard Grass	SE5				-3
	x	Eleocharis sp.	Spikerush Species					
x	x	Elymus repens	Quackgrass	SE5				3
x	x	Elymus virginicus	Virginia Wildrye	S5			5	-3
x		Epipactis helleborine	Broad-leaved Helleborine	SE5				3
	x	Iris pseudacorus	Yellow Iris	SE4				-5
x		Juncus dudleyi	Dudley's Rush	S5			1	-3
x		Juncus effusus	Soft Rush	S5			4	-5
	x	Leersia oryzoides	Rice Cutgrass	S5			3	-5
x		Leersia virginica	White Cutgrass	S4			6	-3
	x	Lolium multiflorum	Annual Ryegrass	SE1?				
x		Maianthemum racemosum	Large False Solomon's Seal	S5			4	3
x		Panicum capillare	Common Panicgrass	S5			0	0
x		Panicum dichotomiflorum	Fall Panicgrass	SE5				-3
x	x	Phalaris arundinacea	Reed Canarygrass	S5			0	-3
x	x	Phleum pratense	Common Timothy	SE5				3

VASCULAR PLANT LIST - North Bridlewood Subdivision, Arva Ontario

Plant species observed in 2023

NORTH OF MEDWAY ROAD	SOUTH OF MEDWAY ROAD	SCIENTIFIC NAME	COMMON NAME	PROVINCIAL STATUS (S-RANK)	SARO STATUS	COSEWIC STATUS	COEFFICIENT OF CONSERVATISM	COEFFICIENT OF WETNESS
x		Poa compressa	Canada Bluegrass	SE5				3
x	x	Poa palustris	Fowl Bluegrass	S5			5	-3
x	x	Poa pratensis	Kentucky Bluegrass	S5			0	3
	x	Sagittaria latifolia	Broad-leaved Arrowhead	S5			4	-5
	x	Schoenoplectus tabernaemontani	Soft-stemmed Bulrush	S5			5	-5
x	x	Scirpus atrovirens	Dark-green Bulrush	S5			3	-5
x	x	Setaria pumila	Yellow Foxtail	SE5				0
x	x	Symplocarpus foetidus	Eastern Skunk Cabbage	S5			7	-5
x		Typha angustifolia	Narrow-leaved Cattail	SE5				-5

FLORISTIC SUMMARY	TOTAL
Total Species	205
Native Species	126
Introduced (exotic) species	79
Species at Risk in Ontario (END, THR or SC)	1
Species at Risk in Canada (END, THR or SC)	1
Rare in Ontario (S1, S2 or S3)	2
Uncommon to common in Ontario (S4)	13
Common to very common in Ontario (S5)	111
Highly sensitive plant species with C value of 8, 9 or 10	2
Wetland Plant Species (-5, -4 or -3)	66

Appendix G Wildlife

Appendix G List of Wildlife Observed at the Bridle Path North Subdivision Study Area

COMMON NAME	SCIENTIFIC NAME	S-Rank	SARO Status	SARA Status
BIRDS				
Chimney Swift	*Chaetura pelagica*	S3B	THR	THR
Killdeer	*Charadrius vociferus*	S4B	-	-
Great Blue Heron	*Ardea herodias*	S4	-	-
Turkey Vulture	*Cathartes aura*	S5B,S3N	-	-
Osprey	*Pandion haliaetus*	S5B	-	-
Bald Eagle	*Haliaeetus leucocephalus*	S4	-	-
Red-tailed Hawk	*Buteo jamaicensis*	S5	-	-
Belted Kingfisher	*Megaceryle alcyon*	S5B,S4N	-	-
Downy Woodpecker	*Dryobates pubescens*	S5	-	-
Northern Flicker	*Colaptes auratus*	S5	-	-
Eastern Wood-Pewee	*Contopus virens*	S4B	SC	SC
Willow Flycatcher	*Empidonax traillii*	S4B	-	-
Eastern Phoebe	*Sayornis phoebe*	S5B	-	-
Great Crested Flycatcher	*Myiarchus crinitus*	S5B	-	-
Eastern Kingbird	*Tyrannus tyrannus*	S4B	-	-
Warbling Vireo	*Vireo gilvus*	S5B	-	-
Blue Jay	*Cyanocitta cristata*	S5	-	-
Tree Swallow	*Tachycineta bicolor*	S4S5B	-	-
Barn Swallow	*Hirundo rustica*	S4B	SC	THR
Black-capped Chickadee	*Poecile atricapillus*	S5	-	-
Red-breasted Nuthatch	*Sitta canadensis*	S5	-	-
White-breasted Nuthatch	*Sitta carolinensis*	S5	-	-
House Wren	*Troglodytes aedon*	S5B	-	-
Carolina Wren	*Thryothorus ludovicianus*	S4	-	-
American Robin	*Turdus migratorius*	S5	-	-
Gray Catbird	*Dumetella carolinensis*	S5B,S3N	-	-
European Starling	*Sturnus vulgaris*	SNA	-	-
Cedar Waxwing	*Bombycilla cedrorum*	S5	-	-
American Goldfinch	*Spinus tristis*	S5	-	-
Chipping Sparrow	*Spizella passerina*	S5B,S3N	-	-
Field Sparrow	*Spizella pusilla*	S4B,S3N	-	-
Song Sparrow	*Melospiza melodia*	S5	-	-
Orchard Oriole	*Icterus spurius*	S4B	-	-
Baltimore Oriole	*Icterus galbula*	S4B	-	-
Red-winged Blackbird	*Agelaius phoeniceus*	S5	-	-
Brown-headed Cowbird	*Molothrus ater*	S5	-	-
Common Yellowthroat	*Geothlypis trichas*	S5B,S3N	-	-
Yellow Warbler	*Setophaga petechia*	S5B	-	-
Northern Cardinal	*Cardinalis cardinalis*	S5	-	-
Rose-breasted Grosbeak	*Pheucticus ludovicianus*	S5B	-	-
Indigo Bunting	*Passerina cyanea*	S5B	-	-
MAMMALS				
Eastern Cottontail	*Sylvilagus floridanus*	S5	-	-
Grey Squirrel	*Sciurus carolinensis*	S5	-	-
Beaver	*Castor canadensis*	S5	-	-
White-tailed Deer	*Odocoileus virginianus*	S5	-	-
Eastern Red Bat	*Lasiurus borealis*	S4	END	-
Big Brown Bat	*Eptesicus fuscus*	S4	-	-
Hoary Bat	*Lasiurus cinereus*	S4	END	-
Little Brown Myotis	*Myotis lucifugus*	S3	END	END
Silver-haired Bat	*Lasionycteris noctivagans*	S4	END	-

Explanation of Status and Acronymns

S1: Critically Imperiled—Critically imperiled in the province (often 5 or fewer occurrences)
S2: Imperiled—Imperiled in the province, very few populations (often 20 or fewer),
S3: Vulnerable—Vulnerable in the province, relatively few populations (often 80 or fewer)
S4: Apparently Secure—Uncommon but not rare
S5: Secure—Common, widespread, and abundant in the province
SX: Presumed extirpated
SH: Possibly Extirpated (Historical)
SNR: Unranked
SU: Unrankable—Currently unrankable due to lack of information
SNA: Not applicable—A conservation status rank is not applicable because the species is not a suitable target for conservation activities.
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
S#B- Breeding status rank
S#N- Non Breeding status rank
?: Indicates uncertainty in the assigned rank
END: Endangered
THR: Threatened
SC: Special Concern
NAR: Not At Risk

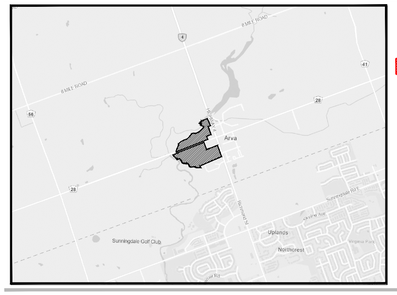
Appendix H Site Plan

PART OF LOT 17,
CONCESSION 6 & 7
MUNICIPALITY OF MIDDLESEX CENTRE
COUNTY OF MIDDLESEX

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

Surveyor's Certificate

I HEREBY AUTHORIZE 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.



SUBJECT TO THE CONDITIONS, IF ANY, SET FORTH IN OUR IN OUR LETTER DATED_____,2020
THIS DRAFT PLAN IS APPROVED UNDER SECTION 51 OF THE *PLANNING ACT*
_____ DAY OF _____ ,2020

5	April 9, 2025	Issued	CCF & RM
4	November 18, 2024	Request from Client	PL
3	October 18, 2024	Request from Client	PL
2	October 1, 2024	Revised Apartment blocks, SWM	PL
1	July 26, 2024	Issued	CCF
	Date	**Issued / Revision**	**By**

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

A. As Shown	B. As Shown	C. As Shown
D. Residential	E. As Shown	F. As Shown
G. As Shown	H. Municipal Water Supply Available	I. Silt Loam
J. As Shown	J. All Services As Required	L. As Shown

Description	Lots/Blocks	Units	Area (ha)
Low Density Residential	1, 3, 7, 16 - 21, 24, 25	120	7.842
Medium Density Residential (Street Townhouses)	5, 9, 10, 12, 22, 27	49	1.593
Medium Density Residential (Cluster Townhouses)	13 - 15	62	1.893
Medium/High Density Residential (Apartments)	8, 11, 23	699	4.207
Park	35		0.315
Walkway	31, 43		0.090
Maintenance Setback	4, 6		0.579
Storm Water Management	30, 37		1.275
Pump Station	36		0.160
Open Space	2, 29, 44		1.617
0.3m Reserves	40, 41		0.009
Road Widening	32, 33		0.459
Roads			3.857
Total	38	930	23.897 ha.

York DEVELOPMENTS

MHBC PLANNING URBAN DESIGN & LANDSCAPE ARCHITECTURE
540 BINGEMANS CENTRE DRIVE, SUITE 200, KITCHENER, ON, N2B 3X9 | P: 519 576 3650 | WWW.MHBCPLAN.COM

File No.	Drawn By	Date
1094 'BE'	L.M./P.L./C.C.F./R.M.	April 9, 2025

PRELIMINARY DRAFT PLAN OF SUBDIVISION

Plan Scale 1:2000
10 20 40 60 80 100

North

Q:\1094 'BE' - ARVA\GRAPHICS\DP\MHBC PROPOSED DP_09APR2025.DWG