Agenda
Ecological Community Advisory Committee

3rd Meeting of the Ecological Community Advisory Committee

February 15, 2024, 4:30 PM

Committee Room #5

The City of London is situated on the traditional lands of the Anishinaabek (AUh-nish-in-ah-bek), Haudenosaunee (Ho-den-no-show-nee), Lūnaapéewak (Len-ah-pay-wuk) and Attawandaron (Add-a-won-da-run).

We honour and respect the history, languages and culture of the diverse Indigenous people who call this territory home. The City of London is currently home to many First Nations, Métis and Inuit today.

As representatives of the people of the City of London, we are grateful to have the opportunity to work and live in this territory.

The City of London is committed to making every effort to provide alternate formats and communication supports for meetings upon request. To make a request specific to this meeting, please contact advisorycommittee@london.ca.

Pages

1. **Call to Order**

    1.1 Disclosures of Pecuniary Interest

2. **Scheduled Items**

    2.1 4:30PM - Justin Adema, Manager, Long Range Planning re ReThink Zoning

3. **Consent**

    3.1 2nd Report of the Ecological Community Advisory Committee 2

    3.2 Planting Under or Around Powerlines and Electrical Equipment 4

4. **Sub-Committees and Working Groups**

    4.1 Environmental Management Guidelines Terms of Reference 22

    4.2 Draft Byron Gravel Pit Secondary Plan 25

5. **Items for Discussion**

    5.1 Gloucester Deferred Trail Segment

    5.2 32 Chesterfield Avenue 29

    5.3 Tree Protection By-law and Natural Features 130

6. **Adjournment**

Ecological Community Advisory Committee
Report

The 2nd Meeting of the Ecological Community Advisory Committee
January 18, 2024

Attendance

PRESENT: S. Levin (Chair), S. Evans, T. Hain, S. Hall, B. Krichker, R. McGarry, G. Sankar, S. Sivakumar and V. Tai and H. Lysynski (Committee Clerk)

ABSENT: M. Lima and K. Moser

ALSO PRESENT: S. Butnari, K. Edwards, E. Hunt, M. Shepley and E. Williamson

The meeting was called to order at 4:32 PM; it being noted that S. Evans, T. Hain, G. Sankar, S. Sivakumar and V. Tai were in remote attendance.

1. Call to Order

1.1 Disclosures of Pecuniary Interest

That it BE NOTED that no pecuniary interests were disclosed.

2. Scheduled Items

2.1 Draft 2024-2027 Multi-Year Budget

That it BE NOTED that the presentation from K. Murray, Director, Financial Planning and Business Support, appended to the Ecological Community Advisory Committee Added Agenda related to the Draft 2024-2027 Multi-Year Budget, was received.

2.2 Civic Infrastructure Compensation

That it BE NOTED that the presentation from K. Edwards, Manager, Community Planning, appended to the Ecological Community Advisory Committee Added Agenda related to Civic Infrastructure Compensation, was received.

3. Consent

3.1 1st Report of the Ecological Community Advisory

That it BE NOTED that the 1st Report of the Ecological Community Advisory Committee, from its meeting held on December 14, 2023, was received.

3.2 Municipal Council Resolution – 12th Report of the Ecological Community Advisory Committee

That it BE NOTED that the Municipal Council resolution adopted at its meeting held on December 19, 2023 with respect to the 12th Report of the Ecological Community Advisory Committee was received.

4. Sub-Committees and Working Groups

None.

5. Items for Discussion

5.1 Multi-Year Budget Business Cases 61, 62 and 63

That the following actions be taken with respect to Business Cases 61, 62 and 63 in the Draft 2024-2027 Multi-Year Budget:

a) the Municipal Council BE REQUESTED to include Business Cases 61, 62 and 63 in the Final 2024-2027 Multi-Year Budget;

b) the revised, attached, 20247-2027 Budget recommendation BE FORWARDED to the Budget Committee for consideration; and,

b) the Ecological Community Advisory Committee Vice Chair BE REQUESTED to attend the January 29, 2024 Budget Committee meeting to support the above-mentioned business cases.

5.2 Environmental Management Guidelines Update (2024) Terms of Reference

That a Working Group BE ESTABLISHED consisting of S. Levin (lead), S. Evans, S. Hall and B. Krichker, to review and report back on the draft Terms of Reference for the Environmental Management Guidelines; it being noted that the Ecological Community Advisory Committee heard a verbal presentation from E. Williamson, Ecologist Planner and received the draft Terms of Reference for the Environmental Management Guidelines update appended to the Ecological Community Advisory Committee Added Agenda.

5.3 Bryon Gravel Pits Draft Secondary Plan

That a Working Group BE ESTABLISHED consisting of S. Hall (lead), S. Levin and K. Moser with respect to the Byron Gravel Pits Draft Secondary Plan; it being noted that the Byron Gravel Pits Draft Secondary Plan was appended to the Ecological Community Advisory Committee Agenda.

6. Adjournment

The meeting adjourned at 6:10 PM.

Electrical Safety Authority

Planting Under or Around Powerlines & Electrical Equipment

Table of Contents

Introduction 3

Defining the Risk 4

Electrical Issues and Hazards – Planting Under or Around Powerlines & Electrical Equipment

Getting Started 6

Planning – to Avoid Potential Electrical Hazards
Planting – to Avoid Potential Electrical Hazards

Appendix A: Plant Hardiness Index 10
Plant Hardiness Geographical Map 13

Definitions 14

Reference Chart A: Tree Planting Zones 15

Reference Chart B: Base Zone Near Hydro Poles 15

Quick Reference Guide: Landscape and Arborist Trades 16

Quick Guide & Contact Information: Homeowners 17

LEGAL DISCLAIMER

This document contains AWARENESS ONLY material to assist members of the Public and Industry Professionals to select the correct tree and location to avoid conflicts with the overhead and/or underground powerlines.

This document does not have the force of the law. Where there is a conflict between this document and any Municipal, Regional and/or Township by-laws, legislation or regulation which may apply, the relevant law prevails.

Contact the local Municipality, Regional and/or Township offices to determine if permits are required to plant trees.

Contact your *Local Distribution Company (LDC)* to determine their requirements to plant trees and/or shrubs under or around powerlines and electrical equipment.

Introduction

The "Planting Under or Around Powerlines and Electrical Equipment" Guideline responds to the number of reports of powerline contact incidents associated with the pruning or removal of trees, shrubs and vines.

This is one of two guidelines produced by the Electrical Safety Authority with the support of Ontario's Local Distribution Companies (LDC) and Corban and Goode Landscape Architecture and Urbanism to reduce electrical contact incidents and other electrical hazards when:

- ☐ Planting Under or Around Powerlines and Electrical Equipment
- ☐ Vegetation Management Around Powerlines

These guidelines provides information and insights to support landscape and arborist trades workers, maintenance workers, and homeowners. The guidelines share important information on potential electrical risks, how to avoid these risks, provincial standards, and best practices that, if followed, can decrease electrical incidents.

This guideline includes sections on:

- ☐ Electrical Issues and Hazards
- ☐ Avoiding Potential Hazards
  - Planning
  - Planting

A companion guideline has been created that focuses on avoiding electrical issues and hazards when pruning or removing of trees and/or shrubs under or around overhead powerlines and electrical equipment.

We would like to acknowledge the insights and contributions of Corban and Goode Landscape Architecture and Urbanism. Through sharing their insights we have worked to produce easy to use Guidelines for audiences engaging in landscape planning.

Electrical Issues and Hazards – Planting Under or Around Powerlines & Electrical Equipment

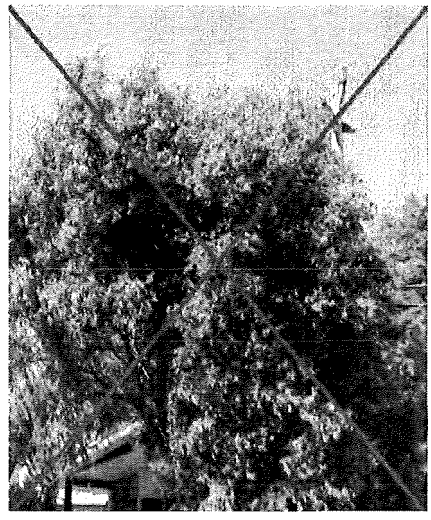
Individuals engaged in planning and/or planting under or around powerlines and electrical equipment, such as Landscape Architects, Landscapers, Municipalities or the public need to be aware of the electrical hazards associated with planting in the vicinity of powerlines or electrical equipment.

Trees

Some species grow at a rapid rate and at a height which directly interferes with overhead powerlines. Planting the wrong tree under or around overhead powerlines create hazards to members of the public and workers. These include:

Potential Hazard or Electrocution from:

- direct contact – when playing in or working around trees where powerlines are hidden by foliage.
- energized objects – branches and limbs caught in the powerlines may unexpectedly become conductive.
- contact with powerlines – during tree maintenance, pruning or removal, including direct contact by unqualified individuals and contact through tree pruning tools.
- downed powerlines – when energized powerlines are pulled down to the ground by broken branches and limbs.



Potential Fires – branches and limbs in close proximity to powerlines can lead to electrical arcing that can create fires.

Power interruptions – resulting when branches and limbs that break damaging powerlines during storms or from disease.

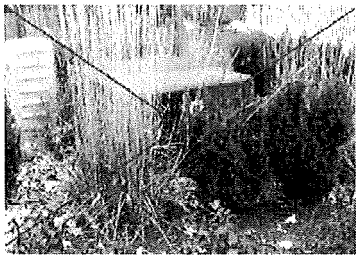
When selecting trees for planting, it is important to consider location of overhead powerlines, the growth rate for specific varieties based on the environment and placement.

Qualified ***Utility arborists*** should do maintenance on trees near overhead powerlines. Any other Landscaper, Arborist, or homeowner should contact the LDC to arrange for power to be disconnected prior to starting work.

Shrubs

Planting shrubs and other plant material near electrical equipment can:

- cause an obstruction for powerline maintenance workers;
- disguise potential hazards;
- cause damage to underground powerlines;
- contact energized components through the roots possibly becoming energized.

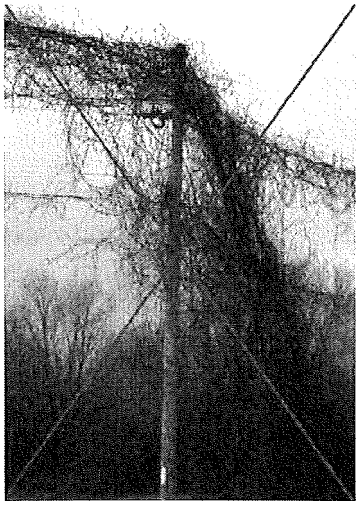


Obstruction around a transformer

Vines

Planting vines at the base of a powerline pole or guy wire will eventually creep and come into contact with energized overhead powerlines or electrical equipment. Vines in contact with powerlines can become energized and be a hazard to the public, cause power interruptions, or fires.

Pole growth contacting electrical equipment & powerlines



Guy-wire growth contacting electrical equipment & powerlines

Getting Started – Planning & Planting to Avoid Potential Electrical Hazards

Trees, shrubs and plant materials help homeowners and business owners create a property that they can enjoy and benefit from. Before starting, it is important to locate overhead and underground powerlines, and to understand the impact of landscape plans on the electrical infrastructure and electrical equipment. Up-front consideration of electrical powerlines and equipment can avoid potential electrical hazards that can occur from contact between trees, shrubs and roots, and electrical powerlines and equipment.

Before you start any landscape planning, check for:

- ☑ Municipal, Regional or Township By-Laws that specify preferred tree species and locations for planting.

- ☑ LDC requirements regarding planting under or around the overhead powerlines or around underground equipment including underground powerlines.

- ☑ Easements that may be on the property. Easements may contain underground and/or overhead powerlines and electrical equipment which allows the LDC the legal right to access properties to install and maintain electrical services to the property and/or neighbourhood. A land title search will identify if there are existing easements.

Underground Powerlines

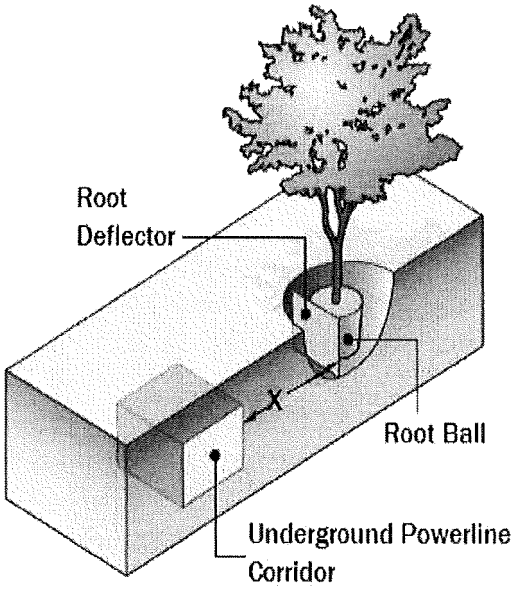
Underground powerlines exist in rural, urban and industrial environments and can be compromised when excavating if these powerlines have not been located prior to excavating. All excavations require a locate to be done to identify underground services such as electrical, gas,water, etc.

Contact Ontario One Call to request a locate.

Note: All locates must be received prior to excavation.
Utilities will only locate utility owned underground services. It is the responsibility of the property owner or excavator/landscaper to locate non utility owned services.

Note: driving stakes in the ground for tree support also requires locates also to be done.

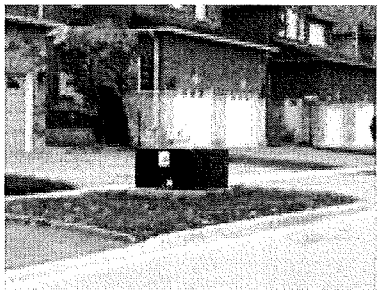
- Powerlines may be directly buried, or in conduit, and can be located at different depths depending on grade changes that may have occurred. When planting in the vicinity of underground powerlines, the minimum clearance required from the edge of the root ball to the edge of the underground powerline corridor is 1.0m (3 ft). The LDC can provide their clearance requirements from the underground powerlines to the root ball.If the determined distance cannot be achieved, the LDC may require the installation of a root deflector against the root ball.



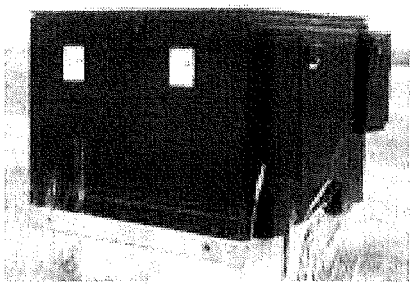
ACKNOWLEDGEMENT-HYDRO OTTAWA

Electrical Equipment – above ground mounted or underground chamber

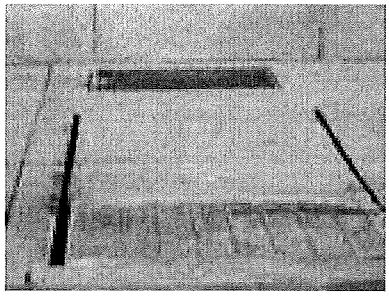
Depending on the LDC, electrical equipment such as a transformer or switchgear, may be above ground mounted on a concrete pad foundation (pad mounted) or in an underground chamber. Pad mounted electrical equipment, are typically green in color. Obstructions such as structures, fences, trees, shrubs or other vegetation should not be placed near the equipment. Clearance is required around the pad mounted equipment and underground cables for your safety and the safety of Utility workers who require access at all times.



Pad mounted transformer



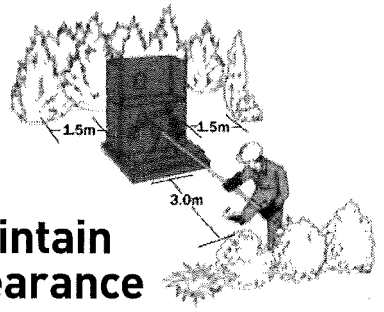
Pad mounted switchgear



Underground Chamber

- Typically the LDC requires a minimum of 3.0 m (10 ft) in front of the pad mounted transformer door(s) and 1.5 m (4.9 ft) around the sides and back. The door(s) can be identified by the padlock. Pad mounted switchgears however requires a minimum of 3.0m (10 ft) in the front and at the back doors of the unit and 1.5 m (4.9 ft) at the sides.

- You should also be aware of the presence of a buried 'ground loop' that is installed approximately 1.0 m (3 ft) around the perimeter of the foundation and the minimum of 2 ground rods located at the outside corners of this 'ground loop'. The 'ground loop' protects the public and workers from potential hazards associated with **step and touch** potential that can exist from fault conditions.



Maintain Clearance

Energized electrical equipment.

Maintain working clearance in front of Green Box of 3m, and on other 3 sides of 1.5m from fences, shrubs and structures.

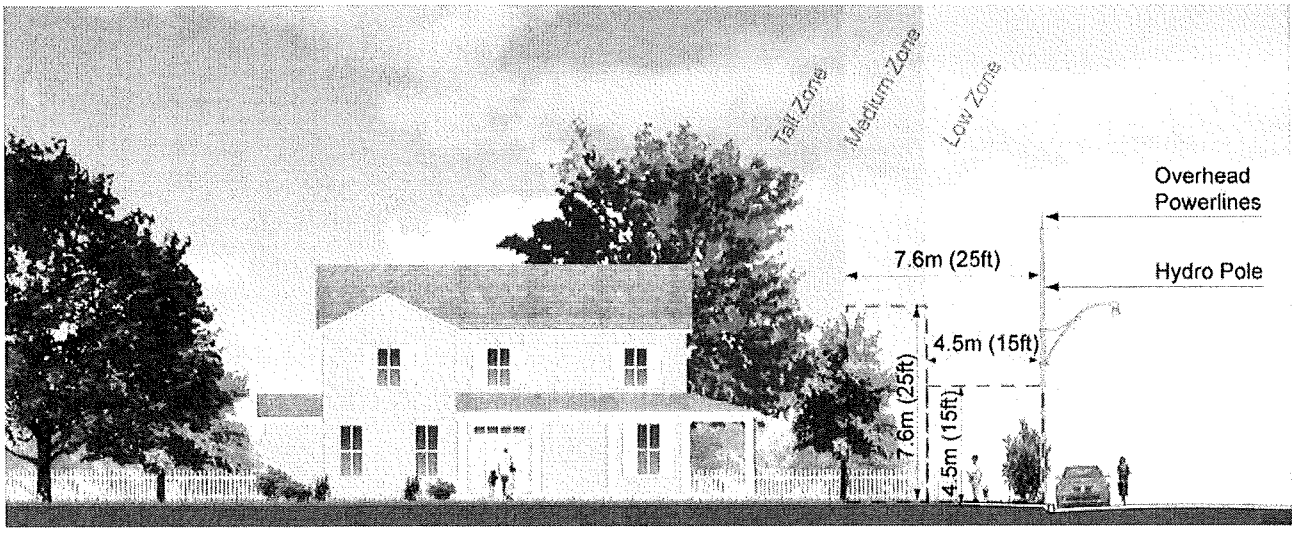
Overhead Powerlines

☑ Considering overhead powerlines is critical in the planning and planting of large trees and shrubs. The *LDC* can assist in identifying the type of powerline:
- Primary distribution and transmission powerlines – these are typically non-insulated **bare** conductors and carry high voltage power.
- Secondary distribution powerlines – these may be insulated and carry low voltage power.

☑ Planting under or around powerlines requires caution to ensure:
- Delivery of Plant Materials – trees that are being planted should not be delivered under or around the powerlines. Delivery equipment such as a boom truck can come into contact with the overhead wires. The same for digging with equipment such as a high hoe, the equipment can also come into contact with the overhead wires.
- Trees do not come in contact with overhead powerlines when unloading.

☑ A careful review of the tree planting zone in which your landscape project is in will assist in determining the type of trees that can be considered. Tree planting is categorized in 3 different zones; Low, Medium and Tall. Factoring these zones into landscape plans will ensure that the tree at full maturity doesn't come into contact with the overhead powerlines, and will not compromise powerlines if branches and limbs are broken during extreme weather.

☑ To ensure accuracy determining the height and width at maturity, it is important to consider the Plant Hardiness Index accompanied with the *Plant Hardiness Geographical Map* (Appendix A). This will confirm where you can plant the specie of tree in proximity to overhead powerlines.

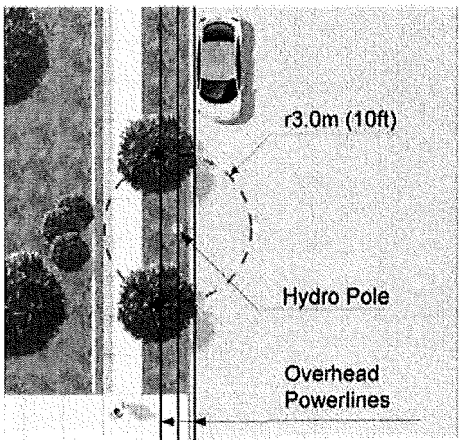


Low Zone – is the area under the power lines and extends to 4.5 m (15 ft) on either side. Trees and/or shrubs planted in this zone should have a maximum mature height and spread of 4.5 m (15 ft).

Medium Zone – extends from the edge of the outer edge of the Low Zone to a distance of 7.6 m (25 ft) on either side of the power line. The maximum mature height and spread of trees planted in this zone should be 7.6 m (25 ft).

Tall Zone – extends from the outer edge of the Medium Zone extending greater than 7.6 m (25 ft) from the power lines. Any strong and healthy tree may be planted in this zone.

Base Zone near the Hydro Pole – Trees and/or shrubs should not be placed closer than 3.0 m (10 ft) from the base of a hydro pole.



Appendix A: Plant Hardiness index

Geographical Area														LOW ZONE – SMALL TREES *Latin Name* Common Name	SPREAD	HEIGHT
0a	0b	1a	1b	2a	2b	3a	3b	4a	4b	5a	5b	6a	6b		(m)	(m)
				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	*Acer ginnala*, Amur Maple	4.5	4.5
								✓	✓	✓	✓	✓	✓	*Amelanchier laevis* Allegheny Serviceberry, Tree Form	4.0	4.5
								✓	✓	✓	✓	✓	✓	*Cornus kousa*, Chinese Flowering Dogwood Tree Form	3.5	4.5
										✓	✓	✓	✓	*Cornus florida 'Rubra'*, Pink Flowering Dogwood Tree Form	4.5	4.5
								✓	✓	✓	✓	✓	✓	*Magnolia Stellata*, Star Magnolia Tree Form	4.0	3.0
								✓	✓	✓	✓	✓	✓	*Malus cultivars*, Crab Apple varieties	2.5-4.0	4.5
				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	*Prunus virginiana 'Schubert'*, Schubert Chokecherry Tree Form	4.0	4.5

Geographical Area														MEDIUM ZONE – MEDIUM TREES *Latin Name* Common Name	SPREAD	HEIGHT
0a	0b	1a	1b	2a	2b	3a	3b	4a	4b	5a	5b	6a	6b		(m)	(m)
				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	*Acer ginnala*, Amur Maple 'Flame'	7.0	7.0
						✓	✓	✓	✓	✓	✓	✓	✓	*Aesculus glabra*, Ohio Buckeye	7.0	7.5
								✓	✓	✓	✓	✓	✓	*Amelanchier canadensis*, Shadblow Serviceberry/Juneberry, Treeform	3.0	7.5
								✓	✓	✓	✓	✓	✓	*Amelanchier x grandiflora 'Autumn Brilliance' (PP5717)*, Tree Form	5.0	7.5
										✓	✓	✓	✓	*Cercis Canadensis*, Eastern Redbud Tree Form	7.0	7.5
						✓	✓	✓	✓	✓	✓	✓	✓	*Crataegus phaenopyrum*, Washington Hawthorn Tree Form	7.0	7.5
												✓	✓	*Koelreauteria paniculata*, Golden Rain Tree	7.0	7.5
								✓	✓	✓	✓	✓	✓	*Malus cultivars*, Crab Apple varieties	5.0-7.0	7.0
								✓	✓	✓	✓	✓	✓	*Malus 'Robinson'*, Robinson Crab Apple	7.5	7.5
								✓	✓	✓	✓	✓	✓	*Malus 'Selkirk'*, Selkirk Crab Apple	7.5	7.5
								✓	✓	✓	✓	✓	✓	*Malus 'Winter Gold'*, Winter Gold Crab Apple	6.0	7.5
								✓	✓	✓	✓	✓	✓	*Prunus sargentii 'Rancho'*, Columnar Sargent Cherry	3.0	7.5
										✓	✓	✓	✓	*Prunus serrulata 'Kwanzan'*, Kwanzan Oriental Cherry	5.0	7.0
										✓	✓	✓	✓	*Pyrus calleryana 'Aristocrat' (PP3193)*, Aristocrat Callery Pear	7.0	7.5
				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	*Syringa reticulatata 'Ivory Silk'*, Ivory Silk Tree Lilac	5.0	7.5
				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	*Viburnum lentago*, Nannyberry Tree Form	7.5	7.5

* Malus cultivars come in a variety of species. Select the specie's maximum height for the specific planting zone equipment.

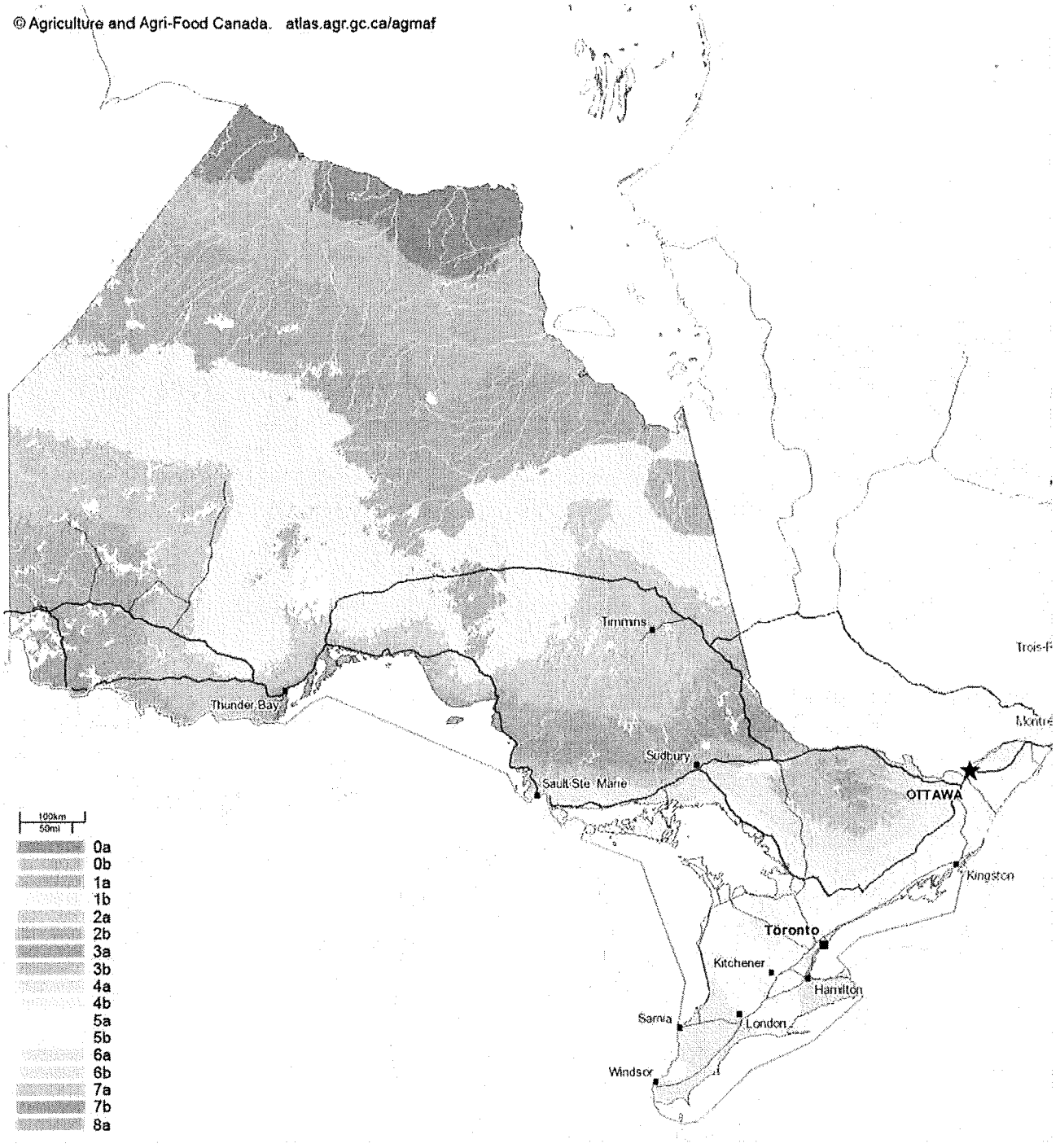
Appendix A: Plant Hardiness index-cont'd

														TALL ZONE – TALL TREES		
Geographical Area														*Latin Name* Common Name	SPREAD	HEIGHT
0a	0b	1a	1b	2a	2b	3a	3b	4a	4b	5a	5b	6a	6b		(m)	(m)
										✓	✓	✓	✓	*Acer campestre*, Hedge Maple	10.0	10.0
						✓	✓	✓	✓	✓	✓	✓	✓	*Acer x freemanii 'Armstrong'*, Armstrong Maple	8.0	15.0
								✓	✓	✓	✓	✓	✓	*Acer x freemanii 'Jeffersred' (PP4864)*, Autumn Blaze Maple	13.0	16.0
								✓	✓	✓	✓	✓	✓	*Acer x freemanii 'Celzam' (PP7279)*, Celebration Maple	8.0	15.0
								✓	✓	✓	✓	✓	✓	*Acer x freemanii 'Scarsen'*, Scarlet Sentinel Maple	8.0	15.0
				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	*Acer negundo* , Manitoba Maple	15.0	13.0
								✓	✓	✓	✓	✓	✓	*Acer nigrum*, Black Sugar Maple	12.0	15.0
										✓	✓	✓	✓	*Acer platanoides*, Norway Maple	10.0	13.0
											✓	✓	✓	*Acer pseudoplatanus*, Sycamore Maple	8.0	13.0
						✓	✓	✓	✓	✓	✓	✓	✓	*Acer rubrum*, Red Maple	15.0	16.0
								✓	✓	✓	✓	✓	✓	*Acer rubrum, 'Karppick'*, Karpick Red Maple	7.0	12.0
					✓	✓	✓	✓	✓	✓	✓	✓	✓	*Acer saccharinum*, Silver Maple	15.0	18.0
										✓	✓	✓	✓	*Aesculus hippocastanum*, Common Horse Chestnut	16.0	18.0
										✓	✓	✓	✓	*Carpinus betulus*, European Hornbeam	13.0	20.0
										✓	✓	✓	✓	*Carpinus betulus 'Fastigiata'*, Pyramidal European Hornbeam	4.0	12.0
								✓	✓	✓	✓	✓	✓	*Catalpa speciosa*, Northern Catalpa	6.0	12.0
										✓	✓	✓	✓	*Cladrastis lutea*, Yellowwood	10.0	12.0
								✓	✓	✓	✓	✓	✓	*Crataegus crus-galli var. inermis*, Thornless Cockspur Hawthorn Tree Form	10.0	10.0
				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	*Celtis occidentalis*, Common Hackberry	18.0	20.0
										✓	✓	✓	✓	*Celtis occidentalis 'Prairie Pride'*, Prairie Pride Hackberry	12.0	12.0
								✓	✓	✓	✓	✓	✓	*Cercidiphyllum japonicum*, Katsura Tree	7.0	15.0
										✓	✓	✓	✓	*Corylus colurna*, Turkish Hazel	8.0	15.0
								✓	✓	✓	✓	✓	✓	*Fagus grandifolia*, American Beech	20.0	30.0
								✓	✓	✓	✓	✓	✓	*Fagus sylvatica*, European Beech	12.0	15.0
								✓	✓	✓	✓	✓	✓	*Ginkgo biloba*, Maidenhair Tree	11.0	17.0
								✓	✓	✓	✓	✓	✓	*Ginkgo biloba 'Autumn Gold'* Autumn Gold Maidenhair Tree	10.0	10.0
								✓	✓	✓	✓	✓	✓	*Ginkgo biloba 'JFS-UGAZ'* , Golden Colannade™ Maidenhair Tree	8.0	15.0
								✓	✓	✓	✓	✓	✓	*Ginkgo biloba 'Princeton Sentry', Princeton Sentry Maidenhair Tree*	5.0	13.0

Appendix A: Plant Hardiness index-cont'd

														TALL ZONE – TALL TREES		
Geographical Area														*Latin Name* Common Name	SPREAD	HEIGHT
0a	0b	1a	1b	2a	2b	3a	3b	4a	4b	5a	5b	6a	6b		(m)	(m)
								✓	✓	✓	✓	✓	✓	*Gleditsia triacanthos var. inermis*, Common Thornless Honeylocust	13.0	17.0
								✓	✓	✓	✓	✓	✓	*Gleditsia triacanthos var. inermis "Impcole'*, Imperial Honeylocust	10.0	10.0
								✓	✓	✓	✓	✓	✓	*Gymnocladus dioicus*, Kentucky Coffee Tree	13.0	17.0
										✓	✓	✓	✓	*Liquidambar styraciflua*, Sweetgum	12.0	15.0
										✓	✓	✓	✓	*Liriodendron tulipifera*, Tulip Tree	15.0	25.0
										✓	✓	✓	✓	*Liriodendron tulipifera 'Fastigiatum'*, Columnar Tulip Tree	5.0	15.0
								✓	✓	✓	✓	✓	✓	*Magnolia x galaxy*, Galaxy Magnolia Tree Form	6.0	12.0
								✓	✓	✓	✓	✓	✓	*Magnolia x loebneri 'Merrill'*, Merrill Magnolia Tree Form	10.0	13.0
						✓	✓	✓	✓	✓	✓	✓	✓	*Nyssa sylvantica*, Black-Gum	10.0	16.0
								✓	✓	✓	✓	✓	✓	*Phellodendron amurense*, Amur Cork Tree	9.0	13.0
										✓	✓	✓	✓	*Platanus x acerfolia 'Bloodgood'*, London Plane Tree	13.0	16.0
										✓	✓	✓	✓	*Pyrus calleryana 'Bradford'*, Bradford Callery Pear	7.0	13.0
										✓	✓	✓	✓	*Pyrus calleryana 'Capital'*, Capital Callery Pear	4.0	11.0
						✓	✓	✓	✓	✓	✓	✓	✓	*Quercus macrocarpa*, Burr Oak	13.0	18.0
								✓	✓	✓	✓	✓	✓	*Quercus palustris*, Pin Oak	13.0	25.0
										✓	✓	✓	✓	*Quercus robur*, English Oak	13.0	18.0
								✓	✓	✓	✓	✓	✓	*Quercus rubra*, Red Oak	15.0	16.0
						✓	✓	✓	✓	✓	✓	✓	✓	*Robina pseudoacacia 'Bessoniana'*, Bessoniana Black Locust	6.0	10.0
								✓	✓	✓	✓	✓	✓	*Robina pseudoacacia 'Frisia'*, Frisia Black Locust	8.0	13.0
						✓	✓	✓	✓	✓	✓	✓	✓	*Tilia americana*, Basswood	13.0	25.0
								✓	✓	✓	✓	✓	✓	*Tilia americana 'Redmond'*, American Linden	10.0	20.0
						✓	✓	✓	✓	✓	✓	✓	✓	*Tilia cordata 'Greenspire'*, Greenspire Littleleaf Linden	12.0	16.0
								✓	✓	✓	✓	✓	✓	*Tilia tomentosa*, Silver Linden	15.0	23.0
						✓	✓	✓	✓	✓	✓	✓	✓	*Ulmus Americana 'Princeton'*, Princeton Hybrid Elm	16.0	23.0
										✓	✓	✓	✓	*Ulmus 'Frontier'*, Frontier Hybrid Elm	10.0	13.0
										✓	✓	✓	✓	*Ulmus parvifolia*, Chinese Elm or Lacebark	10.0	13.0
								✓	✓	✓	✓	✓	✓	*Ulmus x 'Pioneer'*, Pioneer Hybrid Elm	15.0	25.0
										✓	✓	✓	✓	*Zelcova serrata*, 'Musashino' Zelkova	5.0	15.0
										✓	✓	✓	✓	*Zelcova serrata*, Green Vase Zelkova (PP5080)	13.0	16.0

Appendix A: Plant Hardiness Geographical Map



Definitions

Easement – a right granted to a LDC on property owned by others to use their property to support the distribution of electricity. Easements may contain underground and/or overhead powerlines and electrical equipment which requires the LDC to have legal access to property for maintenance and installation of electrical services.

Limits of Approach – specifies the required distance between workers and equipment to energized overhead electrical lines and conductors with a nominal phase-to-phase voltage rating set. The LDC should be contacted to define the voltage rating for overhead powerlines where work is being done.

Local Distribution Company (LDC) – A Distributor who is licensed under the Ontario Energy Board (OEB) responsible for transmitting electricity to municipal infrastructure including general public and public area.

Locates – Requesting of information from a facility owner identifying all their underground facilities by the use of surface markings such as coloured spray paint or flag identifiers, maps or drawings.

Pad mounted Equipment – Electrical equipment approved to be installed above ground on a concrete foundation.

Plant Hardiness Index – is a geographically defined area in which a specific category of plant life is capable of growing, as defined by climatic conditions, including its ability to withstand the minimum temperatures of the geographical area.

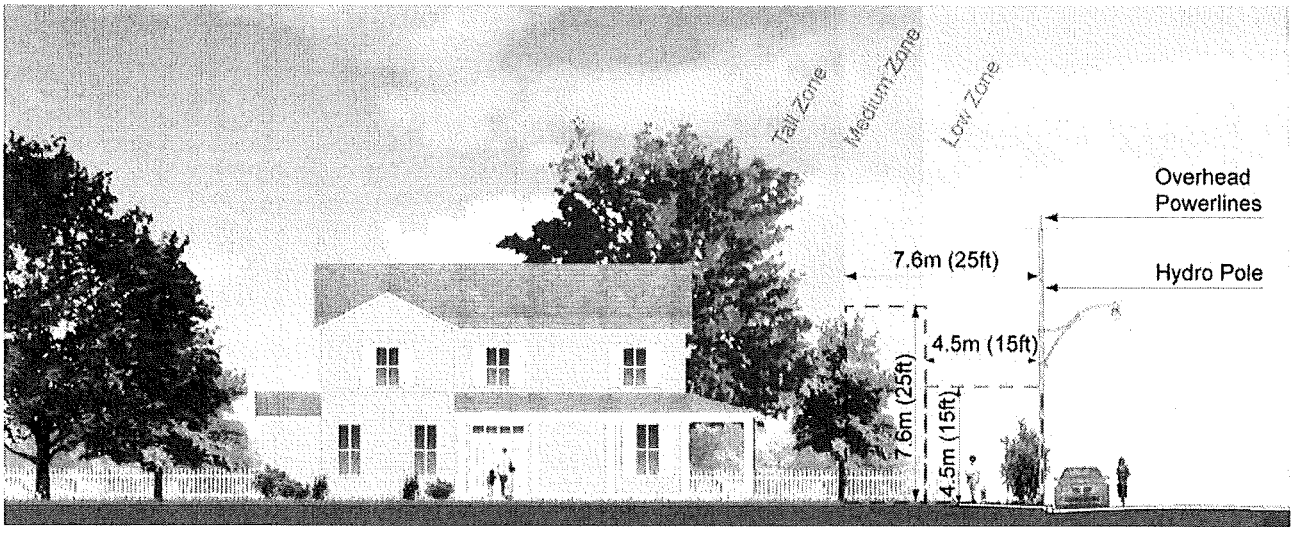
Root Deflector – Is a mechanical barrier placed between the tree roots and the electrical cables to prevent damage to the cables. A root deflector can be made from 6.5 mm (1/4") rigid plastic, fibreglass or non-degradable material.

Step Potential – Is the voltage entering a person from one foot through the body and exiting the other foot standing near an energized ground object.

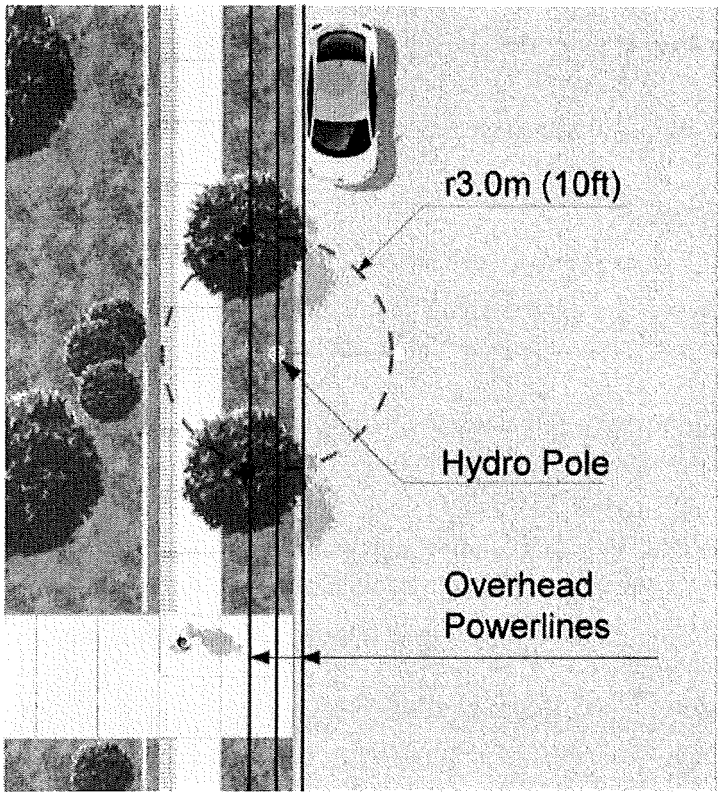
Touch Potential – Is the voltage entering a person and exiting the body through the feet while contacting an energized object.

Utility Arborist – Arborists who are 444B Certified that are authorized to prune, clear vegetation, fell or remove trees within the Ont. OH&S Act defined ***'limits of approach'***.

Reference Chart A: Tree Planting Zones
Reference Chart B: Base Zone Near Hydro Poles



Tree Planting Zones



Base Zone Near Hydro Poles

Quick Reference Guide: Landscape & Arborist Trades

'Look Up! Look Out!' to avoid potential electrical hazards

☑ Locate overhead powerlines and follow Ont. OH&S Act's Limits of Approach

☑ Locate all underground services prior to excavating

Contact Ontario One Call to obtain all underground locates
Utilities will only locate underground services which they own. It is the responsibility of the property owner or excavator/landscaper to locate non utility owned services.

☑ Check Municipal, Regional and Township By-Laws for specifications

☑ Check with the *LDC* for their planting requirements under or around powerlines and electrical equipment including underground powerlines

☑ Select landscape materials and designs that meet clearance requirements under or around powerlines and electrical equipment, specifically:

☑ **Underground Powerlines** – the minimum clearance required from the edge of the root ball to the edge of the underground powerline corridor is 1.0 m (3ft.)

☑ **Electrical Equipment** – when planting near *pad mounted equipment*:

- **Transformers** – 3.0 m (10 ft.) is required in front of the door(s) and 1.5M (4.9 ft.) on the sides and back
- **Switchgear** – 3.0 m (10 ft.) is required in the front and back doors and 1.5M (4.9 ft.) on the sides

Overhead Powerlines – 'look up! look out!'

1. Consider required distances between powerlines and trees or shrubs when selecting species.
   - LOW ZONE – is the area under the power lines and extends to 4.5 m (15 ft) on either side. Trees and/or shrubs planted in this zone should have a maximum mature height and spread of 4.5 m (15 ft).
   - MEDIUM ZONE – extends from the outer edge of the low zone to a distance of 7.6 m (25 ft) on either side of the power line. The maximum mature height and spread of trees planted in this zone should be 7.6 m (25 ft).
   - TALL ZONE – extends from the outer edge of the medium zone extending greater than 7.6 m (25 ft) from the power lines. Any strong and healthy tree may be planted in this zone.
   - BASE ZONE NEAR HYDRO POLES – Trees and/or shrubs should not be placed closer than 3.0 m (10 ft) from the base of a hydro pole.
2. Delivery of plant materials – Unloading of the tree(s) is not to be done under or around the overhead powerlines. Delivery equipment such as a boom truck can come into contact with the overhead wires. The same for digging with equipment such as a high hoe, the equipment can also come into contact with the overhead wires.

Quick Guide & Contact Information: Homeowners

'Look Up! Look Out!' to avoid potential electrical hazards

☑ Locate Overhead Powerlines – **avoid potential electrical risks from:**

1. **DIRECT CONTACT** – when working around trees where powerlines are hidden by foliage
2. **ENERGIZED OBJECTS** – branches and limbs caught in the powerlines may unexpectedly become conductive
3. **PLANTING TREES AND SHRUBS TOO CLOSE TO POWERLINES** – when selecting species, a landscape professional can provide advice on indentifying the best species of trees or shrubs for landscape projects near powerlines.
4. **DELIVERY OF PLANT MATERIALS** – unloading of the tree(s) is not to be done under or around the overhead powerlines. Delivery equipment such as a boom truck can come into contact with the overhead wires. The same for digging with equipment such as a high hoe, the equipment can also come into contact with the overhead wires.

   ☑ **Locate Underground Powerlines** prior to digging or excavating to plant trees.the minimum clearance required from the edge of the root ball to the edge of the underground powerline corridor is 1.0 m (3ft.)

Contact Ontario One Call to obtain all underground locates
Utilities will only locate underground services which they own. It is the responsibility of the property owner or excavator/landscaper to locate non utility owned services.

☑ Electrical Equipment – **minimum clearance when planting near pad mounted equipment:**

- **TRANSFORMERS** – 3.0 m (10 ft.) is required in front of the door(s) and 1.5M (4.9 ft.) on the sides and back
- **SWITCHGEAR** – 3.0 m (10 ft.) is required in the front and back doors and 1.5M (4.9 ft.) on the sides

☑ Check Municipal, Regional and Township By-Laws for specifications

☑ Check with the *LDC* for their planting requirements under or around overhead powerlines and electrical equipment including underground powerlines

Check with the *LDC* to identify easements that might apply

ECAC Working Group comments regarding EMG scoped review
Received at ECAC at its January 2024 meeting. Prepared by S. Evans, S. Hall, B. Krichker, S. Levin on February 8, 2024

ECAC finds the existing EMG's content in sections 3 and 4 to be comprehensive and in compliance with Provincial Policy which requires all municipalities to prepare Natural Heritage Systems Studies.

The draft ToR states: City staff have heard various and repeated concerns about how the definitions of woodlands and patches were revised in the 2021 EMGs, and have seen how this can create challenges in applying the evaluation criteria for significant woodlands. This also applies to boundary delineation.

ECAC comments on Terms of Reference (ToR) related to:

- Evaluation of significant woodlands and woodlands and;
- Boundary delineations of significant woodlands and woodlands

It would be helpful if we and perhaps the rest of the stakeholder/reference group knew what these concerns are prior to the discussion or at least at the start of the discussion on Feb 13th

(ECAC was not asked directly for its concerns and what should be part of this review.)

Section 3 of the EMG is fifteen pages of relatively detailed evaluation criteria.

To scope this even further, which subsections have been at issue and why? Again, it would be helpful to know what these concerns are prior to or at the discussion on Tuesday.

Sec 4 of the EMG has been raised as an area of concern. Again, we are unaware of the issues that have led to this being a priority. Understandably if there is issue with the identification of Significant Woodlands and Woodlands being questioned, then 4.3 would also be at issue. However, it is unclear why 4.7 is at issue. Is it the minimum size or other matter?

It is also understandable why 4.8 would be part of the review to determine what is included in the identified area to be protected and buffered. ECAC will be particularly interested in the outcome of this part of the review.

ECAC RECOMMENDATION FOR INCLUSION IN THIS EMG REVIEW

Although the Terms of Reference is not clear in all areas (Section 3.1 of the ToR appears to be open to including other scoped items vs page 3 which suggests otherwise), ECAC

would like to ask that the following be included in the EMG review as an item to be added to the requirements for a submitted EIS:

An EIS must include a map of the most recent city air photo for a roughly 1 km square. Ideally the EIS should include air photos from the past 5 years to show any changes on the landscape. If other NHS features are within the 1 Km area, the EIS must indicate how the proposal will not cause a net loss of ecological function off site. Ideally, at least one map must include the site topography (see the following sample map). This issue is closely connected to the boundary delineation section of the EMG.

ECAC comments on other parts of the Terms of Reference.

We have no major concerns about the section dealing with provincial changes and housekeeping other than the following comments:

-provincial changes

Shorter review timelines under provincial legislation and that the Conservation Authorities no longer provide comment on natural heritage matters have had an effect on the reviews undertaken by a municipality. Where a municipality is not satisfied with an environmental study it can require a peer review. Should criteria be included in the EMG for when a peer review is required and development of such criteria be included in this review?

-housekeeping

We would appreciate a list of known, changes and housekeeping items (other than typos) – perhaps a list will be useful to all participants at the start of the process.

For ECAC, a housekeeping matter is how the word 'should' is interpreted when considering what is included in an EIS.

ECAC REQUESTS THE FOLLOWING BE INCLUDED AS A STEP IN THE TERMS OF REFERENCE

At the end of this process, the participants should be asked for recommendations for inclusions in the next review. This list would then need to be part of the staff report which would allow tracking of issues raised. An example would include post construction monitoring requirements.

- miscellaneous

ECAC has become aware of a recent (August 2023) study looking at impacts of development on habitat for freshwater turtles in Ontario. We believe this paper is highly relevant to the substance of the EMGs, and so we would ask that the consultant retained for the current review please read this study:
Auge, A.C., Blouin-Demers, G., Hasler, C.T. and Murray, D.L. (2024), Demographic evidence that development is not compatible with sustainability in semi-urban freshwater turtles. Anim. Conserv.. https://doi.org/10.1111/acv.12903

ECAC working group comments on Draft Byron Pit Secondary Plan
Received January 2024 meeting, Reviewed February 9, 2024
Reviewed by S. Hall, S. Levin, K. Mosher

3.4 Habitat for Endangered and Threatened Species

This section includes the following shown in italics. From a system perspective, one study should be carried out for the entire site. The City should do it because of the lapse in time since the City did the field work at the site.

ECAC does not support substituting individual studies by each land owner instead of one comprehensive study. One reason is the time lapse between development proposals. The second is if there is a desire and commitment to address the bank swallow colony, identifying compensation if required, would be best done at the front end.

If the city does not support our recommendation, the following subsection should be revised so that it is clear that each land owner will be required to complete studies to screen, etc: As written it could be interpreted that the first study would meet the requirement to screen for SAR and no future studies (SLSR or EIS) would be required to do so.

i*) Studies to screen for, confirm and delineate habitat for endangered and / or threatened species shall be completed prior to any proposed re-development of the Study Area;*

Bank Swallows

The Bank Swallow nest colony appears to meet the criterion for Significant Wildlife Habitat according to **Significant Wildlife Habitat Criteria Schedules For Ecoregion 7E, January, 2015**

However, the criterion does state that "Does not include a licensed/permitted Mineral Aggregate Operation." ECAC is given to understand the license still exists, however**, the question which must be resolved ASAP is whether or not there is still an operation.**

If it is no longer an operation, then the Schedule for 7E states "a colony identified as SWH will include a 50m radius habitat area from the peripheral nests."

3.2.1 Natural Heritage System

2.1.5 of the Provincial Policy Statement prohibits development or site alteration in significant wildlife habitat unless unless it has been demonstrated that there will be **no *negative impacts* on the natural features or their *ecological functions*. (highlighting ours)**

The Draft section below (specifically the notion of replacement in subsection a) seems to be contrary to the PPS and must be revised.

iv) Recognizing the long history of disturbance in the Study Area has created some types of significant wildlife habitat not previously documented, opportunities to protect and enhance these features in the Study Area shall be identified through the development process.

a) For significant wildlife habitat, replacement rather than in situ protection may be considered where the feature(s) and function(s) can be provided elsewhere in the Secondary Plan area and are demonstrated, through an EIS, to provide a net gain to the Natural Heritage System, including consideration of buffers to adjacent land uses.

ECAC is supporting of the following clause. There are a variety of funding sources for alternatives for bank swallows for example. However, the City traditionally has not had the resources to identify and respond to calls for applications. It is recommended that the City work with the UTRCA which has historically been successful in identifying and responding to funding opportunities.

vi) The City is supportive of exploring opportunities to protect existing and / or create new habitat for extant endangered and/or threatened species in the context of this Secondary Plan area, in accordance with any applicable the Endangered Species Act and Aggregate Resources Act policies, and in consultation with the appropriate provincial agency(ies).

<u>Buffers</u>

References to buffering natural heritage features should be to the Environmental Management Guidelines rather than using the word "appropriate."

Wetlands

Sub section 1 of 3.2.1 indicates an SLSR or EIS will be required. Subsection 2a of 3.2.1 states:

Wetland naturalization and/or creation around the margins of the Central Pond may be considered where appropriate.

What is unclear here is who would be responsible for any wetland naturalization or creation around the Central Pond when the Pond will be part of a city feature. What would compel a proponent to do this work as part of a condition of development? Only parkland dedication or cash in lieu would be required. Other than the City, who would do this work? ECAC feels this reinforces that there should be one comprehensive EIS/SLSR done by the City.

Given the time since the City collected natural heritage data for the site, it would be appropriate given the relatively small size of the site, that the City undertakes an EIS rather than leave it to a piece meal approach as each land owner moves forward with an application as stated in section 3.2.1.

iii) Protection and enhancement of natural features should be detailed as part of any future landscape and park plans associated with future development applications.

1.4.2.4 Create a Diverse and Resilient Natural Environment

Objective vi is as follows. Why would non native species be preferred over native species?

Integrate strategic plantings of large statured non-invasive trees to provide cooling, improve air quality and support outdoor activities in a context of climate change;

1.4.2.5 Sustainable Growth Management

Why non native species?

iv) Plant native trees and non-native trees and vegetation to enhance biodiversity and resilience to climate change;

In the following, why does the city need the Province in order to comply with the ESA? This section should also include "the city work with outside funders and organizations to provide compensation opportunities for loss of habitat of SAR species if there is no other opportunity to avoid or mitigate.

v) Work with the Province to ensure compliance with the Endangered Species Act as it relates to confirmed habitat for Species at Risk in the Study Area; and,

3.2.2 Protection of Significant Natural Features

It is unclear how using non native but non invasive species is beneficial.

ii) Naturalization, restoration and /or habitat creation is to integrate native and non-invasive species appropriate for the site and the target habitat(s).

32 Chesterfield Avenue, London

Subject Lands Status Report and Environmental Impact Study

Prepared for:
Pearl Investments
c/o Subramanian Suppiah
6 Hebbard Place
St. John's, Newfoundland
A1A 5J6

Prepared by:
Dan Riley
Terrestrial and Wetland Biologist
Natural Resource Solutions Inc.
415 Phillip Street, Unit C
Waterloo, ON
N2L 3X2

To be submitted to the City of London

Project No. 2363 | January 2024

Executive Summary

Natural Resource Solutions Inc. (NRSI) was retained by Pearl Investments in November 2019 to complete an Environmental Impact Study (EIS) for a proposed re-development of a residential lot located at 32 Chesterfield Avenue in London, Ontario. A Tree Preservation Plan for the subject property has been prepared by NRSI under a separate cover. The subject property is approximately 0.6ha in size within the Central Thames Subwatershed and is bounded by natural features including the Thames River, wetland and forest, as well as Chesterfield and Veronica Avenue, and residences.

Due to the presence of the Thames River and its floodplain, a large portion of the subject property is regulated by the Upper Thames River Conservation Authority (UTRCA). The focus of the following EIS is to ensure that there will be no significant impacts to the adjacent natural heritage features with the re-development of the proposed residential lot.

Natural heritage information was collected and reviewed to identify key natural heritage features, habitats and species that are reported from, or have the potential to occur within the study area. An Ecological Land Classification (ELC), tree inventory, a spring, summer, and fall vegetation survey, woodland dripline delineation, reptile area searches, breeding bird surveys, and aquatic habitat assessment were conducted to characterize the subject property.

Woodlands adjacent to the proposed development area and partially overlapping the subject property have been identified as Significant. The Significant Woodland does not overlap the proposed development limits and a 30m buffer has been established on the subject property. This 30m buffer partially overlaps the existing residential lot, which will be retained in its existing condition. Since a vegetated buffer will not be provided on the existing residential lot, lands in the north portion of the subject property will be enhanced and naturalized for conveyance to the City of London. These measures will improve the overall quality of the Significant Woodland in the long-term.

Candidate Significant Wildlife Habitat and Species at Risk habitat was assumed present within the Significant Woodland adjacent to the subject property and has been considered through the development planning process. A single Species at Risk, Kentucky Coffee-tree, was identified within the subject property, it was determined to be a planted specimen but is still afforded protection under the *Endangered Species Act, 2007*. The presence of the Kentucky Coffee-tree

within the proposed development area will be addressed by transplanting the tree in accordance with the requirements of Ontario Regulation 242/08.

The potential impacts of the proposed development include; site grading, vegetation removal, relocation of Species at Risk, hydrological changes, sedimentation and erosion, injury to trees, and impacts to wildlife and vegetation communities. The recommended mitigation strategies to address these potential impacts will ensure that there are no significant negative impacts on the adjacent Significant Woodland, watercourses or related wildlife and habitats. These strategies include the following proposed conditions of approval, to be considered during the consent stage:

- Development of a comprehensive Environmental Management and Monitoring Plan (EMMP), that will include a Naturalization Planting Plan, and proposed monitoring plan for the subject property and plantings within the naturalization area;
- Submission of a Notice of Activity and preparation of a Mitigation Plan for the relocation of the Kentucky Coffee-tree;
- Development of a detailed Grading Plan that promotes infiltration and directs overland flows to the municipal stormwater management system;
- The installation and maintenance of heavy-duty combined sediment and erosion control fence and Tree Protection Fencing, supervised by a Certified Arborist, including immediate removal once construction activities have concluded;
- Restrict construction activities to 7:00am to 7:00pm, with artificial lighting turned away from natural features and dust suppression measures implemented;
- Tree removal should occur with consideration to the protection and general timing windows for migratory birds and Species at Risk bats (April 1- September 30);
- Ensure stabilization and re-vegetation of bare soils are completed as soon as possible after construction; and
- Development of an environmental guide to be handed out to all new homeowners to avoid/minimize residual impacts.

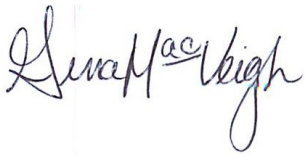
32 Chesterfield Avenue, London

Subject Lands Status Report and Environmental Impact Study

Project Team

Gina MacVeigh	Project Manager, Senior Aquatic Biologist
Dan Riley	Terrestrial and Wetland Biologist
Jeremy Bannon	Terrestrial and Wetland Biologist, Certified Arborist
Pat Deacon	Terrestrial and Wetland Biologist
Nathan Miller	Terrestrial and Wetland Biologist
Elizabeth Milne	Terrestrial and Wetland Biologist
Kaitlin Filippov	GIS Specialist

Report submitted on January 12, 2024



Gina MacVeigh
Project Manager
Aquatic Biologist

Table of Contents

1.0 Introduction 1

2.0 Project Scoping 1

2.1 Study Area 1

2.2 Background Information 1

2.2.1 Collection and Review of Background Information 1

2.2.2 Significant Species Screening 2

2.2.3 Significant Wildlife Habitat Screening 3

2.3 Relevant Policies, Legislation and Planning Studies 4

3.0 Field Methods 8

3.1 Field Surveys 8

3.1.1 Vegetation Surveys 8

3.1.2 Tree Inventory 9

3.1.3 Bird Surveys 9

3.1.4 Reptile Area Searches 9

3.1.5 Additional Wildlife 9

3.1.6 Significant Wildlife Habitat Assessment and SAR Habitat 9

3.1.7 Aquatic Survey 10

4.0 Existing Conditions 11

4.1 Soil, Terrain and Drainage 11

4.2 Vegetation 11

4.2.1 Vegetation Communities 11

4.2.2 Vascular Flora 12

4.2.3 Tree Inventory 13

4.3 Wildlife 14

4.3.1 Birds 14

4.3.2 Herpetofauna 14

4.3.3 Mammals 15

4.3.4 Butterflies 15

4.3.5 Odonates 16

4.4 Aquatic Resources 16

4.4.1 South Thames River 16

4.4.2 Drainage to South Thames River 16

5.0 Significance and Sensitivity of Natural Features 18

5.1 Significant Wetlands 18
5.2 Significant Valleylands 18
5.3 Significant Woodlands 18
5.4 Environmentally Significant Areas 20
5.5 Corridors and Linkages 21
5.6 Significant Wildlife Habitat 21
5.6.1 Candidate: Bat Maternity Colonies 21
5.7 Habitat of Endangered and Threatened Species 21
5.7.1 Kentucky Coffee-tree 22
5.7.2 Little Brown Myotis, Northern Myotis and Tri-colored Bat 22
5.8 Fish Habitat 22
5.9 Buffers 23
5.10 Potential Naturalization Areas 23
5.11 Summary of Natural Feature Constraints 24
6.0 Impact & Net Effects Assessment 26
6.1 Description of the Proposed Undertaking 26
6.2 Approach to Impact and Net Effects Assessment 26
6.3 Existing Impacts 26
6.4 Significant Woodland Buffer 27
6.5 Direct Impacts 28
6.5.1 Site Grading 28
6.5.2 Vegetation Clearing 29
6.5.3 Species at Risk 31
6.6 Indirect Impacts 32
6.6.1 Hydrological Changes 32
6.6.2 Erosion and Sedimentation 33
6.6.3 Impacts to Wildlife and Vegetation Communities 34
7.0 Environmental Management and Monitoring Plan 35
7.1 Management and Enhancement of Naturalization Area 35
7.2 Monitoring 35
7.2.1 During Construction 36
7.3 Post- Construction Stage 36
8.0 Conclusions 38
9.0 References 40

List of Tables

Table 1. Relevant Policies, Legislation and Planning Studies. 4
Table 2. Field Survey Summary 8
Table 3. Ecological Land Classification Community Descriptions 11
Table 4. Summary of Inventoried Trees Within the Subject Property 13
Table 5. Summary of Natural Feature Constraints. 24

Maps

Map 1. Study Area
Map 2. Existing Conditions
Map 3. Constraints and Proposed Development Concept

List of Appendices

Appendix I Environmental Study Scoping Checklist
Appendix II Species at Risk (SAR) and Species of Conservation Concern (SCC) Screening Table
Appendix III Significant Wildlife Habitat Screening Table
Appendix IV Vascular Flora Species Observed within the Study Area and Subject Property
Appendix V Bird Species Reported from the Study Area
Appendix VI Herpetofauna Species Reported from the Study Area
Appendix VII Mammal Species Reported from the Study Area
Appendix VIII Butterfly Species Reported from the Study Area
Appendix IX Odonate Species Reported from the Study Area
Appendix X Fish Species Reported from the Study Area
Appendix XI Mussel Species Reported from the Study Area
Appendix XII Net Effects Assessment Table

1.0 Introduction

Natural Resource Solutions Inc. (NRSI) was retained by Pearl Investments in November 2019 to complete an Environmental Impact Study (EIS) for a proposed re-development of a residential lot located at 32 Chesterfield Avenue in London, Ontario. A Characterization Report was prepared in February 2021 and submitted to the City of London as part of the second scoping meeting (October 2022). This Subject Lands Status Report (SLSR) and EIS have been prepared as part of the requirements for a complete application as identified within the pre-consultation record. This SLSR and EIS aims to detail the results of the field program, and provide an analysis of on-site regulations, constraints, and opportunities for development.

The subject property is comprised of 1 lot totaling approximately 0.6 ha in size. The Thames River and associated floodplain, wetland and forest are present to the north, with the Chesterfield Avenue right-of-way to the west, residences fronting onto Gladstone Avenue to the east, and Veronica Avenue to the south (Map 1). The subject property is comprised of an uninhabited residence, above ground pool, and lawn which is bordered by deciduous hedgerows to the west and east. A slope leading to the river floodplain exists to the north of the residence. Within the floodplain, there is a portion of forest with wetland present off-property to the northwest. The subject property is located within the Central Thames Subwatershed and is within Ecoregion 7E.

The City of London Official Plan, hereafter referred to as the London Plan (2023) has identified Woodland on Map 5 adjacent and overlapping a small portion of the subject property, and Significant Valleyland to the immediate north of the subject property (Map 2). Due to the presence of wetland, floodplain and the Thames River, the lands extending from the existing residence to the river are regulated by the Upper Thames River Conservation Authority (UTRCA) under Ontario Regulation 157/06 (2013). In accordance with the London Plan policies and the UTRCA regulation governing development within or adjacent to regulated features, an Environmental Impact Study (EIS) is required to demonstrate that the proposed development will not negatively impact existing natural features or their ecological functions.

This report summarizes the work completed and includes background species information for the subject property and study area, the results of original field surveys including breeding birds, bat habitat, insects, vegetation communities and vascular flora. The detailed characterization was used to inform an analysis of the significance and sensitivity of natural features, the

identification of any natural feature constraints in association with land use policy designations, and the assessment of potential impacts and mitigation measures associated with details of the proposed development. This report has been developed in accordance with the *City of London Environmental Management Guidelines (EMG; 2021b).*

2.0 Project Scoping

A Pre-Application Consultation meeting was held between City Planner Catherine Lowery and MHBC Planner Eric Miles on June 24, 2019. During this meeting it was determined that tree preservation was a focus for natural heritage comments and an EIS would be required. It was noted that the scope of the EIS should be developed in consultation with the City's Ecologist Planner James MacKay. NRSI biologist Gina MacVeigh had a conference call with James MacKay and Brent Parsons from UTRCA, as well as the project team to define the scope of the EIS.

Following the completion of the Characterization Report in February 2021, the project was temporarily put on hold. In October 2022 an updated development concept was provided to NRSI. To ensure that all necessary field studies had be completed in light of the updated concept, a second scoping meeting was held on November 21, 2022. The scoping meeting was attended by representatives from NRSI, MHBC, the City of London, the UTRCA and, the Ecological Community Advisory Committee (ECAC). The meeting determined that no additional field studies were required. The Environmental Study Scoping Checklist (ESSC) developed for this project and approved by the City of London is provided in Appendix I.

2.1 Study Area

For the purposes of this report, the term "subject property" refers to the lands owned by the proponent that have been identified within the Proposal Summary prepared by MacNaughton Hermsen Britton Clarkson Planning Limited (MHBC) (Aug 2022). The term "study area" refers to the subject property, and lands surrounding the subject property, to include adjacent lands (120 m), as per the scoping meeting. In addition, information was collected from the Natural Heritage Information Centre squares (1x1 km) natural heritage background data and the wildlife atlas squares (10x10 km) which overlap the study area.

2.2 Background Information

2.2.1 Collection and Review of Background Information

Existing natural heritage information was collected and reviewed to identify key natural heritage features, habitats and species that are reported from, or have the potential to occur within the study area. Background information collected for the Characterization Report (NRSI 2021) was updated in November 2023 to ensure all significant species and features have been appropriately considered for this SLSR and EIS. The following background information sources

were reviewed to provide an accurate understanding of the physical and biological attributes within the study area:

- Ministry of Natural Resources and Forestry (MNRF);
- Ministry of the Environment, Conservation and Parks (MECP);
- Upper Thames Region Conservation Authority (UTRCA 2021);
- London Plan (2023);
- Middlesex County Official Plan (2023);
- Middlesex County Natural Heritage Study (UTRCA 2014);
- Natural Heritage Information Centre (NHIC) (MNRF 2023);
- Department of Fisheries and Oceans (DFO) Aquatic Species at Risk Maps (DFO 2023);
- Ontario Breeding Bird Atlas (OBBA) (BSC et al. 2008);
- Ontario Reptile and Amphibian Atlas (ORAA) (Ontario Nature 2019);
- Ontario Butterfly Atlas (Macnaughton et al. 2023);
- Atlas of the Mammals of Ontario (Dobbyn 1994);
- Ontario Odonata Atlas (OOAD 2023).

Species lists were compiled to provide information on species reported from within the vicinity of the study area based on data available from the wildlife atlases listed above. Information on species from the survey squares that overlap with the study area (17MH85) were compiled. These initial species lists were used to guide the scope and type of wildlife field surveys required.

2.2.2 Significant Species Screening

Based on the compiled species lists, a screening exercise was completed to assess the potential for reported Species at Risk (SAR) and Species of Conservation Concern (SCC) to occur in the subject property and study area. This involved cross-referencing the preferred habitat for reported SAR and SCC (MECP 2023, Eakins 2020, Michigan Flora Online 2011) against habitats known to occur in the study area. This exercise was completed to ensure that the potential presence of all SAR and SCC within the study area was adequately assessed in this study.

Species at Risk are those listed on the SAR in Ontario List (SARO) (MECP 2023) and/or the federal Species at Risk list (Government of Canada 2023). These include species identified by

the Committee on the Status of Species at Risk in Ontario (COSSARO) as provincially Endangered, Threatened, or Special Concern. Species listed by COSSARO as Endangered or Threatened are protected by the *Endangered Species Act*, 2007 (ESA), which includes protection of their habitat, and are referred to as regulated SAR. Aquatic Species listed as Endangered or Threated under the *Species at Risk Act,* 2007 (SARA), which includes protection to their habitat are also referred to as regulated SAR. Species listed as Special Concern are included in the definition of SCC, which includes the following:

- Species designated provincially as Special Concern;
- Species that have been assigned a conservation status (S-Rank) of S1 to S3 or SH by the (Natural Heritage Information Center (NHIC)); and
- Species that are designated federally as Threatened or Endangered by the Committee for the Status of Endangered Wildlife in Canada (COSEWIC), but not provincially by COSSARO. If these species are listed under the Species at Risk Act (SARA) under Schedule 1 they are protected by the federal Act but not provincially by the ESA.

Full SAR/SCC screening results are provided in Appendix II.

2.2.3 Significant Wildlife Habitat Screening

A screening exercise was completed to assess the presence of Significant Wildlife Habitat (SWH) within the study area. SWH is protected under the Ontario Provincial Policy Statement (PPS) (OMMAH 2020) and is described in the Significant Wildlife Habitat Technical Guide (SWHTG) (OMNR 2000) as being comprised of four major categories of habitat:

- Seasonal concentration areas;
- Rare vegetation communities and specialized wildlife habitat;
- Habitats of terrestrial species of conservation concern; and
- Animal movement corridors.

Specific criteria defining wildlife habitat significance for Ecoregion 7E are described in the SWHTG Addendum (MNRF 2015). Individual SWH types within these four broad categories were assessed as either not present, candidate, or confirmed for the study area based on a comparison of significance criteria against information obtained from relevant background documents. Aquatic SCC and their habitat are considered under the *Fisheries Act* provisions.

SWH types are discussed in further detail in Section 5.6. The SWH screening results are provided in Appendix III.

2.3 Relevant Policies, Legislation and Planning Studies

Natural features identified during background review and field investigations were evaluated against relevant policies, legislation and planning studies (Table 1) to help inform suitable land-use concepts, guide the layout of development, and identify areas to be protected.

Table 1. Relevant Policies, Legislation and Planning Studies.

Policy/Legislation/Planning Study	Description	Project Relevance
Provincial Policy Statement (OMMAH 2020)	• Issued under the authority of Section 3 of the Planning Act and came into effect on May 1, 2020, replacing the 2014 PPS (OMMAH 2014). • Section 2.1 of the PPS – Natural Heritage, establishes clear direction on the adoption of an ecosystem approach and the protection of resources that have been identified as 'significant'. • The Natural Heritage Reference Manual (MNRF 2010) and the Significant Wildlife Habitat Technical Guide (OMNR 2000) were prepared by the MNRF to provide guidance on identifying natural features and in interpreting the Natural Heritage sections of the PPS.	• Three natural features were identified within the subject property or on adjacent lands as having potential implications under the PPS: o Candidate Significant Wildlife Habitat; o Significant Valleylands; o Significant Woodland; and o Fish Habitat.
Endangered Species Act, 2007	• The original ESA, written in 1971, underwent a year-long review which resulted in a number of changes which came into force in 2007. • The ESA prohibits killing, harming, harassing or capturing Species at Risk	• Based on the background review several SAR were identified as having the potential to occur within the study area based on potential adjacent habitats. • A single Kentucky Coffee-tree was observed on the subject property. It was determined to

Policy/Legislation/Planning Study	Description	Project Relevance
	(SAR) and protects their habitats from damage and destruction.	be a planted specimen; however, its presence will be addressed through consultation with the MECP. • SAR bat habitat has been identified as candidate in woodlands outside the development area (cavity tree in the lowland) • Aquatic SAR are likely present within the Thames River, which borders the subject property.
UTRCA Regulation 157/06 (2013) Environmental Planning Policy Manual for the Upper Thames River Conservation Authority (UTRCA 2006)	• Regulation issued under *Conservation Authorities Act,* R.S.O. 1990. • Through this regulation, the UTRCA has the responsibility to regulate activities in natural and hazardous areas (i.e., areas in and near rivers, streams, floodplains, wetlands, and slopes). • The Environmental Planning Policy Manual outlines policies designed to protect natural heritage features and systems from the potentially negative impacts of development and site alteration.	• The UTRCA regulates a large portion of the subject property due to the proximity of the Thames River and wetland on adjacent lands. • Permitting from the UTRCA must be obtained for proposed works within their regulation areas. • Several natural features were identified within the subject property or adjacent lands as having potential implications under the Environmental Planning Policy Manual for the UTRCA: o Unevaluated Wetland; o Watercourse; o Fish Habitat; o Significant Wildlife Habitat; o Significant Woodland: and o Significant Valleylands.
The London Plan (City of London 2023)	• The City of London's Official Plan, The London Plan (2023), outlines current policies for the protection of natural features within the City of London which represent a constraint for development. • The London Plan was adopted by Council and	• Two natural features were identified within the subject property or adjacent lands as having potential implications under The London Plan, these include: o Significant Valleylands; and o Woodlands.

Policy/Legislation/Planning Study	Description	Project Relevance
	the Province in 2016, and consolidated in 2023.	
City of London Environmental Management Guidelines (2021b)	• Outlines policy guidelines, standards, process and procedures for the preparation and review of Environmental Impact Statements, determination of buffers and setbacks, evaluation of significant woodlands, and stormwater management facilities as required by the province and the City of London.	• Environmental Management Guidelines are to be followed through the project steps including data collection standards, evaluation of significant woodlands and guidelines for determining setbacks and ecological buffers. • As this development application will occur within 120m of significant natural heritage features, an EIS is required and as such, the Environmental Management Guidelines were to be followed through the project steps including data collection standards and guidelines for determining setbacks and ecological buffers.
City of London Tree Protection By-law C.P.-1555-252 (2021a)	• Regulates harm or destruction of trees within the Urban Growth Boundary • Outlines Tree Protection Areas • Amended by C.P—1555(b) – 29 on December 21, 2021	• The subject property occurs within the Urban Growth Boundary • The subject property does not fall within a Tree Protection Area. • Distinctive Trees are located within the subject property. • Though tree removal as a condition of Site Plan Application are exempt, the general protections outlined must still be considered. • A tree inventory and Tree Protection Plan (TPP) have been completed and provided as a standalone document.
Thames Valley Corridor Plan (Dillon Consulting 2011)	• Figure 5a of the Plan indicates a proposed secondary trail or pathway along the northern edge of the subject property.	• In the Pre-Application Consultation, City staff from Parks, Planning and Design commented that a parkland dedication at the north end of the site may be pursued to

Policy/Legislation/Planning Study	Description	Project Relevance
		establish a future pathway connection. • As development is not proposed within the lowland area, this section of the property can be considered for dedication and would not have implications for the project.
Department of Fisheries and Oceans Canada (DFO) Fisheries Act (1985)	• Under the updated federal Fisheries Act, fish are protected through two core prohibitions: Section 34.4(1) the death of fish by means other than fishing, and Section 35(1) the harmful alteration, disruption, or destruction (HADD) of fish habitat (Government of Canada 2019). • Fish habitat is defined as "spawning grounds and any other areas, including nursery, rearing, food supply and migration areas, on which fish depend directly or indirectly in order to carry out their life processes".	• The Thames River is fish habitat and is adjacent to the subject property but no work is slated within the highwater mark of the river. • The drainage feature to the Thames that originates from the stormwater outlet at Chesterfield Ave should be considered as fish habitat and standard ESC measures be implemented to ensure no impacts during and after development.
Species at Risk Act (2002)	• The SARA applies to all species listed on Schedule 1 that are on federal lands, are an aquatic species, or are a species of migratory bird protected by the Migratory Birds Convention Act, 1994. Schedule 1 is the official list of wildlife SAR within Canada. Once a species is listed on Schedule 1, it benefits from all the legal protection afforded, and the mandatory recovery planning required, under the SARA.	• The Thames River provides habitat and critical habitat for numerous aquatic species. • As development is not proposed within the lowland area, it is unlikely that SAR will be affected. • Considerations for ESC and stormwater should still be provided.

3.0 Field Methods

The type and scope of study methods was determined in consultation with the City of London and UTRCA. The ESSC developed for this project and approved by the City of London is provided in Appendix I.

3.1 Field Surveys

Field surveys were undertaken on the subject property and within the study area to characterize natural features and identify significant and sensitive natural heritage features and species that have potential to be adversely affected by the proposed development. A total of 7 field visits were completed between April and October 2020. The survey types are summarized in Table 2. Surveys conducted were undertaken in accordance with provincial and local guidance documents as indicated below.

Table 2. Field Survey Summary

Survey	Protocol	Dates
Initial Site Visit	N/A	April 8, 2020
Bat Habitat Assessment	OMNR 2011, MNRF 2014	April 8, 2020
Significant Wildlife Habitat Assessment	MNRF 2015	April 8, 2020, May 6, 2020, June 30, 2020, October 7, 2020
Reptile Area Searches/Incidentals	N/A	April 8, 2020, June 9, 2020, June 30, 2020, October 7, 2020
Breeding Bird Surveys	OBBA 2001	June 9, 2020, June 30, 2020
Ecological Land Classification	Lee et al. 1998	April 8, 2020
Vegetation Inventories	Area Search by ELC Polygon	April 8, 2020, May 6, 2020, June 30, 2020, October 7, 2020
Woodland Dripline Delineation	N/A	May 11, 2020
Aquatic Investigation	N/A	June 9, 2020
Tree Inventory	City of London 2016	September 2, 2020, September 30, 2020

3.1.1 Vegetation Surveys

Vegetation community delineation was completed using aerial photography with community descriptions and boundaries refined in the field. The communities were identified using the Ecological Land Classification (ELC) System for southern Ontario (Lee et al. 1998). Details of vegetation communities were recorded including species composition, dominance and uncommon species or features.

All observed species of vascular flora within the subject property were recorded during a summer, spring and fall vascular flora inventory.

The hedgerow dripline within the subject property was delineated and surveyed using an SXBlue II GNSS GPS unit GPS unit by a Certified Arborist from NRSI. This delineation was not field verified with City staff. The boundary is shown on Map 2.

3.1.2 Tree Inventory

A comprehensive tree inventory was completed by NRSI Certified Arborists within the tablelands of the subject property. During these visits any trees with the potential to be impacted by any proposed development were identified and assessed as per the City of London's tree protection by-laws. Individual trees that were greater than or equal to 10cm in Diameter at Breast Height (DBH) were assessed by a Certified Arborist. The location of trees inventoried was subsequently surveyed using an SXBlue II GNSS GPS unit by the Certified Arborist.

3.1.3 Bird Surveys

Breeding bird surveys were completed in June between sunrise and 10:00 hrs. Surveys consisted of an area search of the property with species documented by ELC community. All bird species were recorded based on visual or auditory confirmation following the standard Ontario Breeding Bird Atlas (OBBA) methodology (BSC et al. 2001).

3.1.4 Reptile Area Searches

The subject property was searched for potential hibernacula during the initial site visit. Reptile area searches were completed during all subsequent field visits.

3.1.5 Additional Wildlife

All observations of birds, mammals, herpetofauna and insects were documented on all field visits. This included actual direct observations of individuals, as well as signs of wildlife presence (i.e. tracks, scats, dens, nests etc.).

3.1.6 Significant Wildlife Habitat Assessment and SAR Habitat

Significant Wildlife Habitat (SWH) types and SAR habitats identified as potentially occurring within the study area (i.e. Candidate) during the background review were further assessed for their presence in the field during all surveys. This included searching the subject property for

stick nests during leaf off, as well as conducting a visual search for potential hibernacula for snakes.

The bat habitat assessment was completed based on the guidelines outlined in the Survey Protocol for Species at Risk Bats within Treed Habitats for Little Brown Myotis, Northern Myotis & Tri-Colored Bats (MNRF 2017).

Standing live or dead trees with cracks, crevices, hollows, cavities, and/or loose or naturally exfoliating bark that could provide suitable roosting habitat for bats were documented within the subject property. Tree species, DBH, decay class according to Watt and Caceres (1999), and the number, height, and type (e.g., cavity, crevice, sloughing bark, etc.) of suitable roost sites was documented for each candidate roost tree.

3.1.7 Aquatic Survey

A high-level aquatic habitat assessment was completed on the Tributary to the Thames River on the adjacent lands from where it exits the culvert to the confluence with the Thames River.

4.0 Existing Conditions

4.1 Soil, Terrain and Drainage

The subject property is located within the Thames River spillway channel. The soils on the site are well-drained sandy loam on the tableland and finer textured silt loam in the lowland.

The tableland and lowland portions of the site are nearly flat with a gentle north-facing aspect. These two areas are separated by a pronounced slope that descends from approximately 246 masl to approximately 238 masl, bisecting the property in a west-east orientation. Site drainage is directed north toward the Thames River. A ditch runs along the eastern property boundary (on the tableland to the east of the residence). Approximately 25m west of the property boundary, beyond the terminus of Chesterfield Avenue, a stormwater outlet is present on the lower slope, and directs water into a channel that connects to the Thames River.

The subject property does not contain any wetland features. A riverine slough comprised of marsh and swamp is present approximately 40m from the western property line and more than 50m from the proposed development area on the tableland.

The subject property lies within the Upper Thames River watershed, which falls under the jurisdiction of the UTRCA. Drainage moves south to north across the property. To the west of the residence the topography slopes toward a watercourse that originates from a buried SWM outlet. To the east of the residence drainage collects along the property boundary and collects within the forest within the lowland area.

4.2 Vegetation

4.2.1 Vegetation Communities

A summary of ELC communities identified within the subject property is provided in Table 3 and shown on Map 2. A wetland comprised of marsh and swamp is present off-site more than 50m from the property boundary and as such is not further detailed in this report.

Table 3. Ecological Land Classification Community Descriptions.

ELC Code	Community Type	Community Description
FOD7-3	Fresh - Moist Willow Lowland Deciduous Forest	Lowland forest is present in the northern extent of the subject property. This habitat is comprised of several large Crack Willow (*Salix fragilis*), with numerous mid-age Manitoba Maple (*Acer negundo*) and small numbers of Black Walnut (*Juglans nigra*). The shrub layer contains European Buckthorn (*Rhamnus cathartica*) which becomes dense near the edge of

ELC Code	Community Type	Community Description
		the cultural meadow. The groundcover is comprised mainly of Garlic Mustard (*Alliaria petiolata*) Dames Rocket (*Hesperis matronalis*) and exhibits limited diversity.
H1 & H2	Deciduous Hedgerow	The residence is surrounded by two deciduous hedgerows comprised of native trees including Red Oak (*Quercus rubra*), Bur Oak (*Quercus macrocarpa*) and Common Hackberry (*Celtis occidentalis*). Both hedgerows contain small numbers of European Buckthorn in the shrub layer as well as native species including Chokecherry (*Prunus virginiana*) and Alternate-leaved Dogwood (*Cornus alternifolia*). 1954 air photography does not indicate any mature hedgerow trees to be present and tree cover in the general area is limited to the slope that bisects the property (University of Toronto 2020).
CUM	Cultural Meadow	An area of cultural meadow is present in the northern extent of the property. A large portion of this meadow was mowed until recently when the residence was occupied. The meadow is comprised of Smooth Brome (Bromus inermis) with Reed Canary Grass (Phalaris arundinacea) in the low area along the west edge of the meadow.
Residence	Developed	A single detached residence and manicured lawn comprises much of the proposed development area. The yard contains a number of landscape trees and a groundcover of Kentucky Bluegrass (*Poa pratensis)* with sporadic early successional species that have established in the absence of mowing through the summer. Details pertaining to the trees within this area are outlined in the TIPP prepared under a separate cover.

4.2.2 Vascular Flora

A total of 68 vegetation species were observed by NRSI biologists within the study area during vegetation inventories. A complete list of all observed species and species reported from the vicinity of the study area is provided in Appendix IV.

A review of NHIC data for the square that overlaps the study area found no SAR or SCC vascular plants reported (MNRF 2023). NRSI biologists observed one SAR plant during the 2020 surveys. Kentucky Coffee-tree (*Gymnocladus dioicus*) was found growing in the yard of the residence. This species was planted and is not of natural origin; however, the individual is still afforded protection under the *ESA, 2007*. False Sunflower (*Heliopsis helianthoides*), a species considered to be rare in Middlesex County was observed off-property in the cultural meadow community to the north, associated with the floodplain conditions.

4.2.3 Tree Inventory

In total, 113 trees were inventoried, including 21 species. Of the trees inventoried and assessed, 94 are native species and 19 are non-native. Table 4 provides a summary of trees inventoried from the subject property and adjacent lands. The Tree Protection Plan (TPP) prepared by NRSI (2023) provides a fulsome description of the inventoried trees, and provides mitigation and compensation measures for trees on and adjacent to the subject property.

Table 4. Summary of Inventoried Trees Within the Subject Property

Common Name	Scientific Name	Excellent	Good	Fair	Poor	Very Poor	Dead	Total
Native Species								
American Basswood	*Tilia americana*			2			1	3
American Beech	*Fagus grandifolia*		1	5				6
American Elm	*Ulmus americana*						1	1
Black Cherry	*Prunus serotina*			5	1			6
Black Walnut	*Juglans nigra*		5	3				8
Bur Oak	*Quercus macrocarpa*		4	15				19
Common Hackberry	*Celtis occidentalis*			2				2
Eastern Red Cedar	*Juniperus virginiana*			1	2	3	1	7
Eastern White Pine	*Pinus strobus*	1	1					2
Freeman's Maple	*Acer x freemanii*		2					2
Manitoba Maple	*Acer negundo*		1	2	1			4
Northern Red Oak	*Quercus rubra*		11	11				22
Shagbark Hickory	*Carya ovata*			1				1
Sugar Maple	*Acer saccharum*		3	3				6
White Ash	*Fraxinus americana*					1		1
White Oak	*Quercus alba*		2	2				4
Total		1	30	52	4	4	3	94
Non-Native Species								
Norway Maple	*Acer platanoides*		2	10				12
Norway Spruce	*Picea abies*		1					1
Thornless Honey Locust	*Gleditsia triancanthos var. inermis*			1				1
White Mulberry	*Morus alba*			3	1			4
Winged Euonymus	*Euonymus alatus*				1			1
Total		0	3	14	2	0	0	19
Overall Total		1	33	66	6	4		113

4.3 Wildlife

4.3.1 Birds

Breeding Bird Surveys

A total of 92 bird species are reported from the study area or vicinity based on the OBBA and NHIC database (BSC et al. 2008, MNRF 2023).

NRSI biologists documented 28 species within the study area during breeding bird surveys. One of these species was not previously documented in the OBBA or NHIC database, Chestnut-sided Warbler (*Setophaga pensylvanica*). A complete list of all observed species and species reported from the vicinity of the study area is provided in Appendix V.

Based on available background information, three bird SAR and seven bird SCC are reported from the vicinity of the study area (BSC et al. 2008, MNRF 2023). Appendix II provides a summary of significant species reported from the vicinity of the study area, including their current status ranks and preferred habitats. Based on the surveys conducted in 2020, the study area may provide habitat for 2 of these SAR/SCC although neither were observed. The residence and river corridor provide suitable nesting and foraging habitat for Barn Swallow (*Hirundo rustica*) while the treed features within the valley and floodplain provide moderately suitable habitat for Eastern Wood-pewee (*Contopus virens*). A single Chimney Swift (*Chaetura pelagica*) was observed as an incidental fly-over on April 8, 2020 and again on June 9, 2020. This species is listed as Threatened both provincially and federally (MNRF 2023, Government of Canada 2023). The residence does not have a chimney that could provide suitable nesting habitat and this individual was observed foraging above the river.

Stick Nest Area Search

The trees within the subject property were visually assessed during leaf off to determine if there were any stick nests (i.e. raptor nests). No nests were observed within the subject property.

4.3.2 Herpetofauna

A total of 23 herpetofauna species are reported from the study area or vicinity based on the Ontario Amphibian and Reptile Atlas and NHIC database (Ontario Nature 2019, MNRF 2023) with two being regulated SAR and three being SCC.

Appendix I provides a summary of significant species reported from the vicinity of the study area, including their current status ranks and preferred habitats. A complete list of all observed

species and species reported from the vicinity of the study area is provided in Appendix VI. No reptile or amphibian species were observed on the subject property during the 2020 surveys, and no suitable habitat was observed. The visual survey for potential hibernacula was also completed during the initial site visit and no suitable features were observed.

4.3.3 Mammals

A total of 47 mammal species are reported from the study area or vicinity based on the Mammal Atlas of Ontario and NHIC database (Dobbyn 1994, MNRF 2023). NRSI biologists observed four of these species during the 2020 surveys. All species are common in Ontario and the London area and include Eastern Cottontail (*Sylvilagus floridanus*), Eastern Gray Squirrel (*Sciurus carolinensis*), Northern Raccoon (*Procyon lotor*) and White-tailed Deer (*Odocoileus virginianus*). A complete list of all observed species and species reported from the vicinity of the study area is provided in Appendix VII.

Based on available background information, six mammal SAR and one mammal SCC are reported from the vicinity of the study area (Dobbyn 1994, MNRF 2023). None of the reported SAR or SCC were observed during field surveys conducted by NRSI, and only three were determined to have potentially suitable habitat within the subject property. These SAR are Little Brown Myotis (*Myotis lucifugus)*, Northern Myotis (*Myotis septentrionalis*), and Tri-colored Bat (*Perimyotis subflavus*). Suitable roosting habitat for these bat species is present in a large Crack Willow located within the floodplain and foraging habitat is present within and adjacent to the Significant Woodland. As the proposed development will not impact vegetation in the floodplain area, targeted surveys for bats were not conducted and the habitat remains candidate. Appendix II provides a summary of significant species reported from the vicinity of the study area, including their current status ranks and preferred habitats.

4.3.4 Butterflies

A total of 46 butterfly species are reported from the study area or vicinity based on the Ontario Butterfly Atlas and NHIC database (MacNaughton et al. 2023, MNRF 2023). A complete list of all observed species and species reported from the vicinity of the study area is provided in Appendix VIII.

Based on available background information, four butterfly SCC are reported from the vicinity of the study area (MacNaughton et al. 2023, MNRF 2023). Appendix II provides a summary of significant species reported from the vicinity of the study area, including their current status

ranks and preferred habitats. No regionally, provincially or federally significant species were observed within the subject property during 2020 field surveys.

4.3.5 Odonates

A total of 53 odonate species are reported from the study area or vicinity based on the Ontario Odonate Atlas and NHIC database (OOAD 2023, MNRF 2023). A complete list of all observed species and species reported from the vicinity of the study area is provided in Appendix IX.

Based on available background information, one odonate SCC has been documented in the vicinity of the study area, Slender Bluet (*Enallagma traviatum*). No suitable habitat for this species is present on the subject property. Any habitat that may be considered suitable for these species would be associated with the Thames River off-property, and would not be subject to any impacts relating to the proposed development.

4.4 Aquatic Resources

4.4.1 South Thames River

The South Thames River is immediately adjacent to the subject property. The Forks 2022 Watershed Report Card (UTRCA 2022) identifies that there are 63 fish species and 24 mussel species throughout this area. As no works are slated to occur within the South Thames River, no specific fish or mussel surveys were completed.

Based on available background information (DFO SAR Mapping), seven SAR and four SCC fish and mussels have been documented within the vicinity of the subject property. It is likely that there are more SCC mussels within the Thames River as these are under documented. Any habitat that may be considered suitable for these species would be associated with the Thames River off-property, and are not expected to be subject to any impacts relating to the proposed development. Complete lists of all observed fish and mussel species reported from the vicinity of the study area are provided in Appendix X and XI, respectively.

4.4.2 Drainage to South Thames River

A drainage feature to the South Thames River is present immediately west of the subject property. The feature originates at a stormwater outlet (1.2m culvert) at the north end of Chesterfield Ave through a grate/trash rack and into a rip rap lined pool. Below the pool is a gradient change with rip rap/ placed rock material. The feature is much wider downstream of the gradient change and gradually gets narrows near to the confluence. Evidence of erosion

and high flow was present within the channel. The water was clear and flowing at the time of the investigation, and the water temperature was 12°C. Substates within the channel were primarily muck and silt, with some gravel. The feature had good shading and had access to the floodplain. There is a trail along the feature and a small wooden bridge approximately half way down towards the confluence with the Thames River. No barriers to fish were observed and fish were present at the mouth of the river. No mussels (live or shells) were observed.

5.0 Significance and Sensitivity of Natural Features

An analysis of the significance and sensitivity of existing natural features within the subject property was completed in order to identify those features and habitats that are sensitive to disturbance. This analysis is based on the rarity or significance of features and/or associated functions/processes and/or current policies, legislation, or planning related studies. Such features and functions identified as sensitive to disturbance are further identified as 'constraints' to development, prohibiting or constraining aspects of any proposed development around or within them. The analysis is also used to identify 'opportunity' areas that have been previously disturbed or contain no natural features where potential for habitat rehabilitation or enhancement exists. These areas also allow for possible development that would have less of a direct impact in comparison to areas with natural features and potential wildlife habitat. Results of this analysis are provided in the following sections to inform the development plan.

5.1 Significant Wetlands

There are no Provincially Significant Wetlands (PSWs) or other wetlands present within the subject property. As provided in The London Plan (2023), all wetland features, regardless of their designation, are subject to the Natural Heritage System policies and are protected (City of London 2023).

5.2 Significant Valleylands

The Thames River, which is adjacent to the subject property and present in the study area is mapped as a significant valleylands within the London Plan (2023). Significant valleylands associated with the Thames River overlap the northern edge of the near to the Thames River, but do not overlap the portion of the parcel where development has been proposed, see Map 3.

5.3 Significant Woodlands

The London Plan (2023) recognizes Significant Woodlands and has identified the presence of woodlands on and adjacent to the subject property. The lowland area of the study area is surrounded by woodlands, see Map 2, these woodlands require evaluation for significance in accordance with the City's *EMG* (2021b).

During the initial project scoping meeting the City of London's Ecologist, J. MacKay, indicated that the area between the mapped Significant Woodlands would also need to be evaluated in accordance with the City's *EMG* (2021b), this document was updated in 2021. As such the updated guidelines have been applied for this Significant Woodland evaluation. As shown on

Map 2, two areas of forest (FOD7-3) south of the Thames River are divided by a narrow cultural meadow (CUM). In accordance with Section 4, Guidelines 4 and 6 of the EMG, the CUM area would be treated as a component of the overall vegetation patch since the gap between the FOD7-3 areas is less than 30m and the CUM connects the two forest patches. This is further supported since the vegetation patch is located along the Thames River corridor. The entire unevaluated vegetation patch (CUM and FOD7-3) is greater than 0.5ha and requires assessment for significance in accordance with Appendix D of the EMG (2021b).

Based on the surveys completed in 2020, it was determined that the woodlands are restricted to the lowland area with deciduous hedgerows extending along the western and eastern property boundaries in the tableland area (Map 2).

A portion of the subject property that NRSI biologists mapped as H1 has been identified as Woodland under the London Plan (2023). Within the subject property, there is an abrupt transition from lowland forest, dominated by Manitoba Maple and Willow to the Red Oak that comprise the H1 feature. These Red Oak are situated more than 10m above the elevation of the floodplain forest. Although the canopy is contiguous, structurally these two features (FOD7-3 and H1) are quite different in species composition. Structurally, H1 extends as a projection from the FOD7-3 community, along most of its length it is less than 30m wide. Where the floodplain forest extends from toe-of-slope to the Thames River and provides functional forest habitat, the H1 feature is quite exposed by edge effect and does not contribute to a core forest habitat. As the lands to the south of the subject property are urbanized, the H1 feature does not provide a natural linkage to other areas of natural cover and should not be considered to be significant woodland. In accordance with Section 4, Guideline 3 of the EMG (2021b) projections from woodlands that are less than 30m wide, do not contain a ravine or valley, and provide no linkage function are not included in the overall vegetation patch. H1 has not been identified as a component of the Significant Woodland based on these considerations, see Map 3.

The hedgerow that runs along the eastern side of the subject property, H2, has also been excluded from the larger vegetation patch associated with the FOD7-3 community. H2 is also a narrow projection from the FOD7-3 community that is significantly less than 30m wide along its entire length. The composition of the hedgerow is notably different from that of the FOD7-3 community and it provides no linkage to natural features to the south of the subject property. For these reasons, it has been excluded from the larger vegetation patch which includes the

FOD7-3 and CUM communities within the subject property and not considered a component of the Significant Woodland.

Appendix D of the City of London's EMG (2021b) provides the criteria for the identification of Significant Woodlands. It provides considerations/criteria for evaluation of the significance of woodlands into four broad categories:

- the woodland contains natural features and ecological functions that are important to the environmental quality and integrity of the Natural Heritage System;
- the woodland provides important ecological functions and has an age, size, site quality, diversity of biological communities and associated species that is uncommon for the planning area;
- the woodland provides significant habitat for endangered or threatened species;
- the woodland contains distinctive, unusual or high-quality natural communities or landforms.

Woodlands within the City of London are considered significant if one or more criteria receive a score of High or if five or more criteria receive a score of Medium. Based on the criteria presented in Appendix D the woodland vegetation patch associated with the subject property receives a score of High for several criteria and should be evaluated as significant. The significant component of the woodland vegetation patch would be confined to the lowland areas of the subject property and adjacent lands. In accordance with Section 5 of the EMG (2021b), Significant Woodlands require a buffer of 30m, see Map 3.

The extent of the 30m Significant Woodland buffer is confined to the northern portion of the subject property (Lot 8) where no new development has been proposed. The Significant Woodland buffer does not overlap the proposed development of Lots 1 to 7.

5.4 Environmentally Significant Areas

The City of London recognizes Environmentally Significant Areas (ESA), which are shown on Map 5 (Natural Heritage) of The London Plan (2023). No ESAs are located within or adjacent to the subject property.

5.5 Corridors and Linkages

No designated corridors or linkages other than the Significant Valleylands (Thames River) were identified as per The London Plan (2023). The lowland area within the subject property would act as a linkage or corridor for animal movement.

5.6 Significant Wildlife Habitat

Based on the results of a comprehensive background review and field studies one SWH type is considered candidate within the subject property; Bat Maternity Colonies. No SWH types were confirmed as present during 2020 surveys. This SWH types is discussed in detail below. Full results of the SWH assessment are discussed below and provided in Appendix III.

5.6.1 Candidate: Bat Maternity Colonies

Known locations of forested bat maternity colonies are extremely rare in all Ontario landscapes. Maternity colonies can be found in tree cavities, vegetation and often in buildings; however, buildings are not considered to be SWH. Maternity colonies are often located in mature deciduous or mixed forest stands with greater than 10 large diameter (>25 cm DBH diameter at breast height) wildlife trees per hectare. Silver-haired Bat (*Lasionycteris noctivagans*) prefers older mixed or deciduous forests and forms maternity colonies in tree cavities and small hollows. Older forest areas with at least 21 snags per hectare are preferred (OMNR 2000). A single cavity tree was documented from the western FOD7-3 forest community immediately adjacent to the subject property in the study area. As this tree is situated within the floodplain and would not be subject to any impacts relating to the proposed development, a full bat habitat assessment or acoustic surveys were not completed to confirm the presence or absence of a maternity colony. Therefore, the western FOD7-3 community is considered Candidate SWH for Bat Maternity Colonies

5.7 Habitat of Endangered and Threatened Species

One SAR was observed on the subject property, the Kentucky Coffee-tree. This individual is in the yard to the north of Veronica Avenue is not naturally occurring and appears to have been planted along with other to the south of the subject property.

Based on the results of a comprehensive background review and field studies suitable habitat for three species of SAR bat has been identified within the subject property. Targeted surveys for these species have not been completed, therefore, habitat for these species remains as candidate within the subject property.

5.7.1 Kentucky Coffee-tree

A single, planted Kentucky Coffee-tree was identified from the southeastern corner of the subject property. As a result of this observation, an Information Gathering Form (IGF) was submitted to the MECP in May 2023. This IGF confirms that the tree represents a planted individual and that suitable habitat for the species is not present within the development area of the subject property, where the tree is located, but may be present in the floodplain associated with the Thames River.

5.7.2 Little Brown Myotis, Northern Myotis and Tri-colored Bat

Suitable roosting habitat for Little Brown Myotis, Northern Myotis, and Tri-colored Bat may be present within the subject property. All three species are listed as Endangered provincially and federally. These species were not observed within the subject property by NRSI in 2020, but no targeted bat or bat habitat surveys were completed. As noted in Section 5.2, suitable roosting habitat for bat species may be present within the western FOD7-3 forest community. As such it has been considered candidate habitat for the three SAR bats listed above. Candidate habitat for SAR bats does not overlap any areas of proposed development and is confined to areas adjancent to the subject property and in the northern portion of the subject property that will be conveyed to the City of London. Based on guidance provided by the MECP, the removal of isolated trees is considered unlikely to cause significant impacts to SAR bats, and is therefore not expected to contravene the ESA; the MECP no longer recommends or supports bat habitat assessments or exit surveys that target individual trees. Harm or harassment of any SAR bats that may be using these trees can be avoided as long as the trees are removed during the appropriate window (Oct 1 to March 31). This tree removal timing window recommendation is included in the mitigation measures provided in Section 6.5.2.

Important SAR bat habitats that are the focus of protection efforts and surveys are now scoped to include hibernacula, treed habitats (maternity and day roosts), and buildings or other anthropogenic structures (maternity and day roosts) (MECP 2022). The existing building within subject property may have some potential to provide maternity colony habitat for Little Brown Myotis and other colony-roosting bat species; however, the building is not proposed for removal and any habitat that may be present is not expected to be impacted.

5.8 Fish Habitat

A watercourse is present to the northwest of the subject property and provides direct fish habitat. The Thames River, located to the north of the subject property, also provides direct fish

habitat. The proposed development will be restricted to the tableland to the southeast of the watercourse and well south of the Thames River.

5.9 Buffers

In the City of London, an ecological buffer is required whenever development occurs adjacent to a natural heritage feature. The width of the buffer depends on the type and sensitivity of the feature. The City of London EMG recommends a minimum buffer width of 30m beyond the dripline of trees for Significant Woodlands. The buffer from the Significant Valleylands is determined based on the component of the Natural Heritage System associated with the valleylands, in this case this would be the Significant Woodland. The dripline was surveyed by NRSI in May 2020.

The minimum recommended buffer for permanent watercourses, such as the feature to the northwest of the property, are dependent on the thermal regime of the watercourse in question. A minimum buffer of 15m is recommended for warm-water fish habitat, while a minimum buffer of 30m is recommended from cold-water fish habitat (City of London 2021b). An assessment of the thermal regime of the drainage feature to the northwest of the subject property was not completed; however, as the drainage feature is entirely contained within the Significant Woodland associated with the FOD7-3 community the 30m buffer proposed from this feature will provide appropriate protection for the watercourse as well.

5.10 Potential Naturalization Areas

Potential Naturalization Areas are areas where the opportunity exists to enhance, restore or expand the Natural Heritage System. These areas may include lands suitable to create natural habitats or to compensate for trees lost to development. Naturalization Areas are an important component of the Natural Heritage System as they may enhance, restore or strengthen and expand the health and viability of a natural heritage feature or area. These areas are protected by their inclusion in the Green Space Place Type.

The subject property and adjacent lands have not been identified as Potential Naturalization Areas in the London Plan (2023). The London EMG (2021b) recommends the selection of equivalent naturalization areas based on the ability of the proposed site to enhance lands adjacent to the City's NHS. Lands in the northern portion of the subject property that are associated with the Significant Woodland and Significant Valleylands should be considered for

opportunities to create naturalization areas at the detailed design stage of the proposed undertaking.

5.11 Summary of Natural Feature Constraints

Table 5. Summary of Natural Feature Constraints.

Natural Feature Constraint	Regulatory and Permitting Considerations	Project Considerations
Significant Woodland	• Provincial Policy Statement (OMMAH 2020) • Environmental Planning Policy Manual (UTRCA 2006) • The London Plan (City of London 2023) • County of Middlesex Official Plan (Middlesex County 2023) • Environmental Management Guidelines (City of London 2021b)	• A Significant Woodland is present within the lowland area of the subject property, see Map 3. • Development or site alteration in or within 120m of a Significant Woodland is not permitted unless it has been demonstrated that there will be no negative impacts on the features or their ecological function. • A minimum buffer width of 30m from the Significant Woodand dripline is required in accordance with the City of London *EMG* (2021b).
Watercourse and Fish Habitat	• Provincial Policy Statement (OMMAH 2020) • Environmental Planning Policy Manual (UTRCA 2006) • UTRCA Ont. Reg. 157/06 • Federal Fisheries Act (1985) • The London Plan (City of London 2023) • County of Middlesex Official Plan (Middlesex County 2023) • Environmental Management Guidelines (City of London 2021b)	• Fish habitat is present within the watercourse/drainage feature to the northwest of the subject property. • Fish habitat is also present within the Thames River to the north of the subject property. • Development or site alteration in or within 120 m of the fish habitat is not permitted unless it has been demonstrated that there will be no negative impacts on the features or their ecological function. • Minimum buffer widths from fish habitat vary between 15m and 30m depending on the thermal regime of the watercourse, since the thermal regime of the watercourse to the northwest of the subject property was not completed a 30m buffer has been applied from the high-water mark. • A 30m minimum buffer is required from the Thames River, this buffer has not been mapped since the bank of the Thames River is over 110m from the proposed development area.
Habitat for Threatened and Endangered Species	• Endangered Species Act, 2007 • Species at Risk Act • Provincial Policy Statement (OMMAH 2020)	• Development or site alteration in SAR habitat is not permitted, except in accordance with provincial and federal requirements. • No habitat for SAR has been confirmed within the subject property.

Natural Feature Constraint	Regulatory and Permitting Considerations	Project Considerations

	• Environmental Planning Policy Manual (UTRCA 2006)
	• The London Plan (City of London 2023)
		• Candidate habitat for the following SAR were identified within the study area, but outside the development area:
		  • Little Brown Myotis;
		  • Northern Myotis; and
		  • Tri-colored Bat.
		• These species were not observed on the subject property; however, no targeted surveys were undertaken for SAR bats or their habitat.
		• A single, planted Kentucky Coffee-tree was identified on the subject property. Based on correspondence with the MECP the tree will need to be relocated, but habitat has not been identified for the species within the proposed development area.

Significant Wildlife Habitat	• Provincial Policy Statement (OMMAH 2020) • Environmental Planning Policy Manual (UTRCA 2006) • The London Plan (City of London 2023)	• One candidate SWH type, Bat Maternity Colonies, has been identified within the subject property. • No confirmed SWH are present within the subject property. • Development or site alteration in SWH is not permitted unless it has been demonstrated that there will be no negative impacts on the features or their ecological function.
Significant Valleylands	• Provincial Policy Statement (OMMAH 2020) • Environmental Planning Policy Manual (UTRCA 2006) • The London Plan (City of London 2023) • Environmental Management Guidelines (City of London 2021b)	• Significant Valleylands are present within the riparian corridor of the Thames River to the north of the subject property. • Development or site alteration in valleylands is not permitted unless it has been demonstrated that there will be no negative impacts on the features or their ecological function. • A buffer from the top of bank of Significant Valleylands is required, the minimum buffer width is based on the component of the Natural Heritage System associated with the valleylands, in this case Significant Woodland.
Potential Naturalization Areas	• The London Plan (City of London 2023) • Environmental Management Guidelines (City of London 2021b)	• No Potential Naturalization Areas identified by the London Plan (2023) are present in the study area. • Potential opportunities for naturalization are present in the northern portion of the subject property where development has not been proposed.

6.0 Impact & Net Effects Assessment

6.1 Description of the Proposed Undertaking

The proposed residential development consists of the creation of seven additional single detached development lots on the property at 32 Chesterfield Avenue. The existing residential dwelling (lot 8) will be retained on the property. Interior renovations are proposed for the existing house, but its footprint will not be altered. Driveways for the seven new lots will front onto Chesterfield Avenue and Veronica Avenue, the driveway access for the existing lot will be repositioned to the northern limit of the Chesterfield Avenue road allowance. The layout of the proposed development is shown on Map 3.

It is anticipated that the construction of the proposed project will also involve the connection to the sanitary sewer network and water distribution system from the existing residential subdivision; however, details on the proposed servicing plan are not yet available.

6.2 Approach to Impact and Net Effects Assessment

The potential impacts are determined by comparing the characteristics of the existing natural features and their functions to typical residential and construction processes. Where a development proposal overlaps or is adjacent to natural features, impacts may arise.

The following is a description of the types of impacts that have been assessed.

- **Existing** impacts are discussed in relation to impacts from previous or existing land uses or activities that have affected the natural heritage features of the study area.
- **Direct** impacts are discussed in relation to the natural features and wildlife on the subject property associated with disruption or displacement caused by any potential future 'footprint' of an undertaking.
- **Indirect** impacts are discussed in relation to changes in site conditions such as drainage and water quantity/quality on the subject property and adjacent communities.

A summary of impacts, mitigation measures and net effects is provided in a Net Effects Assessment Table in Appendix XII.

6.3 Existing Impacts

Ecological buffers are required by the London Plan (2023) to mitigate impacts from proposed development on protected natural heritage features. Due to the existing residential use of the

property at 32 Chesterfield Avenue, an ecological buffer has not been established as part of the current residential land use. The existing residential lot is subjected to activities including mowing, gardening, and small-scale recreation, including the presence of an above ground pool.

The City of London *EMG* (2021b) requires that ecological buffers originate from the boundary of natural heritage features and extend outwards to the limit of development.

Mitigation, Protection & Compensation

A 30m buffer has been applied from the Significant Woodland to the north and east of the subject property. Since the footprint existing residential development will be retained, an ecological buffer from the Significant Woodland has not been proposed for lot 8. Alternatively, lands to the north of the existing residential lots, as shown on Map 3, will be conveyed to the City of London for enhancement and naturalization to improve the overall quality of the Significant Woodland and fill in gaps and bays within the woodland. The Significant Woodland buffer will be applied for the seven new lots that have been proposed, but is largely located on lands private lands outside the subject property. The enhancement, naturalization and conveyance of lands in the northern portion of the subject property will ensure a net positive effect, see Map 3.

6.4 Significant Woodland Buffer

The proposed buffer strategy for the Significant Woodland located to the north and east of the subject property will ensure that new construction and infrastructure do not overlap the proposed buffer. This mitigation measure is tied to the potential impacts associated with the proposed development and is a contributing factor to the proposed enhancement and naturalization strategy that will see lands in the northern portion of the subject property conveyed to the City of London. The boundary of the Significant Woodland is associated with the FOD7-3, FOD2-4, SWD4 and CUM (in the north of the subject property) vegetation communities that are shown on Map 2. These communities are largely located outside of the subject property; however, the CUM and FOD7-3 communities are present in the northern extent of the subject property. Since they largely occur on lands outside the subject property, the dripline of the vegetation communities associated with the Significant Woodland were not collected by NRSI in the field, but instead assessed through the delineation of vegetation communities.

A 30m buffer has been mapped from the edge of the Significant Woodland as per the extent of the woodland on Map 5 of the London Plan (2023). The 30m buffer is shown on Map 3. The 30m buffer only overlaps the subject property on lot 8, where no new development is proposed. The new lots and driveways that are proposed for construction have all been located outside of the buffer area.

As described above, and since the footprint of the existing house on lot 8 will be retained, enhancement plantings have not been proposed for the Significant Woodland buffer where it overlaps lot 8. Alternatively, the lands to the north of lot 8 will be naturalized through tree compensation and native vegetation plantings. These naturalization measures will ensure the quality of the Significant Woodland is improved in a meaningful way, and aid in filling gaps in the woodland associated with the CUM community. The proposed naturalization measures are described in greater detail in Section 7.1.

6.5 Direct Impacts

The location of natural features and evaluation of their ecological function should be the basis for any development layout. Direct impacts to these natural features should be avoided where at all possible. Within the subject property, direct impacts to natural features are anticipated to be minimal. The potential direct impacts are discussed in detail below and have been characterized as:

- Site Grading;
- Vegetation Removal; and
- Species at Risk.

6.5.1 Site Grading

Site grading can result in tree root systems being cut or compressed, hydrological flows patterns being altered, and wildlife habitat being removed. Due to the topography of the site, minor grading will be required for the construction of lots 1 to 7. As described in the TPP (NRSI 2023), the majority of trees proposed for retention will not be impacted by grading activities. Three off-property trees may be impacted since their Tree Protection Zone (TPZ) extends into the proposed development area.

If improperly graded, stormwater may runoff from the development area into the Thames River or watercourse northwest of the subject property. Runoff from the development area may result in sedimentation and deposition of excess road salts into the watercourses.

Mitigation, Protection & Compensation

A comprehensive grading plan will be prepared for the proposed development at the consent stage and should be identified as a condition of consent. The proposed grading plan should ensure that runoff is directed away from watercourses to the north and east of the subject property. TPZs should be afforded to retained trees on the subject property and permission to impact the three trees identified on adjacent lands will be required from those landowners.

In order to ensure that proposed grading activities do not impact adjacent natural heritage features or their buffer, the limit of grading should be demarcated in the field through the use of Tree Protection Fencing (TPF) (which will double as Erosion and Sediment Control (ESC) fencing), that will be erected prior to any vegetation removal, site clearing or grading activities. It is anticipated that most grading activities will occur within the seven new lots and will not be required within the existing residential property (lot 8). These mitigation measures will ensure no net effect.

6.5.2 Vegetation Clearing

The removal of isolated trees and trees from the western hedgerow (H2), as well as minor injury to tree limbs or their root systems from machinery and construction activities (e.g., grading, excavation, etc.) may occur. A TPP has been required by the City of London and prepared by NRSI as a standalone report. The TPP has been prepared in consideration of the City of London' Tree-Protection By-law (no. C.P.-1555-252) (2021a), the London Plan (2023), and Section 12 of the Design Specifications & Requirements Manual, Tree Planting and Protection Guidelines (City of London 2019).

The proposed development will result in the removal of 39 trees with a DBH ≥10cm. These removals have been limited to the greatest extent possible and will involve the removal of isolated trees and trees within a hedgerow (H2).

Mitigation, Protection & Compensation

The proposed development plan has been prepared to maximize tree retention within the subject property, while achieving the objective of creating seven new development lots. The TPP (NRSI 2023) identified TPZs from trees that will be retained to minimize damage during grading and construction. TPF (combined with ESC fencing) will be erected prior to the initiation of vegetation removals, site clearing and grading. Specifications for the design and layout of TPF are provided in the TPP. The installed TPF is to be inspected by a Certified Arborist or Registered Professional Forester prior to the commencement of work. These barriers are to be maintained throughout the construction period to ensure the protection of retained trees and their root systems, and trees are to be inspected post-construction for damage.

Compensation measures for trees removed from the subject property should be addressed as a condition of consent since the proposed development cannot be initiated until the consent conditions are fulfilled, this recommendation is also identified in the TPP. It is recommended that compensation plantings be completed within the naturalization areas in the northern portion of the subject property that have been identified for conveyance to the City of London.

The removal of trees and vegetation has the potential to disrupt or harm nesting birds. The schedule of work must consider the *Migratory Birds Convention Act* (*MBCA*) (Government of Canada 2019) construction window. In accordance with the timing window all tree and vegetation removals should occur outside the core nesting period for migratory birds as established by the Canadian Wildlife Service (CWS) (2012). In southern Ontario, this period extends from approximately April 1 to August 31. For any tree or vegetation removal which occurs during the core nesting period, nest surveys may be conducted by a qualified biologist within small, simple habitat areas (i.e., individual isolated trees and hedgerow trees as found on the subject property) just prior to the removal activity (less than 48hrs prior to) to ensure that nesting birds are not present. If active nests are present, nests and an appropriate buffer are to be flagged and protected until the young have fledged and left the nest.

The eggs and nests of all species of wild bird are also protected under the *Fish and Wildlife Conservation Act* (Government of Ontario 1997). This includes species identified as raptors (e.g., hawks and owls), which are not protected under the *Migratory Birds Convention Act*. It should be noted that some species of raptors breed and nest during the winter months in Ontario. Although the subject property does not contain suitable habitat for winter raptor nesting,

care and consideration of the possible presence of winter nesting species should be executed should tree removal occur in the winter.

SAR bats and their habitats are protected by the Endangered Species Act (Government of Ontario 2007). In order to avoid impact to bats and their habitat, trees must be removed outside of the bat active roosting period, which extends from approximately March 31 to September 30. Prior to any tree removal during the active roosting period for bats, a bat habitat assessment will need to be undertaken during the leaf-off period to determine whether potential roosting habitat for SAR bats is present, and correspondence with the MECP may be required.

All recommendations relating to tree removal provided in the TPP (NRSI 2023) should be implemented for the proposed development. These mitigation measures will ensure no net effect.

6.5.3 Species at Risk

Habitat for SAR within the subject property consists of candidate habitat for Little Brown Myotis, Northern Myotis, and Tri-colored Bat in the Significant Woodland (FOD7-3 within the subject property). No vegetation removals or impacts are proposed within the Significant Woodland and a 30m buffer has been applied from the feature. SAR bats may still roost in isolated trees and hedgerows that are present within the subject property and vegetation removals must have consideration for these species as identified above.

A single Kentucky Coffee-tree was identified within the subject property and determined to be a planted specimen associated with the existing residential development. As a planted individual, habitat for the species has not been identified within the development area, but may be present within the floodplain associated with the Thames River. An IGF was submitted to the MECP is May 2023 confirming these findings. A response was received from the MECP in September 2023, they have confirmed that although the Kentucky Coffee-tree is planted it is still protected under the ESA and that works should be registered under O.Reg 242/08 to ensure compliance.

Mitigation, Protection & Compensation

Timing windows for tree and vegetation removals as described in Section 6.5.2 should be implemented to ensure no negative impacts to SAR bats that may result in contravention of the *ESA, 2007*.

In accordance with Section 27.13 of O. Reg. 242/08 (Species Protection, recovery activities) and the Recovery Strategy for Kentucky Coffee-tree in Ontario (MNRF 2017), it is recommended that the Kentucky Coffee-tree on the subject property be relocated to the floodplain associated with the northern areas of the subject property where enhancement and naturalization activities are proposed.

In order to undertake the relocation of the Kentucky Coffee-tree in accordance with Section 27.13 of O. Reg. 242/08, a Notice of Activity must be submitted to the Minister of the MECP prior to commencing the activity. A mitigation plan identifying the steps required to undertake the relocation, minimize adverse effects on the species and monitor the effectiveness of the proposed activity. While carrying out the activity, a record must be maintained identifying the effects of the activity on the species, steps taken to minimize adverse effects, and the names of qualified individuals who carried out the activity. The record must be maintained for five years following its preparation and be provided to the MECP within 14 days of being requested. Within 180 days of the completion of the activity, a report must be prepared and submitted to the MECP that summarizes the activity, provides a copy of the record and summarizes the outcome of the activity.

NRSI recommends that the Notice of Activity and mitigation plan be prepared at the consent stage and be a condition of consent. These mitigation measures will ensure no net effect, or contravention of the *ESA*.

6.6 Indirect Impacts

The following section outlines potential sources of indirect impacts associated with the proposed development:

- Hydrological Changes
- Erosion and Sedimentation; and
- Impacts to Wildlife and Vegetation Communities.

6.6.1 Hydrological Changes

The subject property is located within the Central Thames Subwatershed and is located in proximity to the Thames River, a drainage feature is also present to the northwest of the subject property and flows into the Thames River. Based on site topography, it is anticipated that the existing drainage pattern is primarily surface infiltration and overland flow. Overland flow is

directed north and northeast to the drainage feature and Thames River. The subject property is also located within a Highly Vulnerable Aquifer (UTRCA 2021).

The proposed development will result in pervious lands being replaced with impervious features, including driveways and residential structures. Grading of the site may result in alterations to overland flow patterns.

Mitigation, Protection & Compensation

A grading plan should be developed that promotes infiltration. Overland flows should be directed to the municipal stormwater management system to ensure they are properly treated prior to discharge to the Thames River. Where feasible the use of permeable pavers and pervious pipes should be considered to increase infiltration across the subject property.

During construction, sedimentation controls such as ESC fencing should be implemented to reduce the turbidity of any fun-off water and prevent erosion. Enhancement and naturalization plantings should be provided within the naturalization lands identified in the norther portion of the subject property to further reduce erosion and filter overland runoff from the subject property. These mitigation measures will ensure no net effect.

6.6.2 Erosion and Sedimentation

During construction, areas of bare soil may be exposed that have the potential to erode during precipitation events and impact adjacent natural features. In the event of a heavy rain or snow melt event, sediment laden runoff can enter adjacent natural areas by way of overland flow. In order to protect off-site natural features from potential impacts due to sediment, an ESC plan should be developed and implemented prior to any construction activities on the site, including any vegetation removal and clearing.

Mitigation, Protection & Compensation

Heavy-duty filter fabric ESC fencing should be installed along the limit of disturbance prior to any form of development or site alteration, including any vegetation removals and clearing and grubbing. The heavy-duty ESC fencing should be combined with TPF where possible. The heavy-duty ESC is to be maintained in good working order by the developer and/or their representative for the entire construction phase, and be removed once all development is complete and exposed soils are stabilized. Any exposed soils and steep slopes within the

subject property will require special care to avoid erosion and sedimentation, and should be seeded immediately following grading activities. These mitigation measures will ensure no net effect.

6.6.3 Impacts to Wildlife and Vegetation Communities

Potential indirect impacts to wildlife and vegetation communities may arise from noise and dust associated with construction activities and unnatural lighting resulting from the development. Dust has the potential to cover vegetation, reducing photosynthetic rates, slowing evapotranspiration, and in effect, interrupting thermoregulating processes. During site preparation and construction activities involving a lot of noise, such as site grubbing and grading activities, wildlife may temporarily avoid the area. In addition, artificial lighting resulting from the development can have long-term impacts on wildlife in the adjacent woodlands.

Mitigation, Protection & Compensation

To reduce impacts to wildlife from noise, vibrations and light from construction equipment, daily construction activities should be restricted to between 7:00am and 7:00pm. Noise and vibrations associated with construction is anticipated to be temporary; therefore, significant effects on wildlife are not expected. Dry exposed soils should be soaked to reduce dust on adjacent vegetation. It is not anticipated that the proposed development will significantly impact the ability of wildlife to move across the site, and the long-term use of adjacent natural features will not be affected. These mitigation measures will ensure no net effect.

7.0 Environmental Management and Monitoring Plan

The primary objective of the Environmental Management and Monitoring Plan (EMMP) is to enhance naturalization areas on-site, provide compensation plantings for tree removals, and establish a monitoring plan for the protection of the natural heritage system during and post-construction. An avoidance strategy was employed for the proposed development to mitigate potential impacts, such that there is no encroachment into existing natural features, and no long-term impacts on the resident flora and fauna are expected.

7.1 Management and Enhancement of Naturalization Area

The northern portion of the subject property has been identified for naturalization and conveyance to the City of London, see Map 3. These lands are located adjacent to the Thames River and comprise a cultural meadow gap in the Significant Woodland. A vegetated ecological buffer has not been provided on lot 8, due to the presence of an existing residential property that will be retained. As an alternative to the inclusion of a vegetated buffer on lot 8, it is recommended that these lands to the north of the subject property be conveyed to the City of London and naturalized to improve the overall quality of the Significant Woodland following the completion of construction activities.

It is recommended that a Planting Plan be developed for these lands, and should specify appropriate and diverse native species that are in line with the site conditions, adjacent vegetation communities and ecological context. Plant species that are native to the area and City of London should be incorporated. Additionally, the tree removal compensation plantings should be incorporated into the naturalization area, and the Kentucky Coffee-tree should be transplanted to the area. A fulsome Naturalization Planting Plan will be developed at the consent stage and will be a condition of consent. These plans can be provided as a component of the EMMP.

7.2 Monitoring

During and post-construction monitoring is recommended as a means to ensure that on-site and adjacent natural heritage features are adequately protected, and that the proposed enhancement and naturalization measures are functioning as intended following the build-out of the development. The components of the proposed monitoring program are described below. A fulsome EMMP is to be prepared at the consent stage and will be a condition of consent.

7.2.1 During Construction

- A combined sediment and erosion control fence (i.e. silt fence) and Tree Protection Fencing (TPF) is recommended where trees are situated adjacent to the limit of disturbance. The installation and location of the TPF is to be inspected by a Certified Arborist before any construction activities begin, and maintained by the developer during the entire construction period. Any minimal damage (i.e. damage to limbs or roots) to trees to be retained during construction must be pruned using proper arboricultural techniques. Should any of the trees intended to be retained be seriously damaged or die as a result of construction activities, consultation with the City will be required. More information regarding TPF can be found in the TPP (NRSI 2023).

- Buffer areas associated with the Significant Woodland should be inspected to ensure no unauthorized construction encroachments, vegetation damage, or other disturbances.

7.3 Post- Construction Stage

- Stabilization and re-vegetation of bare soil areas after construction is complete should be completed as soon as possible. Vegetation should not be used as a stabilization method in the summer and winter months, other stabilization methods should be used until planting conditions are appropriate;

- TPF and ESC fencing should be removed upon completion of construction activities. A Certified Arborist should be on site to monitor the removal of the TPF and inspect retained trees and their rooting area. Possible remediation work may be needed if retained trees or root zones are damaged;

- A 2-year monitoring plan should be developed to observe survival of planted trees and vegetation in the naturalization area, and to ensure that the proposed residential development has no negative impacts on surrounding natural features post-construction;

- The monitoring plan should include inspections of the transplanted Kentucky Coffee-tree in accordance with O. Reg. 242/08, and the mitigation plan that is to be prepared at the consent stage. The monitoring plan will be registered under Section 23.17 of O. Reg. 242/08 and a record of these monitoring activities is to be maintained; and

- Promote occupants' environmental stewardship awareness through provision of an environmental guide/brochure that contains a list of recommendations (i.e. dos and

don’ts) to avoid/minimize residual impacts (i.e. control pets, avoid tree removals, avoid use of pesticides and toxic materials, use of invasive plant species/native species alternatives).

The proposed monitoring program will incorporate an adaptive management process in which monitoring results will be used to identify and focus requirements for improved or revised impact mitigation measures. The monitoring program will detail potential measures that may be implemented to alleviate observed residual impacts. For example, where naturalization plantings are observed to exhibit signs of poor health or die-back, additional measures will be considered based on the cause of the impairment (a more frequent watering schedule, installation of measures to mitigate deer browse).

8.0 Conclusions

NRSI was retained by Pearl Investments in November 2019 to complete an EIS for a proposed re-development of a residential lot located at 32 Chesterfield Avenue in London, Ontario, see Map 1. A Tree Preservation Plan for the subject property has been prepared by NRSI under a separate cover. The proposed re-development involves the creation of seven residential lots in the southern extent of the subject property, with the existing residential lot retained in its existing condition.

The subject property is approximately 0.6ha in size and is bounded by natural features including the Thames River, wetland and forest, as well as Chesterfield and Veronica Avenue, and residences. A single residential property on the subject property and includes isolated trees and hedgerows, mowed lawn, landscaped gardens and an above ground pool. The subject property is within the Central Thames Subwatershed and is within Ecoregion 7E. Due to the presence of the Thames River and its floodplain, a large portion of the subject property is regulated by the UTRCA under Ontario Regulation 157/06 (2013).

Based on the results of background reviews and original field surveys, this report found that forests on and adjacent to the subject property, meet the qualifications to be considered Significant Woodland. The Significant Woodland does not overlap the proposed development area, but is present on the existing residential lot that will be retained. No confirmed SWH or SAR habitat has been identified within the study area; however, candidate SWH and SAR habitat has been considered for the Significant Woodland. Additionally, a single SAR, Kentucky Coffee-tree, was identified within the subject property and represents a planted individual. As such, habitat has not been identified for the species, but the individual is afforded protection under the *ESA, 2007*.

Mitigation, protection and compensation measures have been recommended in Section 6.0 of this report. These measures included the enhancement and naturalization of lands in the northern portion of the subject property, these lands will be conveyed to the City of London. As demonstrated in the Net Effects Assessment table (Appendix XII), assuming the recommended avoidance, mitigation and compensation measures are correctly implemented properly, no negative impacts on the natural features or on their ecological functions should occur on or adjacent to the subject property.

At this stage of the proposed project all intentions and requirements of the environmental policies of the City of London Plan (2023), EMG (City of London 2021b), PPS (OMMAH 2020) and other relevant legislation have been met (see Table 1 and Table 5). A comprehensive EMMP, detailed Grading Plan, and Mitigation Plan for the Kentucky Coffee-tree should be developed at the consent stage and considered conditions of consent.

9.0 References

Bird Studies Canada. 2001. Ontario Breeding Bird Atlas (OBBA) Guide for Participants. Atlas Management Board, Federation of Ontario Naturalists, Don Mills.

Bird Studies Canada, Environment Canada's Canadian Wildlife Service, Ontario Nature, Ontario Field Ornithologists and Ontario Ministry of Natural Resources. 2008. Ontario Breeding Bird Atlas Database. Last Updated September 16, 2009. Available from: http://www.birdsontario.org/atlas/aboutdata.jsp?lang=en (Accessed December 2023).

Canadian Wildlife Service (CWS). 2012. "Explanation for the Core Nesting Periods Table." Ottawa, ON: Canadian Wildlife Service.

City of London. 2016. Tree Protection By-law. C.P.-1515-228.

City of London. 2019. Design Specifications & Requirements Manual. The Corporation of the City of London.

City of London. 2021a. Consolidated Tree Protection By-law (C.P.-1555-252). Consolidated December 2021.

City of London. 2021b. Environmental Management Guidelines. London, ON: City of London.

City of London. 2023. The London Plan. City of London. Consolidated May 2023.City of London. 2003 Uplands North Area Plan. City of London Planning Division. Available from: https://www.london.ca/business/Planning-Development/secondary-plans/Documents/UplandsNorthAreaPlan.pdf (Accessed April 2019).

Department of Fisheries and Oceans (DFO). 1985. R.S.C., 1985, c. F-14. Fisheries Act. https://laws-lois.justice.gc.ca/eng/acts/f-14/forks

Department of Fisheries and Oceans (DFO). 2023. Aquatic Species at Risk Maps. Available from: http://www.dfo-mpo.gc.ca/species-especes/sara-lep/map-carte/index-eng.html (Accessed December 2023).

Dillon Consulting. 2011. Thames Valley Corridor Plan. Final Report December 2011

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

Eakins, R.J. 2020. Ontario Freshwater Fishes Life History Database. Version 5.04. Online database. Available from: https://www.ontariofishes.ca/home.htm

Government of Canada. 2002. S.C. 2002, c. 29. Species at Risk Act. https://laws.justice.gc.ca/eng/acts/s-15.3/ (December 11, 2023).

Government of Canada. 2019. S.C. 1994, c.22 Migratory Birds Convention Act. https://laws-lois.justice.gc.ca/eng/acts/M-7.01/ (January 5, 2022).

Government of Canada. 2023. Species at Risk Public Registry: Species Index. Available from: https://wildlife-species.canada.ca/species-risk-registry/sar/index/default_e.cfm

Government of Ontario. 1997. S.O. 1997, c. 41. Fish and Wildlife Conservation Act. https://www.ontario.ca/laws/statute/97f41 (January 5, 2022).

Government of Ontario. 2007. S.O. 2007, c. 6. Endangered Species Act. https://www.ontario.ca/laws/statute/07e06 (January 5, 2022).

Lee, H.T., W.D. Bakowsky, J. Riley, J. Bowles, M. Puddister, P. Uhlig and S. McMurray. 1998. Ecological Land Classification for Southern Ontario: First Approximation and its Application. Ontario Ministry of Natural Resources, Southcentral Science Section, Science Development and Transfer Branch. SCSS Field Guide FG-02.

Macnaughton, A., R. Layberry, C. Jones and B. Edwards. 2023. Ontario Butterfly Atlas Online. Available from: http://www.ontarioinsects.org/atlas_online.htm (Accessed December 2023).

MacNaughton Hermsen Britton Clarkson Planning Limited (MHBC). 2022. 32 Chesterfield Avenue, London Proposal Summary Zoning By-law Amendment Application. August 2022.

Michigan Flora Online. 2011. Reznicek, A.A., E. G. Voss, & B. S. Walters. Last Updated February 2011. University of Michigan. Available from: https://www.michiganflora.net/species.aspx?id=2465

Middlesex County. 2023. County of Middlesex Official Plan. Consolidated July 7,2023. Available from: https://www.middlesex.ca/sites/default/files/documents/Middlesex%20County%20Official%20Plan%20July%2007%202023%20consolidated%20FINAL.pdf (Accessed December 2023).

Natural Resource Solutions Inc. (NRSI). 2021. 32 Chesterfield Avenue, London Natural Heritage Characterization Report. Prepared for Pearl Investments c/o Subramanian Suppiah. February 2021.

Natural Resource Solutions Inc. (NRSI). 2023. 32 Chesterfield Avenue, London Tree Protection Plan. Prepared for Pearl Investments c/o Subramanian. December 2023.

Ontario Ministry of Environment, Conservation and Parks (MECP). 2022. Species at Risk Bat Guidance

Ontario Ministry of Environment, Conservation and Parks (MECP). 2023. Species at Risk in Ontario (SARO). Available online: https://www.ontario.ca/page/species-risk-ontario

Ontario Ministry of Municipal Affairs and Housing (OMMAH). 2020. Provincial Policy Statement. Under the Planning Act. Toronto, ON.

Ontario Ministry of Natural Resources (OMNR). 2000. Significant Wildlife Habitat Technical Guide. Last updated October 2000.

Ontario Ministry of Natural Resources (OMNR). 2011. Birds and Bird Habitats Guidelines for Wind Power Projects. December 2011.

Ontario Ministry of Natural Resources and Forestry (MNRF). 2010. Natural Heritage Reference Manual.

Ontario Ministry of Natural Resources and Forestry (MNRF). 2014. Use of Buildings and Isolated Trees by Species at Risk Bats Survey Methodology. 1 pp.

Ontario Ministry of Natural Resources and Forestry (MNRF). 2015. Significant Wildlife Habitat Ecoregion 7E Criterion Schedule: Addendum to Significant Wildlife Habitat Technical Guide. MNRF, January 2015.

Ontario Ministry of Natural Resources and Forestry (MNRF). 2017. Recovery Strategy for the Kentucky Coffee-tree (*Gymnocladus dioicus*) in Ontario. Ontario Recovery Strategy Series. Prepared by the Ontario Ministry of Natural Resources and Forestry, Peterborough, Ontario. v + 6 pp. + Appendix.

Ontario Ministry of Natural Resources and Forestry (MNRF). 2023. Natural Heritage Information Centre (NHIC): Biodiversity Explorer, Land Information Ontario: http://www.gisapplication.lrc.gov.on.ca/mamnh/Index.html?site=MNR_NHLUPS_NaturalHeritage&viewer=NaturalHeritage&locale=en-US (Accessed December 2023).

Ontario Nature. 2019. Reptiles and Amphibians of Ontario Range Maps. Available from: https://www.ontarioinsects.org/herp/ (Accessed December 2023).

Ontario Odonate Atlas Database (OOAD). 2023. Natural Heritage Information Centre Ontario Odonata Atlas Database.

University of Toronto. 2020. 1954 Air Photos of Southern Ontario. Available online: http://maps.library.utoronto.ca/datapub/Ontario/APS_1954/zipped/428.811.zip

Upper Thames River Conservation Authority (UTRCA). 2006. Environmental Planning Policy Manual for the Upper Thames River Conservation Authority. Approved by Board of Directions June 28, 2006. Available from: http://thamesriver.on.ca/wp-content/uploads//PlanningRegulations/UTRCA-EnvironmentalPlanningPolicyManual-2006.pdf (Accessed April 2019).

Upper Thames River Conservation Authority (UTRCA). 2013. Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses. Ontario Regulation 157/06. Available from https://www.canlii.org/en/on/laws/regu/o-reg-157-06/latest/o-reg-157-06.html (Accessed December 2021).

Upper Thames River Conservation Authority (UTRCA). 2014. Middlesex Natural Heritage Systems Study. Available from: http://thamesriver.on.ca/watershed-health/natural-heritage-studies/middlesex-natural-heritage-systems-study-2014/ (Accessed April 2019).

Upper Thames River Conservation Authority (UTRCA). 2021. Regulated Areas Screening Map. Updated December 2021.

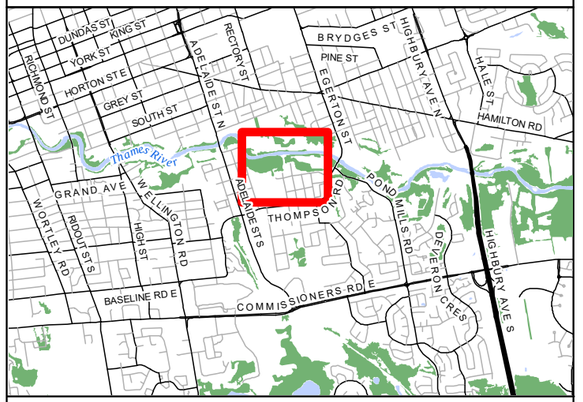
Upper Thames River Conservation Authority (UTRCA). 2022. Forks Corridor 2022 Watershed Report Card. Available from: https://thamesriver.on.ca/wp-content/uploads/RC_Forks.pdf

Maps

Map 1

32 Chesterfield Ave, London

Study Area



Legend

- Study Area (120m)
- Subject Property
- Parcel (City of London)
- Drainage Feature
- Permanent Watercourse
- Intermittent Watercourse
- Wooded Area

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 2363
Date: December 14, 2023

NAD83 - UTM Zone 17
Size: 11x17"
1:3,000

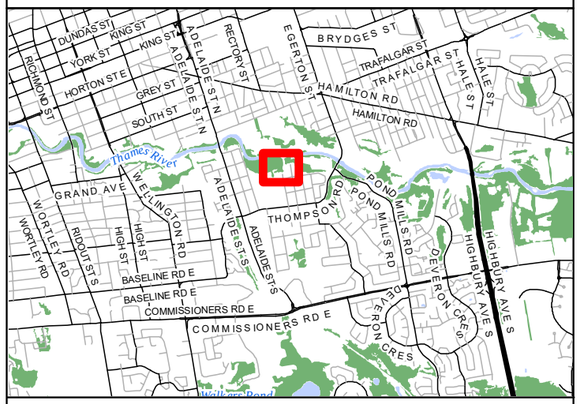
N

0 50 100 150 200 Metres

Map 2

32 Chesterfield Ave, London

Existing Conditions



Legend

- Subject Property
- Drainage Feature
- Dripline (NRSI surveyed 2020)
- Ecological Land Classification (ELC)

(CUM) Cultural Meadow

(FOD2-4) Dry - Fresh Oak - Hardwood Deciduous Forest Type

(FOD7-3) Fresh - Moist Willow Lowland Deciduous Forest Type

(H) Hedgerow

(MAM2) Mineral Meadow Marsh Ecosite

(SWD4) Mineral Deciduous Swamp Ecosite

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 2363
Date: December 14, 2023

NAD83 - UTM Zone 17
Size: 11x17"
1:1,250

0 20 40 60 80 Metres

N

Path: X:\2363_EIS_32ChesterfieldAve_London\NRSI_2363_Map2_ExistingConditions_2K_2023_12_14_GCS.mxd

482100 482200 482300 482400

4758000 4757900 4757800 4757700

Thames River

Residential

Residential

CHESTERFIELD AVENUE

VERONICA AVENUE

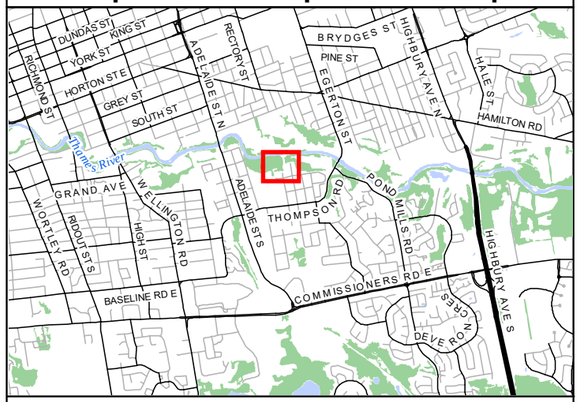
GLADSTONE AVENUE

8 7 6 5 4 3 2 1

Map 3

32 Chesterfield Ave, London

Ecological Constraints and Proposed Development Concept



Legend

- Subject Property
- Conveyance Lands
- Kentucky Coffee Tree
- Proposed Development Concept
- Existing Building Footprint
- Dripline (NRSI surveyed 2020)
- Woodland Buffer (30m)
- UTRCA Regulatory Floodline (approximate)
- UTRCA Regulation Limit (approximate)
- Significant Woodland

City of London Official Plan (2019) (approximate)

- Significant Valleyland

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 2363
Date: December 15, 2023

NAD83 - UTM Zone 17
Size: 11x17"
1:1,250

0 20 40 60 80 Metres

N

Path: X:\2363_EIS_32ChesterfieldAve_London\NRSI_2363_Map3_ConstraintsProposedDevelopment_2K_2023_12_15_GCS.mxd

Appendix I
Environmental Study Scoping Checklist

APPENDIX B - Environmental Study Scoping Checklist

Application/Project Name: 32 Chesterfield Ave

Proponent: Pearl Investments **Date:** November 21, 2022

Proposed Project Works: Development of 7 single detached dwelling, existing to stay

Study Type: Scoped EIS

Lead Consultant: Natural Resource Solutions Inc

Key Contact: Gina MacVeigh, Senior Biologist

Subconsultants: MHBC

Technical Review Team:

☑ Ecologist Planner: S. Butnari/ J. MacKay ■ Province – Species at Risk: MECP

☑ Planner for the File: Alanna Riley ■ Province - Other: MNRF

☑ Conservation Authority: UTRCA Contact: C. Creighton

☑ EEPAC: Sandy Levin, Susan Hall ☐ Other: _____

☐ Project Manager, Environmental Assessment: _____

☐ First Nation(s): _____

Subject Lands and Study Area:

Location/Address and Size (ha) of Subject Lands:
approx 0.6ha

Study Area Size (approximate ha): 0.8 ■ Map (attached): _____

Position of Site in Subwatershed: South Thames River Subwatershed

Tributary Fact Sheet: _____

Is the proposed location within the vicinity of the Thames River (<120 m)? ☑ Yes ☐ No

If Yes, initiate engagement with local First Nation communities. Consultation activity to be provided at Application Review stage.

Policy:

☑ Study must demonstrate how it conforms to the Provincial Policy Statement

☑ Study must demonstrate how it conforms to *The London Plan*

Map 1 Place Types:

☑ Green Space ☐ Environmental Review

Other Place Types: _____

Map 4 Active Mobility Network:

☐ Pathway placement and future trail accesses shall be considered as part of this study.

Map 5 Natural Heritage System:

(Subject Lands and Study Area delineated on current aerial photographs)

☐ Provincially Significant Wetland
☐ Wetlands
☐ Area of Natural & Scientific Interest
☐ Environmentally Significant Area
☐ Potential ESAs
☑ Significant Woodlands
☑ Significant Valleylands
☐ Unevaluated Vegetation Patches
Patch No. _____

Name: _____
☐ Unevaluated Wetlands*
Name: _____
Name: _____
☐ Upland Corridors
☑ Woodlands
☐ Valleylands
☐ Potential Naturalization Areas

** ELC (air photo interpretation and / or previous studies) may identify potential wetlands or other potential features not captured on Map 5.*

Map 6 Hazards and Natural Resources:

☑ Maximum Hazard Line ☑ Conservation Authority Regulation Limit (and text based regulatory limit) – Project falls under *Conservation Authority Act* Section 28

Required Field Investigations:

Aquatic:

☑ Aquatic Habitat Assessment: Assessment of Unnamed tributary
☐ Fish Community (Collection): _____
☐ Spawning Surveys: _____
☐ Benthic Invertebrate Survey: _____
☐ Mussels: _____
☐ Other: _____

Wetlands:

☐ Wetland Delineation: _____
☐ Wetland Evaluation (OWES): _____
☐ Other: _____

Terrestrial (Wetland, Upland and Lowland):

☑ Vegetation Communities (ELC): _____

☑ Botanical Inventories ☐ Winter ☑ Spring ☑ Summer ☐ Fall

☑ Breeding Bird Surveys (type & frequency): 2 surveys

☐ Raptor Surveys: _____ ☐ Shoreline Birds: _____

☐ Crepuscular Surveys: _____ ☐ Grassland Surveys: _____

☐ Amphibian Surveys (type & frequency): _____

☐ Reptile Surveys:

- ☐ Turtle (type & frequency): _____
- ☐ Snake (type & frequency): _____
- ☐ Other (type & frequency): _____

☑ Bat Habitat, Cavity & Acoustic Surveys: acoustic not required

☐ Mammal Surveys: _____

- ☐ Winter Wildlife Surveys: _____

☐ Butterflies (Lepidoptera): _____

☐ Dragonflies / Damselflies (Odonata): _____

☑ Species at Risk Specific Surveys: Cavity assessment

☑ Species of Conservation Concern Surveys: hibernaculum, bat maternity,

☑ Significant Wildlife Habitat Surveys: hibernaculum, bat maternity

☑ Other field investigations: incidental, documentation of invasives

Supporting Concurrent Studies/Investigations:

☐ Hydrogeological/Groundwater: _____

☐ Surface Water/Hydrology: _____

☐ Water Balance: _____

☐ Fluvial Geomorphological: _____

☑ Geotechnical: UTRCA identified

☑ Tree Inventory: _____

☐ Other: _____

Evaluation of Significance:

Federal:

☑ Fish Habitat ☐ Other Federal: _____

☑ Species at Risk (*SARA*)

Provincial:

- ☐ Provincially Significant Wetlands
- ☑ Significant Woodlands
- ☑ Significant Valleylands
- ☑ Significant Wildlife Habitat Ecoregion 7E
- ☐ Areas of Natural & Scientific Interest
- ☑ Fish Habitat
- ☐ Water Resource Systems
- ☑ Species at Risk (*ESA*): _____

Municipal/London:

- ☐ Environmentally Significant Areas (ESAs), Potential ESAs
- ☑ Significant Woodlands, Woodlands
- ☑ Significant Valleylands, Valleylands
- ☐ Wetlands, Unevaluated Wetlands
- ☑ Significant Wildlife Habitat
- ☐ Unevaluated Vegetation Patches
- ☐ Other Vegetation Patches >0.5 ha
- ☐ Potential Naturalization Area
- ☐ Other: _____

Impact Assessment:

- ☑ Impact Assessment Required
- ☑ Net Effects Table Required

Environmental Management Recommendations:

- ☑ Environmental Management Plan: Restoration/enhancement opportunities, appendix
- ☐ Specifications & Conditions of Approval: _____
- ☐ Other: _____

Environmental Monitoring:

- ☐ Baseline Monitoring: _____
- ☐ Construction Monitoring: _____
- ☑ Post-Construction Monitoring: details to be provide with measurable goals (north part)

Additional Requirements and Notes:

A scoping meeting was held previously for the property but development plans have changed significantly, hence why a new Summary Proposal and IPR was completed.

Previous scoping meeting was held March 27, 2020 (virtually). James MacKay was the City Ecologist on the file and Christine Creiighton and Brent Vercheuse from UTRCA were in attendance.

Surveys identified through the scoping meeting were:

? Boundary Delineation - what setback is required, minimum 10m from top of valley/stable slope

? Breeding bird - 2 season

? ELC (review vegetation patch information for 00032)

? 2-season vegetation within the property - Spring and summer. Spring of utmost importance to get those ephemerals

? Documentation of any invasives

? No anurans required - if wetlands or vernal pools identified within the site, they will be completed

? Incidentals for mammals, butterflies, odonata, etc.

? Search for hibernacula and other SWH/SAR habitat during all site visits.

? Tree inventory (no tags required) = tree preservation plan will be required

? Bat habitat search of trees for snags, etc., wildlife trees

UTRCA requested a geotechnical assessment, but that no full hydrog study would be required.

NRSI completed the field work in 2020 following the meeting and provided a NETR to the client, which has been included for review.

Appendix II
Species at Risk (SAR) and Species of Conservation Concern (SCC) Screening Table

Species at Risk (SAR) and Species of Special Concern (SCC) Screening Table

Common Name	Scientific Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	NRSI Observed	Habitat Source	Habitat Preference	Suitable Habitats within Study Area	Rationale
Vascular Plants											
Kentucky Coffee-tree	*Gymnocladus dioicus*	S2	THR	T	T	Schedule 1	Yes	Michigan Flora Online (A. A. Reznicek, E. G. Voss, & B. S. Walters. 2011)	Rich mesic and floodplain forests.	Yes	Suitable habitat for Kentucky Coffee-tree is present in moist woodlands in the north of the subject property. A single individual was observed within the subject property but was determined to be a planted specimen associated with the residential property.
Birds											
Chimney Swift	*Chaetura pelagica*	S3B	THR	T	T	Schedule 1	Yes	Significant Wildlife Habitat Technical Guide: Appendix G (OMNR 2000)	Commonly found in urban areas near buildings; nests in chimneys, hollow trees, and crevices of rock cliffs. Feeds over open water.	No	The abandoned residence on the subject property does not contain chimneys that would provide suitable habitat for this species. Individual Chimney Swifts were observed flying over the subject property and foraging over the Thames River on April 8 and June 9, 2020. No breeding evidence was documented during either observation.
Black Tern	*Chlidonias niger*	S3B,S4M	SC	NAR	NS	No schedule	No	Significant Wildlife Habitat Technical Guide: Appendix G (OMNR 2000)	Large cattail marshes; marshy edges of rivers, lakes or ponds; wet open fens; wet meadows. Returns to same area to nest each year. Must have areas of shallow water (0.5 to 1m deep) and area of open water near nests. Generally found in marshes >20 ha in size.	No	No suitable marshes or waterbodies are present within the study area.
Black-crowned Night-Heron	*Nycticorax nycticorax*	S3B,S2N,S4M					No	Significant Wildlife Habitat Technical Guide: Appendix G (OMNR 2000)	Deciduous woodland swamps, cattail marshes, islands, wooded river and lake banks, coastal wetlands.	No	The Thames River bank to the north of the subject property may provide limited suitable habitat.
Peregrine Falcon	*Falco peregrinus*	S4	SC	NAR	NS	No schedule	No	Species at Risk in Ontario (MECP 2023)	Usually nest on tall, steep cliff ledges close to large bodies of water. Can also nest on the ledges of tall buildings.	No	No buildings or natural features of a suitable height are present within the subject property.
Eastern Wood-Pewee	*Contopus virens*	S4B	SC	SC	SC	Schedule 1	No	Species at Risk in Ontario (MECP 2023)	Mid-canopy layer of forest clearings and edges of deciduous and mixed forest. Abundant in intermediate-age mature forest stands with little understory vegetation.	Yes	The subject property contains a forest community that may provide suitable habitat for this species. Eastern Wood-Pewee was not documented during the completion of breeding bird surveys.

Common Name	Scientific Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	NRSI Observed	Habitat Source	Habitat Preference	Suitable Habitats within Study Area	Rationale
Barn Swallow	*Hirundo rustica*	S4B	SC	SC	T	Schedule 1	No	Significant Wildlife Habitat Technical Guide: Appendix G (OMNR 2000)	Farmlands, rural areas and other open or semi-open areas near body of water. Nests almost exclusively on human-made structures such as open barns, buildings, bridges and culverts.	Yes	The abandoned residence may provide suitable nesting habitat for this speices and the cultural meadow and river corridor to the north may provide foraging habitat. Barn Swallow was not observed within the subject property during the completion of breeding bird surveys.
Purple Martin	*Progne subis*	S3B					No	Significant Wildlife Habitat Technical Guide: Appendix G (OMNR 2000)	Open, trees areas such as farmland, parks, yards, marshes; usually near large bodies of water; colonial; nests in tree cavities, cliff ledges; most common in nest boxes; requires open space for foraging; prefers trees >15 cm dbh.	No	No Purple Martin nest boxes are present within the subject property. The Thames River to the north may provide suitable foraging habitat.
Wood Thrush	*Hylocichla mustelina*	S4B	SC	T	T	Schedule 1	No	Significant Wildlife Habitat Technical Guide: Appendix G (OMNR 2000)	Carolinian and Great Lakes-St. Lawrence forest zones. Undisturbed moist mature deciduous or mixed forest with deciduous sapling growth. Near pond or swamp. Must have some trees higher than 12 m.	No	The subject property contains small and narrow sections of deciduous hedgerow and forest. The lowland area is comprised of Willow and Manitoba Maple and is not suitable for this species.
Bobolink	*Dolichonyx oryzivorus*	S4B	THR	SC	T	Schedule 1	No	Recovery Strategy for the Bobolink and Eastern Meadowlark in Ontario (McCracken et al. 2013)	Large (>10 ha), open expansive grasslands, pastures, hayfields, meadows or fallow fields with dense ground cover. Occasionally nest in large (>50 ha) fields of winter wheat and rye in southwestern Ontario.	No	No open expansive communities are present within the subject property.
Eastern Meadowlark	*Sturnella magna*	S4B,S3N	THR	T	T	Schedule 1	No	Significant Wildlife Habitat Technical Guide: Appendix G (OMNR 2000)	Open pastures, hayfields, grasslands or grassy meadows with elevated singing perches (small trees, shrubs or fence posts). Also weedy borders of croplands, roadsides, orchards, airports, shrubby overgrown fields or other open areas. Generally prefers larger tracts of habitat >10 ha, but will sometimes use smaller tracts.	No	No open expansive communities are present within the subject property.
Reptiles and Amphibians											
Snapping Turtle	*Chelydra serpentina*	S4	SC	SC	SC	Schedule 1	No	Species at Risk in Ontario (MECP 2023)	Slow-flowing rivers and streams, lakes, and permanent or semi-permanent wetlands with soft substrates and vegetation. Key habitat requirements: open areas with structures for basking, open sand or gravel areas for nesting, shallow areas with soft substrates to bury in, soft banks or substrates for hibernation.	No	The subject property is located just south of the Thames River, and therefore suitable habitat may be present within the Thames River but not on the subject property.
Blanding's Turtle (Great Lakes / St. Lawrence population)	*Emydoidea blandingii*	S3	THR	E	E	Schedule 1	No	Recovery Strategy for the Blanding's Turtle (MECP 2019)	Eutrophic, shallow wetlands such as marshes, ponds, swamps, bogs, fens, or coastal wetlands, with soft, muddy substrates, abundant aquatic vegetation, and basking structures (logs, stumps, hummocks). Large overland movements occur between aquatic habitats and to open sandy or gravelly areas for nesting. Forest habitat is important for upland movements. Overwintering typically occurs in permanent wetlands.	No	No suitable larger lakes or large wetlands are present within the project area. It is unlikely that this species would utlilize the limited wetland habitat present.
Northern Map Turtle	*Graptemys geographica*	S3	SC	SC	SC	Schedule 1	No	Species at Risk in Ontario (MECP 2023)	Large bodies of water such as rivers and lakes with soft bottoms, aquatic vegetation, abundant mollusc prey, and basking structures such as logs or rocks. Nesting occurs in open areas with soft substrates such as sand or gravel. Hibernate on the bottom of deep areas of lakes or deep, slow-moving sections of rivers.	No	The subject property is located just south of the Thames River, and therefore suitable habitat may be present within the Thames River but not on the subject property.

Common Name	Scientific Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	NRSI Observed	Habitat Source	Habitat Preference	Suitable Habitats within Study Area	Rationale
Queensnake	*Regina septemvittata*	S2	END	E	E	Schedule 1	No	Recovery Strategy for the Queensnake (Recovery Strategy for the Queensnake) (Gillingwater, S. D. 2011)	Rivers, streams and lakes with clear water, rocky or gravel bottoms, and an abundance of crayfish. Also in marsh and wetland habitats. Rarely found more than 5m from a shoreline. Requires shelter and basking objects both in the water and on shore such as rocks, logs, and vegetation. Hibernation sites include crevices or fissures in bedrock, small mammal burrows, openings along tree roots, or abutments of old bridges.	No	The Thames River may provide suitable habitat but not the subject property. Field survey conducted to identify hibernation sites did not document any suitable features, or snake species within the subject property.
Northern Ribbonsnake	*Thamnophis sauritus septentrionalis*	S4	SC	SC	SC	Schedule 1	No	Significant Wildlife Habitat Technical Guide: Appendix G (OMNR 2000)	Sunny grassy areas with low dense vegetation near bodies of shallow permanent quiet water; wet meadows grassy marshes or sphagnum bogs; borders of ponds, lakes or streams; hibernates in groups.	No	The Thames River corridor may provide suitable habitat but not the subject property. Field survey conducted to identify hibernation sites did not document any suitable features, or snake species within the subject property.
Mammals											
Eastern Small-footed Myotis	*Myotis leibii*	S2S3	END				No	Recovery Strategy for Eastern Small-footed Myotis In Ontario (Humphrey 2017)	Primarily roosts in 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. Occasionally roosts in buildings (including barns, sheds, and exterior walls). Maternity roosts have been documented in rocky habitats, on bridge structures, and in or on buildings. Overwinters in caves and abandoned mines.	No	The abandoned residence has crevices and overhangs that have some limited potential to provide suitable roosting or maternity habitat.; however, no guano was observed during the preliminary site visit. Due to the lack of natural talus slopes, exposed bedrock or rock barrens it is not expected that this species would be present in the vicinity of the subject property. Further to this London is outside the typical range in Ontario where this species generally occurs.
Little Brown Myotis	*Myotis lucifugus*	S3	END	E	E	Schedule 1	No	Recovery Strategy for the Little Brown Myotis, Northern Myotis and Tri-colored Bat in Ontario (Humphrey, C. & H. Fortherby. 2019)	Uses caves, quarries, tunnels, hollow trees or buildings for roosting. Winters in humid caves. Maternity sites in dark warm areas such as attics and barns. Feeds primarily in wetlands and forest edges.	Candidate	The abandoned residence has crevices and overhangs that may provide suitable roosting or maternity habitat. No guano was observed during the preliminary site visit. The preliminary site visit documented one Crack Willow in the lowland portion of the site which provides canddiate roost habitat. No candidate trees are present in the upland area. Suitable forest foraging habitat is present within and surrounding the subject property.

Common Name	Scientific Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	NRSI Observed	Habitat Source	Habitat Preference	Suitable Habitats within Study Area	Rationale
Northern Myotis	*Myotis septentrionalis*	S3	END	E	E	Schedule 1	No	Recovery Strategy for the Little Brown Myotis, Northern Myotis and Tri-colored Bat in Ontario (Humphrey, C. & H. Fortherby. 2019)	Roosts in houses and man-made structures but prefers hollow trees or under loose bark. Hibernates in mines or caves. Hunts within forest, below the canopy.	Candidate	The abandoned residence has crevices and overhangs that may provide suitable roosting or maternity habitat. No guano was observed during the preliminary site visit. The preliminary site visit documented one Crack Willow in the lowland portion of the site which provides canddiate roost habitat. No candidate trees are present in the upland area. Suitable forest foraging habitat is present within and surrounding the subject property.
Tri-colored Bat	*Perimyotis subflavus*	S3?	END	E	E	Schedule 1	No	Recovery Strategy for the Little Brown Myotis, Northern Myotis and Tri-colored Bat in Ontario (Humphrey, C. & H. Fortherby. 2019)	Roosts and maternity colonies in older forests and occasionally in barns or other structures. Forage over water and along streams in the forest. Hibernate in caves.	Candidate	The abandoned residence has crevices and overhangs that may provide suitable roosting or maternity habitat. No guano was observed during the preliminary site visit. The preliminary site visit documented one Crack Willow in the lowland portion of the site which provides canddiate roost habitat. No candidate trees are present in the upland area. Suitable forest foraging habitat is present within and surrounding the subject property.
Woodland Vole	*Microtus pinetorum*	S3?	SC	SC	SC	Schedule 1	No	Species at Risk in Ontario (MECP 2023)	Mature deciduous forest in the Carolinian region where there is a deep litter layer that allows it to burrow.	No	Mature deciduous woodlands are not present within the subject property. The small woodland features and hedgerows would not provide suitable habitat for this species.
American Badger (Southwestern Ontario population)	*Taxidea taxus jacksoni*	S1	END	E	E	Schedule 1	No	Significant Wildlife Habitat Technical Guide: Appendix G (OMNR 2000)	Open grasslands and oak savannahs; dens in new hole or enlarged existing hole; sometimes makes food caches	No	Open grasslands, savannahs or large agricultural areas are not present within the subject property.
Elk	*Cervus elaphus*	SNA	EXT				No	Elk Management Plan (MNRF 2010)	Elk populations were extirpated from the Province of Ontario in the late 1800s. Restoration efforts to re-introduce the species have been undertaken starting in the 1990s. Four restoration areas were identified in the Province including: Lake of the Woods, Lake Huron North Shore, Nipissing/French River, and Bancroft/North Hastings.	No	Elk was extirpated from Ontario and only persists in several small reintrodced populations. These populations do not occur in the vicinity of the study area.

Common Name	Scientific Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	NRSI Observed	Habitat Source	Habitat Preference	Suitable Habitats within Study Area	Rationale
Butterflies											
West Virginia White	*Pieris virginiensis*	S3	SC				No	Species at Risk in Ontario (MECP 2023)	Rich, moist, deciduous woods with populations of Two-leaved Toothwort (Cardamine diphylla; larval food plant).	No	Moist woodlands are present within and adajcent to the subject property. No Two-leav Toothwort was observed within the woodland and this species was not observed during field surveys.
Hackberry Emperor	*Asterocampa celtis*	S3					No	NatureServe (2023)	Can be found in a variety of habitats that have hackberry. Often in riparian areas.	Yes	Woodlands and hedgerows containing Common Hackberry are present within and adjacent to the subject property. Hackberry Emperor was not observed during the completion of field surveys. Additionally, only a single Common Hackberry is proposed for removla in support of the development, this will not impact habitat availability for the species if they are present.
Tawny Emperor	*Asterocampa clyton*	S3					No	NatureServe (2023)	Found in most habitats where hackberries and other Celtis species grow. Various forest types including hardwood, mixedwood, conifer woodland. Other terrestrial habitats are savannah, shrubland, suburban/orchard.	Yes	Woodlands and hedgerows containing Common Hackberry are present within and adjacent to the subject property. Tawny Emperor was not observed during the completion of field surveys. Additionally, only a single Common Hackberry is proposed for removla in support of the development, this will not impact habitat availability for the species if they are present.
Monarch	*Danaus plexippus*	S2N,S4B	SC	E	SC	Schedule 1	No	Species at Risk in Ontario (MECP 2023)	Adults found in a diversity of habitats with a variety of wildflowers. Caterpillars are confined to meadows and open areas where milkweeds grow (larval food plants).	Yes	A small cultural meadow is present at the north end of the subject property. No milkweed species were documented from this meadow during vegetation inventories and no Monarchs were observed during any site visits to the subject property.
Odonates											
Slender Bluet	*Enallagma traviatum*	S2S3					No	Damselflies of the Northeast (Lam 2004)	Permanent ponds and lakes, particularly those located close to woodlands.	No	No large ponds or lakes are present within the subject property.

Common Name	Scientific Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	NRSI Observed	Habitat Source	Habitat Preference	Suitable Habitats within Study Area	Rationale
Fish											
Northern Brook Lamprey (Great Lakes - Upper St. Lawrence population)	*Ichthyomyzon fossor*	S3	SC	SC	SC	Schedule 1	No	Species at Risk in Ontario (MECP 2023)	The Northern brook lamprey inhabits clear, coolwater streams. The larval stage requires soft substrates such as silt and sand for burrowing which are often found in the slow-moving portions of a stream. Adults are found in areas associated with spawning, including fast flowing riffles comprised of rock or gravel. Spawning occurs in May and June. The males construct small, often inconspicuous, nests by picking up pebbles with their mouths and moving them to form the rims of shallow depressions. The sticky eggs are deposited in the nest and adhere to the substrate.	No	The Thames River is located to the north of the subject property.
Silver Shiner	*Notropis photogenis*	S2S3	THR	T	T	Schedule 1	No	Species at Risk in Ontario (MECP 2023)	Moderate to large size streams with swift currents, free of weeds, with clean gravel or boulder bottoms. Gravel riffles needed for spawning (June-July).	No	The Thames River is located to the north of the subject property.
Black Redhorse	*Moxostoma duquesnei*	S2	THR	T	T	Schedule 1	No	Species at Risk in Ontario (MECP 2023)	Pools and riffle areas of medium-sized rivers and streams, usually less than two metres deep. Usually few aquatic plants, a moderate to fast current, and a sandy or gravel bottom. In the spring, adults migrate to breeding habitat where eggs are laid on gravel in fast water.	No	The Thames River is located to the north of the subject property.
Greater Redhorse	*Moxostoma valenciennesi*	S3					No	Freshwater Fishes of North America (Warren and Burr 2014)	Lakes and large rivers with moderate to swift currents, clear water, and substrates of gravel, cobble or boulder.	No	The Thames River is located to the north of the subject property.
Northern Sunfish (Great Lakes - Upper St. Lawrence populations)	*Lepomis peltastes pop. 2*	S3	SC	SC	SC	Schedule 1	No	Species at Risk in Ontario (MECP 2023)	Shallow vegetated areas of quiet, slow flowing rivers and streams, as well as warm lakes and ponds, with sandy banks or rocky bottoms.	No	The Thames River is located to the north of the subject property.
Mussels											
Purple Wartyback	*Cyclonaias tuberculata*	S2	THR	T	NS	No schedule	No	Species at Risk in Ontario (MECP 2023)	Small to large rivers with a variety of substrates including cobble, gravel, mixed gravel and sand. The rivers generally have moderate to swift currents with water depths ranging from 0.6 m to 6 m.	No	The Thames River is located to the north of the subject property.
Round Pigtoe	*Pleurobema sintoxia*	S1	END	E	E	Schedule 1	No	Species at Risk in Ontario (MECP 2023)	Small rivers in areas of moderate flow with gravel, cobble and boulder substrates, to larger rivers in mud, sand and gravel at varying depths. Host fish include: Spotfin Shiner, Northern Redbelly Dace, Bluntnose Minnow, Bluegill and Central Stoneroller.	No	The Thames River is located to the north of the subject property.
Rainbow	*Cambarunio iris*	S1	SC	SC	SC	Schedule 1	No	Species at Risk in Ontario (MECP 2023)	The Rainbow mussel prefers small to medium-sized rivers with a moderate to strong current and sand, rocky, or gravel bottoms. It is found in or near riffle areas and along the edges of vegetation in water less than one metre deep. The Rainbow mussel uses a variety of fish hosts in Ontario, including Striped shiner, Smallmouth bass, Largemouth bass, Green sunfish, Greenside darter, Rainbow darter, and Yellow perch.	No	The Thames River is located to the north of the subject property.
Wavy-rayed Lampmussel	*Lampsilis fasciola*	S2	THR	SC	SC	Schedule 1	No	Species at Risk in Ontario (MECP 2023)	Small to medium rivers with clear water. Shallow riffle areas with clean gravel or sand bottoms. Fish hosts include: Largemouth bass and Smallmouth bass.	No	The Thames River is located to the north of the subject property.
Kidneyshell	*Ptychobranchus fasciolaris*	S1	END	E	E	Schedule 1	No	Species at Risk in Ontario (MECP 2023)	Small to medium sized rivers. Prefers shallow, clear, swift-moving water with gravel and sand. Also used to occur on gravel shoals in the Great Lakes. Fish hosts include: Blackside Darter, Fantail Darter, and Johnny Darter.	No	The Thames River is located to the north of the subject property.
Rayed Bean	*Villosa fabalis*	S1	END	E	E	Schedule 1	No	Species at Risk in Ontario (MECP 2023)	Riffle areas of clear headwaters and small tributaries of river systems. Typically found deeply buried in the sand and gravel substrate in low flow areas. Host fish include: Greenside Darter, Mottled Sculpin, Rainbow Darter and Largemouth Bass.	No	The Thames River is located to the north of the subject property.

Reference List

A. A. Reznicek, E. G. Voss, & B. S. Walters. Michigan Flora Online. University of Michigan. Published: February 2011. Available: https://michiganflora.net/browse.aspx.

Gillingwater, S. D. 2011. Recovery Strategy for the Queensnake (Regina septemvittata) in Ontario. Ontario Recovery Strategy Series. Prepared for the Ontario Ministry of Natural Resources, Peterborough, Ontario. vi + 34 pp.
https://www.ontario.ca/page/queensnake-recovery-Strategy#section-1

Government of Canada. 2022. Species at Risk Public Registry: Species Search. COSEWIC Last Assessment Date: 2022-05-11. Available: https://species-registry.canada.ca/index-en.html#/species?sortBy=commonNameSort&sortDirection=asc&pageSize=10

Humphrey, C. 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

Common Name	Scientific Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	NRSI Observed	Habitat Source	Habitat Preference	Suitable Habitats within Study Area	Rationale

Change Canada 2018).

Lam , E. 2004. Damselflies of the Northeast. Biodiversity Books, Forest Hills, New York. 96 pp.

Ontario Ministry of Natural Resources (OMNR). 2010. Elk Management Plan.

McCracken, J.D., R.A. Reid, R.B. Renfrew, B. Frei, J.V. Jalava, A. Cowie, and A.R. Couturier. 2013. Recovery Strategy for the Bobolink (Dolichonyx oryzivorus) and Eastern Meadowlark (Sturnella magna) in Ontario. Ontario Recovery Strategy Series. Prepared for the Ontario Ministry of Natural Resources, Peterborough, Ontario. viii + 88 pp.

Ministry of Northern Development, Mines, Natural Resources and Forestry (MNRF). 2022. Natural Heritage Information Centre (NHIC): Species List for Ontario. Published: 2014-07-17. All Species List Updated: 2022-04-11. Available: https://www.ontario.ca/page/get-natural-heritage-information

Ministry of the Environment, Conservation and Parks. 2019. Recovery Strategy for the Blanding's Turtle (Emydoidea blandingii) in Ontario. Ontario Recovery Strategy Series. Prepared by the Ministry of the Environment, Conservation and Parks, Peterborough, Ontario. iv + 6 pp. Adoption of the Recovery Strategy for Blanding's Turtle (Emydoidea blandingii), Great Lakes / St. Lawrence population, in Canada (Environment and Climate Change Canada 2018). https://www.ontario.ca/page/blandings-turtle-recovery-Strategy#section-1

Ministry of the Environment, Conservation, and Parks (MECP). 2023. Species at Risk in Ontario. Published: 2018-07-12. Updated: 2023-09-12. Available: https://www.ontario.ca/page/species-risk-ontario

NatureServe. 2023. NatureServer Explorer [web application]. Available at: https://explorer.natureserve.org/

Ontario Ministry of Natural Resources (OMNR). 2000. Significant Wildlife Habitat Technical Guide. Appendix G: Wildlife Habitat Matrices and Habitat Descriptions for Rare Vascular Plants. October 2000.

Warren, M.L., Jr., and B.M. Burr [Eds]. 2014. Freshwater Fishes of North America, Volume 1: Petromyzontidae to Catostomidae. Johns Hopkins University Press, Baltimore, Maryland. xv + 644 pp.

Appendix III
Significant Wildlife Habitat Screening Table

Significant Wildlife Habitat Type	Presence Within Study Area	Presence Within Subject Property	Assessment Details
Seasonal Concentration Areas			
Waterfowl Stopover and Staging Areas (Terrestrial)	Not Present	Not Present	Suitable open habitat with sheet water is not present within the subject property
Waterfowl Stopover and Staging Areas (Aquatic)	Possible	Not Present	No suitable aquatic habitat is present within the subject property. The Thames River is located north of the subject property, and may provide limited stopover habitat. The criteria for SWH would not be fulfilled at this urban site.
Shorebird Migratory Stopover Area	Not Present	Not Present	Suitable habitat (marsh)) is not present. The habitat is not suitable for this SWH type.
Raptor Wintering Area	Not Present	Not Present	The study area does not contain wintering habitat large enough to be considered significant.
Bat Hibernacula	Not Present	Not Present	No caves, mine shafts, or underground foundations or karsts are present within the study area.
Bat Maternity Colonies	Candidate	Candidate	Wooded habitat is present on the subject property that may contain suitable cavities for Bat Maternity Habitat. A bat habitat assessment identified 1 candidate tree (Crack Willow) within the lowland area of the site. The abandonned residence could provide roosting habitat but no guano was observed and buildings are not considered SWH.
Turtle Wintering Area	Not Present	Not Present	No suitable aquatic habitat is present within the subject property. The Thames River is located north of the subject property, and is also not expected to provide suitable conditions for wintering.
Reptile Hibernaculum	Possible	Not Present	Reptile Hibernaculum can be found throughout a variety of habitats, and is very difficult to confirm absence. The abandoned residence has an intact foundation and is situated in the shade, both factors are less likely to support a hibernaculum. No snakes were observed on the subject property during any surveys including during the spring emergence period when hibernating snakes woudl emerge and bask near a hibernacula. No other foundations of features extending below the frost line were observed on the subject property.
Colonially - Nesting Bird Breeding Habitat (Bank and Cliff)	Not Present	Not Present	The slope dividing the upland and lowland is not suitable for bird nesting.
Colonially - Nesting Bird Breeding Habitat (Tree/Shrubs)	Not Present	Not Present	The study area and subject property do not provide suitable swamp habitat.
Colonially - Nesting Bird Breeding Habitat (Ground)	Not Present	Not Present	No rocky islands or peninsulas are present within the study area.
Migratory Butterfly Stopover Areas	Not Present	Not Present	The subject property is not within 5km of Lake Ontario or Lake Erie, and does not provide the minimum required size of suitable habitat.
Landbird Migratory Stopover Areas	Not Present	Not Present	The subject property is not within 5km of Lake Ontario or Lake Erie, and does not meet the minimum size requirements.
Deer Winter Congregation Areas	Not Present	Not Present	The wooded community does not meet the minimum size requirements and has not been mapped by the MNRF.
Rare Vegetation Communities			
Cliff and Talus Slopes	Not Present	Not Present	This vegetation community type is not present within the subject property.
Sand Barrens	Not Present	Not Present	This vegetation community type is not present within the subject property.
Alvar	Not Present	Not Present	This vegetation community type is not present within the subject property.
Old Growth Forest	Not Present	Not Present	This vegetation community type is not present within the subject property.

Significant Wildlife Habitat Type	Presence Within Study Area	Presence Within Subject Property	Assessment Details
Savannah	Not Present	Not Present	This vegetation community type is not present within the subject property.
Tallgrass Prairie	Not Present	Not Present	This vegetation community type is not present within the subject property.
Other Rare Vegetation Communities	Not Present	Not Present	Other rare vegetation community types are not present within the subject property.
Specialized Wildlife Habitat			
Waterfowl Nesting Area	Possible	Not Present	Suitable wetland habitat is not present within the subject property.
Bald Eagle and Osprey Nesting, Foraging and Perching Habitat	Not Present	Not Present	No stick nests were observed in the treed features along the river and in the lowland portion of the subject property.
Woodland Raptor Nesting Habitat	Not Present	Not Present	Suitable habitat, and interior habitat, are not expected to be large enough for this habitat type. Regardless, field surveys for suitable stick nests were completed., and did not identify the presence of any stick nests.
Turtle Nesting Areas	Possible	Not Present	Suitable nesting substrates are not present within the subject property. The banks of the Thames River have sandy areas that are suitable for turtle nesting.
Seeps and Springs	Not Present	Not Present	A seepage feature is present along the eastern property boundary within a gully that directs water into the lowland portion of the site. Only 1 seepage was observed which does not fulfill criteria for SWH.
Amphibian Breeding Habitat (Woodland)	Not Present	Not Present	Vernal pools are not present within the subject property.
Amphibian Breeding Habitat (Wetland)	Possible	Not Present	No suitable wetland habitat is present within the subject property, but are present wtihin the study area.
Woodland Area-Sensitive Bird Breeding Habitat	Not Present	Not Present	Interior forest is not present within the study area.
Habitat for Species of Conservation Concern			
Marsh Bird Breeding Habitat	Possible	Not Present	Suitable wetland habitat is not present within the subject property, but may be present within the study area.
Open Country Bird Breeding Habitat	Not Present	Not Present	No large grassland areas are present within the study area.
Shrub/Early Successional Bird Breeding Habitat	Not Present	Not Present	The subject property does not contain thicket habitat.
Terrestrial Crayfish	Not Present	Not Present	Wetland is not present within the suject property, no chimneys were observed in the area near the river.
Special Concern and Rare Wildlife Species	Not Present	Not Present	and include Eastern Wood-Peweee. Habitat may be present for this species or unreported Special Concern species, to be verified through field surveys. No SCC were documented from the subject property during the 2020 surveys.
Animal Movement Corridors			
Amphibian Movement Corridors	Not Present	Not Present	No significant breeding habitat has been identified within the study area, and therefore no significant Amphibian Movement Corridors can be present.
Exceptions			
Bat Migratory Stopover Area	Not Present	Not Present	The criteria for identifying this SWH type have not yet been defined.

Appendix IV
Vascular Flora Species Observed within the Study Area and Subject Property

Plant Species Reported from the Study Area - 32 Chesterfield Avenue, London (Project #2363)

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	Middlesex	NHIC Data*	NRSI Observed	NRSI Tree Inventory Data
		MNRF 2023a	MECP 2023	Government of Canada 2023	Government of Canada 2023	Government of Canada 2023	Oldham 2017	MNRF 2023b	NRSI Results From 2020	
Gymnosperms	**Conifers**									
Cupressaceae	**Cypress Family**									
Juniperus virginiana	Eastern Red Cedar	S5					X		X	X
Thuja occidentalis	Eastern White Cedar	S5					X		X	
Pinaceae	**Pine Family**									
Picea abies	Norway Spruce	SE3					IX		X	X
Pinus strobus	Eastern White Pine	S5					X		X	X
Dicotyledons	**Dicots**									
Aceraceae	**Maple Family**									
Acer negundo	Manitoba Maple	S5					C		X	X
Acer platanoides	Norway Maple	SE5					IU		X	X
Acer saccharum	Sugar Maple	S5					C		X	X
Acer x freemanii	Freeman's Maple	SNA					hyb		X	X
Apiaceae	**Carrot or Parsley Family**									
Aegopodium podagraria	Goutweed	SE5					IU		X	
Angelica atropurpurea	Purple-stemmed Angelica	S5					C		X	
Anthriscus sylvestris	Wild Chervil	SE4?					IR		X	
Heracleum maximum	American Cow Parsnip	S5					X		X	
Asteraceae	**Composite or Aster Family**									
Arctium minus	Common Burdock	SE5					IC		X	
Cirsium vulgare	Bull Thistle	SE5					IX		X	
Heliopsis helianthoides	False Sunflower	S4S5					R		X	
Rudbeckia laciniata	Cut-leaved Coneflower	S5					X		X	
Solidago canadensis var. canadensis	Canada Goldenrod	S5					X		X	
Solidago flexicaulis	Zigzag Goldenrod	S5					X		X	
Symphyotrichum urophyllum	Arrow-leaved Aster	S4					X		X	
Balsaminaceae	**Touch-me-not Family**									
Impatiens capensis	Spotted Jewelweed	S5					C		X	
Impatiens pallida	Pale Jewelweed	S4					X		X	
Betulaceae	**Birch Family**									
Carpinus caroliniana	Blue-beech	S5					C		X	
Ostrya virginiana	Eastern Hop-hornbeam	S5					C		X	
Boraginaceae	**Borage Family**									
Symphytum officinale	Common Comfrey	SE5					IX		X	
Brassicaceae	**Mustard Family**									
Alliaria petiolata	Garlic Mustard	SE5					IC		X	
Hesperis matronalis	Dame's Rocket	SE5					IX		X	
Celastraceae	**Staff-tree Family**									
Euonymus alatus	Winged Euonymus	SE2					IR		X	X
Convolvulaceae	**Morning-glory Family**									
Convolvulus arvensis	Field Bindweed	SE5					IX		X	
Euphorbiaceae	**Spurge Family**									
Euphorbia virgata	Russian Leafy Spurge	SE5?					IX		X	

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	Middlesex	NHIC Data*	NRSI Observed	NRSI Tree Inventory Data
Fabaceae	**Pea Family**									
Gleditsia triacanthos var. inermis	Thornless Honey-locust	SNA							X	
Gymnocladus dioicus	Kentucky Coffee-tree	S2	THR	T	T	Schedule 1	R		X	
Fagaceae	**Beech Family**									
Fagus grandifolia	American Beech	S4					C		X	X
Quercus alba	White Oak	S5					C		X	X
Quercus macrocarpa	Bur Oak	S5					C		X	X
Quercus rubra	Northern Red Oak	S5					C		X	X
Geraniaceae	**Geranium Family**									
Geranium maculatum	Spotted Geranium	S5					X		X	
Hamamelidaceae	**Witch-hazel Family**									
Hamamelis virginiana	American Witch-hazel	S4S5					C		X	
Hydrophyllaceae	**Water-leaf Family**									
Hydrophyllum virginianum	Virginia Waterleaf	S5					C		X	
Juglandaceae	**Walnut Family**									
Carya ovata	Shagbark Hickory	S5					X		X	X
Juglans nigra	Black Walnut	S4?					X		X	X
Moraceae	**Mulberry Family**									
Morus alba	White Mulberry	SE5					IX		X	X
Oleaceae	**Olive Family**									
Fraxinus americana	White Ash	S4					C		X	X
Papaveraceae	**Poppy Family**									
Sanguinaria canadensis	Bloodroot	S5					X		X	
Polygonaceae	**Smartweed Family**									
Rumex crispus	Curly Dock	SE5					IC		X	
Rumex obtusifolius	Bitter Dock	SE5					IX		X	
Primulaceae	**Primrose Family**									
Lysimachia ciliata	Fringed Loosestrife	S5					X		X	
Lysimachia nummularia	Creeping Jennie	SE5					IX		X	
Ranunculaceae	**Buttercup Family**									
Clematis virginiana	Virginia Virgin's-bower	S5					C		X	
Ranunculus repens	Creeping Buttercup	SE5					IH		X	
Thalictrum pubescens	Tall Meadow-rue	S5					X		X	
Rhamnaceae	**Buckthorn Family**									
Rhamnus cathartica	Common Buckthorn	SE5					IC		X	
Rosaceae	**Rose Family**									
Geum canadense	White Avens	S5					X		X	
Prunus serotina	Black Cherry	S5					C		X	X
Prunus virginiana	Choke Cherry	S5					C		X	
Rubus occidentalis	Black Raspberry	S5					C		X	
Salicaceae	**Willow Family**									
Salix euxina	Crack Willow	SE					IX		X	
Tiliaceae	**Linden Family**									
Tilia americana	American Basswood	S5					C		X	X
Ulmaceae	**Elm Family**									
Celtis occidentalis	Common Hackberry	S4					X		X	X
Ulmus americana	American Elm	S5					C		X	X
Urticaceae	**Nettle Family**									
Urtica gracilis	Slender Stinging Nettle	S5					C		X	

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	Middlesex	NHIC Data*	NRSI Observed	NRSI Tree Inventory Data
Violaceae	**Violet Family**									
Viola sororia	Woolly Blue Violet	S5					X		X	
Vitaceae	**Grape Family**									
Vitis riparia	Riverbank Grape	S5					C		X	
Monocotyledons	**Monocots**									
Cyperaceae	**Sedge Family**									
Carex hitchcockiana	Hitchcock's Sedge	S4S5					U		X	
Carex pensylvanica	Pennsylvania Sedge	S5					C		X	
Iridaceae	**Iris Family**									
Iris pseudacorus	Yellow Iris	SE4					IR		X	
Liliaceae	**Lily Family**									
Erythronium americanum	Yellow Trout-lily	S5					X		X	
Maianthemum stellatum	Star-flowered False Solomon's Seal	S5					X		X	
Poaceae	**Grass Family**									
Poa palustris	Fowl Bluegrass	S5					X		X	
Poa pratensis ssp. pratensis	Kentucky Bluegrass	SE5					IC		X	
Total								**0**	**69**	**20**

*NHIC Atlas Square: 17MH8257

References

Ministry of Natural Resources and Forestry (MNRF). 2023a. Natural Heritage Information Centre (NHIC): Species List for Ontario. Published: 2014-07-17. All Species List Updated: 2023-05-17. Available: https://www.ontario.ca/page/get-natural-heritage-information

Ministry of the Environment, Conservation, and Parks (MECP). 2023. Species at Risk in Ontario. Published: 2018-07-12. Updated: 2023-05-23. Available: https://www.ontario.ca/page/species-risk-ontario

Government of Canada. 2023. Species at Risk Public Registry: Species Search. COSEWIC Last Assessment Date: 2023-05-05. Available: https://species-registry.canada.ca/index-en.html#/species?sortBy=commonNameSort&sortDirection=asc&pageSize=10

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

Ministry of Natural Resources and Forestry (MNRF). 2023b. Natural Heritage Information Centre (NHIC): Make a Natural Heritage Area Map Application. Published: 2014-07-17. Updated 2023-03-03. Available: https://www.ontario.ca/page/make-natural-heritage-area-map

Appendix V
Bird Species Reported from the Study Area

Bird Species Reported from the Study Area - 32 Chesterfield Ave., London (Project #2363)

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	OBBA*	NHIC Data**	NRSI Observed: Highest Level of Breeding Evidence
		MNRF 2023a	MECP 2023	Government of Canada 2023	Government of Canada 2023	Government of Canada 2023	BSC et al. 2006	MNRF 2023b	NRSI Results from 2020
Anatidae	**Ducks, Geese & Swans**								
Aix sponsa	Wood Duck	S5B,S3N					CO		
Anas platyrhynchos	Mallard	S5					CO		**PO**
Branta canadensis	Canada Goose	S5					CO		**PR**
Cygnus olor	Mute Swan	SNA					CO		
Phasianidae	**Partridges, Grouse & Turkeys**								
Bonasa umbellus	Ruffed Grouse	S5					PO		
Meleagris gallopavo	Wild Turkey	S5					CO		
Columbidae	**Pigeons & Doves**								
Columba livia	Rock Pigeon	SNA					CO		
Zenaida macroura	Mourning Dove	S5					CO		**PO**
Cuculiformes	**Cuckoos & Anis**								
Coccyzus americanus	Yellow-billed Cuckoo	S4B					PR		
Coccyzus erythropthalmus	Black-billed Cuckoo	S4S5B					PR		
Apodidae	**Swifts**								
Chaetura pelagica	Chimney Swift	S3B	THR	T	T	Schedule 1	CO		**OB**
Trochilidae	**Hummingbirds**								
Archilochus colubris	Ruby-throated Hummingbird	S5B					CO		
Rallidae	**Rails, Gallinules & Coots**								
Rallus limicola	Virginia Rail	S4S5B					PO		
Charadriidae	**Plovers & Lapwings**								
Charadrius vociferus	Killdeer	S4B					CO		
Scolopacidae	**Sandpipers & Allies**								
Actitis macularia	Spotted Sandpiper	S5B					PR		
Scolopax minor	American Woodcock	S4B					PR		
Laridae	**Gulls, Terns & Skimmers**								
Chlidonias niger	Black Tern	S3B,S4M	SC	NAR	NS	No schedule	PO		
Ardeidae	**Herons & Bitterns**								
Butorides virescens	Green Heron	S4B					PO		
Nycticorax nycticorax	Black-crowned Night-Heron	S3B,S2N,S4M						X	
Cathartidae	**Vultures**								
Cathartes aura	Turkey Vulture	S5B,S3N					PR		
Pandionidae	**Osprey**								
Pandion haliaetus	Osprey	S5B					PO		
Accipitridae	**Hawks, Kites, Eagles & Allies**								
Accipiter cooperii	Cooper's Hawk	S4	NAR	NAR	NS	No schedule	CO		
Buteo jamaicensis	Red-tailed Hawk	S5	NAR	NAR	NS	No schedule	CO		
Circus hudsonius	Northern Harrier	S5B,S4N	NAR	NAR	NS	No schedule	PO		
Strigidae	**Typical Owls**								
Bubo virginianus	Great Horned Owl	S4					CO		
Megascops asio	Eastern Screech-Owl	S4	NAR	NAR	NS	No schedule	PR		

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	OBBA*	NHIC Data**	NRSI Observed: Highest Level of Breeding Evidence
Alcedinidae	**Kingfishers**								
Megaceryle alcyon	Belted Kingfisher	S5B,S4N					CO		
Picidae	**Woodpeckers**								
Colaptes auratus	Northern Flicker	S5					CO		
Dryobates pubescens	Downy Woodpecker	S5					CO		**PO**
Dryobates villosus	Hairy Woodpecker	S5					CO		
Dryocopus pileatus	Pileated Woodpecker	S5					PO		
Melanerpes carolinus	Red-bellied Woodpecker	S5					PR		
Falconidae	**Caracaras & Falcons**								
Falco peregrinus	Peregrine Falcon	S4	SC	NAR	NS	No schedule	CO		
Falco sparverius	American Kestrel	S4					CO		
Tyrannidae	**Tyrant Flycatchers**								
Contopus virens	Eastern Wood-Pewee	S4B	SC	SC	SC	Schedule 1	PR	X	
Empidonax minimus	Least Flycatcher	S5B					PR		
Empidonax traillii	Willow Flycatcher	S4B					CO		
Myiarchus crinitus	Great Crested Flycatcher	S5B					CO		
Sayornis phoebe	Eastern Phoebe	S5B					CO		**CO**
Tyrannus tyrannus	Eastern Kingbird	S4B					CO		
Vireonidae	**Vireos**								
Vireo gilvus	Warbling Vireo	S5B					PR		**PO**
Vireo olivaceus	Red-eyed Vireo	S5B					PR		
Corvidae	**Crows & Jays**								
Corvus brachyrhynchos	American Crow	S5					PR		**CO**
Cyanocitta cristata	Blue Jay	S5					CO		**PR**
Alaudidae	**Larks**								
Eremophila alpestris	Horned Lark	S4					CO		
Hirundinidae	**Swallows**								
Hirundo rustica	Barn Swallow	S4B	SC	SC	T	Schedule 1	CO		
Petrochelidon pyrrhonota	Cliff Swallow	S4S5B					CO		
Progne subis	Purple Martin	S3B					CO		
Stelgidopteryx serripennis	Northern Rough-winged Swallow	S4B					CO		
Tachycineta bicolor	Tree Swallow	S4S5B					CO		
Paridae	**Chickadees & Titmice**								
Poecile atricapillus	Black-capped Chickadee	S5					CO		**PR**
Sittidae	**Nuthatches**								
Sitta canadensis	Red-breasted Nuthatch	S5					PO		
Sitta carolinensis	White-breasted Nuthatch	S5					CO		**PO**
Troglodytidae	**Wrens**								
Cistothorus stellaris	Sedge Wren	S4B	NAR	NAR	NS	No schedule	PR		
Thryothorus ludovicianus	Carolina Wren	S4					CO		
Troglodytes aedon	House Wren	S5B					CO		**PR**
Polioptilidae	**Gnatcatchers**								
Polioptila caerulea	Blue-gray Gnatcatcher	S4B					CO		
Turdidae	**Thrushes**								
Catharus fuscescens	Veery	S5B					PO		
Hylocichla mustelina	Wood Thrush	S4B	SC	T	T	Schedule 1	CO	X	
Sialia sialis	Eastern Bluebird	S5B,S4N	NAR	NAR	NS	No schedule	PR		

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	OBBA*	NHIC Data**	NRSI Observed: Highest Level of Breeding Evidence
Turdus migratorius	American Robin	S5					CO		**PR**
Mimidae	**Mockingbirds, Thrashers & Allies**								
Dumetella carolinensis	Gray Catbird	S5B,S3N					CO		**PO**
Mimus polyglottos	Northern Mockingbird	S4					PO		
Toxostoma rufum	Brown Thrasher	S4B					PR		
Sturnidae	**Starlings**								
Sturnus vulgaris	European Starling	SNA					CO		
Bombycillidae	**Waxwings**								
Bombycilla cedrorum	Cedar Waxwing	S5					CO		**PO**
Passeridae	**Old World Sparrows**								
Passer domesticus	House Sparrow	SNA					CO		**PO**
Fringillidae	**Finches & Allies**								
Haemorhous mexicanus	House Finch	SNA					CO		
Spinus tristis	American Goldfinch	S5					CO		**PO**
Emberizidae	**New World Sparrows & Allies**								
Melospiza georgiana	Swamp Sparrow	S5B,S4N					CO		
Melospiza melodia	Song Sparrow	S5					CO		**PR**
Passerculus sandwichensis	Savannah Sparrow	S5B,S3N					CO		
Pipilo erythrophthalmus	Eastern Towhee	S4B,S3N					PR		
Pooecetes gramineus	Vesper Sparrow	S4B					PR		
Spizella pallida	Clay-colored Sparrow	S4B					PR		
Spizella passerina	Chipping Sparrow	S5B,S3N					CO		**PO**
Spizella pusilla	Field Sparrow	S4B,S3N					CO		
Icteridae	**Troupials & Allies**								
Agelaius phoeniceus	Red-winged Blackbird	S5					CO		**PO**
Dolichonyx oryzivorus	Bobolink	S4B	THR	SC	T	Schedule 1	PO		
Icterus galbula	Baltimore Oriole	S4B					CO		**PO**
Molothrus ater	Brown-headed Cowbird	S5					CO		**PO**
Quiscalus quiscula	Common Grackle	S5					CO		**PO**
Sturnella magna	Eastern Meadowlark	S4B,S3N	THR	T	T	Schedule 1	CO	X	
Parulidae	**Wood Warblers**								
Geothlypis trichas	Common Yellowthroat	S5B,S3N					CO		
Parkesia noveboracensis	Northern Waterthrush	S5B					PR		
Seiurus aurocapilla	Ovenbird	S5B					PR		
Setophaga pensylvanica	Chestnut-sided Warbler	S5B							**PO**
Setophaga petechia	Yellow Warbler	S5B					CO		**PR**
Setophaga pinus	Pine Warbler	S5B,S3N					PR		
Setophaga ruticilla	American Redstart	S5B					PR		**PR**
Vermivora cyanoptera	Blue-winged Warbler	S4B					PR		
Cardinalidae	**Cardinals, Grosbeaks & Allies**								
Cardinalis cardinalis	Northern Cardinal	S5					CO		**PR**
Passerina cyanea	Indigo Bunting	S5B					PR		
Pheucticus ludovicianus	Rose-breasted Grosbeak	S5B					CO		**PO**
Total							**92**	**4**	**28**

*OBBA Atlas Square: 17MH85

**NHIC Atlas Square: 17MH8257

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	OBBA*	NHIC Data**	NRSI Observed: Highest Level of Breeding Evidence

References

Ministry of Natural Resources and Forestry (MNRF). 2023a. Natural Heritage Information Centre (NHIC): Species List for Ontario. Published: 2014-07-17. All Species List Updated: 2023-05-17. Available: https://www.ontario.ca/page/get-natural-heritage-information

Ministry of the Environment, Conservation, and Parks (MECP). 2023. Species at Risk in Ontario. Published: 2018-07-12. Updated: 2023-05-23. Available: https://www.ontario.ca/page/species-risk-ontario

Government of Canada. 2023. Species at Risk Public Registry: Species Search. COSEWIC Last Assessment Date: 2023-05-05. Available: https://species-registry.canada.ca/index-en.html#/species?sortBy=commonNameSort&sortDirection=asc&pageSize=10

Bird Studies Canada (BSC), Environment Canada's Canadian Wildlife Service, Ontario Nature, Ontario Field Ornithologists and Ontario Ministry of Natural Resources. 2006. Ontario Breeding Bird Atlas Database, 31 January 2008. https://www.birdsontario.org/jsp/datasummaries.jsp

Ministry of Natural Resources and Forestry (MNRF). 2023b. Natural Heritage Information Centre (NHIC): Make a Natural Heritage Area Map Application. Published: 2014-07-17. Updated 2023-03-03. Available: https://www.ontario.ca/page/make-natural-heritage-area-map

Appendix VI
Herpetofauna Species Reported from the Study Area

Reptile and Amphibian Species Reported from the Study Area - 32 Chesterfield Ave., London (Project #2363)

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	ORAA*	NHIC Data**	NRSI Observed
		MNRF 2023a	MECP 2023	Government of Canada 2023	Government of Canada 2023	Government of Canada 2023	Ontario Nature 2019	MNRF 2023b	NRSI Results from 2020
Turtles									
Chelydra serpentina	Snapping Turtle	S4	SC	SC	SC	Schedule 1	X		
Chrysemys picta marginata	Midland Painted Turtle	S4		SC	SC	Schedule 1	X		
Emydoidea blandingii	Blanding's Turtle (Great Lakes / St. Lawrence population)	S3	THR	E	E	Schedule 1	X		
Graptemys geographica	Northern Map Turtle	S3	SC	SC	SC	Schedule 1	X		
Snakes									
Lampropeltis triangulum	Milksnake	S4	NAR	SC	SC	Schedule 1	X		
Nerodia sipedon sipedon	Northern Watersnake	S5	NAR	NAR	NS	No schedule	X		
Regina septemvittata	Queensnake	S2	END	E	E	Schedule 1	X		
Storeria dekayi	Dekay's Brownsnake	S5	NAR	NAR	NS	No schedule	X		
Thamnophis sauritus septentrionalis	Northern Ribbonsnake	S4	SC	SC	SC	Schedule 1	X		
Thamnophis sirtalis sirtalis	Eastern Gartersnake	S5					X		
Salamanders									
Ambystoma laterale	Blue-spotted Salamander	S4					X		
Ambystoma maculatum	Spotted Salamander	S4					X		
Notophthalmus viridescens viridescens	Red-spotted Newt	S5					X		
Plethodon cinereus	Eastern Red-backed Salamander	S5					X		
Frogs and Toads									
Anaxyrus americanus	American Toad	S5					X		
Dryophytes versicolor	Gray Treefrog	S5					X		
Pseudacris triseriata pop. 1	Western Chorus Frog (Carolinian population)	S4	NAR	NAR	NS	No schedule	X		
Pseudacris crucifer	Spring Peeper	S5					X		
Lithobates catesbeianus	American Bullfrog	S4					X		
Lithobates clamitans	Green Frog	S5					X		
Lithobates palustris	Pickerel Frog	S4	NAR	NAR	NS	No schedule	X		
Lithobates pipiens	Northern Leopard Frog	S5	NAR	NAR	NS	No schedule	X		
Lithobates sylvaticus	Wood Frog	S5					X		
Total							**23**	**0**	**0**

*ORAA Atlas Square: 17MH85

**NHIC Atlas Square: 17MH8257

References

Ministry of Natural Resources and Forestry (MNRF). 2023a. Natural Heritage Information Centre (NHIC): Species List for Ontario. Published: 2014-07-17. All Species List Updated: 2023-05-17. Available: https://www.ontario.ca/page/get-natural-heritage-information

Ministry of the Environment, Conservation, and Parks (MECP). 2023. Species at Risk in Ontario. Published: 2018-07-12. Updated: 2023-05-23. Available: https://www.ontario.ca/page/species-risk-ontario

Government of Canada. 2023. Species at Risk Public Registry: Species Search. COSEWIC Last Assessment Date: 2023-05-05. Available: https://species-registry.canada.ca/index-en.html#/species?sortBy=commonNameSort&sortDirection=asc&pageSize=10

Ontario Nature. 2019. Ontario Reptile and Amphibian Atlas Program: Interactive Range Maps. Accessed October 2019.

Ministry of Natural Resources and Forestry (MNRF). 2023b. Natural Heritage Information Centre (NHIC): Make a Natural Heritage Area Map Application. Published: 2014-07-17. Updated 2023-03-03. Available: https://www.ontario.ca/page/make-natural-heritage-area-map

Appendix VII
Mammal Species Reported from the Study Area

Mammal Species Reported from the Study Area - 32 Chesterfield Ave., London (Project #2363)

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	Ontario Mammal Atlas	NHIC Data**	NRSI Observed
		MNRF 2023a	MECP 2023	Government of Canada 2023	Government of Canada 2023	Government of Canada 2023	Dobbyn 1994	MNRF 2023b	NRSI Results from 2020
Didelphimorphia	**Opossums**								
Didelphis virginiana	Virginia Opossum	S4					X		
Eulipotyphla	**Shrews, Moles, Hedgehogs, and Allies**								
Blarina brevicauda	Northern Short-tailed Shrew	S5					X		
Condylura cristata	Star-nosed Mole	S5					X		
Parascalops breweri	Hairy-tailed Mole	S4					X		
Sorex cinereus	Masked Shrew	S5					X		
Sorex fumeus	Smoky Shrew	S5					X		
Sorex hoyi	Pygmy Shrew	S4					X		
Sorex palustris	Water Shrew	S5					X		
Chiroptera	**Bats**								
Eptesicus fuscus	Big Brown Bat	S4					X		
Lasionycteris noctivagans	Silver-haired Bat	S4		E	NS	No schedule	X		
Lasiurus borealis	Eastern Red Bat	S4		E	NS	No schedule	X		
Lasiurus cinereus	Hoary Bat	S4		E	NS	No schedule	X		
Myotis leibii	Eastern Small-footed Myotis	S2S3	END				X		
Myotis lucifugus	Little Brown Myotis	S3	END	E	E	Schedule 1	X		
Myotis septentrionalis	Northern Myotis	S3	END	E	E	Schedule 1	X		
Perimyotis subflavus	Tri-colored Bat	S3?	END	E	E	Schedule 1	X		
Lagomorpha	**Rabbits and Hares**								
Lepus americanus	Snowshoe Hare	S5					X		
Lepus europaeus	European Hare	SNA					X		
Sylvilagus floridanus	Eastern Cottontail	S5					X		X
Rodentia	**Rodents**								
Castor canadensis	Beaver	S5					X		
Erethizon dorsatum	Porcupine	S5					X		
Glaucomys volans	Southern Flying Squirrel (Great Lakes Plains population)	S4	NAR	NAR	NS	No schedule	X		
Marmota monax	Woodchuck	S5					X		
Microtus pennsylvanicus	Meadow Vole	S5					X		
Microtus pinetorum	Woodland Vole	S3?	SC	SC	SC	Schedule 1	X		
Mus musculus	House Mouse	SNA					X		
Napaeozapus insignis	Woodland Jumping Mouse	S5					X		
Ondatra zibethicus	Muskrat	S5					X		
Peromyscus leucopus	White-footed Mouse	S5					X		
Peromyscus maniculatus	Deer Mouse	S5					X		
Rattus norvegicus	Norway Rat	SNA					X		
Sciurus carolinensis	Eastern Gray Squirrel	S5					X		X
Synaptomys cooperi	Southern Bog Lemming	S4					X		
Tamias striatus	Eastern Chipmunk	S5					X		
Tamiasciurus hudsonicus	Red Squirrel	S5					X		
Zapus hudsonius	Meadow Jumping Mouse	S5					X		
Canidae	**Canines**								
Canis latrans	Coyote	S5					X		
Vulpes vulpes	Red Fox	S5					X		
Felidae	**Felines**								
Lynx canadensis	Canada Lynx	S5	NAR	NAR	NS	No schedule	X		
Mephitidae	**Skunks and Stink Badgers**								
Mephitis mephitis	Striped Skunk	S5					X		
Mustelidae	**Weasels and Allies**								
Mustela richardsonii	American Ermine	S5					X		
Neogale frenata	Long-tailed Weasel	S4					X		
Neogale vison	American Mink	S4					X		

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	Ontario Mammal Atlas	NHIC Data**	NRSI Observed
Taxidea taxus jacksoni	American Badger (Southwestern Ontario population)	S1	END	E	E	Schedule 1	X		
Procyonidae	**Raccoons and Allies**								
Procyon lotor	Northern Raccoon	S5					X		X
Artiodactyla	**Deer and Bison**								
Cervus elaphus	Elk	SNA	EXT				X		
Odocoileus virginianus	White-tailed Deer	S5					X		X
Total							**47**	**0**	**4**

*Mammal Atlas Square Number: MT
**NHIC Atlas Square: 17MH8257

References

Ministry of Natural Resources and Forestry (MNRF). 2023a. Natural Heritage Information Centre (NHIC): Species List for Ontario. Published: 2014-07-17. All Species List Updated: 2023-05-17. Available: https://www.ontario.ca/page/get-natural-heritage-information

Ministry of the Environment, Conservation, and Parks (MECP). 2023. Species at Risk in Ontario. Published: 2018-07-12. Updated: 2023-05-23. Available: https://www.ontario.ca/page/species-risk-ontario

Government of Canada. 2023. Species at Risk Public Registry: Species Search. COSEWIC Last Assessment Date: 2023-05-05. Available: https://species-registry.canada.ca/index-en.html#/species?sortBy=commonNameSort&sortDirection=asc&pageSize=10

Dobbyn, J.S. 1994. Atlas of the Mammals of Ontario. Don Mills, Federation of Ontario Naturalists. 120p.

Ministry of Natural Resources and Forestry (MNRF). 2023b. Natural Heritage Information Centre (NHIC): Make a Natural Heritage Area Map Application. Published: 2014-07-17. Updated 2023-03-03. Available: https://www.ontario.ca/page/make-natural-heritage-area-map

Appendix VIII
Butterfly Species Reported from the Study Area

Butterfly Species Reported from the Study Area - 32 Chesterfield Ave., London (Project #2363)

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	Ontario Butterfly Atlas*	NHIC Data**	NRSI Observed
		MNRF 2023a	MECP 2023	Government of Canada 2023	Government of Canada 2023	Government of Canada 2023	Macnaughton et al. 2023	MNRF 2023b	NRSI Results from 2020
Hesperiidae	**Skippers**								
Anatrytone logan	Delaware Skipper	S4					X		
Ancyloxypha numitor	Least Skipper	S5					X		
Epargyreus clarus	Silver-spotted Skipper	S4					X		
Erynnis baptisiae	Wild Indigo Duskywing	S4					X		
Poanes viator	Broad-winged Skipper	S4					X		
Polites peckius	Peck's Skipper	S5					X		
Polites themistocles	Tawny-edged Skipper	S5					X		
Thymelicus lineola	European Skipper	SNA					X		
Wallengrenia egeremet	Northern Broken Dash	S5					X		
Papilionidae	**Swallowtails**								
Heraclides cresphontes	Giant Swallowtail	S4					X		
Papilio glaucus	Eastern Tiger Swallowtail	S5					X		
Papilio polyxenes	Black Swallowtail	S5					X		
Papilio troilus	Spicebush Swallowtail	S4					X		
Pieridae	**Whites and Sulphurs**								
Colias eurytheme	Orange Sulphur	S5					X		
Colias philodice	Clouded Sulphur	S5					X		
Pieris rapae	Cabbage White	SNA					X		
Pieris virginiensis	West Virginia White	S3	SC				X		
Lycaenidae	**Harvesters, Coppers, Hairstreaks, Blues**								
Celastrina lucia	Northern Spring Azure	S5					X		
Celastrina neglecta	Summer Azure	S5					X		
Celastrina sp.	Azure species	SNA					X		
Cupido comyntas	Eastern Tailed Blue	S5					X		
Satyrium calanus	Banded Hairstreak	S4					X		
Satyrium caryaevorus	Hickory Hairstreak	S4					X		
Satyrium liparops	Striped Hairstreak	S5					X		
Satyrium titus	Coral Hairstreak	S5					X		
Nymphalidae	**Brush-footed Butterflies**								
Aglais milberti	Milbert's Tortoiseshell	S5					X		
Asterocampa celtis	Hackberry Emperor	S3					X		
Asterocampa clyton	Tawny Emperor	S3					X		
Cercyonis pegala	Common Wood-Nymph	S5					X		
Coenonympha california	Common Ringlet	S5					X		
Danaus plexippus	Monarch	S2N,S4B	SC	E	SC	Schedule 1	X		
Euphydryas phaeton	Baltimore Checkerspot	S4					X		
Junonia coenia	Common Buckeye	SNA					X		
Lethe eurydice	Eyed Brown	S5					X		
Limenitis archippus	Viceroy	S5					X		
Limenitis arthemis astyanax	Red-spotted Purple	S5					X		
Megisto cymela	Little Wood-Satyr	S5					X		
Nymphalis antiopa	Mourning Cloak	S5					X		
Nymphalis l-album	Compton Tortoiseshell	S5					X		

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	Ontario Butterfly Atlas*	NHIC Data**	NRSI Observed
Phyciodes cocyta	Northern Crescent	S5					X		
Phyciodes tharos	Pearl Crescent	S4					X		
Polygonia comma	Eastern Comma	S5					X		
Polygonia interrogationis	Question Mark	S5					X		
Speyeria cybele	Great Spangled Fritillary	S5					X		
Vanessa atalanta	Red Admiral	S5B					X		
Vanessa cardui	Painted Lady	S5B					X		
Total							**46**	**0**	**0**

*TEA Atlas Square: Square #
**NHIC Atlas Square: Square #

References

Ministry of Natural Resources and Forestry (MNRF). 2023a. Natural Heritage Information Centre (NHIC): Species List for Ontario. Published: 2014-07-17. All Species List Updated: 2023-05-17. Available: https://www.ontario.ca/page/get-natural-heritage-information

Ministry of the Environment, Conservation, and Parks (MECP). 2023. Species at Risk in Ontario. Published: 2018-07-12. Updated: 2023-05-23. Available: https://www.ontario.ca/page/species-risk-ontario

Government of Canada. 2023. Species at Risk Public Registry: Species Search. COSEWIC Last Assessment Date: 2023-05-05. Available: https://species-registry.canada.ca/index-en.html#/species?sortBy=commonNameSort&sortDirection=asc&pageSize=10

Macnaughton A., Layberry R., Cavasin R., Edwards B., and C. Jones. 2023. Ontario Butterfly Atlas. Updated January 2023. Available: https://www.ontarioinsects.org/atlas/index.html

Ministry of Natural Resources and Forestry (MNRF). 2023b. Natural Heritage Information Centre (NHIC): Make a Natural Heritage Area Map Application. Published: 2014-07-17. Updated 2023-03-03. Available: https://www.ontario.ca/page/make-natural-heritage-area-map

Appendix IX
Odonate Species Reported from the Study Area

Odonate Species Reported from the Study Area - 32 Chesterfield Ave., London (Project #2363)

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	Odonate Atlas*	NHIC Data**	NRSI Observed
		MNRF 2023a	MECP 2023	Government of Canada 2023	Government of Canada 2023	Government of Canada 2023	OOAD 2023	MNRF 2023b	
Calopterygidae	**Broadwinged Damselflies**								
Calopteryx aequabilis	River Jewelwing	S5					X		
Calopteryx maculata	Ebony Jewelwing	S5					X		
Hetaerina americana	American Rubyspot	S4					X		
Lestidae	**Spreadwings**								
Lestes congener	Spotted Spreadwing	S5					X		
Lestes dryas	Emerald Spreadwing	S5					X		
Lestes eurinus	Amber-winged Spreadwing	S4					X		
Lestes rectangularis	Slender Spreadwing	S5					X		
Lestes unguiculatus	Lyre-tipped Spreadwing	S5					X		
Lestes vigilax	Swamp Spreadwing	S4					X		
Coenagrionidae	**Narrow-winged Damselflies**								
Argia apicalis	Blue-fronted Dancer	S4					X		
Argia fumipennis violacea	Violet Dancer	S5					X		
Argia moesta	Powdered Dancer	S5					X		
Coenagrion resolutum	Taiga Bluet	S5					X		
Enallagma antennatum	Rainbow Bluet	S4					X		
Enallagma boreale	Boreal Bluet	S5					X		
Enallagma carunculatum	Tule Bluet	S5					X		
Enallagma civile	Familiar Bluet	S5					X		
Enallagma ebrium	Marsh Bluet	S5					X		
Enallagma exsulans	Stream Bluet	S5					X		
Enallagma geminatum	Skimming Bluet	S4					X		
Enallagma signatum	Orange Bluet	S4					X		
Enallagma traviatum	Slender Bluet	S2S3					X		
Enallagma vesperum	Vesper Bluet	S4					X		
Ischnura posita	Fragile Forktail	S4					X		
Ischnura verticalis	Eastern Forktail	S5					X		
Nehalennia irene	Sedge Sprite	S5					X		
Aeshnidae	**Darners**								
Aeshna canadensis	Canada Darner	S5					X		
Aeshna constricta	Lance-tipped Darner	S5					X		
Aeshna umbrosa	Shadow Darner	S5					X		
Aeshna verticalis	Green-striped Darner	S4					X		
Anax junius	Common Green Darner	S5					X		
Gomphidae	**Clubtails**								
Phanogomphus spicatus	Dusky Clubtail	S5					X		
Corduliidae	**Emeralds**								
Epitheca princeps	Prince Baskettail	S5					X		
Libellulidae	**Skimmers**								
Celithemis elisa	Calico Pennant	S5					X		
Celithemis eponina	Halloween Pennant	S4					X		
Erythemis simplicicollis	Eastern Pondhawk	S5					X		

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	Odonate Atlas*	NHIC Data**	NRSI Observed
Ladona julia	Chalk-fronted Corporal	S5					X		
Leucorrhinia frigida	Frosted Whiteface	S5					X		
Leucorrhinia glacialis	Crimson-ringed Whiteface	S4					X		
Leucorrhinia intacta	Dot-tailed Whiteface	S5					X		
Libellula incesta	Slaty Skimmer	S4					X		
Libellula luctuosa	Widow Skimmer	S5					X		
Libellula pulchella	Twelve-spotted Skimmer	S5					X		
Nannothemis bella	Elfin Skimmer	S4					X		
Pachydiplax longipennis	Blue Dasher	S5					X		
Pantala hymenaea	Spot-winged Glider	S4					X		
Perithemis tenera	Eastern Amberwing	S4					X		
Plathemis lydia	Common Whitetail	S5					X		
Sympetrum obtrusum	White-faced Meadowhawk	S5					X		
Sympetrum rubicundulum	Ruby Meadowhawk	S5					X		
Sympetrum semicinctum	Band-winged Meadowhawk	S4					X		
Sympetrum vicinum	Autumn Meadowhawk	S5					X		
Tramea lacerata	Black Saddlebags	S4					X		
Total							**53**	**0**	**0**

**Odonate Atlas Square Numbers: 17MH85*
***NHIC Atlas Squares: 17MH8257*

References

Ministry of Natural Resources and Forestry (MNRF). 2023a. Natural Heritage Information Centre (NHIC): Species List for Ontario. Published: 2014-07-17. All Species List Updated: 2023-05-17. Available: https://www.ontario.ca/page/get-natural-heritage-information

Ministry of the Environment, Conservation, and Parks (MECP). 2023. Species at Risk in Ontario. Published: 2018-07-12. Updated: 2023-05-23. Available: https://www.ontario.ca/page/species-risk-ontario

Government of Canada. 2023. Species at Risk Public Registry: Species Search. COSEWIC Last Assessment Date: 2023-05-05. Available: https://species-registry.canada.ca/index-en.html#/species?sortBy=commonNameSort&sortDirection=asc&pageSize=10

Ontario Odonata Atlas Database (OOAD). 2023. Natural Heritage Information Centre, Ontario Ministry of Natural Resources and Forestry. Species data by 10x10 km square accessed on June 8, 2023

Ministry of Natural Resources and Forestry (MNRF). 2023b. Natural Heritage Information Centre (NHIC): Make a Natural Heritage Area Map Application. Published: 2014-07-17. Updated 2023-03-03. Available: https://www.ontario.ca/page/make-natural-heritage-area-map

Appendix X
Fish Species Reported from the Study Area

Fish Species Reported from the Study Area - 32 Chesterfield Ave., London (Project #2363)

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	Fisheries and Oceans SAR Data	Aquatic Resource Area Data	NHIC Data*
		MNRF 2023a	MECP 2022	ernment of Canada 2	ernment of Canada 2	ernment of Canada 2	DFO 2022	MNRF 2023b	MNRF 2023c
Petromyzontidae	**Lampreys**								
Ichthyomyzon fossor	Northern Brook Lamprey (Great Lakes - Upper St. Lawrence population)	S3	SC	SC	SC	Schedule 1	X		
Cyprinidae	**Carps**								
Cyprinus carpio	Common Carp	SNA						X	
Leuciscidae	**Minnows**								
Campostoma anomalum	Central Stoneroller	S4	NAR	NAR	NS	No schedule		X	
Chrosomus eos	Northern Redbelly Dace	S5						X	
Cyprinella spiloptera	Spotfin Shiner	S4						X	
Luxilus chrysocephalus	Striped Shiner	S4	NAR	NAR	NS	No schedule		X	
Luxilus cornutus	Common Shiner	S5						X	
Nocomis biguttatus	Hornyhead Chub	S4	NAR	NAR	NS	No schedule		X	
Nocomis micropogon	River Chub	S4	NAR	NAR	NS	No schedule		X	
Notemigonus crysoleucas	Golden Shiner	S5						X	
Notropis photogenis	Silver Shiner	S2S3	THR	T	T	Schedule 1	X	X	X
Notropis rubellus	Rosyface Shiner	S4	NAR	NAR	NS	No schedule		X	
Notropis volucellus	Mimic Shiner	S5						X	
Pimephales notatus	Bluntnose Minnow	S5	NAR	NAR	NS	No schedule		X	
Pimephales promelas	Fathead Minnow	S5						X	
Rhinichthys atratulus	Blacknose Dace	SNR						X	
Rhinichthys cataractae	Longnose Dace	S5						X	
Semotilus atromaculatus	Creek Chub	S5						X	
Catostomidae	**Suckers**								
Catostomus commersonii	White Sucker	S5						X	
Hypentelium nigricans	Northern Hog Sucker	S4						X	
Moxostoma duquesnei	Black Redhorse	S2	THR	T	T	Schedule 1	X		X
Moxostoma erythrurum	Golden Redhorse	S4	NAR	NAR	NS	No schedule		X	
Moxostoma valenciennesi	Greater Redhorse	S3						X	
Ictaluridae	**North American Catfishes**								
Ameiurus melas	Black Bullhead	S4						X	
Ameiurus nebulosus	Brown Bullhead	S5						X	
Noturus flavus	Stonecat	S4						X	
Esocidae	**Pikes**								
Esox lucius	Northern Pike	S5						X	
Esox masquinongy	Muskellunge	S4						X	
Umbridae	**Mudminnows**								
Umbra limi	Central Mudminnow	S5						X	
Salmonidae	**Trouts and Salmons**								
Salmo trutta	Brown Trout	SNA						X	
Gasterosteidae	**Sticklebacks**								
Culaea inconstans	Brook Stickleback	S5						X	
Centrarchidae	**Sunfishes and Basses**								
Ambloplites rupestris	Rock Bass	S5						X	
Lepomis cyanellus	Green Sunfish	S4	NAR	NAR	NS	No schedule		X	
Lepomis gibbosus	Pumpkinseed	S5						X	
Lepomis macrochirus	Bluegill	S5						X	
Lepomis peltastes pop. 2	Northern Sunfish (Great Lakes - Upper St. Lawrence populations)	S3	SC	SC	SC	Schedule 1	X		
Micropterus dolomieu	Smallmouth Bass	S5						X	
Micropterus salmoides	Largemouth Bass	S5						X	

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	Fisheries and Oceans SAR Data	Aquatic Resource Area Data	NHIC Data*
Pomoxis nigromaculatus	Black Crappie	S4						X	
Percidae	**Perches and Darters**								
Etheostoma blennioides	Greenside Darter	S4	NAR	NAR	SC	Schedule 3		X	
Etheostoma caeruleum	Rainbow Darter	S4						X	
Etheostoma exile	Iowa Darter	S5						X	
Etheostoma flabellare	Fantail Darter	S4						X	
Etheostoma microperca	Least Darter	S4	NAR	NAR	NS	No schedule		X	
Etheostoma nigrum	Johnny Darter	S5						X	
Perca flavescens	Yellow Perch	S5						X	
Percina caprodes	Logperch	S5						X	
Percina maculata	Blackside Darter	S4						X	
Sander vitreus	Walleye	S5						X	
Total							**4**	**46**	**2**

*NHIC Atlas Square(s): 17MH8257

References

Ministry of Natural Resources and Forestry (MNRF). 2023a. Natural Heritage Information Centre (NHIC): Species List for Ontario. Published: 2014-07-17. All Species List Updated: 2023-05-17. Available: https://www.ontario.ca/page/get-natural-heritage-information

Ministry of the Environment, Conservation, and Parks (MECP). 2023. Species at Risk in Ontario. Published: 2018-07-12. Updated: 2023-05-23. Available: https://www.ontario.ca/page/species-risk-ontario

Government of Canada. 2023. Species at Risk Public Registry: Species Search. COSEWIC Last Assessment Date: 2023-05-05. Available: https://species-registry.canada.ca/index-en.html#/species?sortBy=commonNameSort&sortDirection=asc&pageSize=10

Department of Fisheries and Oceans Canada (DFO). 2022. Aquatic Species at Risk Critical Habitat and Species at Risk Distribution Data. Updated: 2022-12-29. Available: https://www.dfo-mpo.gc.ca/species-especes/sara-lep/map-carte/index-eng.html

Ministry of Natural Resources and Forestry (MNRF). 2023b. Land Information Ontario: Ontario GeoHub. Aquatic Resource Area Survey Point Data. Published: 2009-06-08. Updated: 2023-05-26. Available: https://geohub.lio.gov.on.ca/datasets/

Ministry of Natural Resources and Forestry (MNRF). 2023c. Natural Heritage Information Centre (NHIC): Make a Natural Heritage Area Map Application. Published: 2014-07-17. Updated 2023-03-03. Available: https://www.ontario.ca/page/make-natural-heritage-area-map

Appendix XI
Mussel Species Reported from the Study Area

Mussel Species Reported from the Study Area - 32 Chesterfield Ave., London (Project #2363)

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA STATUS	SARA SCHEDULE	Fisheries and Oceans SAR Data	NHIC Data
		MNRF 2023a	MECP 2023	Government of Canada 2023	Government of Canada 2023	Government of Canada 2023	DFO 2022	MNRF 2023b
Unionida	**Native Freshwater Mussels**							
Ambleminae								
Cyclonaias tuberculata	Purple Wartyback	S2	THR	T	NS	No schedule		X
Pleurobema sintoxia	Round Pigtoe	S1	END	E	E	Schedule 1	X	
Lampsilinae								
Cambarunio iris	Rainbow	S1	SC	SC	SC	Schedule 1	X	
Lampsilis fasciola	Wavy-rayed Lampmussel	S2	THR	SC	SC	Schedule 1	X	
Ptychobranchus fasciolaris	Kidneyshell	S1	END	E	E	Schedule 1	X	
Villosa fabalis	Rayed Bean	S1	END	E	E	Schedule 1	X	
Total							**5**	**1**

*NHIC Atlas Squares: 17MH8257

References

Ministry of Natural Resources and Forestry (MNRF). 2023a. Natural Heritage Information Centre (NHIC): Species List for Ontario. Published: 2014-07-17. All Species List Updated: 2023-05-17. Available: https://www.ontario.ca/page/get-natural-heritage-information

Ministry of the Environment, Conservation, and Parks (MECP). 2023. Species at Risk in Ontario. Published: 2018-07-12. Updated: 2023-05-23. Available: https://www.ontario.ca/page/species-risk-ontario

Government of Canada. 2023. Species at Risk Public Registry: Species Search. COSEWIC Last Assessment Date: 2023-05-05. Available: https://species-registry.canada.ca/index-en.html#/species?sortBy=commonNameSort&sortDirection=asc&pageSize=10

Department of Fisheries and Oceans Canada (DFO). 2022. Aquatic Species at Risk Critical Habitat and Species at Risk Distribution Data. Updated: 2022-12-29. Available: https://www.dfo-mpo.gc.ca/species-especes/sara-lep/map-carte/index-eng.html

Ministry of Natural Resources and Forestry (MNRF). 2023b. Natural Heritage Information Centre (NHIC): Make a Natural Heritage Area Map Application. Published: 2014-07-17. Updated 2023-03-03. Available: https://www.ontario.ca/page/make-natural-heritage-area-map

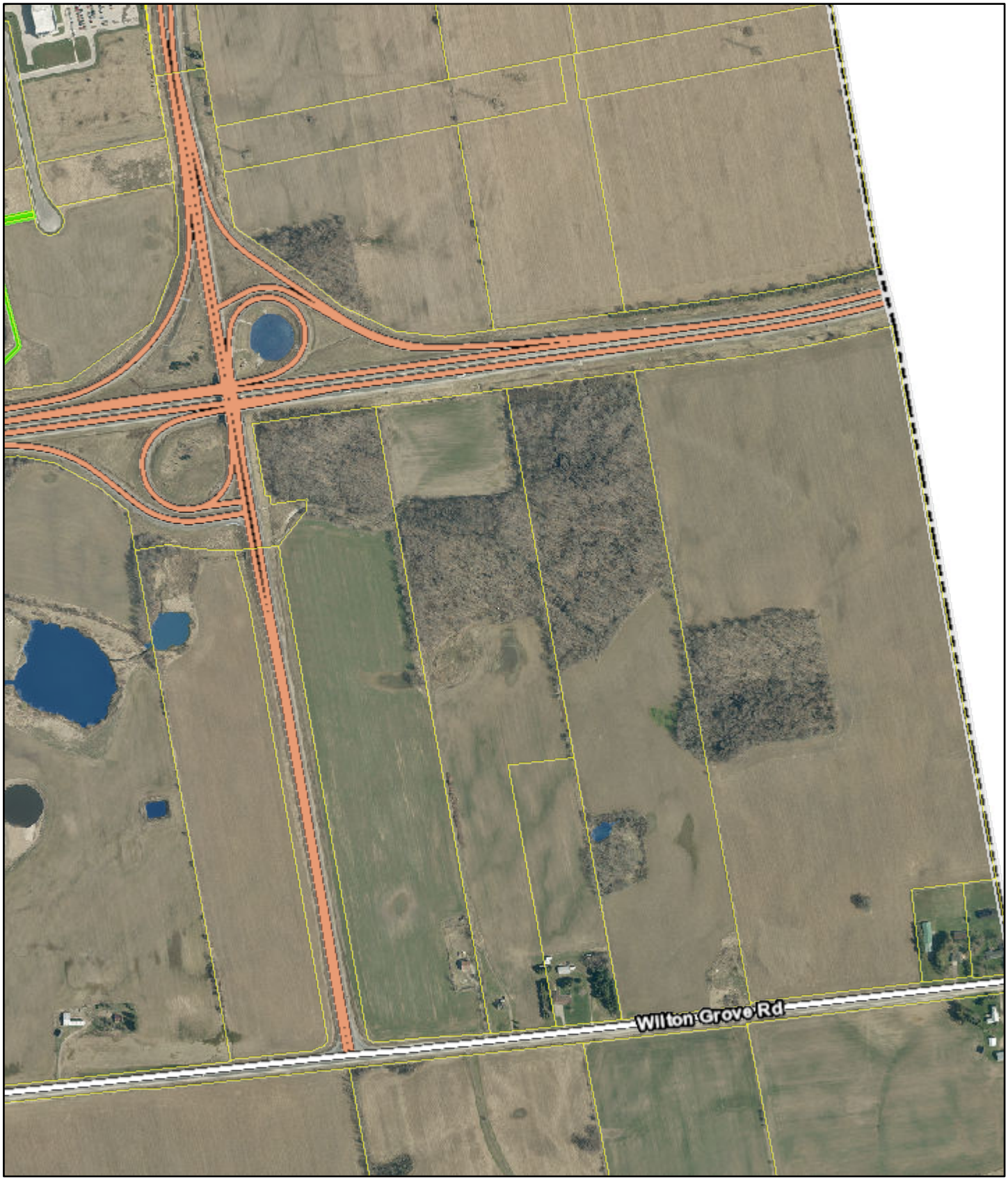
Appendix XII
Net Effects Assessment Table

SOURCE OF IMPACT	POTENTIAL AREAS AFFECTS & POTENTIAL EFFECTS	AVOIDANCE, MITIGATION, COMPENSATION	NET EFFECTS & RATIONALE
1.0 Existing Impacts (where opportunities for net positive effects have been identified):			
6.3 Existing Conditions	The adjacent Significant Woodland is currently not buffered from residential activities such as lawn maintenance.	A 30m Significant Woodland buffer has be applied. This buffer primarily overlaps the existing residential lot, the footprint of the residential dwelling is not proposed to be altered. Since the buffer overlaps an existing developed lot, it has not been proposed for planting and enhancement. Alternatively, the portion of the subject property to the north of lot 8 will be enhanced, naturalized and conveyed to the City of London. An invasive species management plan and planting plan will be developed at the consent stage.	A net improvement to Significant Woodland will be realized through enhancement and naturalization measures implemented within the portion of the subject property to the north of lot 8. No new construction is proposed within the 30m buffer identified from the Significant Woodland, much of which is located on lands outside of the subject property.
2.0 Direct Impacts:			
6.5.1 Site Grading	Site grading has the potential to cut or compress tree root systems, change hydrological flow patterns, destabilize slopes, and remove wildlife habitat.	Grading will be limited to areas outside of the 30m Significant Woodland buffer. Tree protection areas are delineated in the TPP (NRSI 2023)	No significant net effects are expected.
6.5.2 Vegetation Removal	Removal of isolated trees and hedgerow trees is proposed. This can adversely affect wildlife that rely on this habitat. Trees reduce flooding and heat island effects.	Trees within the subject property have been identified for retention and protected wherever possible, as shown in the TPP (NRSI 2023). Trees should be removed outside of MBCA and active bat seasons, outlined in the TPP and EIS. Compensation trees are required, the compensation ratio to be used will be determined at the	With proposed compensation and naturalization area plantings, and adherence to wildlife timing windows, no net effects are expected.

SOURCE OF IMPACT	POTENTIAL AREAS AFFECTS & POTENTIAL EFFECTS	AVOIDANCE, MITIGATION, COMPENSATION	NET EFFECTS & RATIONALE
		consent stage. Native plantings will also be provided within the enhancement and restoration areas in the north of the subject property.	
6.5.3 Species at Risk	A planted Kentucky Coffee-tree is present within the proposed development area. Although habitat is not present within the subject property, it has been confirmed that the individual is afforded protection under the *ESA, 2007.*	The Kentucky Coffee-tree will be relocated to the naturalization area identified in the northern portion of the subject property, within the floodplain of the Thames River. A Notice of Activity and Mitigation Plan will be prepared in accordance with O. Reg. 242/08.	Through the correct implementation of the Kentucky Coffee-tree relocation and development of a Mitigation Plan, no net effects are anticipated.
3.0 Indirect Impacts:			
6.6.1 Hydrological Changes	The proposed development and grading may result in changes to overland flow patterns and will reduce pervious lands within the subject property. Proposed construction works could result in turbid water entering the Thames River and drainage feature.	A grading plan will be developed that promotes infiltration and directs overland flows to the municipal SWM system. The grading plan will be developed at the consent stage. During construction ESC measures such as fencing will be implemented.	Through the development of an appropriate grading plan and implementation of ESC measures during construction, no significant net impacts are expected.
6.6.2 Erosion and Sedimentation	During construction, areas of bare soil may be exposed that have the potential to erode during precipitation events and impact adjacent natural features. In the event of a heavy rain or snow melt event, sediment laden runoff can	Erosion and Sediment Control (ESC) fencing will be required as part of an ESC Plan.	Through the use of an effective ESC Plan, no significant net impacts are expected.

SOURCE OF IMPACT	POTENTIAL AREAS AFFECTS & POTENTIAL EFFECTS	AVOIDANCE, MITIGATION, COMPENSATION	NET EFFECTS & RATIONALE
	enter adjacent natural areas by way of overland flow.		
6.6.3 Impacts to Wildlife and Vegetation Communities	Potential indirect impacts to wildlife and vegetation communities may arise from noise and dust associated with construction activities. Dust has the potential to cover vegetation, reducing photosynthetic rates, slowing evapotranspiration, and in effect, interrupting thermoregulating processes.	Adherence to a construction schedule, and soaking dry exposed soils are recommended to mitigate these potential impacts.	Construction schedules and soaking exposed soils should effectively ensure that there are no significant net impacts.

London City Map



2024-02-09, 12:59:45 p.m.

1:8,000

0 0.05 0.1 0.2 mi

0 0.1 0.2 0.4 km

London City Map

2024-02-09, 12:57:23 p.m.

1:8,000

0 0.05 0.1 0.2 mi

0 0.1 0.2 0.4 km

CITY OF LONDON
TREE PROTECTION BY-LAW

SCHEDULE B

as of October 26, 2020

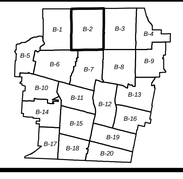
Tree Protection Area

KEY MAP
B-2

1:6,500

0 100 200 400

Meters



DISCLAIMER:

The City of London Tree Protection By-Law Maps and related information are made available for information only.
The City of London does not warrant that this information is the most current version or that there are no errors or omissions contained herein.
The City of London accepts no responsibility for damages, if any, suffered by any person as a result of decisions made or actions based on this information and any person undertaking work based on this information.
Any person undertaking work based on this information assumes all risk in connection therewith and any damages done or occasioned shall be at the sole risk and expense of that person.
Readers of this information should verify it with the City's Planning Services before acting on it.
No permission is given for distribution of the Tree Protection By-Law maps or related information for commercial purposes.
This information may be used for other purposes only if the user of this information repeats this disclaimer and the notice of copyright.

CITY OF LONDON
TREE PROTECTION BY-LAW

SCHEDULE B

as of October 26, 2020

Tree Protection Area

KEY MAP
B-3

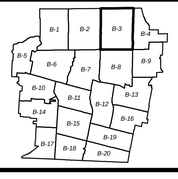
1:6,500

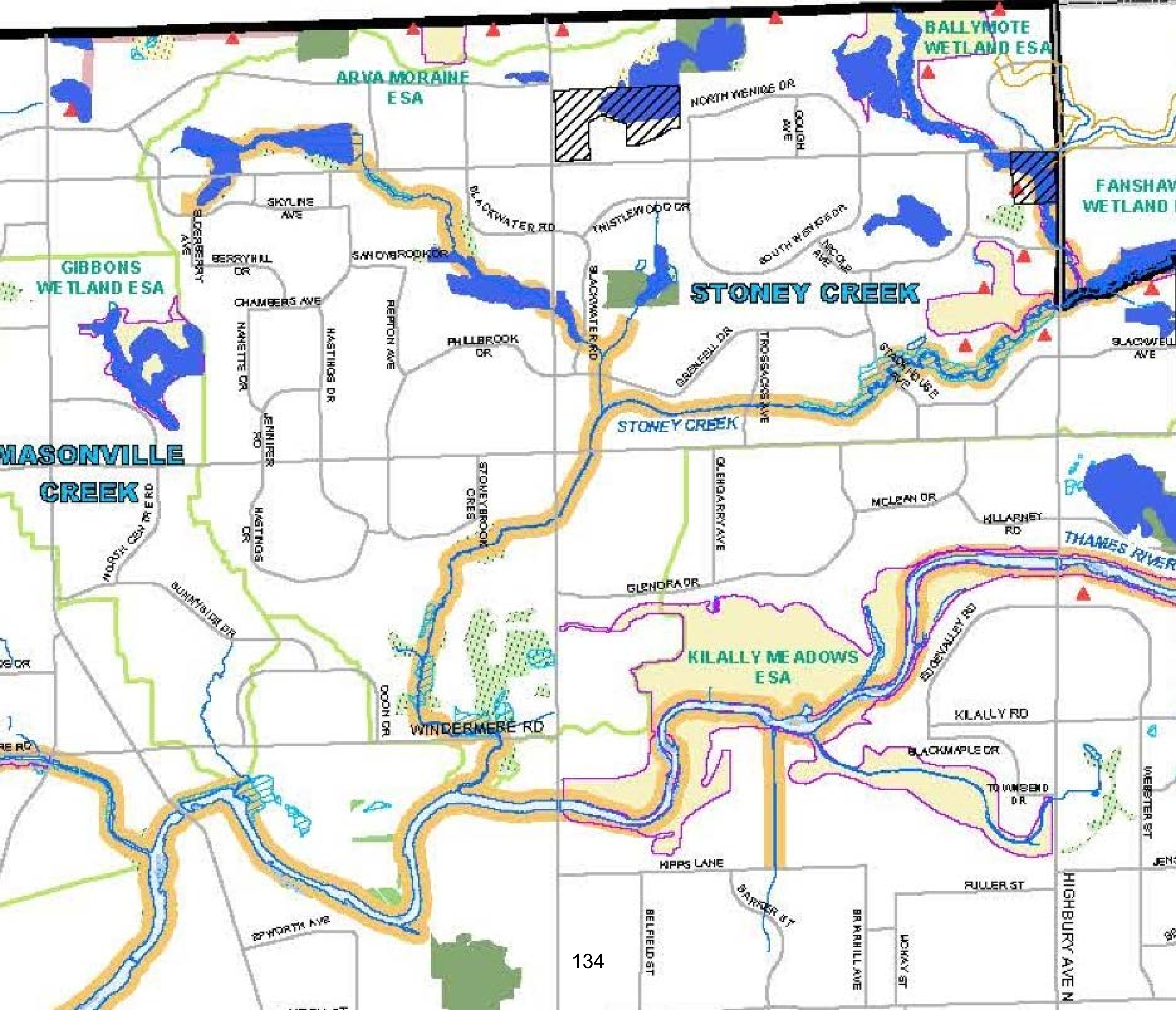
0 100 200 400

Meters

DISCLAIMER:

The City of London Tree Protection By-Law Maps and related information are made available for information only.
The City of London does not warrant that this information is the most current version or that there are no errors or omissions contained herein.
The City of London accepts no responsibility for damages, if any, suffered by any person as a result of decisions made or actions based on this information and any person undertaking work based on this information.
Any person undertaking work based on this information assumes all risk in connection therewith and any damages done or occasioned shall be at the sole risk and expense of that person.
Readers of this information should verify it with the City's Planning Services before acting on it.
No permission is given for distribution of the Tree Protection By-Law maps or related information for commercial purposes.
This information may be used for other purposes only if the user of this information repeats this disclaimer and the notice of copyright.




BALLYMOTE WETLAND ESA
ARVA MORAINE ESA
NORTH WENIGE DR
GOUGH AVE
FANSHAW WETLAND
SKYLINE AVE
ELDERBERRY AVE
BLACKWATER RD
THISTLEWOOD DR
SOUTH WENIGE DR
NICOLE AVE
GIBBONS WETLAND ESA
BERRYHILL DR
SANDYBROOK DR
STONEY CREEK
CHAMBERS AVE
NANETTE DR
HASTINGS DR
REPTON AVE
PHILLBROOK DR
GASKELL DR
TROSSACHS AVE
STACKHOUSE AVE
BLACKWELL AVE
JENNIFER RD
STONEY CREEK
MASONVILLE CREEK
STONEYBROOK CRES
GLENGARRY AVE
MCLEAN DR
KILLARNEY RD
NORTH CENTRE RD
HASTINGS DR
THAMES RIVER
SUNNYSIDE DR
GLENORA DR
EDGEVALLEY RD
KILALLY MEADOWS ESA
KILALLY RD
DOON DR
WINDERMERE RD
BLACKMAPLE DR
TOWNSEND DR
WEBSTER ST
KIPPS LANE
FULLER ST
HIGHBURY AVE N
BARKER ST
BELFIELD ST
BRIARHILL AVE
MCKAY ST
EPWORTH AVE